

# U.S. Department of the Interior Bureau of Land Management

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Environmental Assessment  
DOI-BLM-AZ-A010-2017-0039-EA

## Proposed Grazing Permit Renewals For Beaver Dam Slope and Mormon Well Allotments

Mohave County, Arizona

March 2020

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*Applicants:*

Edward L. Bowler  
E. Kip Bowler and Bret D. Bowler  
Allen Frei  
Dennis Frei  
Kyle D. Frei  
Nick Frei

Arizona Strip Field Office  
345 E. Riverside Drive  
St. George, Utah 84790  
Phone: (435) 688-3200  
FAX: (435) 688-3258



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## List of Acronyms

ACEC	Area of Critical Environmental Concern
AGFD	Arizona Game and Fish Department
AMP	Allotment Management Plan
AUM	Animal Unit Month
BCC	Birds of Conservation Concern
BLM	Bureau of Land Management
CBW	Composition by Weight
CFR	Code of Federal Regulations
DFC	Desired Future Condition
DPC	Desired Plant Community
DR	Decision Record
DWR	Dry Weight Rank
EA	Environmental Assessment
EIS	Environmental Impact Statement
ESA	Endangered Species Act
ESD	Ecological Site Description
ESI	Ecological Site Inventory
FLPMA	Federal Land Policy and Management Act
FONSI	Finding of No Significant Impact
GIS	Geographic Information System
IAT	Interdisciplinary Assessment Team
NEPA	National Environmental Policy Act
NRCS	Natural Resources Conservation Service
OHV	Off-Highway Vehicle
PFC	Proper Functioning Condition
PL	Public Law
PNC	Potential Natural Community
PRIA	Public Rangelands Improvement Act
p.z.	Precipitation Zone
RAC	Resource Advisory Council
RMP	Resource Management Plan
S&G	Standards and Guidelines
TGA	Taylor Grazing Act
USC	United States Code
USFWS	U.S. Fish and Wildlife Service
VRM	Visual Resource Management

# Chapter 1

## Purpose and Need for Action

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### 1.1 Introduction

The Bureau of Land Management (BLM) is considering the renewal of four grazing permits on the Beaver Dam Slope Allotment and the two grazing permits on the Mormon Well Allotment (see Figure A.1 in Appendix A). The BLM is responsible for determining the appropriate levels and management strategies for livestock grazing on these allotments. In 2008, the BLM conducted an evaluation of rangeland conditions on these allotments; a detailed discussion on rangeland health for these allotments can be found in Chapter 3, Section 3.2.2. An Interdisciplinary Assessment Team (IAT), during the land health evaluation process, reviewed resource conditions on the Beaver Dam Slope Allotment and recommended that conditions across the allotment were meeting Standard #1 and Standard #2, and partially meeting Standard #3. Livestock grazing was not identified as the causal factor for not fully meeting applicable Standards for Rangeland Health. In addition, BLM resource staff and staff from the U.S. Fish and Wildlife Service (USFWS) made field visits to this allotment to assess resource conditions and discuss desired vegetative communities for the Mojave Desert tortoise. The results of these discussions are incorporated into the desired plant community objectives developed for the allotment, as well as in making recommendations on whether resource conditions were meeting the standards for rangeland health. A land health evaluation report was completed for the Beaver Dam Slope Allotment in 2012 (BLM 2012).

The IAT also reviewed resource conditions on the Mormon Well Allotment and recommended that the allotment was meeting Standard #1 and partially meeting Standard #3. As with the Beaver Dam Slope Allotment, BLM resource staff and staff from the USFWS made field visits to this allotment to assess resource conditions and discuss desired vegetative communities for the Mojave Desert tortoise. The results of these discussions are incorporated into the desired plant community objectives developed for the allotment, as well as in making recommendations on whether resource conditions were meeting the standards for rangeland health. Livestock grazing was not identified as the causal factor for not fully meeting applicable Standards for Rangeland Health in this allotment. A land health evaluation report was completed for the Mormon Well Allotment in 2011 (BLM 2011). This allotment contains a riparian area, in the Mormon Well area of Beaver Dam Wash, which includes a large cottonwood gallery, although recent hydrological changes in the area have led to rapid loss of riparian vegetation. The riparian habitat that is present is located on private and state land; the portion of Beaver Dam Wash which occurs on federal land (the very northern end) is dry most of the year and non-riparian due to water withdrawals for the private land. The Arizona Standards and Guidelines provide an exemption to Standard 2 (Riparian/Wetland Sites) for areas with water withdrawals “permitted for construction, mining, or other similar activities” and that therefore do not provide for riparian or wetland habitat. Water from Beaver Dam Wash is withdrawn from the creek via water wells for livestock watering, as a private water source, and for domestic and irrigation uses. Thus, this area is not by definition a wetland/riparian area, so Standard #2 is not applicable on this allotment.

This Environmental Assessment (EA) has been prepared to disclose and analyze the environmental consequences of the proposed grazing permit renewals, as well as alternative livestock management, for the Beaver Dam Slope and Mormon Well Allotments. 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 these allotments, and whether changes to current management are necessary. This EA also serves as a tool to help the authorized officer make an informed decision that is in

conformance with the Arizona Strip Field Office Resource Management Plan (RMP) (BLM 2008a). The action culminates the evaluations conducted on the allotments under the Arizona BLM Standards for Rangeland Health and Guidelines for Grazing Management (BLM 1997). In addition, this EA determines if current grazing management practices would maintain desirable conditions and continue to allow improvement of public land resources, or whether changes in grazing management for the allotments are necessary. This EA is intended to evaluate the findings of the land health evaluations as it relates to vegetation conditions and resource values in the allotments. This is done in an effort to balance demands placed on the resources by various authorized uses within the allotments.

## **1.2 Purpose and Need**

The grazing permittees have submitted applications to renew their ten-year term grazing permits on the Beaver Dam Slope and Mormon Well Allotments. The BLM is proposing to fully process these grazing permits in accordance with all applicable laws, regulations, and policies. Compliance with all applicable laws and regulations includes consultation, coordination and cooperation with affected individuals, interested publics, States, and Indian Tribes; completion of the applicable level of NEPA review; consultation with the United States Fish and Wildlife Service (USFWS) under Section 7 of the Endangered Species Act; and ensuring that the allotments are achieving or making significant progress toward achievement of land health standards and RMP objectives.

The purpose of this action is to provide for livestock grazing opportunities on public lands where consistent with meeting management objectives, including the Arizona Standards for Rangeland Health and Guidelines for Livestock Grazing Management (BLM 1997) and the Arizona Strip Field Office RMP (BLM 2008a).

BLM Arizona adopted the Arizona Standards for Rangeland Health and Guidelines for Livestock Grazing Management in 1997; these Standards for Rangeland Health were incorporated into the Arizona Strip Field Office RMP. Standards for rangelands should be achieving or making significant progress towards achieving the standards and to provide for proper nutrient cycling, hydrologic cycling, and energy flow. Guidelines direct the selection of grazing management practices and, where appropriate, livestock facilities to promote significant progress toward, or the attainment and maintenance of, the standards. The RMP identifies resource management objectives and management actions that establish guidance for managing a broad spectrum of land uses and allocations for public lands in the Arizona Strip Field Office. The RMP identified public lands within the Beaver Dam Slope and Mormon Well Allotments as available for domestic livestock grazing with seasonal restrictions. Both allotments have designated critical habitat for desert tortoise, which limits the grazing season to October 15 – March 15 (during desert tortoise inactive season). Where consistent with the goals and objectives of the RMP and land health standards, allocation of forage for livestock use and the issuance of grazing permits to qualified applicants are provided for by the TGA and FLPMA.

The need for the proposed action is to respond to the applicants and fully process the term grazing permits on the Beaver Dam Slope and Mormon Well Allotments. The BLM now intends to consider whether to renew, renew with modifications, or not renew the grazing permits, in accordance with all applicable laws, regulations, and policies.

The Arizona Strip Field Office Manager is the authorized officer responsible for the decisions regarding management of public lands within these allotments. 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 Beaver Dam Slope Allotment and Mormon Well Allotment to ensure management objectives and Arizona Standards for Rangeland Health are achieved.

### 1.3 Conformance with Land Use Plan

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

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

- **DFC-GM-01:** Healthy, sustainable rangeland ecosystems will be maintained or improved to meet Arizona's Standards for Rangeland Health (1997) and produce a wide range of public values such as wildlife habitat, livestock forage, recreation opportunities, clean water, and functional watersheds.
- **DFC-GM-02:** Livestock use and associated management practices will be conducted in a manner consistent with other resource needs and objectives to ensure that the health of rangeland resources is preserved or improved so that they are productive for all rangeland values. Where needed, public rangeland ecosystems will be improved to meet objectives.
- **LA-GM-01:** All allotments will continue to be classified as available for grazing by livestock under the principle of multiple use and sustained yield, except where specifically noted.
- **LA-GM-03:** The following livestock grazing allotments with desert tortoise habitat will be available for livestock grazing:
  - Beaver Dam Slope
  - Highway
  - Mormon Well
  - Littlefield Community
  - Mesquite Community
- **MA-GM-02:** Implementing the Arizona Standards for Rangeland Health will continue on all grazing allotments in accordance with established schedules and congressional requirements. The Arizona Standards for Rangeland Health and Guidelines for Grazing Management will apply to all livestock grazing activities. These guidelines address management practices at the grazing AMP-level and are intended to maintain desirable conditions or improve undesirable rangeland conditions within reasonable time frames.
- **MA-GM-03:** The interdisciplinary allotment evaluation process will continue to be used to provide specific guidance and actions for managing livestock grazing. Existing AMPs and other activity plans will be consistent with achieving the DFCs and standards for rangeland health. They will contain the site-specific management objectives, as well as actions, methods, tools, and appropriate monitoring protocols.
- **MA-GM-04:** Existing management practices and levels of use on grazing allotments will be reviewed and evaluated on a priority basis to determine if they meet or are making progress toward meeting the Arizona Standards for Rangeland Health. Appropriate and timely actions will be implemented to deal with those areas not meeting the standards.
- **MA-GM-05:** The allotment management categorization process will continue to be used to define the level of management needed to properly administer livestock grazing according to management needs, resource conflicts, potential for improvement, and BLM funding/staffing constraints. The allotment categories are Custodial, managed 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:** 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%<sup>1</sup>.
- **MA-GM-08:** Any hay or other feed used in administering the livestock operation will be certified weed-free.
- **MA-GM-10:** Season of use on the following livestock grazing allotments with desert tortoise habitat will be from October 15 through March 15, with no authorization of ephemeral extensions:
  - Beaver Dam Slope
  - Highway
  - Mormon Well
  - Littlefield Community (Littlefield Slope Pasture only)
  - Mesquite Community (Littlefield Slope Pasture only)

The following decisions are from Table 2.15 in the RMP regarding Areas of Critical Environmental Concern (ACECs):

- **MA-AC-14(DT):** The Beaver Dam, Highway, and Mormon Well Allotments will be available for livestock grazing from October 15 to March 15.
- **MA-AC-04(VG):** Livestock will be excluded from suitable flycatcher habitat (whether occupied or unoccupied) during the vegetative growing season (bud break to leaf drop).
- **IMPL-AC-03:** Utilization levels of native riparian trees within the Virgin River Corridor ACEC will be limited to 30% of the apical stems per growing season.

The following decision is from Table 2.3 in the RMP concerning Mojave Desert Ecological Zone:

- **DFC-VM-27:** Endemic animal species such as desert tortoise and chuckwalla will be present and thriving with more than adequate food, water, and cover resources.

The following decisions are from Table 2.5 in the RMP concerning Desert Tortoise:

- **DFC-TE-09:** The Mojave population of desert tortoise will be recovered and delisted.
- **DFC-TE-10:** There will be no net loss in the quality or quantity of desert tortoise habitat within the ACECs or WHA (see Map 2.4).
- **DFC-TE-11:** Desert tortoise populations within the ACECs and Desert Wildlife Management Area (DWMA) will be healthy and self-sustaining. Populations will be stable or increasing. Population declines will be halted.
- **DFC-TE-12:** Desert tortoise populations outside of the ACECs and WHA will be healthy and stable. Declines in the WHA will be minimized to the extent possible through mitigation.

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<sup>1</sup> The Beaver Dam Slope and Mormon Well Allotments are both within desert tortoise habitat, so maximum utilization is 45%.

- **DFC-TE-13:** Desert tortoise habitat will provide sufficient forage and cover attributes to support thriving populations of the species.
- **DFC-TE-14:** Habitat connectivity will be maintained, providing sufficiently frequent contact between tortoises to maintain genetic diversity.

The allotments analyzed in this EA are classified as available for grazing under the RMP, with seasonal restrictions due to desert tortoise habitat and southwestern willow flycatcher habitat within the Virgin River corridor. The alternatives would meet these land use plan decisions. It has also been determined that the alternatives would not conflict with other decisions throughout the RMP.

#### **1.4 Relationship to Statutes, Regulations, or Other Plans**

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

The 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 also complies with 43 CFR 4130.2(a) which states, in part, “Grazing permits or leases shall be issued to qualified applicants to authorize use on the public lands and other lands under the administration of the Bureau of Land Management that are designated as available for livestock grazing through land use plans”.

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

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

Executive Order 13186 requires the BLM and other Federal agencies to work with the USFWS to provide protection for migratory birds. Implementation of the 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 Beaver Dam Slope Allotment Management Plan (AMP), revised in 2002, is incorporated by reference (BLM 2002). There is no AMP for the Mormon Well Allotment.

The subject allotments are in Mohave County, Arizona. The alternatives are consistent with the *Mohave County General Plan* (adopted in 1994 and revised December 5, 2005). While livestock grazing is not

specifically addressed in the Mohave County General Plan, this action does not conflict with decisions contained within the Plan.

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

- Taylor Grazing Act (TGA) of 1934 (43 U.S.C. 315)
- Federal Land Policy and Management Act (FLPMA) of 1976 (43 U.S. Code 1701 et seq.)
- Public Rangelands Improvement Act (PRIA) of 1978 (43 U.S.C. 1901)
- Endangered Species Act of 1973, as amended
- 43 CFR 4100 Grazing Administration - Exclusive of Alaska
- Arizona Water Quality Standards, Revised Statute Title 49, Chapter II
- Section 106 of the National Historic Preservation Act of 1966, as amended
- Native American Graves Protection and Repatriation Act of 1990 (25 U.S. Code [USC] 3001-3013; 104 Stat. 3048-3058)
- National Environmental Policy Act (NEPA) of 1969.
- Migratory Bird Treaty Act of 1918 (16 U.S.C. 703 – 712; CH. 128; July 13, 1918; 40 Stat. 755), as amended

## 1.5 Identification of Issues

Identification of issues for this assessment was accomplished by considering the resources that could be affected by implementation of one of the alternatives. These issues were identified by the Rangeland Resources Team, IAT, and grazing permittees during the scoping meeting for the Beaver Dam Slope Allotment on January 22, 2008 and a field visit on November 18, 2008 (see Standards for Rangeland Health and Guidelines for Grazing Administration Implementation Project: Allotment Assessment for Beaver Dam Slope)<sup>2</sup> (BLM 2012). A scoping meeting for the Mormon Well Allotment was held on February 26, 2008 and a field visit on November 18, 2008 (see Standards for Rangeland Health and Guidelines for Grazing Administration Implementation Project: Allotment Assessment for Mormon Well)<sup>2</sup> (BLM 2011). Input from the BLM interdisciplinary team is found in Table 3.3. The issues identified through this process are:

- Livestock grazing – permit renewal is required in order to allow continued livestock grazing on these allotments.
- Desert tortoise – desert tortoise and its habitat, including designated critical habitat, is present in both allotments; this habitat may be impacted if proper livestock grazing practices are not followed.
- Soil resources - livestock grazing can increase soil compaction, erosion, and productivity losses in trailing, watering, and mineral supplement areas.
- Vegetation – the potential exists for deterioration in ecological condition in these allotments if proper livestock grazing practices are not followed.
- Wildlife (including big game, sensitive species and migratory birds) – habitat for these species, as well as for their prey, may be impacted if proper livestock grazing practices are not followed.

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<sup>2</sup> The Beaver Dam Slope Allotment evaluation and the Mormon Well Allotment evaluation are available at the Bureau of Land Management's Arizona Strip Field Office, 345 E. Riverside Drive, St. George, Utah 84790.

## Chapter 2

### Proposed Action and Alternatives

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#### 2.1 Introduction

This EA focuses on the analysis of four alternatives: Alternative A (proposed action), Alternative B (reduced grazing), Alternative C (increased grazing), and Alternative D (no grazing). The BLM interdisciplinary team explored and evaluated these different alternatives to determine whether the underlying purpose and need for the proposed action, fully processing the term grazing permits on the allotments while ensuring that they are achieving land health standards, would be met.

#### 2.2. Management Common to All Alternatives

##### 2.2.1 Areas of Critical Environmental Concern

###### Beaver Dam Slope ACEC

The Beaver Dam Slope ACEC is managed for the protection of the threatened desert tortoise and Mojave Desert Ecological Zone (BLM 2008a). The Beaver Dam Slope and Mormon Well Allotments are both within this ACEC (Figure A.2). In addition, approximately 55 percent of the Beaver Dam Slope Allotment and all of the public land in the Mormon Well Allotment is designated critical habitat for desert tortoise (Figure A.3). In accordance with RMP decision MA-GM-07, allowable use of key forage species in these allotments is no more than 45% of the current years' growth removed through grazing. Move dates (i.e. removal of livestock from a pasture or the allotment) may be adjusted if monitoring indicates maximum utilization has been reached, or due to unusual climatic conditions, fire, flood, or other acts of nature. If maximum utilization is reached on key species or areas in either 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/allotment (after consultation with the permittees), as deemed necessary by the BLM. The season of use for both allotments would continue to be October 15 through March 15, in accordance with RMP decisions MA-GM-10 and MA-AC-14(DT).

###### Virgin River Corridor ACEC

The southern edge of the Beaver Dam Slope Allotment Pasture 3 is within the Virgin River Corridor ACEC (Figure A.2). This ACEC is managed for the protection of Virgin River fishes, southwestern willow flycatcher, and riparian values. In accordance with RMP decision MA-AC-04(VG), livestock would be excluded from suitable flycatcher habitat (whether occupied or unoccupied) during the vegetative growing season (bud break to leaf drop). Additionally, utilization levels of native riparian trees within the Virgin River Corridor ACEC would be limited to 30% of the apical stem per growing season in accordance with RMP decision IMPL-AC-03.

##### 2.2.2 Arizona Standards for Rangeland Health

The allotments would be managed to achieve the following standards, as described in the Arizona Standards for Rangeland Health (BLM 1997):

- 1) **Standard #1:** Upland soils exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate, and landform (ecological site).
- 2) **Standard #2:** Riparian and wetland areas are in properly functioning condition.

- 3) **Standard #3:** Productive and diverse upland and riparian-wetland plant communities of native species exist and are maintained.

### **2.2.3 Desired Plant Community**

The allotments would be managed to achieve the Desired Plant Community (DPC) objectives included in the Standards for Rangeland Health and Guidelines for Grazing Administration Implementation Project: Allotment Assessment for Beaver Dam Slope (BLM 2012) and the Allotment Assessment for Mormon Well (BLM 2011). These allotment evaluations determine the achievement of the allotment's DPC objectives. These objectives, expressed in species composition by weight (CBW), provide for the habitat needs (both forage and cover) of wildlife, protection for soils and hydrologic functions, and forage for livestock.

Many factors influence changes or differences in frequency of vegetation as shown in the ecological site guides developed by the Natural Resources Conservation Service (NRCS). It is important to note that the site guides are just that – they are “guides”. Site potential must be recognized in determining the kind and amount of vegetation which can be produced on a given piece of land – long-term monitoring of a site indicates what a particular area is capable of producing (SRM 1995). The DPC objectives therefore reflect the potential of each site. The DPC objectives for the Beaver Dam Slope Allotment and the Mormon Well Allotment key areas are:

#### *Beaver Dam Slope Allotment*

##### *Pasture 1, Key Area #4*

Ecological Site: Limy Upland Deep, 6-9-inch precipitation zone (p.z.)

- Maintain total ground cover between 20 and 35%
- Maintain native perennial grass (big galleta, Indian ricegrass, and sand dropseed) between 10 and 20% CBW.
- Maintain browse species (Mormon tea, bursage, ratany and winterfat) between 23 and 55% CBW.
- Maintain shrubs (creosote bush and cactus) between 21 and 30% CBW.
- Maintain forbs between 1 and 10% CBW.

##### *Pasture 2, Key Area #1*

Ecological Site: Limy Upland Deep, 6-9-inch p.z.

- Maintain total ground cover between 20 and 35%
- Maintain native perennial grass (big galleta and Indian ricegrass) to between 1 and 3% CBW.
- Maintain native browse (ratany, bursage) between 25 and 40% CBW.
- Maintain native shrubs (creosote bush, cactus, turpentine bush) between 35 and 55% CBW.
- Maintain forbs between 1 and 10% CBW.

##### *Pasture 3, Key Area #5*

Ecological Site: Coarse Sandy Loam, 6-9-inch p.z.

- Maintain total ground cover between 15 and 30%
- Maintain native perennial grass (Indian ricegrass) between 1 and 3% CBW.
- Maintain browse (winterfat, bursage, ratany, goldeneye) between 41 and 80% CBW.
- Maintain native shrubs (bursage, ratany creosote bush, turpentine bush) between 20 and 35% CBW.
- Maintain forbs between 1 and 10% CBW.

##### *Pasture 3, Key Area #6*

Ecological Site: Limy Upland, 6-9-inch p.z.

- Maintain total ground cover between 15 and 30%
- Maintain native perennial grass (galleta, sand dropseed, Indian ricegrass) between 15 and 30% CBW.

- Maintain browse (winterfat, bursage, ratany) between 38 and 73% CBW.
- Maintain shrubs (creosote bush) between 5 and 15% CBW.
- Maintain forbs between 1 and 10% CBW.

### Mormon Well Allotment

#### Key Area # 1

Ecological Site: Coarse Sandy Loam, 6-9-inch p.z.

Maintain total ground cover at 15-20%.

- Maintain perennial native grass (big galleta, Indian ricegrass, and mesa dropseed) CBW at 15-25%.
- Maintain key browse species (white bursage, Mormon tea, and ratany) CBW at 35-45%.
- Maintain other native shrubs and trees CBW at 10-20%.
- Maintain forbs CBW at 1-10%.

#### Key Area # 2

Ecological Site: Limy Upland Deep, 6-9-inch p.z.

- Maintain total ground cover at 15-20%.
- Maintain perennial native grass (big galleta and Indian ricegrass) CBW at 5-15%.
- Maintain key browse species (white bursage, winterfat, and ratany) CBW at 35-45%.
- Maintain other native shrubs and trees CBW at 40-50%.
- Maintain forbs CBW at 1-10%.

#### Key Area # 3

Ecological Site: Limy Upland Deep, 6-9-inch p.z.

- Maintain total ground cover at 15-20%.
- Maintain key browse species (white bursage and winterfat) CBW at 30-40%.
- Maintain other native shrubs and trees CBW at 55-65%.
- Maintain forbs CBW at 1-10%.

## **2.2.4 Range Improvements**

The land health evaluation for each allotment did not identify the need for new range improvements. Thus, none are proposed under any of the alternatives. Any range improvements proposed in the future would be considered through a separate NEPA process. Only maintenance of current range improvements (fences, pipelines, water facilities, and corrals) would be allowed.

## **2.3 Alternative A – Proposed Action**

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

- Cancel the existing grazing permits for the Beaver Dam Slope Allotment and the Mormon Well Allotment and issue new grazing permits for a period of ten years. There are no proposed changes in number or kind of livestock, or season of use for these allotments. Livestock grazing would occur during the established season of use, and with the number of Animal Unit Months (AUMs)<sup>3</sup> limited to the current active preference shown in Table 2.1 and Table 2.2, by authorization.

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<sup>3</sup> 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.

**Table 2.1. Grazing Proposed Under Alternative A for the Beaver Dam Slope Allotment.**

Beaver Dam Slope Allotment							
Authorization Number	Livestock			Active AUMs	Suspended AUMs	Public Land (acres)	% Public Land
	No.	Kind	Season of Use				
0200195	30	Cattle	10/16 – 3/15	139	30	30,623	93%
0200245	22 1	Cattle	10/16 – 3/15 10/16 – 2/6	101 3	22		
0200246	44 1	Cattle	10/16 – 3/15 10/16 – 2/6	203 3	42		
0201072	97	Cattle	10/16 – 3/15	448	46		
<b>Totals</b>				<b>897</b>	<b>140</b>	<b>30,623</b>	

**Table 2.2. Grazing Proposed Under Alternative A for the Mormon Well Allotment.**

Mormon Well Allotment							
Authorization Number	Livestock			Active AUMs	Suspended AUMs	Public Land (acres)	% Public Land
	No.	Kind	Season of Use				
0201071	92	Cattle	10/16 – 3/15	361	113	12,892	79%
0201086	15	Cattle	10/16 – 3/15	59	19		
<b>Total</b>				<b>420</b>	<b>132</b>	<b>12,892</b>	

### 2.3.1 Grazing System

#### *Beaver Dam Slope Allotment*

The Beaver Dam Slope Allotment is made up of three pastures (see Figure A.1), all of which have desert tortoise habitat and are within the Beaver Dam Slope ACEC (Figures A.3 and A.2). A small portion of the Virgin River Corridor ACEC runs along the southern edge of Pasture 3 (Figure A.2). Figure 2.1 displays the three-pasture deferred rotation schedule for a six year period as agreed to in the 2002 Beaver Dam Slope AMP revision (BLM 2002).



The grazing rotation for this allotment is shown in Figure 2.1. As shown in Figure A.1, the large pasture (Pasture 1) would be used every year from October 15 through January 31; use for the remainder of the grazing season (February 1 – March 15) is then rotated each year between Pasture 1 and the two smaller pastures (Pasture 2 – west of Highway 91 and Pasture 3 – east of Highway 91). The first year of the rotation, Pasture 2 would be used from February 1 – March 15. In the second year, Pasture 3 would be used from February 1 – March 15. During the third year, cattle would use Pasture 1 the entire season (October 15 – March 15). In the fourth year, Pasture 1 would be used from October 15 – January 31, while Pasture 3 would be used from February 1 through March 15. During the fifth year, Pasture 2 would be used from February 1 through March 15. In the sixth year of the rotation, Pasture 1 would again be used from (October 15 – March 15). This system would provide spring and summer rest every year for Pasture 1 and nearly four years of continuous rest for both Pastures 2 and 3, all while following seasonal restrictions for grazing in desert tortoise habitat. The allotment would be rested from March 16 – October 15 every year. Pasture movements would be based on reaching 45% utilization level, even if it occurs before scheduled move dates. When utilization reaches the 45% maximum utilization level, the livestock would be moved to another use area, pasture, or removed from the allotment completely regardless of whether or not there is still time remaining in the season of use. Some flexibility in the order of pasture rotation may be required based on availability of water in certain years. The permittee would contact the BLM before changing the order of pasture movements. Flexibility would not authorize use in excess of the permittee’s active grazing preference (AUMs), grazing outside of the permitted season of use (10/16 – 3/15), or utilization above 45%. There are four separate grazing permittees with authorizations to graze the Beaver Dam Slope Allotment; all of the livestock would follow the same three pasture rotation.

**Table 2.3. Beaver Dam Slope Allotment Three Pasture Deferred Rotation Schedule.**

Pasture	Year One						Year Two						Year Three						
	Oct	Nov	Dec	Jan	Feb	Mar	Oct	Nov	Dec	Jan	Feb	Mar	Oct	Nov	Dec	Jan	Feb	Mar	
1	1 5						1 5						1 5						1 5
2						1 5													
3												1 5							

Pasture	Year Four						Year Five						Year Six						
	Oct	Nov	Dec	Jan	Feb	Mar	Oct	Nov	Dec	Jan	Feb	Mar	Oct	Nov	Dec	Jan	Feb	Mar	
1	1 5						1 5						1 5						1 5
2												1 5							
3						1 5													

	Grazed
	Rested

Mormon Well Allotment

The allotment consists of one pasture, which is grazed with a combination of private and State lands within the allotment. The permittee with authorization 0201071 also holds the State grazing lease for State lands within the Mormon Well Allotment including Beaver Dam Wash. The permittee also owns private land within the allotment. Cattle graze the BLM portion of the allotment from October 16 to March 15 (see Figure 2.2) and are then moved to the State and private lands through the rest of the spring. Cattle are removed from the State and private land by early June. Public land within the allotment is rested from

March 16 – October 15 every year in order to comply with seasonal restrictions for grazing in desert tortoise habitat.

**Table 2.4. Mormon Well Allotment Yearly Grazing Schedule.**

Oct	Nov	Dec	Jan	Feb	Mar
15					15

	Grazed
	Rested

### 2.3.2 Terms and Conditions of Grazing Permits

In addition to the current “Mandatory Terms and Conditions” and standard language on the last page on the grazing permit, the following terms and conditions would be added to the “Other Terms and Conditions” section of the new grazing permits.

#### Both Allotments

- Use of nutritional livestock supplements is allowed, including protein, minerals and salt. However, any supplements used must be dispersed a minimum of ¼ mile from any known water sources, riparian areas, populations of special status plant species, winterfat dominated sites, and cultural or any other sensitive sites.
- Allowable use of key forage species in these allotments is no more than 45% of the current year’s growth removed through grazing.
- Season of use for the Beaver Dam Slope and Mormon Well Allotments will be from October 15 through March 15.

#### Beaver Dam Slope Allotment Permits Only:

- The permittee would be allowed to use an actual use billing system. This privilege may be revoked and the permittee placed on advanced billing if payment of bills and/or actual use reports are late. An actual use grazing report (Form 4130-5) must be submitted within 15 days after completing annual grazing use.
- Grazing on the Beaver Dam Slope Allotment would follow the six year three pasture deferred rotation grazing system established by the revised 2002 Beaver Dam Slope AMP.

#### Mormon Well Allotment Permits Only:

- The permittee would use the advanced billing system.

### 2.3.3 Monitoring and Adaptive Management

The proposed action includes adaptive management, which provides options that may be needed to adjust decisions and actions to meet desired conditions as determined through monitoring. BLM resource specialists would periodically monitor the allotments over the ten-year term of the grazing permits to

ensure that the fundamentals or conditions of rangeland health are 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, management of the allotments 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. For example, drought conditions, fire, or flood events could require adaptive management adjustments to be made. If a permittee disagrees with the BLM’s assessment of the resource conditions or the necessary modifications, the BLM may nevertheless issue a Full Force and Effect Grazing Decision to protect resources.

**2.4 Alternative B – Issue New Ten-Year Grazing Permits with Reduced Grazing (Actual Use/Advance Bill)**

The livestock grazing management practices proposed under this alternative would be similar to those proposed for Alternative A. New grazing permits would be issued for the Beaver Dam Slope and Mormon Well Allotments for a period of ten years with the same terms and conditions, season of use, and utilization levels described for Alternative A (Proposed Action). In addition, monitoring and adaptive management described for Alternative A (see Section 2.3.3) would also be a part of this alternative.

However, Alternative B would issue the new ten-year term grazing permits based on the average actual use level for the Beaver Dam Slope Allotment or the average advanced billing use level for the Mormon Well Allotment. The difference between the actual use or advanced billing average AUMs for each allotment and the current active preference would be converted to suspended AUMs. The analysis is based on the total number of active AUMs for each allotment and the average number of AUMs used over the ten-year period of 2008 - 2017. The proposed reduction of active AUMs would be divided between the four permittees proportionally, based on the percentage of current active AUMs assigned to each permittee, which is determined by their share in the base waters for the allotment (see Table 2.3 and Table 2.5).

Beaver Dam Slope Allotment

As shown in Table 2.1, the current active AUMs for this allotment is 897. Based on actual use report records from 2008 – 2017, the combined average actual use for all permittees was 243 AUMs for the allotment. The difference between the actual use average AUMs of 243 and the current active permitted AUMs is 654 AUMs. Under this alternative, these AUMs would be converted to suspended AUMs, resulting in a total of 794 suspended AUMs, or a 73% decrease in active preference (see Table 2.4). Reductions in AUMs would be applied in proportion to the current number of active AUMs for each permittee on the allotment, as shown in Table 2.3.

**Table 2.5. Percentage of the Preference on the Beaver Dam Slope Allotment by Authorization.**

Beaver Dam Slope Allotment		
Authorization No.	Percentage of the Preference on the Allotment	Change in Active Preference
0200195	15%	-98 AUMs
0200245	12%	-78 AUMs
0200246	23%	-151 AUMs
0201072	50%	-327 AUMs
<b>Total</b>	<b>100%</b>	<b>-654 AUMs</b>

Authorization 0200195 has 15% of the active preference AUMs, so that authorization would be reduced by 98 AUMs. The new active preference AUMs would be 41 and the new suspended AUMs would be 128 for that authorization.

Authorization 0200245 has 12% of the active preference AUMs, so that authorization would be reduced by 78 AUMs. The new active preference AUMs would be 26 and the new suspended AUMs would be 100 for that authorization.

Authorization 0200246 has 23% of the active preference AUMs, so that authorization would be reduced by 151 AUMs. The new active preference AUMs would be 55 and the new suspended AUMs would be 193 for that authorization.

Authorization 0201072 has 50% of the active preference AUMs, so that authorization would be reduced by 327 AUMs. The new active preference AUMs would be 121 and the new suspended AUMs would be 373 for that authorization.

The allotment previously had three permittees. In 2018, one of the authorizations was transferred and divided, so there are now four permittees on the Beaver Dam Slope Allotment. The permittee that transferred the permit had reported non-use for five of the last ten years. The actual use data used to calculate AUMs for this alternative was based on the original three permittees.

**Table 2.6. Grazing Proposed Under Alternative B for Beaver Dam Slope Allotment.**

Authorization Number	Livestock			Active AUMs	Suspended AUMs	Public Land (acres)	% Public Land*
	No.	Kind	Season of Use				
0200195	9	Cattle	10/16 – 3/15	41	128	30,623	93%
0200245	6	Cattle	10/16 – 2/28	25	100		
	3	Cattle	3/1 – 3/15	1			
0200246	12	Cattle	10/16 – 2/28	50	193		
	11	Cattle	3/1 – 3/15	5			
0201072	26	Cattle	10/16 – 3/15	120	373		
	1	Cattle	10/16 – 12/3	1			
<b>Totals</b>				<b>243</b>	<b>794</b>		

Mormon Well Allotment

The Mormon Well Allotment is billed in advance of making use. These permittees do not submit an annual actual use report. The calculations to determine AUMs for this alternative are based on the average number of AUMs that were billed annually for both permittees on the allotment.

As shown in Table 2.2, the current active AUMs for this allotment is 420. Based on advance billing records from 2008 – 2017, the two permittees combined average use was 406 AUMs. The difference between the advance billing average AUMs of 406 and the current active permitted AUMs is 14 AUMs. Under this alternative, these AUMs would be converted to suspended AUMs, resulting in a total of 146 suspended AUMs, or a 3% decrease in active preference (see Table 2.6). Reductions in AUMs would be applied in proportion to the current number of active AUMs for each permittee on the allotment, as shown in Table 2.5.

**Table 2.7. Percentage of the Preference on the Mormon Well Allotment by Authorization.**

Mormon Well Allotment		
Authorization	Percentage of the Preference on the Allotment	Change in Active Preference
0201071	86%	-12 AUMs
0201086	14%	-2 AUMs
<b>Total</b>	<b>100%</b>	<b>-14 AUMs</b>

Authorization 0201071 has 86% of the active preference AUMs, so that authorization would be reduced by 12 AUMs. The new active preference AUMs would be 349 and the new suspended AUMs would be 125 for that authorization.

Authorization 0201086 has 14% of the active preference AUMs that would reduce the active preference by 2 AUMs. The new active preference would be 57 AUMs and the new suspended AUMs would be 21 for that authorization.

**Table 2.8. Grazing Proposed Under Alternative B for the Mormon Well Allotment.**

Mormon Well Allotment							
Authorization Number	Livestock			Active AUMs	Suspended AUMs	Public Land (acres)	% Public Land*
	No.	Kind	Season of Use				
0201071	89	Cattle	10/16 – 3/15	349	125	12,892	79%
0201086	15 11	Cattle Cattle	10/16 – 2/28 3/1 – 3/15	53 4	21		
<b>Total</b>				<b>406</b>	<b>146</b>		

## 2.5 Alternative C – Issue New Ten-Year Grazing Permits with Increased Grazing (Potential Stocking Level Analysis)

Livestock grazing management practices proposed under this alternative would also be similar to those proposed for Alternative A. New grazing permits would be issued for the Beaver Dam Slope and Mormon Well Allotments for a period of ten years with the same terms and conditions, season of use, and utilization levels described for Alternative A (Proposed Action). In addition, monitoring and adaptive management described for Alternative A (see Section 2.3.3) would also be a part of this alternative. However, the livestock grazing use that would occur in this alternative would be the result of a potential stocking level analysis average; this potential stocking level is calculated using utilization at all key areas on each allotment (four key areas on the Beaver Dam Slope Allotment and three key areas on the Mormon Well Allotment) and actual use data (Beaver Dam Slope Allotment) or advanced billing data (Mormon Well Allotment) collected on the allotment from 2008 – 2017. The potential stocking level analysis formula is taken from BLM Technical Reference 4400-7 (BLM 1985).

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

As shown, this formula factors in actual use or advance billing, the average utilization percentage, and desired average utilization (which is 45% for both allotments). From this data, a potential stocking level (permitted use) was calculated for each allotment.

*Beaver Dam Slope Allotment*

As shown in Table 2.7, the potential stocking level calculated for the Beaver Dam Slope Allotment based on the above formula ranges from a low of 765 to a high of 3,319 AUMs. The average potential stocking level for the nine years where utilization data is available is 1,480 AUMs. No utilization data is available for either allotment for the year 2015.

**Table 2.9. Potential Stocking Level Analysis – Beaver Dam Slope Allotment.**

Grazing Year	Actual Use AUMs (% Permitted)	Average Utilization on all Key Species (Key Areas 1, 4, 5, 6)	Potential Stocking Level
2008	295 (33%)	4%	3,319 AUMs
2009	201 (22%)	6%	1,508 AUMs
2010	202 (23%)	9%	1,010 AUMs
2011	204 (23%)	12%	765 AUMs
2012	98 (11%)	5%	882 AUMs
2013	219 (24%)	5%	1,971 AUMs
2014	264 (29%)	7%	1,697 AUMs
2015	321 (36%)	Utilization not read	
2016	275 (31%)	12%	1,031 AUMs
2017	355 (40%)	14%	1,141 AUMs
			<b>Average: 1,480 AUMs</b>

Under this alternative, the active preference of the allotment would be increased by 583 AUMs, from 897 to 1,480 AUMs. All suspended AUMs (140) would be reinstated, and the remaining additional 443 AUMs would be “new.” Table 2.8 shows how the increased AUMs would be distributed between the four permittees (based on each one’s share of the base water for the allotment, as shown in Table 2.3).

**Table 2.10. Grazing Proposed Under Alternative C for the Beaver Dam Slope Allotment.**

Authorization Number	Livestock			Active AUMs	Suspended AUMs	Public Land (acres)	% Public Land*
	No.	Kind	Season of Use				
0200195	48	Cattle	10/16 – 3/15	222	0	30,623	93%
0200245	38 1	Cattle Cattle	10/16 – 3/15 10/16 – 2/6	178	0		
0200246	73 1	Cattle Cattle	10/16 – 3/15 10/16 – 2/6	340	0		
0201072	160 1	Cattle Cattle	10/16 – 3/15 10/16 – 1/4	740	0		
<b>Totals</b>				<b>1,480</b>	<b>0</b>		

Mormon Well Allotment

The potential stocking level for the Mormon Well Allotment ranges from a low of 537 to a high of 2,700 AUMs. The average potential stocking level for the nine years where utilization data is available is 1,209 AUMs (see Table 2.9).

**Table 2.11. Potential Stocking Level Analysis – Mormon Well Allotment.**

Grazing Year	Advance Billed AUMs (% Permitted)	Average Utilization on all Key Species (Key Areas 1, 2, 3)	Potential Stocking Level
2008	420 (100%)	21%	900 AUMs
2009	420 (100%)	17%	1,112 AUMs
2010	322 (77%)	27%	537 AUMs
2011	420 (100%)	21%	900 AUMs
2012	376 (90%)	21%	806 AUMs
2013	420 (100%)	11%	1,718 AUMs
2014	420 (100%)	20%	945 AUMs
2015	420 (100%)	Utilization not read.	
2016	420 (100%)	7%	2,700 AUMs
2017	420 (100%)	15%	1,260 AUMs
<b>Average: 1,209 AUMs</b>			

Under this alternative, the active preference of the allotment would be increased by 789 AUMs, from 420 to 1,209 AUMs. All suspended AUMs (132) would be reinstated, and the remaining additional 657 AUMs would be “new.” Table 2.10 shows how the increased AUMs would be distributed between the

two permittees (based on each one’s share of the base water for the allotment, as shown in Table 2.5). Grazing use under this alternative for the Mormon Well Allotment would be as shown in Table 2.12.

**Table 2.12. Grazing Proposed Under Alternative C for the Mormon Well Allotment.**

Authorization Number	Livestock			Active AUMs	Suspended AUMs	Public Land (acres)	% Public Land*
	No.	Kind	Season of Use				
0201071	265 1	Cattle Cattle	10/16 – 3/15 10/16 – 12/11	1040	0	12,892	79%
0201086	43	Cattle	10/16 – 3/15	169	0		
<b>Total</b>				<b>1,209</b>	<b>0</b>		

## 2.6 Alternative D – No Grazing

Alternative D is to reissue new ten-year term grazing permits on the Beaver Dam Slope Allotment and Mormon Well Allotment with zero authorized AUMs for active preference – all of the 897 active AUMs on the Beaver Dam Slope Allotment and all of the 420 active AUMs on the Mormon Well Allotment would be suspended (i.e., livestock grazing would be deferred for the ten-year permit period). In ten years the allotments would be re-evaluated. No new range improvement projects would be constructed and no modifications would be made to existing projects.

## 2.7 Alternative(s) Considered but Eliminated from Further Analysis

### 2.7.1 No Action Alternative – Renewing Grazing Permit with Current Terms and Conditions

Under this alternative, new ten-year term grazing permits would be issued for the Beaver Dam Slope and Mormon Well Allotments with the same terms and conditions as the current permits. There would be no changes to the kind of livestock, season of use, or number of active permitted AUMs. No new range improvements projects would be constructed and no modifications would be made to existing projects. Livestock grazing on the allotments would continue to be the same as outlined in Alternative A (Proposed Action) except there would be no changes to the current terms and conditions. See Table 2.1 (Beaver Dam Slope Allotment) and Table 2.2 (Mormon Well Allotment) for grazing that would be authorized under this alternative. Potential impacts to elements of the environment would therefore be the same as those described for Alternative A, so a separate analysis of the No Action Alternative is not required (BLM 2008b).



## Chapter 3

### Affected Environment

#### 3.1 Introduction

This chapter provides information to assist the reader in understanding the existing situation and current grazing management on the Beaver Dam Slope Allotment and the Mormon Well Allotment. The affected environment is tiered to the Arizona Strip Proposed RMP/Final EIS (BLM 2007). This EA also incorporates by reference the Standards for Rangeland Health and Guidelines for Grazing Administration Implementation Project: Allotment Assessment for Beaver Dam Slope (BLM 2012) and Standards for Rangeland Health and Guidelines for Grazing Administration Implementation Project: Allotment Assessment for Mormon Well (BLM 2011). This assessment describes the resources and issues applicable to these allotments.

The affected environment of this EA was considered and analyzed by an interdisciplinary team. Table 3.3 (found later in this chapter) addresses the elements and resources of concern considered in the development of this EA; this table indicates whether the element/resource is not present in the project area, present but not impacted to a degree that requires detailed analysis, or present and potentially impacted. The resources identified below include the relevant physical and biological conditions that may be impacted with implementation of the proposed action and/or alternatives to the proposed action and provides the baseline for comparison of impacts described in Chapter 4.

#### 3.2 General Setting

The Arizona Strip is comprised of 2.8 million acres of BLM-administered land in the northwestern portion of Arizona. The Beaver Dam Slope Allotment and Mormon Well Allotment (see Figure A.1) are located in Mohave County, Arizona on lands managed by the BLM's Arizona Strip Field Office. Both allotments are within the Beaver Dam Slope ACEC, and a portion of the Virgin River Corridor ACEC is within the Beaver Dam Slope Allotment (see Figure A.2 in the appendix). Both allotments are outside of Grand Canyon-Parashant and Vermilion Cliffs National Monuments.

The Beaver Dam Slope Allotment is located about one mile north of the town of Beaver Dam, Arizona, in northwestern Arizona, and is bisected by Highway 91 (Figure A.1). The Beaver Dam Slope Allotment is approximately 22 air miles southwest of St. George, Utah. The Virgin River flows through the south end of the allotment. The allotment is bordered on the north by Utah and on the west by Nevada. The southern boundary is Interstate 15 and private land around the town of Beaver Dam, Arizona. It is adjacent to the Mormon Well Allotment on the north and the west. The elevation ranges from 3,060 feet in the north to 1,720 feet in the southern most part. Topography varies from a gentle southeasterly sloping flat in the northeastern half of the allotment to flat broken by several washes of varying sizes in the southwest. Slope is slight (3-5%) over most of the allotment, with the exception of steep slopes in conjunction with the washes located in the southwest. Drainage patterns are well defined over most of the allotment, with all surface runoff draining south to the Virgin River (BLM 2012).

The Mormon Well Allotment is in the northwest corner of Arizona, bordered on the north by Utah and on the west by Nevada. Its southern and eastern boundaries are the Beaver Dam Slope Allotment. It is about three miles northwest of the town of Beaver Dam, Arizona (Figure A.1). Beaver Dam Wash runs through the allotment on State and private lands. The elevation ranges from 1,940 feet to 2,760 feet, with the lowest point near the southeastern corner on State land in Beaver Dam Wash.

### 3.2.1 Climate

The climate in the area of the allotments is arid and warm. Temperatures average 50 – 60 degrees in the winter, with summer temperatures ranging from 98 – 108 degrees. Temperatures as low as 32 degrees and as high as 120 degrees have been recorded. The growing season starts in early March and runs through October, with an average frost-free period of 207 days. Precipitation in Arizona typically occurs in a bimodal fashion, with a very dry May and June. Winter moisture is influenced by Pacific oceanic temperatures and airstreams; summer moisture is influenced by the North American monsoon. Summer moisture generally occurs from July through September. It should be recognized that summer rainstorms exhibit considerable variability in their location and intensity (Sprinkle et al. 2007). Adequate amounts of precipitation may come during one season, then be all but absent through the next season. Then, during the following year, precipitation may occur in different seasons. This fluctuation, coupled with low total precipitation and various soil types with different soil chemistry, makes it difficult for plant establishment on certain sites.

There was a National Weather Service (NWS) rain gauge, Beaver Dam Wash Gauge BEAA3, near the town of Beaver Dam, Arizona. It was located at T. 40 N., R. 15 W., Sec. 5, and was less than ten miles from the furthest part of the Mormon Well Allotment. The rain gauge was less than one mile from some parts of the Beaver Dam Slope Allotment – this rain gauge was discontinued in 2016<sup>4</sup>. Table 3.1 shows that the long-term average for the Beaver Dam area is 7.20 inches of rain annually, with 48% coming during the spring and summer months. Annual precipitation can vary greatly from year to year, with the lowest reading for this rain gauge being 2.11 inches in 2002 and the highest reading of 14.36 inches occurring in 2005. Precipitation comes as rain; it rarely snows. A breakdown of average precipitation by season is presented in Table 3.1. See Appendix D for the complete historic precipitation report from 1952 through 2016 for the Beaver Dam Wash Gauge.

**Table 3.1. Precipitation Data for Beaver Dam Slope and Mormon Well Allotments.**

Rain Gauge	Fall Average		Winter Average		Spring Average		Summer Average		Annual Average
	Percent of total	Inches	Percent of total	Inches	Percent of total	Inches	Percent of total	Inches	Inches
Beaver Dam Wash, Arizona (NWS)	18	1.32	34	2.44	23	1.65	25	1.79	7.20
Beaver Dam, Slope, Utah (BLM HOBO; 2017/18)	16	1.19	48	3.56	9	0.66	27	2.05	7.46

Precipitation at Beaver Dam over the last ten years of available data from the NWS gauge (2005-2016 there were two years with incomplete information) has been at or above normal<sup>5</sup> for five years. Precipitation was below 90% of the long-term average for the other five years. The highest precipitation received in the ten-year period was 199% of average in 2005 and the lowest was 54% of average in 2007. It should be noted that departures from normal are not unusual – in fact, departures from normal are quite typical (Doswell 1997), and precipitation may very often be either well above or well below the seasonal average (National Drought Mitigation Center 2015).

<sup>4</sup> Precipitation data for the allotments is now being collected from a BLM weather station in Beaver Dam Slope.

<sup>5</sup> “At or above normal” for this analysis is considered 90% of average annual precipitation or greater.

### 3.2.2 Land Health Evaluation

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

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

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

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

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

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

In 2008, land health evaluations were conducted for both allotments, and an evaluation report was completed for the Beaver Dam Slope Allotment in 2012 (BLM 2012) and for the Mormon Well Allotment

in 2011 (BLM 2011). These evaluations were made in accordance with the Arizona Standards and Guidelines for the Fundamentals of Rangeland Health (BLM 1997) and standard BLM methods for estimating ecological condition and current trend (Appendix B and Appendix C). Attempting to monitor 100% of any given rangeland is not physically possible. Instead, representative study sites are selected based on their ability to predict range conditions over much larger areas (University of Arizona 2010). Evaluation sites, or key areas as defined in Technical Reference 1734-4 (BLM 1999b), were selected (location and amount) using professional judgment based upon terrain, past uses of the area, and location of waters. Specific locations of key areas are shown in Figure A.6. Existing trend studies, ecological condition data, actual use, and utilization studies for the allotment was analyzed. The trend identified in the rangeland health assessment survey assessed erosion status, vegetative cover, vigor, species diversity, location of the most palatable plants in relation to access to a grazing animal, and general age classes. The land health evaluation identified trend over a wider area within each ecological site or sites surveyed than the 3-foot x 3-foot and 5-foot x 5-foot areas the monitoring studies represent.

The rangeland health evaluation conducted on the Beaver Dam Slope Allotment (BLM 2012) showed all key areas were meeting Standard #1 (Upland Sites); all soil objectives were met. The allotment was meeting Standard #2 (Riparian-Wetland Sites) and the riparian area was rated as properly functioning in 2012, on the section of the Virgin River that passes along the southern boundary of the allotment. The Virgin River segment within the allotment amounts to about 62 acres, and includes the wet zone, woody regeneration zone and the floodplain. Greenline and cross-section data shows healthy riparian vegetation. Willows were present and increasing even though tamarisk continues to dominate. Tamarisk beetles have been released upstream, in Utah to control this invasive species. Key Areas #4 and #6 were meeting Standard #3 (Desired Resource Conditions) (BLM 2012). Key Areas #1 and #5 were partially meeting Standard #3 because of the low composition of perennial grasses and forbs (BLM 2012). The IAT determined that livestock grazing was not the causal factor for partially meeting the DPC (Standard #3) objectives and that current livestock grazing would not be a factor in the areas achieving DPC objectives. The determination was based on ESI, utilization, trend, precipitation data and site visit. The potential for these sites to produce a high composition of perennial grass is low and at specific key areas may not be attainable (BLM 2012). No significant impacts to soils or vegetation were noted during field visits conducted in connection with the evaluation.

The rangeland health evaluation of the Mormon Well Allotment (BLM 2011) showed all key areas were meeting Standard #1 (Upland Sites); all soils objectives were met. As described in Section 1.1, public lands within the Mormon Well Allotment do not contain any sites that meet the definition of a riparian area. Federal policy defines wetlands as areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and which, under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. BLM Technical Reference 1737-11, *Riparian Area Management*, includes marshes, shallow swamps, lakeshores, bogs, muskegs, wet meadows, estuaries, and riparian areas as wetlands (BLM 1998). The portion of Beaver Dam Wash which occurs on federal land (the very northern end) is dry most of the year and non-riparian due to water withdrawals for the private land. The Arizona Standards and Guidelines provide an exemption to Standard 2 (Riparian/Wetland Sites) for areas with water withdrawals “permitted for construction, mining, or other similar activities” and that therefore do not support a prevalence of riparian or wetland vegetation. An exemption for Standard #2 is also provided for “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”. All areas that would qualify as riparian habitat under the RMP definition and in accordance with the Arizona Standards for Rangeland Health are located on state and private lands. The Beaver Dam Wash/Virgin River confluence, which is the only riparian area on federal lands in proximity to Mormon Well (see RMP Map 3.2), is approximately 2.5 miles south of the allotment boundary. Water from Beaver Dam Wash is withdrawn from the creek via water wells for livestock watering, as a private water source, and for domestic and irrigation

uses. Thus, this area is not by definition a wetland/riparian area, so Standard #2 is not applicable on this allotment. Key Areas #1 and #2 were meeting Standard #3 (Desired Resource Conditions) (BLM 2011). Key Area #3 was partially meeting Standard #3 because of the low composition of perennial grasses and forbs (BLM 2011). The site potential for a high composition of perennial grass is low at this key area and may not be attainable. The IAT determined that livestock grazing was not the causal factor for partially meeting DPC (Standard #3) objectives and that current livestock grazing would not be a factor in the areas achieving DPC objectives. No significant impacts to soils or vegetation were noted during the field visits in connection with the evaluation.

An updated land health evaluation report for the Beaver Dam Slope Allotment can be found in Appendix B, and an updated evaluation report for the Mormon Well Allotment can be found in Appendix C. Additional monitoring (pace-frequency, composition, and utilization) data has been collected since the land health evaluations were completed. The updated evaluation reports include the updated trend, utilization, ecological condition, and desired plant community objectives determinations tables based on the most recent monitoring data for each key area, see Appendix B and Appendix C. Table 3.2 shows the overall trend and ecological condition for each allotment. Ecological conditions on the Beaver Dam Slope Allotment range from mid seral, late seral and PNC, showing good condition on the majority of the allotment. Two key areas (#1 and #4) are rated as PNC with a static trend showing that they are in a stable state at the upper end of their potential plant composition according to the Ecological Site Inventory (ESI) site guide for the ecological site. Key Area #5 is late seral with an upward trend. Overall trend for three key areas is rated as static, while the other key area has an upward trend. Key species frequency, which is the ratio between the number of sample units that contain key species and the total number of sample units, compares the most recent data to the base year. Overall trend at a key area is determined by assessing the sum percentages of the following attributes: key species, live vegetation cover/basal cover, and ground cover (surface litter). Both basal cover and surface litter are important attributes when evaluating Standard #1 of rangeland health.

On the Mormon Well Allotment, the ecological condition for Key Areas #1 and #2 is late seral, one with an upward trend and the other has a static trend. Key Area #3 is PNC with and upward trend. Overall the allotment is in good condition.

**Table 3.2. Rangeland Health Data Summary.**

Allotment	Key Area	Ecological Site	Ecological Condition <sup>6</sup>	Overall Trend <sup>7</sup>
Beaver Dam Slope	#1	Limy Upland (Deep), 6 – 9 “ p.z.	PNC	Static
Beaver Dam Slope	#4	Limy Upland (Deep), 6 – 9 p.z.	PNC	Static
Beaver Dam Slope	#5	Coarse Sandy Loam (Limy), 6 – 9 “ p.z.	Late Seral	Up
Beaver Dam Slope	#6	Limy Upland, 6 – 9 “ p.z.	Mid Seral	Static
Mormon Well	#1	Coarse Sandy Loam (Limy), 6 – 9 “ p.z.	Late Seral	Up
Mormon Well	#2	Limy Upland (Deep), 6 – 9 “ p.z.	Late Seral	Static
Mormon Well	#3	Limy Upland (Deep), 6 – 9 “ p.z.	PNC	Up

<sup>6</sup> Ecological condition (composition) data can be found in Appendix B, Tables B.9-B.12 (Beaver Dam Slope Allotment) and in Appendix C, Tables C.9-C.11 (Mormon Well Allotment).

<sup>7</sup> Trend data can be found in Appendix B, Tables B.1-B.4 (Beaver Dam Slope Allotment) and in Appendix C, Tables C.1-C.5 (Mormon Well Allotment).

Based on analyses of the updated allotment monitoring data and supporting documentation contained in each original evaluation report (BLM 2012 and BLM 2011), including partially meeting DPC objectives, resource conditions on both allotments are continuing to make progress toward meeting applicable standards for rangeland health.

### 3.3 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, and must be considered in all EAs (BLM 2008b) have been considered by BLM resource specialists to determine whether they would be potentially affected by the proposed action or alternatives. These elements are identified in Table 3.3, along with the rationale for determination on potential effects. If any element was determined to potentially be impacted, it was carried forward for detailed analysis in this EA; if an element is not present or would not be affected, it was not carried forward for analysis. Table 3.3 also contains other resources that have been considered in this EA. As with the elements of the human environment, if these resources were determined to be potentially affected, they were carried forward for detailed analysis.

**Table 3.3. Elements/Resources of the Human Environment.**

NP = Not present in the area impacted by any of the alternatives  
 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 Resources	NI	<p>The Beaver Dam Slope and Mormon Well Allotments are included in an area that is unclassified for all pollutants and has been designated as Prevention of Significant Deterioration Class II. Air quality in the area is generally good. Exceptions include short-term pollution (particulate matter) resulting from vehicular traffic on unpaved roads. Fugitive dust is also generated by winds blowing across the area, coming from roads and other disturbed areas. Moving livestock can produce small amounts of fugitive dust in the short term, but this would cause negligible and localized impacts on air quality. The alternatives would therefore not impact air quality standards.</p> <p>Cattle grazing on public land (and elsewhere) eat vegetation that potentially stores carbon, and cattle do generate methane. In addition, livestock operations have the potential to generate emissions through vehicle and equipment use. The proposed action would be a minute source of carbon dioxide (CO<sub>2</sub>) and other greenhouse gases (GHGs). This analysis is unable to identify the specific impacts of the proposed action’s GHGs on global warming and climate change because there is insufficient information, and there are numerous models that produce widely divergent results. It is difficult to state with any certainty what impacts may result from GHG emissions, or to what extent the proposed action could contribute to those climate change impacts. It has therefore been determined that the proposed action would have a negligible effect on local, regional, and global climate change.</p>

<b>Resource</b>	<b>Determination</b>	<b>Rationale for Determination</b>
Native American Concerns	NI	The alternatives would not limit access to any ceremonial use of Indian sacred sites, or adversely affect the physical integrity of any such site.
Areas of Critical Environmental Concern	NI	The allotments are within the Beaver Dam Slope ACEC and the Virgin River Corridor ACEC (BLM 2008a). The Beaver Dam Slope ACEC was created for the protection of threatened desert tortoise and Mojave Desert Ecological Zone values (BLM 2008a). The Virgin River Corridor ACEC was created to the protection of Virgin River fishes, southwestern willow flycatcher, and riparian values (BLM 2008a). While potential impacts to desert tortoise could occur (see below), the alternatives would not affect the designation of these ACECs.
Areas Managed to Maintain Wilderness Characteristics	NP	The proposed action is not within any Areas Managed to Maintain Wilderness Characteristics.
Cultural Resources	NI	<p>The nature of the alternatives is such that no impact can be expected on significant cultural resources. Livestock grazing has occurred in these allotments for many years. The BLM would manage the allotment to ensure that livestock grazing would continue to be in compliance with Section 106 of the National Historic Preservation Act (36 CFR 800.3). The proposed alternatives, with no newly proposed range improvement activities, would not greatly alter the grazing activity already in place within the allotments. New range improvement actions, including fences, water facilities, and vegetation treatments, are subject to a Class III inventory and consultation with the Arizona State Historic Preservation Office.</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. 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	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.
Farmlands (Prime or Unique)	NP	There are no prime or unique farmlands within either allotment.
Floodplains	NI	While small portions of the allotment are likely within jurisdictional floodplains, the action of continued grazing would not measurably alter floodplain morphology or hydrology.

Resource	Determination	Rationale for Determination
Fuels / Fire Management	NI	No hazardous fuels reduction or fuels management projects are proposed for the area. Continued livestock use would not affect fire management, other than the continued reduction of some light fuels through livestock grazing.
Geology / Mineral Resources / Energy Production	NI	A records search of LR2000 on September 5, 2018 showed there are no minerals related leases, authorizations or mining claims and no energy production in the project area. Continuing livestock grazing would not alter geological features or mineral resources. Mineral exploration activities are occurring across the Arizona Strip, but grazing of livestock would not alter or impair the opportunities to explore for these resources.
Invasive, Non-native Species	NI	<p>Invasive non-native annual grasses (red brome, cheatgrass and Mediterranean grass) and annual mustards are present in some areas on both allotments, although they are not on the Arizona Noxious Weed list. However, they can be very invasive and can expand their distribution after wildfires. Because they are annual plants their abundance and distribution fluctuates based on the amount and timing of precipitation in the allotment.</p> <p>There is one documented location of puncture vine (<i>Tribulus terrestris</i>) on the Beaver Dam Slope Allotment, which is on the Arizona State Noxious Weed List, in the southwest corner of Pasture 1 Beaver Dam Slope Allotment. However, it has been removed and frequent inspections and monitoring will continue which will reveal any need to retreat and control as necessary. Weed treatments will continue throughout the allotments as weeds are detected.</p> <p>There are some tamarisk trees (<i>Tamarix ramosissima</i>) scattered along the riparian zone of the Virgin River along the southern edge of Pasture 3 on the Beaver Sam Slope Allotment. Tamarisk beetles have been released upstream, in Utah, to control this invasive species (BLM 2012). Tamarisk is not on the Arizona Noxious Weed list.</p> <p>Proper range practices can help prevent the spread of undesirable plant species (Sheley 1995). Sprinkle et al (2007) found that grazing exclusion does not make vegetation more resistant to invasion by exotic annuals. Reasons for this may include: 1) grazing may result in a more diverse age classification of plants due to seed dispersal and seed implementation by grazing herbivores, and 2) grazing removes senescent plant material, and if not extreme, helps open up the plant basal area to increase photosynthesis and rainfall harvesting (Holechek 1981). Loeser et al. (2007) reported that moderate grazing was superior to both grazing exclusion and high impact grazing in maintaining plant diversity and in reducing exotic plant recruitment in a semiarid Arizona grassland. It is also important to note that removal of grazing by domestic livestock does not automatically lead to disappearance of cheatgrass (Young and Clements 2007). Proper grazing use which maintains stable plant communities (as is the case in the these allotments – the majority of the public lands within the allotments are in late seral or PNC, which are a very stable condition) should minimize or have no effect on the</p>



Resource	Determination	Rationale for Determination
		spread of invasive non-native species. The renewal of the grazing permits and continued livestock grazing are therefore not anticipated to increase the rate at which invasive species are spread throughout the area.
Lands / Access	NI	Access to public lands would not be altered or impaired by implementation of the alternatives. While there are lands authorizations within the project area, effects to these authorizations are not expected as long as maintenance of current range improvements (fences) continues to prevent livestock from entering onto highway rights-of-way. No other lands issues have been identified in connection with the alternatives.
Livestock Grazing	PI	Permit renewal is required to allow continued livestock use on the allotment; this issue is therefore analyzed in detail in this EA.
Paleontology	NP	Most of the geologic units are Quaternary deposits that are not likely to contain paleontological resources. The Pleistocene-Miocene Muddy Creek Formation has a minor presence and is rated as having moderate potential for fossils. Units with unknown potential for fossils also exist in the project area. However, no paleontological resources are known to exist anywhere in the project area.
Recreation	NI	The area within these allotments are within the Arizona Strip Extensive Recreation Management Area and receives custodial management for dispersed, unstructured recreation opportunities that focus only on visitor health and safety, user conflict, and resource protection issues while maintaining the area's naturalness/remoteness. The allotments are considered to have recreation values for their geology, scenic viewsheds, history, and remoteness. Visitors to the allotments engage in a variety of recreation activities including sightseeing, driving for pleasure, all-terrain vehicle riding, hiking, horseback riding, hiking, camping, hunting, rock collecting, photography, bird watching, and nature study. The alternatives are not expected to impact the availability of recreational opportunities within these allotments.
Socioeconomic Values	NI	Issuance of a new term grazing permits would allow the permittees 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 significant contributor.
Soil Resources	PI	Livestock grazing can increase soil compaction, erosion, and productivity losses in trailing, watering, and mineral supplement areas; this issue is therefore analyzed in detail in the EA.
Threatened, Endangered, and Candidate Animal Species	PI	Desert tortoise critical habitat is present within the allotments and may be impacted by livestock grazing. The southwestern willow flycatcher and yellow-billed cuckoo may also be impacted by grazing on the allotments. This issue is therefore analyzed in detail later in this EA.
Threatened, Endangered, and Candidate plant Species	NP	No known threatened, endangered, or candidate plant species occur in the Beaver Dam Slope or Mormon Well Allotments.

Resource	Determination	Rationale for Determination
Vegetation	PI	Grazing has a direct impact on vegetation resulting from livestock eating and trampling plants within the allotments. This issue is therefore analyzed in detail later in this EA.
Sensitive Plant Species	NI	Joshua trees occur on both of these allotments; livestock grazing would help reduce fuel loads, which would help reduce fires occurring on the allotments. Fire is the biggest threat to the Joshua tree. While livestock grazing would help reduce the threat of fire to this sensitive plant species, the impact on the species overall is expected to be negligible given the wide range of the species.
Visual Resources	NI	The Beaver Dam Slope and Mormon Well Allotments are designated primarily as Visual Resource Management (VRM) Class II, with the exception of some areas near Beaver Dam Wash that are VRM Class III, and the utility corridor (which crosses the northern parts of both allotments) that is VRM Class IV. The objective for Class II is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape. The objective for Class III is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape. The objective for Class IV is to provide for management activities that require major modification of the existing character of the landscape. The level of change to the characteristic landscape in these areas can be high. Continuing livestock grazing as proposed would not affect visual resources because no new range improvements are proposed, so the existing character of the landscape would not change.
Wastes (hazardous or solid)	NI	There are areas along the edges of the allotments where household trash and other solid waste has been illegally dumped on public lands. The primary reason this is occurring is the close proximity of the allotments to residential areas, Interstate 15 and Highway 91. Continued livestock grazing on the allotments would have no impact on hazardous or solid waste issues already occurring on the allotments.
Water Quality (drinking / ground)	NI	Site visits to the allotments (during rangeland health evaluations and subsequent monitoring) did not indicate that current livestock use is altering water quality – no surface water within the allotments is used for domestic drinking water. Thus, no effect to water quality is expected from the alternatives.
Wetlands / Riparian Zones	NI	In 2012, a riparian Proper Functioning Condition assessment was conducted on the segment of the Virgin River that runs along the southern portion of the Beaver Dam Slope Allotment (BLM 2012). The determination was made that this segment was in Proper Functioning Condition. There have been no changes in management since the assessment was completed. The proposed action would continue current management with a deferred rotation grazing system, which would limit the length of grazing in the riparian area.

Resource	Determination	Rationale for Determination
		As described in Section 3.2.2 of this EA, there are no areas within the Mormon Well Allotment that meet the definition of riparian areas.
Wild Horses and Burros	NP	There are no wild horses or burros, or herd management areas, within the Beaver Dam Slope or Mormon Well Allotments (BLM 2008a).
Wild and Scenic Rivers	NI	The Virgin River flows through the southern edge of the Beaver Dam Slope Allotment. This portion of the river is recommended suitable for recreational values as a wild and scenic river; several public access points to the river exist within the allotment. The Virgin River which is a suitable wild and scenic river. The alternatives would not affect the values of the wild and scenic river since the characteristics that established the potential classification would not be affected (i.e., no changes in management are proposed).
Wilderness	NP	Neither allotment is located within wilderness.
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	NP	There are no woodlands present on either allotment. Both allotments are in the 6-9-inch precipitation zone and are dominated by creosote bush, bursage, and Mojave mixed shrub major vegetation types. No forestry (timber) resources occur on these allotments.

**3.4 Resources Brought Forward for Analysis**

**3.4.1 Livestock Grazing**

A grazing permit is issued for livestock forage produced annually on the public lands and is allotted on an AUM basis. (An AUM is a unit of measurement indicating how much forage is eaten by a cow/calf pair in one month.) The BLM does not control adjacent private lands owned by 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 affected permittee to identify and prescribe actions to be taken that would return the allotment to compliance.

Precipitation and weather patterns affect the amount of vegetation produced on the allotments; fluctuating amounts and the seasonal distribution of precipitation results in varying amounts of forage from year to year. Normal grazing schedules and livestock management practices may have to be modified during periods of drought. WO IM No. 2002-120 and Arizona IM No. AZ-2002-025 outline guidance strategies when evaluating impacts to rangelands due to drought. The BLM works with livestock permittees to voluntarily reduce livestock numbers on public lands, or portions of or entire allotments may be temporarily closed. Livestock operators and the BLM jointly develop short and long-term strategies for modifying livestock use on public land to ensure the conservation and protection of soil and vegetation resources. For example, the BLM works cooperatively with livestock permittees to match available forage with appropriate livestock numbers. Historically, most livestock operators impacted by drought conditions

have voluntarily reduced their numbers without issuance of formal livestock closure notices. However, if the BLM determines immediate protection of the range resource is merited; closures or modifications to an allotment may be issued effective upon issuance under the authority of 43 CFR 4110.3-3.

The Beaver Dam Slope Allotment is categorized as a “maintain” (M) allotment. The *Arizona Strip Field Office RMP* (BLM 2008a) defines maintain allotments as those in which:

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

The Mormon Well Allotment is categorized as a “improve” (I) allotment. The *Arizona Strip Field Office RMP* (BLM 2008a) defines maintain allotments as those in which:

- a) Present range condition is unsatisfactory;
- b) Allotments have high to moderate resource production potential and are producing at a 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.

Land ownership in the Beaver Dam Slope Allotment consists primarily of federal land with some State and private land included (see Table 3.4). Active grazing use for all four authorizations is 897 AUMs, with 140 suspended AUMs (see Section 2.3, Table 2.1 for the breakdown by authorization).

Land ownership in the Mormon Well Allotment is mostly federal land with some State and private land included (see Table 3.4). Active grazing use for the two authorizations is 420 AUMs, with 132 suspended AUMs (see Section 2.3, Table 2.2 for the breakdown by authorization). Livestock on the Mormon Well Allotment are moved on the allotment by herding and controlling the availability of water. Water systems are turned on or off to encourage livestock use or movement in those areas. One of the permittees holds the State grazing lease for State lands within the Mormon Well Allotment including Beaver Dam Wash, and he also owns private land within the allotment. The State and private lands are not fenced separately from the public land. Starting March 15 water sources on the public lands are turned off and livestock are herded to the State and private land where the permittee has a private well and permitted use of the well on State lands. Livestock could leave State or private land and go back to public lands on the allotment but after March 15 there is no water on public lands. The permitted season of use for the Mormon Well Allotment is 10/16 – 3/15; if livestock are observed on public land outside of the permitted season of use, the permittees are contacted. It is the permittees’ responsibility to keep livestock off of the public land from 3/16 – 10/15 to avoid being in trespass. Cattle are removed from the State and private land by early June, they are not there year-round.

**Table 3.4. Land Ownership and AUMs by Allotment.\***

<b>Beaver Dam Slope Allotment</b>		
<b>Ownership</b>	<b>Acres</b>	<b>AUMs</b>
Public	30,623	897
State	715	21

Private	358	7
<b>Mormon Well Allotment*</b>		
<b>Ownership</b>	<b>Acres</b>	<b>AUMs</b>
Public	12,892	420
State	2,806	82
Private	155	0

\*Information from the Arizona Strip Field Office RMP.

The current grazing system for both allotments is described in Section 2.3.1 (Alternative A – Proposed Action).

### Range Improvements

The Beaver Dam Slope and Mormon Well Allotments contain a number of structural range improvements, as listed in Table 3.5 and Table 3.6 and as shown on Figure A.4 in Appendix A. These range improvements consist of corrals, fences, water pipelines, water wells, water storage tanks, livestock troughs, and an unfenced reservoir. Some of the fences are shared by both allotments. The grazing permittees currently maintain existing range improvements through cooperative agreements.

**Table 3.5. Beaver Dam Slope Allotment Existing Range Improvements.**

Range Improvement Type	Quantity
Corral	1
Fences	Approximately 66.6 miles of allotment boundary and pasture fences. About 10 of those miles are shared boundary fences between the Beaver Dam Slope and Mormon Well Allotments.
Water Pipeline	Approximately 8.3 miles of water pipeline.
Water Well	1
Water Storage Tanks	3
Livestock Troughs	2

**Table 3.6. Mormon Well Allotment Existing Range Improvements.**

Range Improvement Type	Quantity
Corral	1
Fences	Approximately 28.3 miles. About 10 of those miles are shared boundary fences between the Beaver Dam Slope and Mormon Well Allotments.
Water Pipeline	0.96 miles of water pipeline.
Water Well	2 (1 on private land and 1 on State land within the allotment).
Water Storage Tanks	2
Unfenced Reservoir	1

### 3.4.2 Soil Resources

Soils within the allotment boundaries are reflective of the diversity of geology, precipitation, slope ranges, vegetation, and landscape stability found within the area of interest. In this case, the footprint for analysis is the 12,892 acres of public land in the Mormon Well Allotment and 30,623 acres of public land in the Beaver Dam Slope Allotment. Geologic deposits of the project area influence the distribution and properties of soils from which they form. The “Geologic Map of the Littlefield 30’ x 60’ Quadrangle, Mohave County, Northwestern Arizona” (Billingsley and Workman 2000) details the mostly young (Quaternary aged; 2.6 million year to 11,000 years before present) wind (sand), water (alluvium), and gravity-deposited (fan, talus, valley fill) materials that culminate in the landforms and soils of the allotments. Tabular and spatial summaries of this data can be found in Tables 3.7 and 3.8 and Figures E.2 and E.4 in Appendix E. (Information in both tables was adapted from Billingsley and Workman, 2000.) The relative youth of the geologic deposits is reflected in the landscape instability resultant soils, as described below.

For both the Mormon Well and Beaver Dam Slope Allotments, pediment calcrete (Qpc) is mapped as underlying large portions (54 and 61%, respectively) of the analysis area; this is an important feature as this “soil cement” that is also known as caliche poses both land use limitations and opportunities. Caliche/calcrete acts like a bedrock rock layer, often at shallow (1-2 feet deep) in the soil that neither roots nor fence posts can penetrate. Vegetation growth is hampered for deep-rooted species, although locally adapted native species can subsist. The caves or burrows formed in caliche provide desert tortoise habitat that are detailed in other sections of this EA.

**Table 3.7. Geologic Units of the Mormon Well Allotment.**

USGS Map Symbol	USGS Name	% of Allotment
Qay	Young alluvial deposits	3.9
Qd	Dune/sand sheet deposits	3.4
Qgo	Old terrace gravel deposits	1.6
Qgy	Young alluvial terrace deposits	2.8
Qpc	Pediment calcrete	53.9
Qs	Stream channel alluvium	4.9
Qt	Talus deposits	0.3
Qv	Valley fill deposits	4.4
Tmc	Muddy Creek Formation	8.5

**Table 3.8. Geologic Units of the Beaver Dam Slope Allotment.**

USGS Map Symbol	USGS Name	% of Allotment
Qay	Young alluvial deposits	9.6
Qd	Dune/sand sheet deposits	6.3
Qgo	Old terrace gravel deposits	0.2
Qao	Older alluvial fan units	10.6
Qgy	Young alluvial terrace deposits	0.1
Qpc	Pediment calcrete	61.4
Qs	Stream channel alluvium	3.6
Qt	Talus deposits	2.3

Qv	Valley fill deposits	0.7
Tmc	Muddy Creek Formation	5.0
Pq	Queantopweap Sandstone	0.1

Soils data shown in Tables E.1 and E.2 and Figures E.1 and E.3 of Appendix E was garnered from the NRCS Web Soil Survey (NRCS 2019). Soil map units for the allotments are predominantly from two soil taxonomic orders: Aridisols and Entisols. Soil orders are the broadest level of soil taxonomic classification and for the purpose of this analysis will be the main differentiation between soil types. The two main soil orders represented reflect the relative youth (recently formed soils), low-precipitation, and low vegetative cover of the allotments. These soils are low in organic matter due to a lack of biomass inputs (root and leaf decay) and soil moisture. Conversely, these soil types are high in sodium, calcium, and/or sulfur salts (carbonates and sulfates) as desert climatic conditions do not promote the leaching of these minerals through the soil profile. Soil pH is accordingly high while fertility (nutrient levels) are low when compared to other soil orders.

Aridisols have an arid soil moisture regime in which there is insufficient precipitation to leach soluble minerals from the soil profile (NRCS 2014). For this reason, salts and carbonate minerals accumulate in the soil profile and the desert vegetation adapted to grow on this soil type/precipitation regime are tolerant of these otherwise harsh conditions. Aridisols account for approximate 71% of the mapped soils for the spatial bounds of the combined allotments. Aridisols are found on alluvial fans, fan remnants, mesas, mesa remnants, mountain slopes, plateaus, alluvial terraces, and sand sheets. Geologic parent materials include sedimentary rocks such limestone and sandstone; for the analysis area any of the documented Aridisols that should occur in the allotments have thin topsoils, typically 1 to 3 inches thick over carbonate-rich subsoils that often result in a root-restricting, cemented “petrocalcic” horizon of caliche.

The other main soil order represented in the allotments are Entisols; these weakly developed soils lack distinguishing characteristics and are considered “young” soils still in the early stages of soil formation. Biotic (organisms) and abiotic (climate, time) factors of soil formation do not have a strong influence on soil properties of Entisols compared to soils forming in wetter, more densely vegetated settings. For these and other reasons, Entisols have a closer resemblance to the geologic parent material they formed from compared to other soil orders. Entisols account for over 28 % of the allotments and occur in the form wind/water-transported, highly erodible, fine-textured “badlands” from gypsum-rich mudstones, and water-deposited alluvium in dry channels. Entisols occur on the same landforms as described for Aridisols but are also found in recent depositional environments such as stream channels, washes, sand sheets, and sand dunes.

Large areas of hydric (wetland) soils are not identified in the soil survey for the project area although isolated riparian/wetlands are found in select locations of Beaver Dam Wash and the Virgin River.

### **3.4.3 Threatened, Endangered, or Candidate Animal Species**

#### **Mojave Desert Tortoise**

The desert tortoise was listed as endangered under emergency rule in 1989 (USFWS 1989) and reclassified to threatened in 1990 (USFWS 1990). Critical habitat was designated on February 8, 1994 (USFWS 1994b). The recovery plan was developed in 1994 (USFWS 1994a) and was revised in May 2011 (USFWS 2011).

The project area is within the Northeastern Mojave Recovery Unit and the Beaver Dam Slope critical habitat unit. The primary constituent elements of desert tortoise critical habitat are as follows:

- Sufficient space to support viable populations within each of the six recovery units and provide for movements, dispersal, and gene flow;
- Sufficient quantity and quality of forage species and the proper soil conditions to provide for the growth of such species;
- Suitable substrates for burrowing, nesting, and overwintering;
- Burrows, caliche caves, and other shelter sites;
- Sufficient vegetation for shelter from temperature extremes and predators; and
- Habitat protected from disturbance and human-caused mortality.

Desert tortoises are most active during the spring and early summer when annual plants are most common. Additional activity occurs during warmer fall months and occasionally after summer rainstorms. In Arizona, tortoises are generally considered to be active from approximately March 15 through October 15, although activity has been observed as early as February and as late as November (depending on climatic conditions). Desert tortoises spend the remainder of the year in burrows, escaping the extreme conditions of the desert.

The desert tortoise is found in creosote-bursage habitats below about 4,500 feet in elevation. Desert tortoise home range sizes vary with respect to location and year. Over its lifetime, each desert tortoise may require more than 1.5 square miles of habitat and make forays of more than seven miles at a time. Tortoises use multiple burrows within their home ranges to aid in escaping temperature extremes while out foraging. During droughts, tortoises forage over larger areas, increasing the likelihood of injury or mortality through encounters with humans and predators.

The allotments have 34,107 acres which have been designated as critical habitat for the desert tortoise. Most of the allotments contain primary constituent elements of desert tortoise critical habitat. The allotments provide sufficient space to support viable populations. Sufficient quantity and quality of forage species and the proper soil conditions to provide for the growth of such species is present. Suitable substrates for burrowing, nesting, and overwintering are present in the allotments. The allotments provide sufficient vegetation for shelter from temperature extremes and predators.

Line distance sampling is used throughout the Mojave Desert to estimate densities of adult tortoises (defined as those  $\geq 180$  mm in length). Table 3.9 summarizes the results of this monitoring for the Beaver Dam Slope since this this method has been used (2001); this data includes transects outside of the allotments in nearby areas of Utah and Nevada (USFWS 2006, 2009, 2012a, 2012b, 2013b, 2014d, 2015, 2016, 2018). Appendix G provides more detailed information on this monitoring.

**Table 3.9. Line Distance Sampling Results.**

<b>Year</b>	<b>Density (Tortoises/km<sup>2</sup>)</b>
2017	1.3
2016	5.6
2015	No data
2014	No data
2013	2.6
2012	5.4
2011	3.3



2010	3.3
2009	3.2
2008	1.1
2007	1.2
2006	No data
2005	0.9
2004	No data
2003	No data
2002	No data
2001	5.6

**Southwestern Willow Flycatcher (*Empidonax traillii extimus*)**

The southwestern willow flycatcher is a riparian obligate, nesting along rivers, streams, and other wetlands in dense riparian habitats from sea level to over 7,000 feet in elevation. Southwestern willow flycatchers most often select dense thickets of Geyer willow (*Salix geyeriana*), coyote willow (*Salix exigua*), Goodding’s willow (*Salix gooddingii*), boxelder (*Acer negundo*), tamarisk (*Tamarix* sp.), Russian olive (*Elaeagnus angustifolia*), or live oak (*Quercus agrifolia*) for nesting.

Nesting begins in late May and early June and young fledge from late June through mid-August (Sogge et al. 2010). Southwestern willow flycatchers usually raise one brood per year, but multiple clutches are not uncommon (USFWS 2004). Changes in riparian plant communities have resulted in the reduction, degradation, and elimination of nesting habitat for the willow flycatcher, curtailing the range, distribution, and numbers of this species.

The entire section of the Virgin River in Arizona is designated as critical habitat for the southwestern willow flycatcher (USFWS 2013a). Approximately 13.6 acres of critical habitat are located in the southern edge of the Beaver Dam Slope Allotment Pasture 3. Riparian habitat in the area has been assessed for possible southwestern willow flycatcher nesting areas and categorized as either suitable or potential. “Suitable” habitat has the density, height, and structure components preferred for southwestern willow flycatcher nesting, whereas “potential” habitat does not have density, height or structure components required for nesting but is expected to reach that stage at some point in the future. All suitable habitat near the allotments occurs at the Beaver Dam Wash-Virgin River confluence, approximately 1.5 miles from the Beaver Dam Slope Allotment. Approximately 250 acres of potential habitat is located within the Virgin River corridor, just south of Beaver Dam Slope Allotment Pasture 3. Approximately 79 acres of potential habitat is also found in Beaver Dam Wash at Mormon Well, most of which is on state and private land (approximately 30 acres on BLM). However, this habitat area does not contain the habitat components (PCEs) necessary for willow flycatcher nesting. As described in Section 3.2.2, public lands within the Mormon Well Allotment do not contain any sites that meet the definition of a riparian area. Federal policy defines wetlands as areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and which, under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. As stated in Section 3.2.2, wetlands include marshes, shallow swamps, lakeshores, bogs, muskegs, wet meadows, estuaries, and riparian areas (BLM 1998). The portion of Beaver Dam Wash which occurs on federal land (the very northern end) does not support a prevalence of riparian or wetland vegetation due to water withdrawals for the surrounding private and state land.

**Yellow-billed Cuckoo (*Coccyzus americanus*)**

Yellow-billed cuckoos are primarily restricted to densely wooded rivers and streams and damp thickets with relatively high humidity. In Arizona, habitat for the species consists of lowland riparian habitats

including streamside cottonwood and willow groves and larger mesquite bosques. They are rarely observed as transient in xeric desert or urban settings (AGFD 2011). In Arizona, most cuckoo nests have been found in willows, but nests have also been discovered in cottonwood, sycamore, alder, mesquite, hackberry, and tamarisk (AGFD 2005).

Nesting peaks later (mid-June through August) than in most co-occurring bird species (USFWS 2014a). Breeding often coincides with outbreaks of cicadas or tent caterpillars and the birds may lay more eggs in good prey-abundant years.

Historically, yellow-billed cuckoos were often listed as a common breeding species within extensive riparian forests in Arizona (AGFD 2005). These dense woodlands once extended for miles along the lower Colorado, Gila, Salt, Verde, Santa Cruz, and San Pedro River valleys. Today, these natural plant communities have been reduced and/or severely degraded so that they bear little resemblance to their former appearance and extent (AGFD 2005). The western distinct population segment of the yellow-billed cuckoo was listed as a threatened species on October 3, 2014 (USFWS 2014a).

Approximately 8.2 acres of proposed critical habitat (USFWS 2014b) is located within the Beaver Dam Slope Allotment, all of which is within the Virgin River corridor. Additional acreage of proposed critical habitat is located south of Beaver Dam Slope Allotment Pasture 3 along the Virgin River and is accessible to livestock due to the lack of range fencing. However, vegetation within this reach of the river is undesirable for cuckoos and consists almost entirely of widely scattered tamarisk shrubs interspersed with small tamarisk thickets or stringers.

One suitable habitat patch of approximately 35 acres is located at the Beaver Dam Wash-Virgin River confluence, which is 1.5 miles from the Beaver Dam Slope Allotment boundary. A cottonwood gallery forest was present at Mormon Well on Beaver Dam Wash (approximately 79 acres, most of which is on state and private land) until about 2014, but recent hydrological changes in the area have led to rapid loss of riparian vegetation. In addition, water from Beaver Dam Wash is withdrawn from the creek for livestock watering, as a private water source, or for other uses and therefore does not support a prevalence of riparian or wetland vegetation. The result is marginal habitat conditions for this species.

Documented sightings of the species have been made at the Beaver Dam Wash-Virgin River Confluence area (in 1978, 1979, and 1999) (McKernan and Braden 2001). Surveys for yellow-billed cuckoos were conducted by BLM personnel at Mormon Well and the Beaver Dam Confluence during the 2012, 2013 and 2014 breeding seasons (Langston pers. Obs.). One adult cuckoo was found in suitable habitat on BLM land on one occasion in 2014 at the Beaver Dam Confluence.

#### **3.4.4 Vegetation**

Precipitation and weather patterns affect the amount of vegetation produced on the allotments; fluctuating amounts and the seasonal distribution of precipitation results in varying amounts of forage from year to year. According to the NRCS, the dominant ecological sites on the Beaver Dam Slope Allotment are limy upland (6-9" p.z.), limy upland deep (6-9" p.z.), and coarse sandy loamy upland (6-9" p.z.). The dominant ecological sites on the Mormon Well Allotment are limy upland deep (6-9" p.z.) and coarse sandy loamy upland (6-9" p.z.). Small inclusions of other ecological sites occur within the allotments.

Beaver Dam Slope Allotment is 99 percent Mojave Desert Ecological Zone and less than one percent Riparian Ecological Zone. The Virgin River riparian area is along the southern part of Pasture 3. The Mormon Well Allotment is 100 percent Mojave Desert Ecological Zone. The dominant vegetation in the Mojave Desert is characterized by Joshua tree (*Yucca brevifolia*), creosote bush (*Larrea tridentata*)/bursage (*Ambrosia dumosa*), and Mojave mixed shrub types. The Beaver Dam Slope Allotment has

approximately 25,907 acres (79%) of creosote bush/bursage vegetation type and about 6,833 acres (21%) of Mojave mixed shrub vegetation type (see Figure A.5). The Mormon Well Allotment has approximately 8,490 acres (53%) of creosote bush/bursage vegetation type and about 7,506 acres (47%) of Mojave mixed shrub vegetation type (see Figure A.5).

Management of the allotments is based on a selection of key species. These species are selected for their similarity to other grasses and browse species that occur in the allotment. The definition of key species is: 1) forage species of sufficient abundance and palatability to justify its use as an indicator to the *degree of use* of associated species; and 2) those species which must, because of their importance, be considered in the management program (SRM 1998). Key species for the allotments are:

#### Beaver Dam Slope

- Creosote bush – important for tortoise denning and medicinal/botanical uses
- Mormon tea – important browse and ethnobotanical uses
- Ratany – important for tortoise forage and denning, as well as ground cover
- Turpentine bush – important for medicinal/botanical uses
- Big galleta – important for tortoise forage as well as ground cover
- Sand dropseed – important for tortoise forage as well as ground cover
- Bursage – important as a ground cover, denning and forage
- Winterfat – important as forage to all herbivores
- Indian ricegrass – important for tortoise forage as well as ground cover
- Goldeneye – important browse plant

#### Mormon Well

- Creosote bush – important for tortoise denning and ethnobotanical uses
- Mormon tea – important browse and ethnobotanical uses
- Ratany – important for tortoise forage and denning, as well as ground cover
- Indigobush – important for ground cover, dye production by American Indians, and aesthetics
- Pepperweed – important for ethnobotanical uses and aesthetics
- Big galleta – important as forage and ground cover
- Mesa dropseed – important as forage and ground cover
- Joshua tree – important for pollinators, denning site for many species, and aesthetics
- Bottlestopper – important as ground cover and to wasps for nests.
- Bursage – important as a ground cover, denning and forage
- Winterfat – important as forage to all herbivores
- Yucca – important as ground cover, forage, ethnobotanical uses
- Globemallow – important forage and early successional ground cover
- Wolfberry – important for ethnobotanical uses for food

### **3.4.5 Wildlife, Including Migratory Birds and Sensitive Species**

#### **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. A Memorandum of Understanding between the BLM and USFWS states that the BLM shall: “At the project level, evaluate the effects of the BLM’s

actions on migratory birds during the NEPA process, if any, and identify where take reasonably attributable to agency actions may have a measurable negative effect on migratory bird populations, focusing first on species of concern, priority habitats, and key risk factors. In such situations, BLM will implement approaches lessening such take.” (BLM and USFWS 2010). Additional protection is provided by the Neotropical Migratory Bird Conservation Act of 2000 (16 USC Chapter 80).

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

**Table 3.10. USFWS Birds of Conservation Concern Found in the Beaver Dam Slope and Mormon Well Allotments.**

Species	Habitat Type in the Allotments
Ferruginous Hawk	Open grassland or shrubland with isolated trees (typically juniper) for nesting. ( <i>BLM Sensitive, see Section 3.3.5</i> )
Golden Eagle	Habitat generalist, but usually forages in open country for small mammals and carrion. Large cliff faces are used for nesting. ( <i>BLM Sensitive, see Section 3.3.5</i> )
Peregrine Falcon	Habitat generalist, but usually associated with canyons (especially near water) where they hunt for other bird species. Cliff faces are used for nesting. ( <i>BLM Sensitive, see Section 3.3.5</i> )
Prairie Falcon	Typically occupy drier and more open country than peregrine falcons, but there is some overlap in habitat. Cliff faces are used for nesting. Found year-round on the Arizona Strip in low numbers.
Costa’s hummingbird	Found in dry desert washes and canyons. Frequently nests in mesquite, acacia, creosote, or other xeroriparian shrubs. Nesting season occurs from January to April, before intense desert heat sets in.
Lucy’s warbler	Common during the breeding season (April-July) in riparian vegetation (cottonwood, willow, tamarisk) or xeroriparian washes (mesquite). The only western warbler species to nest in cavities.
Bell’s vireo	Common nester in riparian thickets with mixed cottonwood, willow, seepwillow, mesquite, or tamarisk.
Bendire’s Thrasher	Favors open desert-scrub or semi-desert habitat with scattered cholla cactus, Joshua trees, cliffrose, or sagebrush. An uncommon breeder on the Arizona Strip.

### Sensitive Species

Sensitive species are usually rare within at least a portion of their range. Many are protected under certain State and/or Federal laws. Species designated as sensitive by the BLM must be native species

found on BLM-administered lands for which the BLM has the capability to significantly affect the conservation status of the species through management, and either:

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

All federally designated candidate species, proposed species, and delisted species in the five years following delisting are included as BLM sensitive species. Based on occurrence records and monitoring data, the sensitive species that may occur within the Beaver Dam Slope and Mormon Well Allotments and that may be affected by actions proposed in one of the alternatives presented in Chapter 2 are displayed in Table 3.11.

**Table 3.11. Sensitive Species Associated with the Beaver Dam Slope and Mormon Well Allotments.**

Species	Potential for Occurrence	
	Beaver Dam Slope	Mormon Well
Western Burrowing Owl ( <i>Athene cunicularia hypogea</i> )	Potential	Potential
Monarch Butterfly ( <i>Danaus plexippus</i> )	Potential	Potential

Several additional sensitive species occur on the Arizona Strip. However, it has been determined that these species would not be affected by actions proposed in this EA. These species are therefore not addressed further in this document. The sensitive species that will not be discussed in further detail can be found in Table F.1 in Appendix F, along with the rationale for their exclusion from further analysis.

**Western Burrowing Owl (*Athene cunicularia hypogea*)**

Burrowing owls occupy a wide variety of open habitats including grasslands, deserts, or open shrublands. Burrowing owls rarely dig their own burrows and largely rely on existing burrows dug by prairie dogs, ground squirrels, badgers, skunks, coyotes, and foxes but will also use manmade and other natural openings. Desert tortoise burrows have also been used. Burrowing owls have moderate to high nest-site fidelity to general breeding areas and even to particular nest burrows; burrows are re-used at a higher rate if the bird has reproduced successfully during the previous year (Klute et al. 2003). Moderate grazing can have a beneficial impact on burrowing owl habitat by keeping grasses and forbs low (MacCracken et al. 1985) but the control of burrowing rodent colonies in grazed areas is believed to be a significant factor in the burrowing owl's decline (Desmond and Savidge 1996). Burrowing owls are infrequently encountered on the Arizona Strip, likely due to the lack of prairie dog or other large rodent colonies.

Suitable habitat for burrowing owls is present on sparsely vegetated areas of the allotments. Although potential nesting habitat is available, no nest sites are known to occur within the allotment.

### **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 2014c).

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

Monarchs may breed in low numbers within the allotments, although documentation is lacking. Milkweed species are present, including showy milkweed. Migrating monarchs have been observed in the late summer just south of the allotments along the Virgin River. Wildflowers are present throughout the allotments in early spring and late summer during Monarch migration.

## Chapter 4

# Environmental Consequences

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### 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 3.3). The intent of this analysis is to provide the scientific and analytical basis for the environmental consequences. General effects from projects similar to the proposed action are also described in the Arizona Strip Proposed RMP/Final EIS (BLM 2007).

### 4.2 Direct and Indirect Impacts

#### 4.2.1 Livestock Grazing

##### 4.2.1.1 Alternative A – Proposed Action

The proposed action would affect the livestock grazing permittees on the Beaver Dam Slope and Mormon Well Allotments by renewing their ten-year term grazing permits. The proposed action would maintain the current level of livestock grazing authorized for the permittees (Table 2.1 and Table 2.2), which would result in a continued viable ranching operation for the livestock operators and provide some degree of stability for the permittees' livestock operations. There would be no change to the kind of livestock, permitted number of livestock or the total number of AUMs. Permit renewal would also meet the purpose and need for the action identified in Chapter 1 of this EA – to provide for livestock grazing opportunities on public lands where consistent with meeting management objectives, including the Arizona Standards for Rangeland Health and Guidelines for Livestock Grazing Management and the Arizona Strip Field Office RMP (BLM 2008a), and to respond to applications to fully process and renew permits to graze livestock on public land.

##### 4.2.1.2 Alternative B – Issue New Ten-Year Grazing Permits with Reduced Grazing (Actual Use/Advance Bill)

This alternative would affect the livestock grazing permittees on the Beaver Dam Slope and Mormon Well Allotments. New ten-year term grazing permits would be issued, but this alternative would reduce AUMs authorized for the permittees, which would affect the permittees' livestock operations by not allowing as many livestock to graze on the allotments during the same season of use. For the Beaver Dam Slope Allotment, active AUMs would be reduced by 73% from current permitted use, or a reduction of 654 AUMs. The Mormon Well Allotment active AUMs would be reduced by 3%, or a reduction of 14 AUMs. The reduction would be divided between the permittees on each allotment based on their share of the base waters (see Table 2.4 and 2.6). There would be no change to the kind of livestock permitted. The reduced AUMs would not provide as much stability and compatibility especially on the Beaver Dam Slope Allotment. This would thereby force the permittees to shrink their herds or pursue other options for the unpermitted livestock, such as leasing private pasture or obtaining substitute federal grazing permits on a different allotment. This could be challenging because federal permits do not become available very often and are in high demand.

#### **4.2.1.3 Alternative C – Issue New Ten-Year Grazing Permits with Increased Grazing (Potential Stocking Level Analysis)**

Under this alternative, new ten-year term grazing permits would be issued with increased grazing preference (increased active AUMs). Active AUMs for the Beaver Dam Slope Allotment would be increased by 65% over current permitted use, or an additional 583 AUMs. Active AUMs for the Mormon Well Allotment active AUMs would be increased by 188% over current permitted use, or an additional 789 AUMs. The increase would be divided between the permittees on each allotment based on their share of the base waters (see Tables 2.8 and 2.10). Although the active AUMs would be increased, the allowable utilization level would remain at 45% and the season of use would remain the same as Alternative A (October 16 – March 15). Running increased numbers of livestock would likely require increased herding to move livestock to new use areas or pastures as the allowable utilization level is reached. Increasing the number of livestock grazed each year would increase the amount of livestock drinking water that would be required. The amount and location (Figure A.4 Range Improvements and Tables 3.5 and 3.6) of existing waters could be a limiting factor to increasing livestock numbers especially in drought years. The distribution of livestock across the pastures would be limited by the distance to water likely leaving areas within pastures under-utilized. There are no new range improvements, including no new water developments, proposed under this alternative.

Similar to Alternative A, this alternative would result in continued viable ranching operations for the livestock operators and provide some degree of stability for the permittees' livestock operations – increased preference would allow the permittees to increase the size of their herds. Permit renewal would meet the purpose and need for the action identified in Chapter 1 of this EA – to provide for livestock grazing opportunities on public lands where consistent with meeting management objectives, including the Arizona Standards for Rangeland Health and Guideline for Livestock Management and the Arizona Strip Field Office RMP (BLM 2008a), and to respond to applications to fully process and renew permits to graze livestock on public land.

#### **4.2.1.4 Direct and Indirect Impacts of Alternative D – No Grazing**

This alternative would drastically affect the livestock grazing permittees on the Beaver Dam Slope and Mormon Well Allotments by not authorizing any active preference under the new ten-year term grazing permits. All of the 897 active AUMs on the Beaver Dam Slope Allotment and all of the 420 active AUMs on the Mormon Well Allotment would be suspended (i.e., livestock grazing would be deferred for the ten-year permit period). In ten years, the allotments would be re-evaluated. The action would not provide current or future use, stability and compatibility for the permittees' livestock operations because they would not be authorized to use the allotments. This would force them to seek alternative arrangements for their herds, such as leasing private pasture or obtaining substitute federal grazing permits on a different allotment (which, as described in Section 4.2.1.2 could be challenging). This would likely be a large economic impact to the permittees. This alternative would not meet the purpose and need for action identified in Chapter 1 of this EA – to provide for livestock grazing opportunities on public lands where consistent with meeting management objectives, including the Arizona Standards for Rangeland Health and Guidelines for Livestock Grazing Management and the Arizona Strip Field Office RMP (BLM 2008a), and to respond to applications to fully process and renew permits to graze livestock on public land. (See Section 3.2.2, Appendix B and Appendix C for a discussion on the current vegetative condition on the allotments, including the Arizona Standards for Rangeland Health and Guidelines for Livestock Grazing Management.) In ten years, the condition of the allotments would be re-evaluated, and a determination would be made at that time on whether to issue new grazing permits.



#### 4.2.2 Soil Resources

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

From the standpoint of soil infiltration/permeability and erosion rates, 32% of the soils mapped for the Mormon Well Allotment and 24% for the Beaver Dam Slope Allotment have inherent resiliency to grazing impacts that owe to the skeletal (> 35% rock fragment content by volume) nature of the soils. These are documented spatially and in tabular form in Appendix E soil maps Figures E.1 and E.3 and associated legend Tables E.1 and E.2. Rocky soils are less prone to erosion as rock fragments serve to “armor” the soil from wind and water erosion. Rock fragments and coarser (sand-sized) soil particles also are more permeable, meaning that water is able to infiltrate through the soil profile faster relative to finer (clay and silt-rich) soils. Soils within the footprint of the allotments that are rocky/coarse textured have a higher degree of resiliency to erosion and compaction but are often less productive from a vegetation standpoint. Conversely, soils with unprotected sandy surfaces, steeply sloping fine-textured and/or gypsum-laden profiles are less resilient when it comes to land uses such as grazing. For the Mormon Well Allotment, map unit 28 (Gypill-Badland association, 10-70% slopes) is mapped as comprising nearly 40% of the landscape and represents this more vulnerable, less productive soil type. A similar map unit (Ty; Typic Torriorthents-Badland association) is mapped on 8% of the Beaver Dam Slope Allotment. Wind-deposited sandy soils

Soils with a diverse and robust mix of root sizes (ranging from larger tree and shrub roots to smaller/finer grass and forb roots) have higher function and productivity than counterparts that lack this vegetative component. Mojave Desert vegetative cover is naturally sparser relative to other ecosystems; as such, vegetative root density is inherently lower. Given this reality, soil organic matter is accordingly lower and ultimately translates to thinner “topsoil” (soil A horizon) in the allotments. Soil organic matter has an overriding influence on many soil properties, of which erosion and compaction-resistance are no exceptions. The relative dearth of soil organic matter in the soils mapped for the project area does render these soils less productive and to some regard more susceptible to compaction and erosion. Several soil map units and their associated landforms (Map Unit 29 on the Mormon Well Allotment and Map Units 28, 34, BD, and Ty on the Beaver Dam Slope Allotment) have the term “Badland” in the map unit names. Lower range production (150 pounds per acre on normal year; NRCS 2019) and more deleterious effects to soils are likely when these soils are subject to disturbance. On the Mormon Well Allotment, this soil type (Map Unit 28) sees less grazing utilization due to the higher slopes and lower vegetation productivity, but some trailing impacts to waters can be expected. The Beaver Dam Slope Allotment had less of the “Badland” type soils/landform (approximately 20% of the allotment), deeming this allotment more resilient and productive overall from a soils use and management perspective.

The season of use for the two allotments coincides during a period of the year (particularly winter) when soil moisture levels are often at their highest. This can exacerbate grazing-related soil impacts in the form of compaction, reduced infiltration, and decreased soil organic matter inputs. Laboratory-measured (quantitative) bulk density tests for compaction as part of the 2010 land health evaluation process showed that for three key areas on the Mormon Well Allotment, soils were compacted (higher bulk density),

including one to the point of restricting root growth (Smith 2010). Qualitative observations in February 2019 documented hoof shear and compaction throughout both allotments, in addition to biological soil crust damage; abnormally wet conditions account for some of the higher than expected levels of trailing and grazing impacts. Seasonal rest and rotational grazing maintained through grazing infrastructure and active management is important for giving soils and the vegetative growth it supports a chance for recovery and to keep temporary impacts from becoming permanent ones.

Biological soil crusts are ubiquitous throughout the allotments, although densities are not generally as high as the neighboring Colorado Plateau physiographic province. Where they do occur on the allotments (particularly on the aforementioned gypsum-bearing geologic and soil strata), biological soil crusts provide valuable ecosystem function and services including soil retention (buffering from erosion forces), nutrient cycling, and moisture-retention.

Since vegetative health can be used as a proxy for soil health, areas that are meeting or making significant progress towards meeting the previously described standards for rangeland health should have soils that have similarly favorable trends with regard to productivity. The 45% utilization threshold, as proposed in the action alternatives, would help promote conditions that promote soil health and productivity.

#### **4.2.2.1 Alternative A – Proposed Action**

Maintenance of the current level of livestock grazing authorized for the permittees and the total number of AUMs would retain the status quo for the previously described impacts to soils from grazing. The aforementioned driving and resisting forces of soil properties as they relate to grazing use would continue in the absence of other factors such as climatic events or wildfire.

Current level of impacts to soils in these areas would be maintained and no changes in soil conditions are anticipated. Ongoing monitoring of the relevant ecological conditions (e.g. soil, vegetation, and hydrology) would indicate whether impacts to these resources are occurring, should inform short and long-term use, management considerations, and actions in relation to the permitted grazing action.

#### **4.2.2.2 Alternative B – Issue New Ten-Year Grazing Permits with Reduced Grazing (Actual Use/Advance Bill)**

Direct and indirect effects under Alternative B would be similar to those described under Alternative A and the preceding general effects analysis for soils. However, the 73% reduction on the Beaver Dam Slope Allotment and a 3% reduction on the Mormon Well Allotment would likely result in a concurrent reduction in grazing impacts to soils.

#### **4.2.2.3 Alternative C – Issue New Ten-Year Grazing Permits with Increased Grazing (Potential Stocking Level Analysis)**

Direct and indirect effects under Alternative B would be similar to those described under Alternative A and the preceding general effects analysis for soils. However, the 65% increase in stocking levels for the Beaver Dam Slope Allotment and 188% on the Mormon Well Allotment would likely result in more soil erosion, compaction and hydrologic impairment.

#### **4.2.2.3 Alternative D – No Grazing**

The effects to soil resources from the cessation of grazing by livestock would be variable. Commonly associated effects to soils from grazing (namely compaction and reductions in vegetative cover) would cease. Vegetation, which provides a protective canopy for soils, would have the most rest and recovery as compared to the other alternatives. Abiotic (time, freeze-thaw) and biotic processes (i.e. root growth, soil

organic matter accumulation) would help attenuate some grazing impacts where they occur. The extent of soil recovery in the form of improved infiltration capacity (soil permeability) and erosion rates would be hard to quantify on a landscape scale; qualitatively speaking, these improvements could be reasonably expected with the preclusion of domestic grazing. This alternative would have the greatest beneficial impacts to soils of all the alternatives.

### **4.2.3 Threatened, Endangered, and Candidate Animal Species**

#### **4.2.3.1 Alternative A – Proposed Action**

##### **Mojave Desert Tortoise**

Cattle have been known to trample desert tortoises and their burrows, but the frequency of trampling or how this affects tortoise populations is unclear (Boarman 2002). Direct mortality or injury may occur if cattle step on tortoises, their eggs, tortoise burrows, or shelter sites (Berry 1990, as amended; Avery and Neibergs 1993; USFWS 1994a). These direct effects generally occur when grazing is authorized during the desert tortoise active period but may also occur during the inactive period. Several cases of trampling have been reported on the Arizona Strip; however, the frequency with which trampling occurs is unknown. Trampling has been documented on the Beaver Dam Slope in 1988 (Coffeen 1990). Although there is no documentation that trampling has occurred within the Beaver Dam Slope or Mormon Well Allotments, it is reasonable to assume it could occur. It is not anticipated that trampling would affect individual tortoises when they are active since grazing would occur during the tortoise inactive season, although trampling could occur within the Mormon Well Allotment on state and private lands since those areas are grazed when tortoises are active. Livestock may also trample tortoises on BLM-managed lands within the Mormon Well Allotment, since livestock would have access; however, this is anticipated to be rare due to management actions (salt and water placement) intended to concentrate livestock away from BLM-managed lands during this time. Crushing burrows could occur when livestock use these allotments during the tortoise inactive season, resulting in tortoises being crushed inside their burrows, similar to what happened on the Beaver Dam Slope in 1988 (Coffeen 1990).

Livestock are not likely to trample desert tortoise eggs under Alternative A on the Beaver Dam Slope Allotment since eggs are laid from mid-May through July and most or all would hatch before cattle would be turned out onto these allotments in October (Ernst et al. 1994). However, livestock may access portions of the Mormon Well Allotment until early June. However, as described above, this is anticipated to be rare due to management actions (salt and water placement) intended to concentrate livestock away from BLM-managed lands during this time. Tortoise fatalities and injuries are anticipated to be low due to the low density of tortoises in this area (USFWS 2019a).

Grazing operations may also result in direct fatality or injury of desert tortoises that are struck by vehicles associated with grazing activities, and possibly during range improvement maintenance projects.

Non-native annual plants can increase because of livestock grazing, while native perennial bunchgrasses, which are highly palatable desert tortoise forage species, can become less abundant resulting in habitat degradation (Berry and Nicholson 1984; McClaran and Anable 1992), although this has not been documented in the range monitoring data for these allotments. Invasives such as red brome and Sahara mustard do occur in the allotments in wet years; 2005 (an extremely wet year) had high numbers of invasives, but monitoring data shows that on normal to dry years there were few to no invasives. The presence of stable plant communities, such as occur across most of these allotments, allows little to no growth of these invasive plants except in very wet years (see Section 3.2.2).

Both cattle and desert tortoises consume annual forbs and grasses in the spring if winter precipitation has been sufficient for annual production (Burkhardt and Chamberlain 1982, Burge and Bradley 1976, Coombs 1979, Minden 1980, Esque 1994). During dry winters and other seasons, cattle consume primarily perennial shrub and grass species, such as white bursage, range ratany, and big galleta grass. Outside of the spring months or in dry years when winter annual plants are not available, desert tortoise diets comprise a greater percentage of shrubs, perennial grasses, and dried annuals (Henen 1992; Turner et al. 1984; Nagy and Medica 1986; Hohman and Ohmart 1980). The primary constituent elements of habitat that are essential for the conservation of the desert tortoise include important forage plants (that provide nutritional needs) and shelter plants. The allotments provide many of these important forage and shelter plants, including creosote, bursage, ratany, and galleta. In addition, the allotments have not had the devastating wildfires that have occurred just north in Utah, or on other parts of the Arizona Strip, leaving the allotments with mature and healthy Mojave Desert vegetation.

Both allotments would be available for grazing from October 15 through March 15. Livestock would be feeding on available early winter annual growth, plus perennial shrubs and grasses, at this time. This seasonal restriction would reduce some forage competition between livestock and tortoises for winter annual plants, which exhibit most growth in April and May (Beatley 1974). If perennial plants are overgrazed and reduced in availability, desert tortoise would have less perennial forage in the summer when it is needed most (Jarchow and May 1989, Nagy and Medica 1986). If winter precipitation does not produce winter annual growth, desert tortoise exiting hibernation must feed upon perennial shrubs and grasses and what dried annual vegetation is still available after livestock have been grazing in the area. Ensuring that cattle do not exceed the established forage use threshold of 45% percent current annual growth would help reduce direct competition for forage between cattle and desert tortoises and simultaneously reduce the chances of desert tortoise habitat degradation. As shown in the monitoring data in Appendix B (Tables B.6-B.9) and Appendix C (Tables C.7-C.9), utilization at all key areas is light and trend is static or up, which should ensure maintenance of the primary constituent elements of habitat that are essential for the conservation of the desert tortoise.

The Mormon Well Allotment would be available for grazing from October 15 through March 15 on BLM land. However, about 20% (3,374 acres) of the Mormon Well Allotment is located on Arizona State Trust land and private land. Livestock grazing is administered by the Arizona State Land Department on state lands within this area and is expected to continue. Cattle are removed from state and private land by early June and trespass cattle intermittently occur in BLM areas not available to livestock grazing. The direct and indirect effects listed in this section would occur during the desert tortoise active season in the vicinity of Mormon Well where a water source is maintained on private land.

### **Southwestern Willow Flycatcher and Yellow-billed Cuckoo**

No direct effects are anticipated from livestock grazing as outlined in the proposed action because cattle would not be present during the same time of year as these species. Both southwestern willow flycatchers and yellow-billed cuckoos would not arrive in the project area until late May and would leave the area before late September, which is outside the season of use for livestock (October 15 to March 15).

Potential indirect effects of livestock grazing on riparian habitat would be similar for both species. Grazing removes new shoots of native vegetation that could develop into suitable nesting habitat and may slow the regeneration of degraded habitat. Overuse of riparian areas by livestock can eliminate vegetation that holds banks in place and maintains the river channel and may eventually lead to degradation and collapse of banks and loss of vegetation. However, seasonal grazing restrictions in place for the Mojave Desert tortoise (March 15-October 15) are also in place on all areas with known suitable habitat for southwestern willow flycatchers and yellow-billed cuckoos within the project area. No grazing is authorized in critical habitat during the growing season.

Based on condition assessments it was determined that livestock grazing is not resulting in the destruction or impairment of riparian regeneration and that livestock grazing actions are not modifying southwestern willow flycatcher or yellow-billed cuckoo habitat.

#### **4.2.3.2 Alternative B – Issue New Ten-Year Grazing Permits with Reduced Grazing (Actual Use/Advance Bill)**

##### **Mojave Desert Tortoise, Southwestern Willow Flycatcher and Yellow-billed Cuckoo**

Impacts under Alternative B would be similar to those described under Alternative A (see Section 4.2.3.1). However, Alternative B would result in a 73% reduction of grazing use on the Beaver Dam Slope Allotment and a 3% reduction on the Mormon Well Allotment. Subsequently, the direct and indirect effects to desert tortoises, southwestern willow flycatchers, and yellow-billed cuckoos described in Alternative A would be substantially less in the Beaver Dam Slope Allotment resulting in increases in plant growth and reductions in disturbance. Effects on the Mormon Well Allotment would likely be similar to those under Alternative A, given the very small change in grazing that would be authorized under this alternative.

#### **4.2.3.3 Alternative C – Issue New Ten-Year Grazing Permits with Increased Grazing (Potential Stocking Level Analysis)**

##### **Mojave Desert Tortoise, Southwestern Willow Flycatcher and Yellow-billed Cuckoo**

Impacts under Alternative C would be similar to those described under Alternative A (see Section 4.2.3.1), except Alternative C would increase grazing by 65% on the Beaver Dam Slope Allotment and 188% on the Mormon Well Allotment. However, utilization would still be in the “moderate” category (authorized utilization would remain at a maximum of 45%). Since grazing use has been light most years on both allotments (see Appendix B, Tables B.6-B.9 and Appendix C, Tables C.7-C.9), this alternative would likely result in utilization levels at or near the 45% limit in most (if not all) years. Grazing in riparian areas would also increase, potentially limiting new growth or regeneration of important species such as willow or cottonwood.

#### **4.2.3.4 Alternative D – No Grazing**

##### **Mojave Desert Tortoise, Southwestern Willow Flycatcher and Yellow-billed Cuckoo**

Under this alternative, no livestock grazing would occur, so plants would only be minimally grazed (by wildlife). Vegetation would therefore have the most rest and recovery as compared to the other alternatives. Plants would have the maximum amount of energy compounds in their stems for survival and reproduction and plant communities would continue to provide more than sufficient forage and shelter for all three species. There would be no direct effects to desert tortoises due to trampling or collapsing of burrows and no disturbance from livestock operations. Impacts to these species would primarily be beneficial in the form of increased vegetation for forage and cover and a lack of disturbance from livestock operations such as moving cattle in and out of pastures, and maintenance of range improvements.

### **4.2.4 Vegetation**

#### **Impacts to Vegetation Common to Alternatives A - C**

Plants live in ecosystems full of herbivores that range from small insects to large grazing animals. Losing leaves or stems to herbivores is a common event in the life of a rangeland plant. For rangeland plants to

remain healthy and productive, enough vegetation must remain after grazing so that plants can photosynthesize and manufacture energy to produce more leaves, stems, and seeds.

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

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

Under Alternatives A – C, livestock grazing on both allotments would occur during the established season of use (October 16 – March 15), which is during the fall, winter and early spring. Grazing on the Beaver Dam Slope Allotment would follow the three-pasture deferred rotation system (Figure 2.1 in Section 2.3.1) established by the 2002 Beaver Dam Slope AMP revision. On the Beaver Dam Slope Allotment, the three-pasture deferred rotation grazing system would allow early spring grazing (February and March) on one out of three pastures each year and provide early spring rest for the other two pastures. Grazing during the late winter and early spring allows warm season plants to grow and set seed. Grazing during the dormant season (fall and winter), when most perennial plants are not actively growing and after seed production, would have neutral to negligible effects on plant communities because plants would be able to fix a significant amount of carbon prior to biomass removal and would be able to set seed. Dormant season grazing allows both cool and warm season plants to grow, replenishing root reserves and set seed during the growing season. Overall plant vigor would be maintained by dormant season grazing because plants would be grazed only after senescing (the plant growth phase from full maturity to death or dormancy). After the grasses go dormant, they are affected little by grazing (University of Idaho 2011).

Livestock and wildlife trample seeds into the soil and with enough moisture, seedling establishment could occur. Pasture movements would be made based on a maximum 45% utilization level of the current years' growth. Most rangeland grasses and forbs can have 40-50% of their leaves and stems removed every year and still remain healthy and productive. Public land within both allotments would be rested from grazing during the growing season every year (March 16 – October 15). This would allow vegetation to have regrowth from any spring grazing and go to seed most years depending on moisture. The proposed grazing system would allow plants to rest and replenish root reserves before they are grazed again, which would maintain plant vigor and therefore overall vegetative condition.

#### **4.2.4.1 Alternative A – Proposed Action**

Under Alternative A, grazing would be authorized with the same season of use, pasture rotation, and maximum utilization level (see Section 4.2.4). The active preference (stocking level) would remain the

same as the current level for both allotments (see Tables 2.1 and 2.2). Allotment monitoring data indicates that resource conditions on both allotments are currently making progress toward meeting applicable standards for rangeland health; livestock grazing was not cited as the causal factor for not fully meeting standards. Table 3.2 (in Section 3.2.2) shows that the key areas in the Beaver Dam Slope Allotment are mid seral, late seral, or PNC with static or upward trend, which is a stable condition. Two of the key areas in the Mormon Well Allotment are late seral with either a static or upward trend; the other key area is PNC with an upward trend. All of these are also in a stable condition. Utilization has been below the 45% utilization level during the ten-year period 2008 – 2018 on the Beaver Dam Slope Allotment. Utilization on the Mormon Well Allotment Key Area # 1 was 52% in 2008 on ricegrass. This was the only reading above 45% during the 2008 – 2018 period on the Mormon Well Allotment. Utilization has not been a problem on either allotment (see Tables B.6 – B.9 in Appendix B and Tables C.7 – C.9 in Appendix C). DPC Objectives were partially met on both allotments (see Tables B.14 – B.17 in Appendix B and Tables C.13 – C.15 in Appendix C). Livestock grazing was not the causal factor for partially meeting rangeland health.

Based on a review of current monitoring data, the current season of use and stocking level (active AUMs) which allow for growing season rest every year is working on both allotments (see Section 4.2.4 above). Ecological condition would be maintained or improved over time (key areas are in mid to late seral or PNC with static to upward trends which is a stable condition). Monitoring of the allotments would continue – if future monitoring indicates any areas within the allotment are not continuing to make progress towards meeting rangeland health, changes to the grazing use would be made. However, current monitoring data does not indicate that any changes to grazing management are necessary.

#### **4.2.4.2 Alternative B – Issue New Ten-Year Grazing Permits with Reduced Grazing (Actual Use/Advance Bill)**

Impacts under Alternative B would be similar to those described under Alternative A (see Section 4.2.4.1). However, Alternative B would result in a 73% reduction of grazing use on the Beaver Dam Slope Allotment and a 3% reduction on the Mormon Well Allotment, so grazing intensity under this alternative would be less (i.e., lighter utilization, although utilization up to 45% could still occur). Thus, additional foliage would remain on palatable plants (both grasses and shrubs) within the allotments (particularly on Beaver Dam Slope Allotment), which would maximize their herbage producing ability (Holechek et al. 1999).

Livestock grazing as proposed under this alternative would minimally affect vegetation, and overall plant vigor would be maintained. Monitoring of the allotment would continue – if future monitoring indicates any areas within the allotment are not in compliance with the Fundamentals of Rangeland Health, and livestock grazing is a causal factor, changes to the grazing use would be made (as described in Section 2.3.3 of this EA).

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

Impacts under Alternative C would be similar to those described under Alternative A (see Section 4.2.3.1), except Alternative C would increase grazing by 65% on the Beaver Dam Slope Allotment and 188% on the Mormon Well Allotment. Increasing active AUMs while keeping the same season of use would likely result in larger numbers of livestock being grazed each year. This would increase grazing intensity under this alternative, although the maximum utilization level would remain at 45%. Annual average utilization levels on the Beaver Dam Slope Allotment from 2008-2018 ranged between 1 – 22%, well below the allowable 45% utilization level (see Tables B.6 – B.9 in Appendix B). Annual average utilization levels on the Mormon Well Allotment from 2008 – 2018 ranged between 2 – 37% (see Tables C.7 – C.9 in

Appendix C). The increases in stocking level (increased AUMs) proposed in this alternative would likely increase impacts to vegetation over the current level of authorized AUMs as described in Alternative A.

Utilization in both allotments would likely reach the allowable utilization limit of 45% every year. With a higher grazing intensity due to larger numbers of livestock, it is likely that pasture movements would be made more frequently than they are currently (Alternative A). If the permittees increased livestock numbers to the maximum permitted, it is possible that the allotment would not support the increased numbers through the entire season of use. This would be a concern especially during drought years. Once utilization reaches the 45% maximum utilization level, the livestock would be moved to another use area, pasture, or removed from the allotment completely regardless of whether or not there is still time remaining in the season of use. Increased herding would be needed to properly implement an increase in stocking level and assure proper livestock distribution. The location of existing water sources (Figure A.4) would limit the ability of livestock to spread use over the pastures without overutilization occurring in some areas. There may also be parts of the allotment that would be under-utilized or possibly not used at all due to the distance from water. Since there is no recent forage inventory data for these allotments, it is unknown whether there is additional forage available to support these increased numbers on a long-term basis. This alternative would therefore have the greatest impact on vegetation on both allotments. Monitoring the allotments would continue; if future monitoring indicates any areas within the allotment are not in compliance with the Fundamentals of Rangeland Health, and livestock is a causal factor, changes to the grazing use would be made (as described in Section 2.3.3 of this EA).

#### **4.2.4.4 Direct and Indirect Impacts of Alternative D – No Grazing**

Under Alternative D, no livestock grazing would occur so plants would only be minimally grazed and browsed by wildlife, including desert tortoise. Vegetation would therefore have the most rest and recovery as compared to the other alternatives. Plants would have the maximum amount of energy compounds in their stems for survival and reproduction. Both allotments are currently making progress toward meeting rangeland health and would benefit from rest from grazing. All plant species would benefit from no grazing. This alternative would result in vegetation having the maximum amount of energy in their stems and roots for survival and reproduction.

#### **4.2.5 Wildlife (including 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, B and C would limit utilization to 45% in the allotments, which would help maintain vegetative condition, and therefore wildlife habitat components. Utilization of key species has not been greater than 14% on the Beaver Dam Slope Allotment or greater than 27% on the Mormon Well Allotment over the past 10 years (see Tables 2.7 and 2.9).

##### **4.2.5.1 Alternative A – Proposed Action**

###### **Migratory Birds**

Properly managed livestock grazing is designed to cause minimal impacts to rangeland resources, including wildlife habitat. Managing the allotments at their present stocking levels and with continued seasonal restrictions would result in maintaining the ecological condition of the allotment.



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. Wintering birds in the area, such as seed-eating sparrows, may be impacted by minor forage competition from livestock. However, no take of any migratory bird species is anticipated. Habitat components required for Costa's hummingbird, Lucy's warbler, Bendire's thrasher, and Bell's vireo would be minimally impacted by continuing with the current grazing system in the allotments.

## **Sensitive Species**

### **Western 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 can do well in moderately grazed areas. Occupied burrows in other allotments on the Arizona Strip frequently have cows nearby during monitoring visits (Langston, personal obs.). Prey species are numerous in the allotments and include small mammals, insects, reptiles, and amphibians. Vegetation in the allotments is sufficient to provide food and shelter requirements for populations of prey species for the burrowing owl. Disturbance to nest sites from livestock management operations may occur but this species is known to tolerate moderate levels of disturbance. Implementation of the proposed action is not likely to have major impacts to burrowing owl habitat or nesting success in the allotments.

### **Monarch Butterfly**

Livestock grazing alters the structure, diversity, and growth pattern of vegetation, which affects the associated insect community. Grazing during a time when flowers are already scarce may result in insufficient forage for the monarch butterfly. Recommended grazing practices (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.

#### **4.2.5.2 Alternative B – Issue New Ten-Year Grazing Permits with Reduced Grazing (Actual Use/Advance Bill)**

Direct and indirect effects under Alternative B would be similar to those described under Alternative A (see Section 4.2.5.1). However, Alternative B would result in a 73% reduction on the Beaver Dam Slope Allotment and a 3% reduction on the Mormon Well Allotment. Subsequently, the direct and indirect effects to migratory birds and sensitive species described in Alternative A would be substantially less in the Beaver Dam Slope Allotment, resulting in increases in plant growth and reductions in disturbance. Effects on the Mormon Well Allotment would likely be similar to those under Alternative A, given the very small change in grazing pressure.

#### **4.2.5.3 Alternative C – Issue New Ten-Year Grazing Permits with Increased Grazing (Potential Stocking Level Analysis)**

Direct and indirect effects under Alternative C would be similar to those described under Alternative A (see Section 4.2.5.1). However, Alternative C would increase grazing by 65% on the Beaver Dam Slope

Allotment and 188% on the Mormon Well Allotment, likely resulting in substantially more impacts on vegetation (see Section 4.2.4.3) than described under Alternative A. This increase in grazing pressure would likely result in utilization levels reaching the 45% limit in most (if not all) years, especially on the Mormon Well Allotment. Grazing in riparian areas would also increase, potentially limiting new growth or regeneration of important species such as willow or cottonwood.

#### **4.2.5.4 Alternative D – No Grazing**

Under this alternative, no livestock grazing would occur. As described in Section 4.2.4.4, vegetation would have the most rest and recovery as compared to the other alternatives. Plants would have the maximum amount of energy compounds in their stems for survival and reproduction and plant communities would continue to provide more than sufficient forage and shelter for all three species. There would be no direct effects to migratory birds or sensitive species and no disturbance from livestock operations. In addition, nesting sites for birds would not be impacted by livestock within the allotment. Impacts to these species would primarily be beneficial in the form of increased vegetation for forage and cover and a lack of disturbance from livestock operations.

### **4.3 Cumulative Impacts**

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

There are a wide variety of uses and activities occurring on the lands within and adjacent to the Beaver Dam Slope and Mormon Well Allotments, including livestock grazing, hiking, camping, hunting, vehicle touring, etc. Specific actions that have occurred, are occurring, or are likely to occur in the reasonably foreseeable future include:

- **Livestock grazing** – The Beaver Dam Slope and Mormon Well Allotments and the adjacent BLM-administered land are active grazing allotments. Livestock grazing in the region has evolved and changed considerably since it began in the 1860s and is one factor that has created the current environment.
- **Recreation** – Recreation activities occurring throughout the project area involve a broad spectrum of pursuits ranging from dispersed and casual recreation to organized, BLM-permitted group uses. Typical recreation in the region includes off-highway vehicle (OHV) driving, scenic driving, hunting, hiking, wildlife viewing, horseback riding, camping, backpacking, mountain biking, geocaching, picnicking, night-sky viewing, and photography. The Arizona Strip is known for its large-scale undeveloped areas and remoteness, which provide an array of recreational opportunities for users who wish to experience primitive and undeveloped recreation, as well as those seeking more organized or packaged recreation experiences.
- **Wildland fire** - During the period 1980 – 2017 there have been 20 documented fires. Fourteen of these fires were less than one acre in size, most were about 0.1 acre each. No large wildfires have occurred on the allotments during this period. There is always a risk of wildfire, in the past most wildfires in this area were human caused but natural causes such as lightning is a possibility especially during the summer monsoon season or during extended drought. It is likely that there will be wildfire starts sometime in the reasonably foreseeable future.

### 4.3.1 Livestock Grazing

The cumulative impact analysis area for livestock grazing is the Beaver Dam Slope and Mormon Well Allotments. Actions that contribute cumulatively to the condition of grazing allotments are livestock grazing practices in the past and present, as well as recreational activities, condition of vegetation, the presence and spread of invasive, non-native species, and wildfire.

Livestock grazing in the region has evolved and changed considerably since the 1860s and is one factor that has created the current environment. At the turn of the 20<sup>th</sup> 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. Protective vegetative cover was reduced, and more runoff brought erosion, rills, and gullies in some areas.

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 voluntary livestock reductions during dry periods and restricted season of use have improved range conditions. During the 1990s, grazing decisions were issued restricting the season of use on these allotments to October 15 to March 15 and removing authorization for temporary non-renewable AUMs. Changes were made to implement the 1998 Arizona Strip RMP amendment for desert tortoise and its habitat in order to “address tortoise recovery goals and objectives while reducing impacts on local communities and human activities that occur in the Mojave Desert” (63 FR 39886, published July 24, 1998). These changes included designating/expanding three ACECs (two of which were the Beaver Dam Slope ACEC and the Virgin River ACEC that overlap Beaver Dam Slope and Mormon Well allotments), modifying management prescriptions for these ACECs (as outlined in the Arizona Strip Field Office RMP – BLM 2008a), and closing the Pakoon ACEC to livestock grazing (which is outside the analysis area for this EA). The net result has been greater species diversity, improved plant vigor, and increased ground cover from grasses and forbs.

Aggressive wildland fire suppression on federal lands within the allotments is anticipated to continue into the foreseeable future due to the presence of desert tortoise habitat. This would help maintain the Mojave Desert plant communities, which are intact in both allotments.

The effects of livestock grazing on resources in the allotments identified in this EA have been analyzed under the “Direct and Indirect Impacts” section of this chapter (Section 4.2). Since livestock grazing occurs throughout the area and on adjacent State and private lands, it is reasonable to assume that impacts similar to those identified earlier in this chapter would occur elsewhere in the area. Another action not mentioned above that may affect livestock grazing is listing a species as threatened or endangered under the Endangered Species Act, including designating critical habitat. The desert tortoise is currently listed under the ESA, which was the reason for changing the season of use on these allotments to October 15 – March 15. Additional listings could result in additional restrictions. Making areas unavailable for livestock grazing, placing restrictions on season of use, reducing access, or applying other restrictions meant to protect special status species may impact livestock grazing operations through the loss of forage, increased difficulty of access, increased costs of operation, and reduced livestock numbers (BLM 2007).

Although all of the above actions can affect livestock grazing, it is not anticipated that any of the alternatives would result in cumulative impacts to livestock grazing when added to other past, present, and reasonably foreseeable activities in the area.

### **4.3.2 Soil Resources**

The cumulative impacts analysis area for soils is the 315,000-acre HUC-8 Lower Virgin River watershed. This watershed covers the spatial boundaries of both grazing allotments and has similar environmental conditions and land use/management activities to those of the EA. Actions that contribute cumulatively to the overall condition of soils for the cumulative impacts analysis area are livestock grazing, recreational activities, residential and commercial development, mining activities, energy and water-use infrastructure, and wildfire.

Soils in the cumulative impacts analysis area formed under conditions that had no vehicles or large ungulate grazing animals to impact them. Population growth, grazing, and infrastructure developments over the past 150 years have resulted in soil disturbance on hundreds of thousands of acres at and near homesteads, communities, roads, utility corridors, and waters across the Arizona Strip. Ground and surface water use/withdrawal has cumulative impacts on soils as they can “dewater” riparian areas, rendering soils drier, less productive, and more vulnerable to all forms of erosion. Continued population growth and the resulting growth in vehicle and OHV use and visitation in the region would continue to add to the acreage of soil disturbance. Cyclical drought and annually higher air temperatures could reduce overall vegetative cover, making soils more susceptible to erosion. Wildfire would continue to make soils more susceptible to erosion and conversion of the vegetation to types that are less conducive to soil health and productivity. Successful implementation of the land health evaluation process and related standards should ensure that soils exhibit infiltration, permeability, and erosion rates that are appropriate to soil type, climate, and ecological site. It is therefore anticipated that the alternatives would not result in significant cumulative impacts to soils when added to other past, present, and reasonably foreseeable activities in the area.

### **4.3.3 Vegetation**

The cumulative impact analysis area for vegetation is the Beaver Dam Slope and Mormon Well Allotments. Actions that contribute cumulatively to the overall condition of vegetation and the presence and spread of invasive, non-native species are livestock grazing, recreational activities, and wildfire.

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

Aggressive wildfire control is expected to continue throughout this area, which has Mojave Desert tortoise critical habitat. Wildfire, depending on its size and intensity, would have a long-term impact to vegetation, which in the arid environment of the Mojave Desert could take decades to recover. It would likely change vegetation composition and available forage for livestock and wildlife. Invasive annual plants would likely increase and spread after wildfire, displacing native perennial plants.

The Mormon Well Allotment has had one documented fire during the period between 1980 and 2017. This fire occurred in 1997 and totaled about 0.1 acre. None of the key areas in either allotment have been burned. None of the areas that burned have burned more than once since 1980. The majority of the fires were human caused; four were caused by natural sources. With the low number of acres burned to date the Mojave Desert Ecological Zone is intact in both allotments

The effects of livestock grazing on vegetation in the Beaver Dam Slope and Mormon Well Allotments have been analyzed under the “Direct and Indirect Impacts” section of this chapter. Past, present, and reasonably foreseeable actions within the analysis area would continue to affect this resource, as described above. Since livestock grazing occurs throughout the area, it is reasonable to assume that impacts similar to those identified earlier in this chapter would occur elsewhere in the area. In addition to livestock grazing, there are a wide variety of uses and activities occurring on the lands within and adjacent to the Beaver Dam Slope and Mormon Well Allotments, as described above. This additive impact may affect wildlife habitat or corridors and the greater ecosystems by altering vegetation associations. These systems and the health of the region as a whole are important for the survival of many native species, including the desert tortoise. Both allotments are making progress toward meeting the standards for rangeland health (which takes into account all uses of public rangelands, not just livestock grazing). It is anticipated that the alternatives analyzed in this EA would allow both allotments to continue to make improvement. The alternatives would not result in significant cumulative impacts to vegetation resources when added to other past, present, and reasonably foreseeable activities in the area. Use of monitoring and adaptive management (see Section 2.2.3) would allow the BLM to adjust grazing management based on changing conditions identified on the allotments.

#### **4.3.4 Wildlife (including Threatened, Endangered, Candidate, Migratory Birds, and Sensitive Species)**

The cumulative impact analysis area for wildlife (including threatened, endangered, and candidate species, migratory birds, and sensitive species) is the Beaver Dam Slope and Mormon Well Allotments and adjacent lands within three miles. Actions that contribute cumulatively to the overall disturbance to wildlife and wildlife habitat include livestock grazing, recreation activities, and wildfire.

Past livestock grazing resulted in the degradation of wildlife habitat from overgrazing and the introduction of invasive plant species. Livestock grazing in the region has evolved and changed considerably since the 1860s. At the turn of the previous century, large herds of livestock grazed in uncontrolled open range, causing changes in plant, soil, and water relationships. In response, livestock grazing reform began in 1934 with passage of the Taylor Grazing Act. Subsequent laws, regulations, and policy changes have resulted in adjustments in livestock numbers, season-of-use changes, and other management changes. Grazing continues in the analysis area and is managed such that ecological condition of the area is good and all land health standards are being met or are progressing toward being met.

Recreational pursuits, particularly OHV use, have caused disturbance to most all species and their habitats. With the increase in local populations has come a dramatic increase in the level of OHV use, resulting in increased disturbance, injury, and mortality to wildlife, particularly ground dwelling species with low mobility. Transportation corridors exist through the habitat of virtually all species found within the analysis area. Impacts vary by species and by the location, level of use, and speed of travel over the road. OHV use is a threat to desert tortoises, resulting in crushed tortoises, crushed burrows, and the destruction of tortoise habitat (USFWS 2011).

Wildfire could play a large role in the quality of habitat in the analysis area (see Section 4.3.2 above). Burned areas in the Mojave Desert are extremely slow to recover and the disturbance often results in an

increase in non-native annual grasses. These non-native plants are often the fine fuels that carry the fire making burned areas more likely to burn again in the future.

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

#### **4.4 Monitoring**

Long Term: Long term monitoring studies are scheduled to be read at all key areas every 5 years (see Figure A.6 for the location of key areas). Frequency, cover and composition data are collected using the pace frequency and dry-weight-rank (DWR) methods to measure achievement of standards for rangeland health and detect changes in resource conditions. DWR studies would be used to measure attainment of the key area DPC objectives. In addition, pace frequency studies would occur at each key area to detect changes of individual species, which determines a trend or change in vegetation composition. DWR and pace frequency study methodologies are described in *Sampling Vegetation Attributes*, Interagency Technical Reference 1734-4 (BLM 1999b).

Short Term: Livestock use on key forage plants is determined by conducting grazing utilization studies using the Grazed-Class Method as described in the *Utilization Studies and Residual Measurements* Interagency Technical Reference 1734-3 (BLM 1999a). Utilization studies would be completed by the BLM when livestock are removed from the pasture. Study data would be compiled each year. Other information to be collected and compiled includes precipitation and actual use. All monitoring data would be used to evaluate current management of the allotment and assist the BLM in making management decisions that help achieve vegetation objectives.

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

The monitoring addressed above is sufficient to identify changes in vegetation as a result of livestock grazing activities. In addition to those methods described, there are efforts in place to inventory for noxious weed establishment (see Table 3.3 in Chapter 3). All monitoring would be in accordance with BLM monitoring protocols and would be subject to funding and staff availability.

## Chapter 5

### Consultation and Coordination

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#### 5.1 Introduction

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

#### 5.2 Summary of Public Participation

Public involvement for the Beaver Dam Slope Allotment's permit renewal process began with a scoping meeting on January 22, 2008 and a field visit on November 18, 2008 (BLM 2012); public involvement for the Mormon Well Allotment's permit renewal process began on February 26, 2008 with an initial scoping meeting followed with a field visit on November 18, 2008 (BLM 2011). In February and May 2010, BLM resource staff and staff from the U.S. Fish and Wildlife Service (USFWS) made field visits to allotments within desert tortoise habitat (including these allotments) to assess resource conditions and discuss desired vegetative communities for the Mojave Desert tortoise. The results of these discussions were incorporated into the desired plant community objectives developed for the allotments, as well as in making recommendations on whether resource conditions were meeting the standards for rangeland health. The land health evaluations were conducted by an interdisciplinary assessment team of BLM resource specialists, assisted by the Rangeland Resources Team appointed by the Arizona Resource Advisory Council. Draft evaluations were sent out for public review and comment to individuals, groups, and agencies. Comments were incorporated into the final land health evaluation reports.

Comments received in response to the completion of these evaluations were also incorporated into the EA process as scoping comments (Appendix H). The EA reflects the analysis of the proposed grazing permit renewals. A preliminary EA was posted on the BLM ePlanning web page on April 1, 2019 for review; a notice of public comment period letter was sent to those persons and groups listed on the Arizona Strip interested publics mailing list notifying them of the availability of the EA for a 30-day review and comment period. All comments received during development of the EA are summarized in Appendix H along with a response to each comment.

#### 5.3 List of Preparers and Reviewers

The following tables list persons who contributed to preparation of this EA. Table 5.1 identifies the individuals who took part in the preparation and review of this document, while Table 5.2 identifies individuals consulted during the development of this document.

**Table 5.1. List of BLM Preparers/Reviewers.**

Name	Title	Resource Area(s) of Specialty
Gloria Benson	Tribal Liaison	Native American Religious Concerns
Brian Bock	Fuels/ Fire Management	Fuels/ Fire Management
Lorraine Christian	Arizona Strip Field Manager	Project Oversight
Rody Cox	Geologist	Geology, Minerals, Energy, Paleontology
Jannice Cutler	Rangeland Management Specialist	Livestock Grazing, Invasive, Non-Native Species, Vegetation

<b>Name</b>	<b>Title</b>	<b>Resource Area(s) of Specialty</b>
Shawwna Dao	Realty Specialist	Lands/Realty/Access
Amber Hughes	Environmental Coordinator	NEPA Compliance
Jon Jasper	Recreation Planner	Recreation/Wilderness/VRM
Jace Lambeth	Rangeland Management Specialist	Special Status Plants
Shawn Langston	Wildlife Biologist	Special Status Animals, Wildlife
Brian McMullen	Soil Scientist	Soils, Water, Air
Sarah Page	Archaeologist	Cultural Resources

**Table 5.2. Non-BLM Agency Reviewers.**

<b>Name</b>	<b>Title</b>	<b>Agency/Organization</b>
Daniel Bulletts	Environmental Program Director	Kaibab Paiute Tribe
Peter Bungart	Senior Archaeologist	Hualapai Tribe
Dawn Hubbs	Cultural Staff	Hualapai Tribe
Rob Nelson	Habitat Evaluation and Lands Program Manager	Arizona Game and Fish Department
Luke Thompson	Field Supervisor	Arizona Game and Fish Department
Brian Wooldridge	Threatened and Endangered Wildlife	US Fish and Wildlife Service

#### **5.4 U.S. Fish and Wildlife Service Consultation**

Formal consultation under Section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.) was initiated on April 19, 2019. This consultation concerned the possible effects of renewing the grazing permits for the Beaver Dam Slope and Mormon Well Allotments on the Arizona Strip Field Office in Mohave County, Arizona on Mojave Desert tortoise, southwestern willow flycatcher, and yellow-billed cuckoo. The Biological Opinion states that the action, as proposed, is not likely to jeopardize the continued existence of the Mojave Desert tortoise, and is not likely to destroy or adversely modify designated critical habitat for Mojave desert tortoise. See Appendix J US Fish and Wildlife Service (USFWS) Biological Opinion (02EAAZ00-2019-F-0543) signed August 29, 2019. Desert tortoise conservation measures from 2007 RMP Biological Opinion for the Arizona Strip BLM Resource Management Plan (22410-2007- F-0463) are incorporated by reference. The USFWS concurred with the BLM’s determination that the proposed action “may affect, but is not likely to adversely affect” the Virgin chub and its critical habitat, the woundfin and its critical habitat, the Virgin spinedace, the southwestern willow flycatcher and its critical habitat, and the yellow-billed cuckoo and its proposed critical habitat (Appendix J).



## Chapter 6

### References

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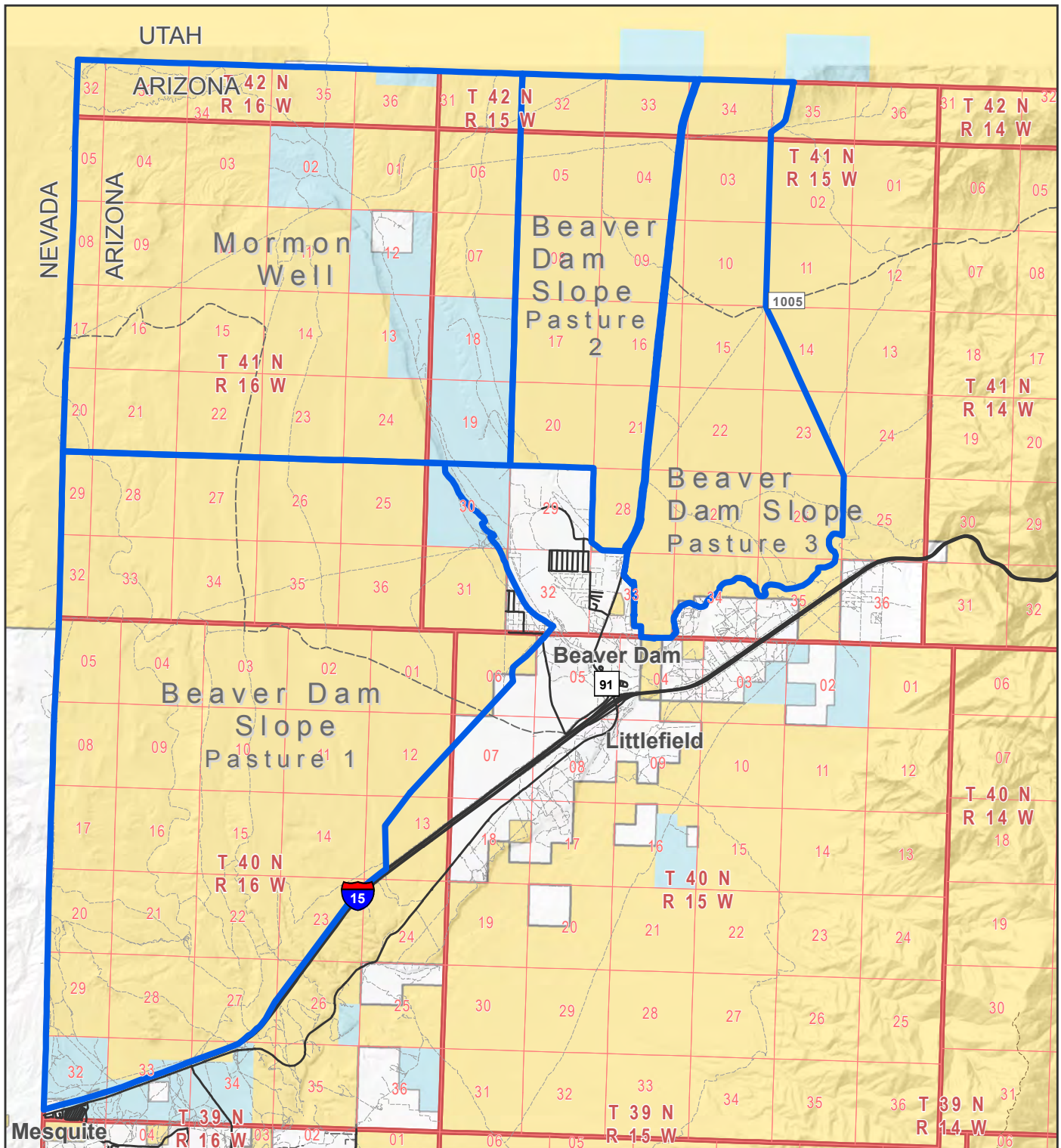
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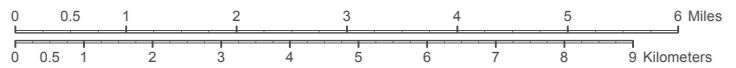
# Figure A.1 - Beaver Dam Slope Allotment and Mormon Well Allotment Location

## NEPA Number DOI-BLM-AZ-A010-2017-0039-EA

Bureau of Land Management - Arizona Strip District - Arizona Strip Field Office



- |                            |                             |
|----------------------------|-----------------------------|
| Beaver Dam Slope Allotment | <b>Arizona Strip Routes</b> |
| Mormon Well Allotment      | Primary Road Paved          |
| <b>Surface Management</b>  | Secondary Road Paved        |
| Bureau of Land Management  | Secondary Road Unpaved      |
| State                      | Tertiary Road Unpaved       |
| Private                    | Single Track                |



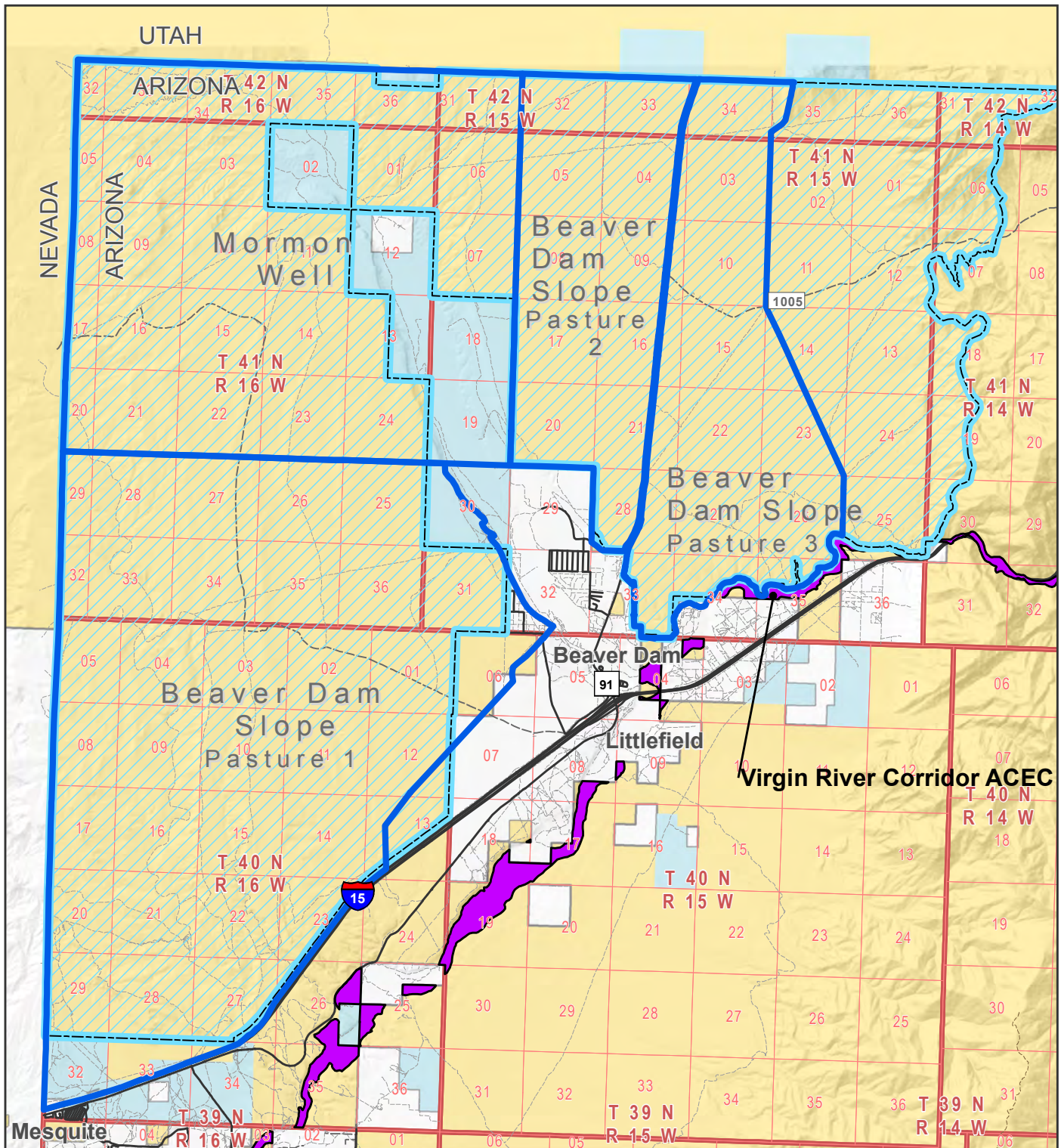




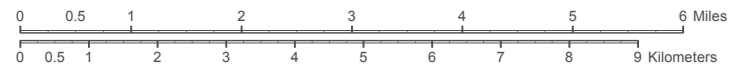
# Figure A.2. Beaver Dam Slope & Virgin River Corridor Area of Critical Environmental Concern

NEPA Number DOI-BLM-AZ-A010-2017-0039-EA

Bureau of Land Management - Arizona Strip District - Arizona Strip Field Office



- Beaver Dam Slope
  - Mormon Well
  - Beaver Dam Slope
  - Virgin River Corridor
- Surface Management**
- Bureau of Land Management
  - State
  - Private
- Arizona Strip Routes**
- Primary Road Paved
  - Secondary Road Paved
  - Secondary Road Unpaved
  - Tertiary Road Unpaved
  - Single Track

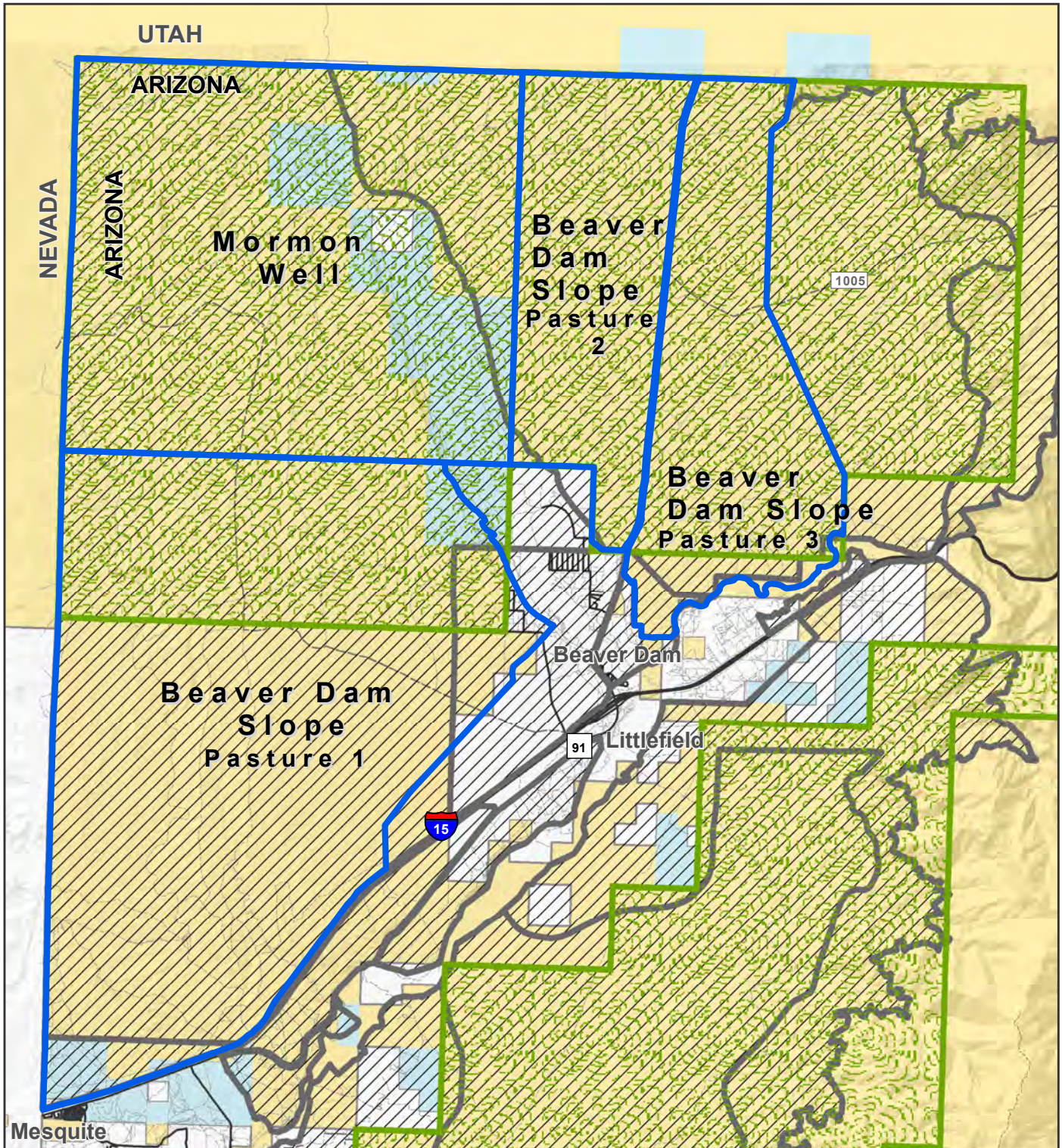




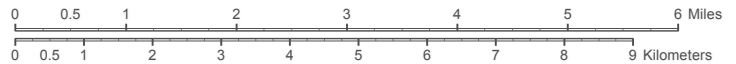
# Figure A.3. Designated Desert Tortoise Critical Habitat

NEPA Number DOI-BLM-AZ-A010-2017-0039-EA

Bureau of Land Management - Arizona Strip District - Arizona Strip Field Office



- |                           |                                  |  |                             |
|---------------------------|----------------------------------|--|-----------------------------|
|                           | Beaver Dam Slope                 |  | <b>Arizona Strip Routes</b> |
|                           | Mormon Well                      |  | Primary Road Paved          |
|                           | Critical Desert Tortoise Habitat |  | Secondary Road Paved        |
|                           | Desert Tortoise Habitat          |  | Secondary Road Unpaved      |
| <b>Surface Management</b> |                                  |  | Tertiary Road Unpaved       |
|                           | Bureau of Land Management        |  | Single Track                |
|                           | State                            |  |                             |
|                           | Private                          |  |                             |

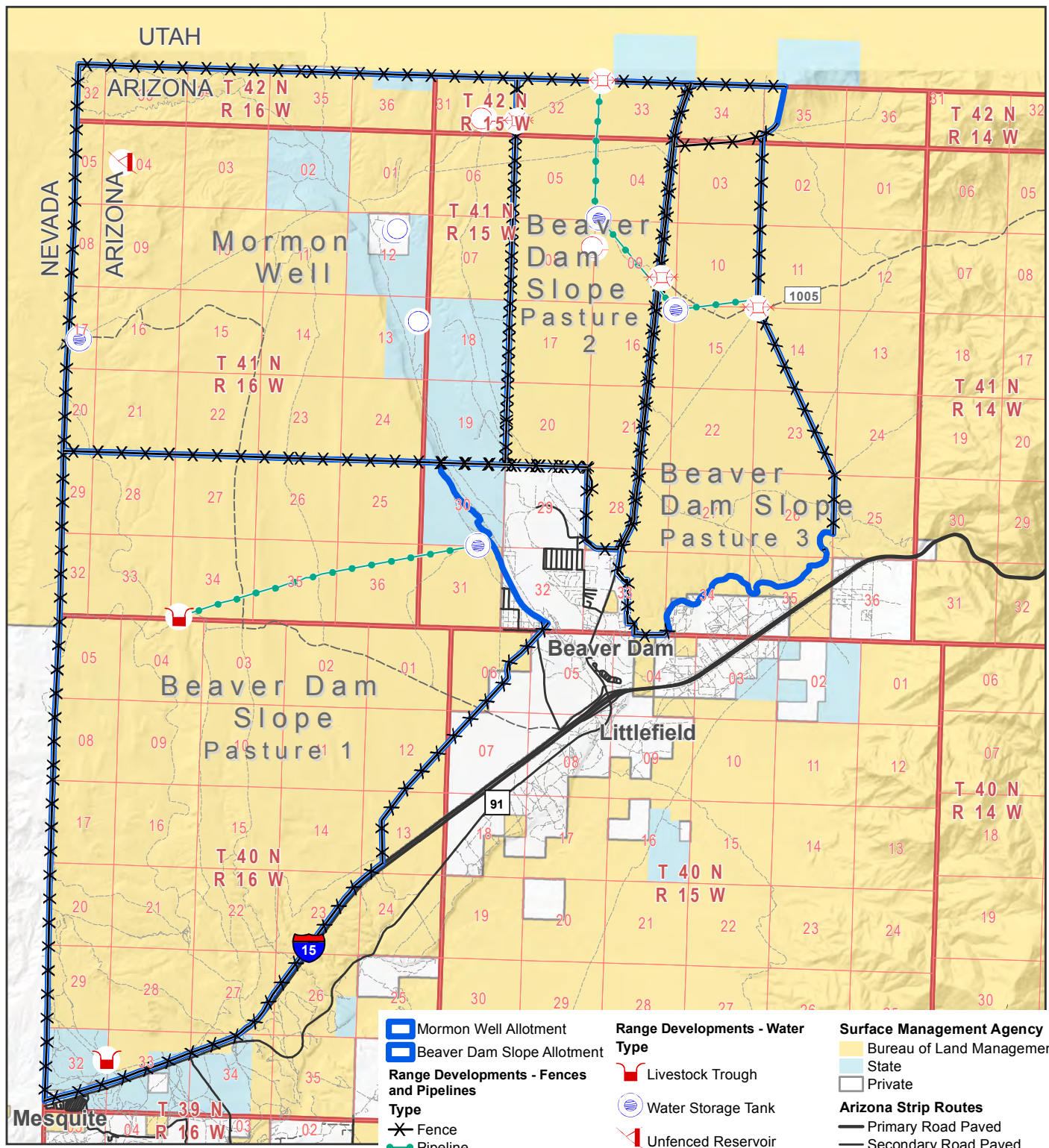




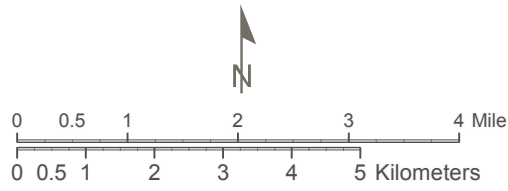
# Figure A.4. Range Improvements on Beaver Dam Slope & Mormon Well Allotments

NEPA Number DOI-BLM-AZ-A010-2017-0039-EA

Bureau of Land Management - Arizona Strip District - Arizona Strip Field Office



- |  |                                       |                                  |
|--|---------------------------------------|----------------------------------|
| Mormon Well Allotment                            | <b>Range Developments - Water</b>     | <b>Surface Management Agency</b> |
| Beaver Dam Slope Allotment                       | <b>Type</b>                           | Bureau of Land Management        |
| <b>Range Developments - Fences and Pipelines</b> | Livestock Trough                      | State                            |
| <b>Type</b>                                      | Water Storage Tank                    | Private                          |
| Fence  | Unfenced Reservoir                    | <b>Arizona Strip Routes</b>      |
| Pipeline   | Well                                  | Primary Road Paved               |
|  | <b>Range Developments - Non-water</b> | Secondary Road Paved             |
|  | <b>Type</b>                           | Secondary Road Unpaved           |
|  | Cattleguard                           | Tertiary Road Unpaved            |
|  | Corral                                | Single Track                     |

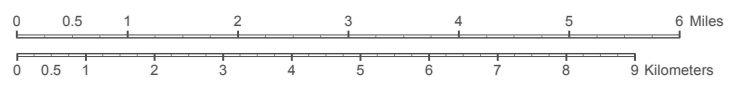
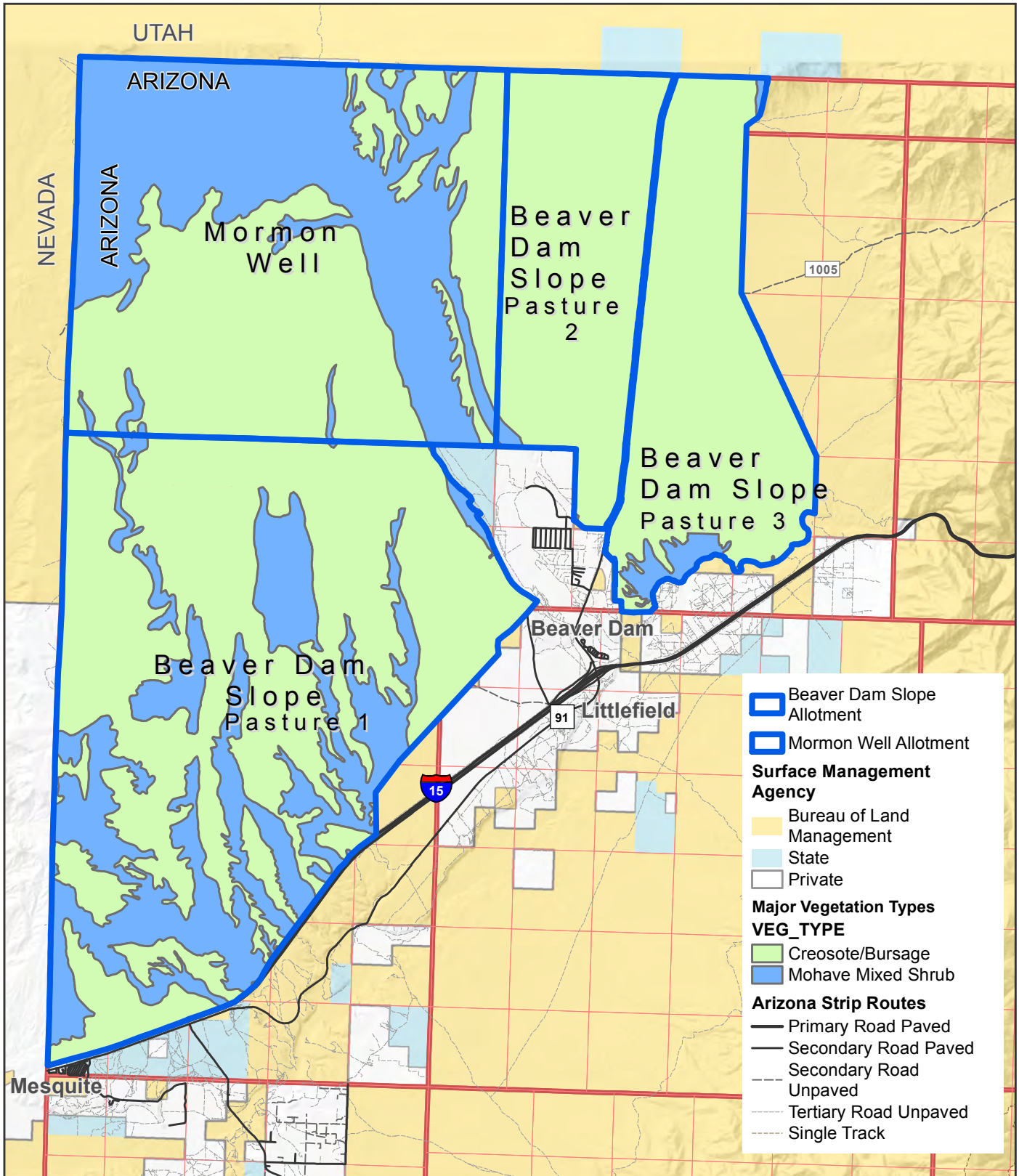




# Figure A.5. Major Vegetation Types - Beaver Dam Slope & Mormon Well Allotments

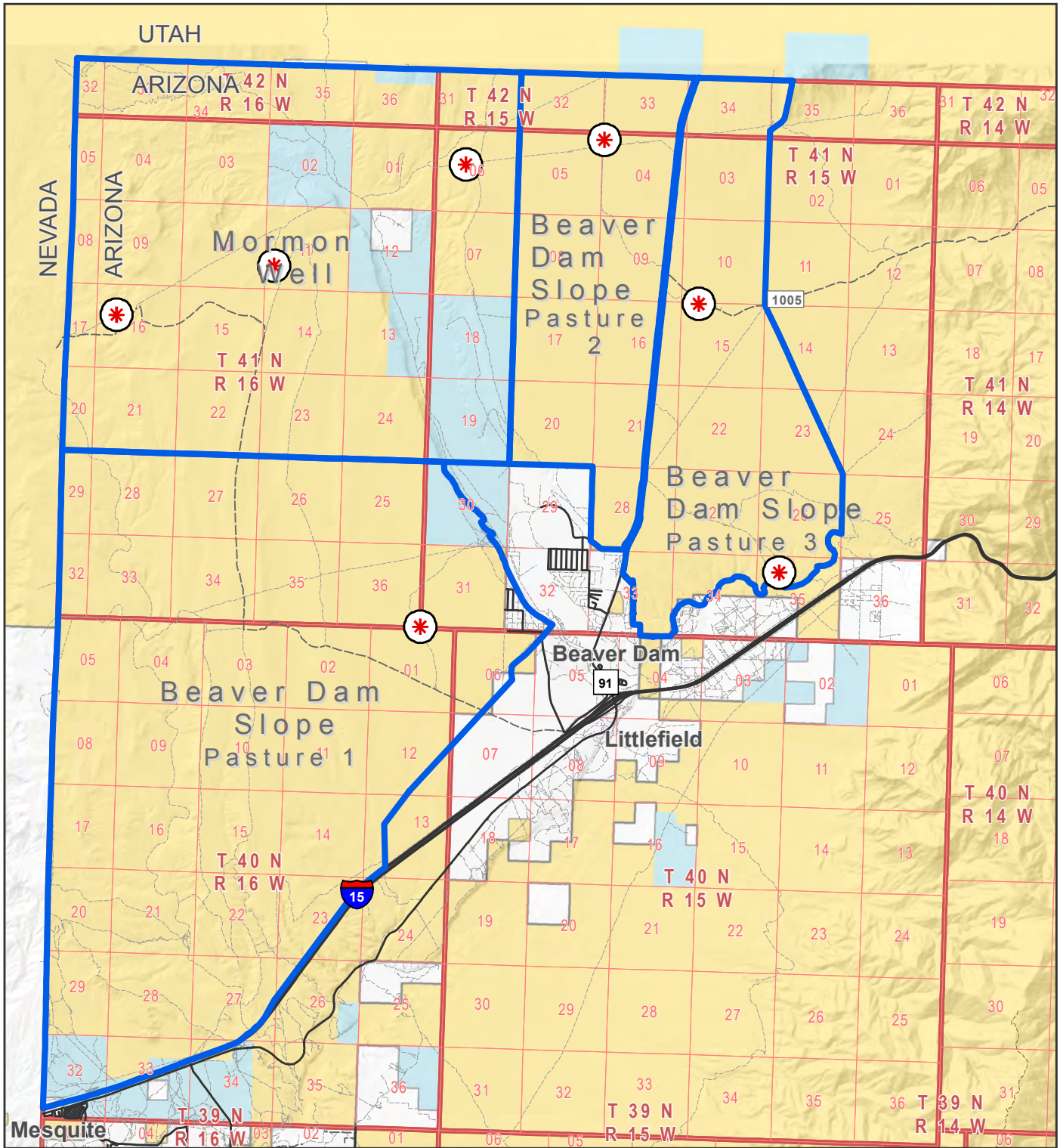
NEPA Number DOI-BLM-AZ-A010-2017-0039-EA

Bureau of Land Management - Arizona Strip District - Arizona Strip Field Office

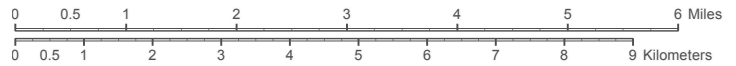




**Figure A.6. Key Area Monitoring Locations - Beaver Dam Slope Mormon Well Allotments**  
 NEPA Number DOI-BLM-AZ-A010-2017-0039-EA  
 Bureau of Land Management - Arizona Strip District - Arizona Strip Field Office



- Beaver Dam Slope Allotment
- Mormon Well Allotment
- Surface Management Agency**
  - Bureau of Land Management
  - State
  - Private
- Arizona Strip Routes**
  - Primary Road Paved
  - Secondary Road Paved
  - Secondary Road Unpaved
  - Tertiary Road Unpaved
  - Single Track
- Key Area - Monitoring Location



## APPENDIX B – Beaver Dam Slope Allotment Land Health Evaluation Report Update

The Beaver Dam Slope Allotment land health evaluation was completed in 2012. That evaluation showed that the allotment was making progress towards meeting all applicable standards for rangeland health. In 2012, a riparian-wetland Proper Functioning Condition (PFC) assessment was conducted on the segment of the Virgin River that runs along the southern portion of the Beaver Dam Slope Allotment in Pasture 3. The determination was made that segment was in Proper Functioning Condition. This update re-evaluates the allotment based on analysis of additional monitoring data that has been collected since the original evaluation was completed.

### Updated Monitoring Data

#### Trend

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

The key species frequency, which is the ratio between the number of sample units that contain key species and the total number of sample units, compares the most recent data to the base year. Detailed tables for each key area with data by year and species is available below in Tables B.1 - B.4. Overall trend at a key area is determined by assessing the sum percentages of the following attributes: key species, live vegetation cover/basal cover, and ground cover (surface litter). Both basal cover and surface litter are important attributes when evaluating Standard #1 (Upland Sites) of the Arizona Standards for Rangeland Health (BLM 1997). Overall trend at a key area is the direction of change in frequency observed between the initial reading (base year) and the current reading, as depicted by the arrows, i.e., (↗) up, (↘) down, and (→) no apparent static or static. The threshold for a change in trend is +/- 10 percent.

Trend plots were established on the Beaver Dam Slope Allotment in 1981 and 1982 (see Figure A.6). These plots are usually read on a five-year interval. The most recent reading for these key areas was 2017 for Beaver Dam Slope Key Areas #1 and #4, and 2015 for Key Areas #5 and #6.

**Table B.1. Trend Data Beaver Dam Slope Allotment, Key Area #4.**

Pasture 1, Key Area #4 – Pace Frequency Method				
Year	Percent Frequency of Key Species	Percent Live Basal Vegetation	Percent Litter	Total
1982	60	3	16	79
1984	85	3	27	115
1988	95	4.5	38.5	138
1991	83	4	41	128
1996	44	12	8	64
2007	32	2	33	67
2012	70	trace	32	102
2017	61	1	19.7	81.7
<b>Overall Trend for Beaver Dam Slope Pasture 1, Key Area #4: (→) static</b>				

The trend for Pasture 1 Key Area # 4 was static from 1982 as compared to 2017. Data from 2017 showed a slight increase in percent frequency of key forage species, a slight decrease in live basal vegetation and an increase in litter. The total reading is just over a 2 percent increase.

**Table B.2. Trend Data Beaver Dam Slope Allotment, Key Area #1.**

<b>Pasture 2, Key Area #1 – Pace frequency Method</b>				
<b>Year</b>	<b>Percent Frequency of Key Species</b>	<b>Percent Live Basal Vegetation</b>	<b>Percent Litter</b>	<b>Total</b>
1981	38	1	24	63
1984	41	trace	22	63
1986	51	1	41	93
1990	49	2.5	21	72.5
1996	17	6	10	33
2007	17	3	53	73
2012	33	2	35	70
2017	32	1	23	56
<b>Overall Trend for Beaver Dam Slope Pasture 2, Key Area #1: (→) static</b>				

The trend for Pasture 2, Key Area # 1 was static form 1981 as compared to 2017. Data from 2017 showed a decrease in percent frequency of key species, no change in live basal vegetation and a slight decrease in litter.

**Table B.3. Trend Data Beaver Dam Slope Allotment, Key Area #5.**

<b>Pasture 3, Key Area #5 – Pace Frequency Method</b>				
<b>Year</b>	<b>Percent Frequency of Key Species</b>	<b>Percent Live Basal Vegetation</b>	<b>Percent Litter</b>	<b>Total</b>
1982	41.5	1	16	58.5
1983	90	1	44	135
1984	71	2	35	108
1990	86.5	5.5	26.5	118.5
1996	39.5	14	6	59.5
2006	38	3	20	61
2011	58	2	23	83
2015	51	1	24.5	76.5
<b>Overall Trend for Beaver Dam Slope Pasture 3, Key Area #5: (↗) up</b>				

The trend for Pasture 3, Key Area # 5 was up from 1982 as compared to 2015. Data from 2015 showed an increase in percent frequency of key species, no change in live basal vegetation and an increase in litter.

**Table B.4. Trend Data Beaver Dam Slope Allotment, Key Area #6.**

Pasture 3, Key Area # 6 – Pace Frequency Method				
Year	Percent Frequency of Key Species	Percent Live Basal Vegetation	Percent Litter	Total
1982	74	1.5	4	79.5
1983	124	6.5	37	167.5
1989	126	5	25	156
1996	60	11	8	79
2006	48	4	24	76
2011	90	4	17	111
2015	61	1	21	83
<b>Overall Trend for Beaver Dam Slope Pasture 3, Key Area 6: (→) static</b>				

The trend for Pasture 3, Key Area #6 the trend was static from 1982 as compared to 2015. Data from 2015 showed a decrease in percent frequency of key species, slight decrease in live basal vegetation and an increase in litter.

Utilization

Utilization is defined as the proportion of the current year’s forage production that is consumed or destroyed by grazing animals (both livestock and wildlife). Average utilization levels of key forage species for this allotment should not exceed 45%.

Management of the allotment is based on a selection of key species. Key species for the Beaver Dam Slope Allotment are listed in Section 3.4.4 of this EA. Tables B.5-B.8 show percent utilization of key forage species by year read at each of the four key areas. Blank cells indicate no plants of that species were encountered in the transect. Average percent utilization by year is calculated by averaging the utilization readings for all key species read in a given year at a specific key area. During the last ten-year period (2008 – 2018) no utilization readings above 45% were recorded on any of the four key areas in the Beaver Dam Slope Allotment. Utilization was not read on any of the key areas in 2015 due to travel restrictions on this and surrounding allotments.

**Table B.5. Utilization Summary Beaver Dam Slope Allotment, Key Area #4.**

Species	Year Utilization Data Collected										
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
<b>Shrubs</b>											
<i>Ambrosia dumosa</i>	No use	No use	Not read	10%	18%	No use	18%	Not read	8%	17%	10%
<i>Ephedra nevadensis*</i>			Not read			No use		Not read	20%	30%	18%
<i>Ceratoides lanata</i>	10%	15%	Not read	37%	23%	No use	22%	Not read	12%	9%	18%
<b>Grasses</b>											
<i>Hilaria rigida</i>	21%	10%	Not read	10%	18%	No use	15%	Not read	15%	17%	21%



<i>Oryzopsis hymenoides</i>		6%	Not read	5%	14%	No use	24%	Not read	24%	10%	31%
Average Percent Utilization by Year	11%	12%	Not read	10%	17%	No use	19%	Not read	15%	14%	20%

This key area was visited in 2013 but no use was recorded on any of the key species.

**Table B.6. Utilization Summary Beaver Dam Slope Allotment, Key Area #1.**

Species	Year Utilization Data Collected										
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
<b>Shrubs</b>											
<i>Acamptopappus sphaerocephalus</i>	Not read	No use	25%					Not read			
<i>Ambrosia dumosa</i>	Not read	No use	4%	6%	4%	4%	5%	Not read	9%	14%	19%
<i>Ephedra nevadensis</i>	Not read	No use				10%		Not read	20%	30%	45%
<i>Ceratooides lanata</i>	Not read	No use		40%	No use			Not read		10%	
<b>Grasses</b>											
<i>Hilaria rigida</i>	Not read	No use		15%	4%	7%	8%	Not read	23%	17%	22%
<i>Oryzopsis hymenoides</i>	Not read	No use		15%	No use	9%		Not read	10%	No use	
Average Percent Utilization by Year	Not read	No use	6%	8%	3%	6%	5%	Not read	15%	15%	22%

The key area was visited in 2009 but no use was recorded on any of the key species.

**Table B.7. Utilization Summary Beaver Dam Slope Allotment, Key Area #5.**

Species	Year Utilization Data Collected										
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
<b>Shrubs</b>											
<i>Ambrosia dumosa</i>	No use	No use	No use	19%	No use	7%	1%	Not read	12%	15%	22%
<i>Ceratooides lanata</i>	No use	No use	32%	12%	No use	14%	1%	Not read	14%	18%	23%
<b>Grasses</b>											
<i>Hilaria rigida</i>	No use	No use	23%	6%	No use	10%	1%	Not read	19%	19%	14%
Average Percent Utilization by Year	No use	No use	18%	14%	No use	10%	1%	Not read	14%	16%	20%

The key area was visited in 2008, 2009, and 2012 but no use was recorded on any of the key species.

**Table B.8. Utilization Summary Beaver Dam Slope Allotment, Key Area #6.**

Species	Year Utilization Data Collected										
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
<b>Shrubs</b>											
<i>Ambrosia dumosa</i>	No use	No use	No use	20%	No use	No use	1%	Not read	2%	10%	15%
<i>Ceratoides lanata</i>	No use	3%	20%	23%	No use	No use	1%	Not read	2%	13%	15%
<b>Grasses</b>											
<i>Hilaria rigida</i>	No use	15%	7%	14%	No use	2%	1%	Not read	2%	11%	12%
Average Percent Utilization by Year	No use	10%	4%	17%	No use	2%	1%	Not read	2%	11%	14%

They key area was visited in 2008 and 2012 but no use was recorded on any of the key species.

Utilization on key species has ranged from 0 – 45%, with most readings well below 30%, which allows the species to maintain themselves in drought, even with grazing. In addition, livestock are removed from the allotment by March 15 each year, and the east and middle pastures get multi-year rest from grazing, both of which allow for the growth of desert vegetation during the spring and summer without any grazing use.

Ecological Site Inventory Data – Ecological Condition

The tables below compare the most recent plant composition data from the trend plots to the desired plant community composition from the site guide for each ecological site at each key area. The site guide used for the information below is the Soil Survey of Shivwits Area, Arizona, Part of Mohave County (NRCS, 2004). It should be noted that the vegetative composition listed in the site guide is an average across the entire ecological site; variations within an ecological site (due to inclusions or transition zones) may result in an actual plant composition that is different from that listed in the site guide. For example, the site guide for a limy upland suggests a composition range for galleta grass (*Hilaria rigida*) at 0-1% but monitoring data (at Key Area #6) is currently at 23% for galleta grass. Some of the Ecological Condition tables below list more than one Ecological Site Description (ESD) for that key area. In some cases, the older original ESD has been updated and given a different name but the code number has remained the same see Key Area #4 for example Limy Upland (Deep) 6 – 9” p.z. (R030XB215AZ) (Sandy Loam Upland 6 -9” p.z. Limy). The Limy Upland (Deep) 6 – 9” p.z. is the older version that was used for the S&G written in 2012. The Sandy Loam Upland 6 -9” p.z. Limy is the updated version of the same ESD with a slightly different name but both are linked by the same code R030XB215AZ. Some of the older ESDs are no longer available that is why the updated versions have been included.

Ecological condition of Key Areas #1 (93% of the expected potential natural community) and #4 (78% of the expected potential natural community) are PNC. Ecological condition of Key Area #5 is late seral (65% of the expected potential natural community). Ecological condition of Key Area #6 is mid seral (44% of the expected potential natural community). These plant communities are in accordance with the NRCS ecological site guides. The site guides show perennial grass species are a minor component of the overall composition. Shrubs are expected to make up the majority of species composition at these ecological sites. While current monitoring at some of the key areas did not detect “hits” for grass species such as Indian ricegrass, species such as this with naturally low abundance may be present in the area but

out of the monitoring quadrat (and therefore record a score of zero). Management is in place (including utilization levels and season of use) that would help ensure the native Mojave Desert plant species are maintained in the plant community (BLM 2012).

**Table B.9. Beaver Dam Slope Allotment Ecological Site Inventory Data – Ecological Condition Key Area #4.**

<b>Pasture 1, Key Area #4</b> <b>Limy Upland (Deep) 6 – 9” precipitation zone (p.z.) (R030XB215AZ)</b> <b>(Sandy Loam Upland 6 – 9” p.z. Limy)</b> <b>Most recent monitoring data collected in 2017.</b>			
Plant Species	Current Composition	Site Guide Composition	Current Score <sup>8</sup>
<b>Shrubs</b>			
<i>Acamptopappus sphaerocephalus</i>	1%	3 – 8%	1
<i>Ambrosia dumosa</i> *	62%	35 - 45%	45
<i>Ceratoides lanata</i> *	7%	1 - 5% (other shrubs)	5
<i>Cylindropuntia acanthocarpa</i> var. <i>acanthocarpa</i>	2%	1 - 3%	2
<i>Ephedra nevadensis</i> *	0	1 - 3%	0
<i>Krameria parvifolia</i> *	8%	1 - 5%	5
<i>Larrea tridentata</i>	8%	25 - 35%	8
<b>Perennial Grasses</b>			
<i>Hilaria rigida</i> *	6%	1 - 5%	5
<i>Oryzopsis hymenoides</i> *	4%	1 - 5%	4
<b>Perennial Forbs</b>			
<i>Sphaeralcea</i> sp.	3%	1 – 5%	3
<b>Ecological Condition: Total of Current Score = 78 – PNC (representative of 3,305 ac.)</b>			

\* Species used to judge utilization levels by cattle.

<sup>8</sup> “Current score” = lower of either Column 2 (current composition) or Column 3 (site guide composition)

**Table B.10. Beaver Dam Slope Allotment Ecological Site Inventory Data – Ecological Condition Key Area #1.**

<b>Pasture 2, Key Area #1</b> <b>Limy Upland (Deep) 6 – 9” p.z. (R030XB215AZ)</b> <b>(Sandy Loam Upland 6 – 9” p.z. Limy)</b> <b>Most recent monitoring data collected in 2017.</b>			
<b>Plant Species</b>	<b>Current Composition</b>	<b>Site Guide Composition</b>	<b>Current Score<sup>9</sup></b>
<b>Shrubs</b>			
<i>Ambrosia dumosa</i> *	51%	35 - 45%	45
<i>Cylindropuntia acanthocarpa</i> var. <i>acanthocarpa</i>	< 1%	1 - 3%	< 1
<i>Krameria parvifolia</i> *	4%	1-5%	4
<i>Larrea tridentata</i>	35%	25 - 35%	35
<i>Opuntia</i> sp.	2%	1 – 3 %	2
<i>Thamnosma montana</i>	6%	1 - 5% (other shrubs)	5
<i>Yucca brevifolia</i>	1%	0 - 1%	1
<b>Perennial Grasses</b>			
<i>Hilaria rigida</i> *	0%	1 - 5%	0
<i>Oryzopsis hymenoides</i> *	1%	1 - 5%	1
<b>Perennial Forbs</b>			
<i>Baileya multiradiata</i>	< 1%	5 - 10% (forb group)	< 1
<b>Ecological Condition: Total of Current Score = 93 – PNC (representative of 4,039 ac.)</b>			

\* Species used to judge utilization levels by cattle.

<sup>9</sup> “Current score” = lower of either Column 2 (current composition) or Column 3 (site guide composition)

**Table B.11. Beaver Dam Slope Allotment Ecological Site Inventory Data – Ecological Condition Key Area #5.**

<b>Pasture 3, Key Area #5</b> <b>Coarse Sandy Loam (Limy) 6 – 9” p.z. (R030XB205AZ)</b> <b>(Sandy Loam Upland 6 – 10” p.z. Limy Subsurface, Gravelly)</b> <b>Most recent monitoring data collected in 2015.</b>			
<b>Plant Species</b>	<b>Current Composition</b>	<b>Site Guide Composition</b>	<b>Current Score<sup>10</sup></b>
<b>Shrubs</b>			
<i>Acamptopappus sphaerocephalus</i> *	0	1 - 5%	0
<i>Ambrosia dumosa</i> *	34%	20 - 35%	34
<i>Ceratoides lanata</i> *	8%	1-5% (other shrubs)	5
<i>Krameria parvifolia</i> *	10%	1-2%	2
<i>Larrea tridentata</i>	21%	40 - 50%	21
<i>Opuntia sp.</i>	1	0 – 2%	1
<i>Thamnosma montana</i>	0	0%	0
<b>Perennial Grasses</b>			
<i>Oryzopsis hymenoides</i> *	1%	0 - 3%	1
<i>Sporobolus flexuosus</i>	1%	0 – 4%	1
<b>Perennial Forbs</b>			
Forbs	0	1 – 5%	0
<b>Ecological Condition: Total of Current Score = 65 – Late Seral (representative of 1,283 ac.)</b>			

\* Species used to judge utilization levels by cattle.

**Table B.12. Beaver Dam Slope Allotment Ecological Site Inventory Data – Ecological Condition Key Area #6.**

<b>Pasture 3, Key Area #6</b> <b>Limy Upland 6 – 9” p.z. (R030XB214AZ)</b> <b>Most recent monitoring data collected in 2015.</b>			
<b>Plant Species</b>	<b>Current Composition</b>	<b>Site Guide Composition</b>	<b>Current Score<sup>11</sup></b>
<b>Shrubs</b>			
<i>Ambrosia dumosa</i> *	32%	25 – 35%	32
<i>Ceratoides lanata</i> *	< 1	1 – 5%	< 1
<i>Krameria parvifolia</i> *	2%	1 – 5%	2

<sup>10</sup> “Current score” = lower of either Column 2 (current composition) or Column 3 (site guide composition)

<sup>11</sup> “Current score” = lower of either Column 2 (current composition) or Column 3 (site guide composition)

<i>Larrea tridentata</i>	9%	15 – 25%	9
<b>Perennial Grasses</b>			
<i>Hilaria rigida</i> *	23%	1%	1
<b>Perennial Forbs</b>			
Forbs	0	1 – 2%	0
<b>Ecological Condition: Total of Current Score = 44 – Mid Seral (representative of 5,487 ac.)</b>			

\* Species used to judge utilization levels by cattle.

In summary, Key Areas #1 and #4 are PNC ecological condition, Key Area #5 is in late seral ecological condition, and Key Area #6 is in mid seral ecological condition.

#### Desired Plant Community Objectives

Desired Plant Community (DPC) Objectives for each key area are listed below and in Tables B.13 – B.16. The tables compare the most recent plant composition data from the trend plots to the desired plant community objectives that were established for each key area. DPC objectives were developed during the land health evaluation process by an interdisciplinary team of resource specialists. The species composition objectives were developed by consulting the Ecological Site Guides, developed by NRCS, and site-specific information of the potential of the site to produce vegetation. Site guides used are from the Soil Survey of Shivwits Area, Arizona (Part of Mohave County) (NRCS 2004). The DPC objectives implement RMP objectives and reflect vegetative composition and attributes important for desert tortoise habitat, as well as habitat requirements for other species. The objectives are set to be achieved within a time interval of 20 years from permit renewal. DPC objectives are expressed in figures of Composition by Weight (CBW). Composition data is collected using the Dry Weight Rank sampling method (BLM 2012).

Long-term monitoring of a site indicates what a particular area is capable of producing. Objectives were partially met at each key area; resource conditions are making progress toward meeting applicable standards for rangeland health (Standard #3 - Desired Resource Conditions). The DPC objectives for the Beaver Dam Slope Allotment key areas are:

#### **Pasture 1, Key Area # 4**

Ecological Site: Limy Upland Deep, 6-9-inch precipitation zone (p.z.).

- Maintain total ground cover between 20 and 35%.
- Maintain native perennial grass (big galleta, Indian ricegrass, and sand dropseed) between 10 and 20% CBW.
- Maintain browse species (Mormon tea, bursage, ratany and winterfat) between 23 and 55% CBW.
- Maintain shrubs (creosote bush and cactus) between 21 and 30% CBW.
- Maintain forbs between 1 and 10% CBW.

**Table B.13. Desired Plant Community Objectives Determination Table - Pasture 1, Key Area #4.**

<b>Pasture 1, Key Area #4</b>			
<b>Ecological site: Limy Upland Deep, 6 – 9-inch p.z. (R030XB215AZ) (Sandy Loam Upland 6 – 9” p.z. Limy) Most recent monitoring data collected in 2017.</b>			
<b>Plant Group (or Ground Cover)</b>	<b>Current Composition</b>	<b>Desired Plant Composition</b>	<b>Objective Met or Not Met</b>
<b>Total Ground Cover</b>	<b>39%</b>	<b>20 - 35%</b>	<b>Met (Exceeds)</b>
<b>Browse</b>	<b>77%</b>	<b>23 – 55%</b>	<b>Met (Exceeds)</b>
<i>Ambrosia dumosa</i>	62		
<i>Ceratoides lanata</i>	7		
<i>Ephedra nevadensis</i>	0		
<i>Krameria parvifolia</i>	8		
<b>Shrubs</b>	<b>11%</b>	<b>21 – 30%</b>	<b>Not Met</b>
<i>Acamptopappus sphaerocephalus</i>	1		
<i>Cylindropuntia acanthocarpa</i> var. <i>acanthocarpa</i>	2		
<i>Larrea tridentata</i>	8		
<b>Perennial Native Grasses</b>	<b>10%</b>	<b>10 – 20%</b>	<b>Met</b>
<i>Hilaria rigida</i>	6		
<i>Oryzopsis hymenoides</i>	4		
<b>Perennial Forbs</b>	<b>3%</b>	<b>1 – 10%</b>	<b>Met</b>
<i>Sphaeralcea</i> sp.	3%		

These objectives are partially met at this key area. Total ground cover is currently 39% which exceeds the objective. The composition of browse species exceeds the objective with 77%, although there was no *Ephedra nevadensis* recorded in the most recent reading in 2017. Shrubs do not meet the objective with the current composition at 11%. The composition of perennial native grasses meets the objective with 10%. The perennial forb objective was met with 3%. The Historic Climax Plant Community (R030XB215AZ) is a desert shrub site; dominant species include creosote bush (*Larrea tridentata*) and white bursage (*Ambrosia dumosa*). It is unclear why the shrub objective is not met since these species are not palatable to livestock or wildlife. However, it should be noted that if the browse and shrub objectives were combined, the objective would be met since the combined DPC would be 44-85%, and the combined current browse and shrub composition is 88%. The current shrub community provides habitat components (cover and shelter) for desert tortoise and other wildlife. Some perennial grasses are present in small upland drainages. This site may be a less well drained site that favors white bursage (*Ambrosia dumosa*) over creosote bush. This key area is PNC (Table B.9).

**Pasture 2, Key Area # 1**

Ecological Site: Limy Upland Deep, 6-9-inch p.z.

- Maintain total ground cover between 20 and 35%.
- Maintain native perennial grass (big galleta and Indian ricegrass) to between 1 and 3% CBW.
- Maintain native browse (ratany, bursage) between 25 and 40% CBW.

- Maintain native shrubs (creosote bush, cactus, turpentine bush) between 35 and 55% CBW.
- Maintain forbs between 1 and 10% CBW.

**Table B.14. Desired Plant Community Objectives Determination Table - Pasture 2, Key Area # 1.**

<b>Pasture 2, Key Area #1</b>			
<b>Ecological site: Limy Upland Deep, 6 – 9-inch p.z. (R030XB215AZ)</b> <b>(Sandy Loam Upland 6 – 9” p.z. Limy)</b> <b>Most recent monitoring data collected in 2017.</b>			
<b>Plant Group (or Ground Cover)</b>	<b>Current Composition</b>	<b>Desired Plant Composition</b>	<b>Objective Met or Not Met</b>
<b>Total Ground Cover</b>	<b>25%</b>	<b>20 - 35%</b>	<b>Met</b>
<b>Browse</b>	<b>55%</b>	<b>25 – 40%</b>	<b>Met (Exceeds)</b>
<i>Ambrosia dumosa</i>	51		
<i>Krameria parvifolia</i>	4		
<b>Shrubs</b>	<b>44%</b>	<b>35 – 55%</b>	<b>Met</b>
<i>Cylindropuntia acanthocarpa</i>	< 1		
<i>Larrea tridentata</i>	35		
<i>Opuntia sp.</i>	2		
<i>Thamnosma montana</i>	6		
<i>Yucca brevifolia</i>	1	0	
<b>Perennial Native Grasses</b>	<b>1%</b>	<b>1 – 3%</b>	<b>Met</b>
<i>Hilaria rigida</i>	0		
<i>Oryzopsis hymenoides</i>	1		
<b>Perennial Forbs</b>	<b>&lt; 1%</b>	<b>1 – 10%</b>	<b>Not Met</b>
<i>Baileya multiradiata</i>	< 1		

At this key area the objectives for total ground cover, shrubs, and perennial native grasses were all met. The objective for browse was met and exceeded. The objective for perennial forbs was not met. As the composition of shrubs (which includes both browse and shrub groups) increases as a site moves towards PNC (in the absence of disturbance), and shrubs dominate the community, the composition of forbs decrease. In addition, forbs fluctuate in abundance according to the winter and spring moisture so will be present some years and not present other years. The Historic Climax Plant Community (R030XB215AZ) is a desert shrub site; dominant species include creosote bush (*Larrea tridentata*) and white bursage (*Ambrosia dumosa*). Some perennial grasses are present in small upland drainages. This site may be a less well drained site that favors white bursage (*Ambrosia dumosa*) over creosote bush. The shrub component (browse and shrubs combined) accounts for 99% of the plant composition. This key area is PNC (Table B.10).

**Pasture 3, Key Area # 5**

Ecological Site: Coarse Sandy Loam (Limy) 6-9-inch p.z.

- Maintain total ground cover between 15 and 30%.
- Maintain native perennial grass (Indian ricegrass) between 1 and 3% CBW.
- Maintain browse (winterfat, bursage, ratany, goldeneye) between 41 and 80% CBW.



- Maintain native shrubs (bursage, ratany creosote bush, turpentine bush) between 20 and 35% CBW.
- Maintain forbs between 1 and 10% CBW.

**Table B.15. Desired Plant Community Objectives Determination Table - Pasture 3, Key Area #5.**

<b>Pasture 3, Key Area #5</b>			
<b>Ecological site: Coarse Sandy Loam (Limy) 6 – 9” p.z. (R030XB205AZ) (Sandy Loam Upland 6 – 10” p.z. Limy Subsurface, Gravelly) Most recent monitoring data collected in 2015.</b>			
<b>Plant Group (or Ground Cover)</b>	<b>Current Composition</b>	<b>Desired Plant Composition</b>	<b>Objective Met or Not Met</b>
<b>Total Ground Cover</b>	<b>25%</b>	<b>15 – 30%</b>	<b>Met</b>
<b>Browse</b>	<b>52%</b>	<b>41 – 80%</b>	<b>Met</b>
<i>Ambrosia dumosa</i>	34		
<i>Ceratoides lanata</i>	8		
<i>Krameria parvifolia</i>	10		
<b>Shrubs</b>	<b>22%</b>	<b>20 – 35%</b>	<b>Met</b>
<i>Larrea tridentata</i>	21		
<i>Opuntia sp.</i>	1	0	
<i>Thamnosma montana</i>	0		
<b>Perennial Native Grasses</b>	<b>2%</b>	<b>1 – 3%</b>	<b>Met</b>
<i>Hilaria rigida</i>	0		
<i>Oryzopsis hymenoides</i>	1		
<i>Sporobolus flexuosus</i>	1	0	
<b>Perennial Forbs</b>	<b>0</b>	<b>1 – 10%</b>	<b>Not Met</b>

The objectives were partially met at this key area. Total ground cover, browse, shrubs, and perennial native grass objectives were all met. The combined composition for browse and shrubs accounted for 74% of the plant composition at this key area. The objective for perennial forbs was not met. However, as noted above, forbs fluctuate in abundance according to the winter and spring moisture. The Historic Climax Plant Community (R030XB205AZ) for this site is dominated by desert shrub community with creosote bush (*Larrea tridentata*) and white bursage (*Ambrosia dumosa*) dominant, with minor amounts of big galleta (*Hilaria rigida*) grass in small upland drainages. *Oryzopsis hymenoides* (at 1%) and *Sporobolus flexuosus* (also at 1%) combined to meet the perennial native grass objective. This key area is late seral (Table B.11).

**Pasture 3, Key Area # 6**

Ecological Site: Limy Upland, 6-9-inch p.z.

- Maintain total ground cover between 15 and 30%.
- Maintain native perennial grass (galleta, sand dropseed, Indian ricegrass) between 15 and 30% CBW.
- Maintain browse (winterfat, bursage, ratany) between 38 and 73% CBW.
- Maintain shrubs (creosote bush) between 5 and 15% CBW.
- Maintain forbs between 1 and 10% CBW.

**Table B.16. Desired Plant Community Objectives Determination Table – Pasture 3, Key Area #6.**

<b>Pasture 3 Key Area #6</b>			
<b>Ecological site: Limy Upland, 6 – 9-inch p.z. (R030XB214AZ)</b>			
<b>Most recent monitoring data collected in 2015.</b>			
<b>Plant Group (or Ground Cover)</b>	<b>Current Composition</b>	<b>Desired Plant Composition</b>	<b>Objective Met or Not Met</b>
<b>Total Ground Cover</b>	<b>23%</b>	<b>15 – 30%</b>	<b>Met</b>
<b>Browse</b>	<b>34%</b>	<b>38 – 73%</b>	<b>Not Met</b>
<i>Ambrosia dumosa</i>	32		
<i>Ceratoides lanata</i>	< 1		
<i>Krameria parvifolia</i>	2		
<b>Shrubs</b>	<b>9%</b>	<b>5 – 15%</b>	<b>Met</b>
<i>Larrea tridentata</i>	9		
<b>Perennial Native Grasses</b>	<b>23%</b>	<b>15 – 30%</b>	<b>Met</b>
<i>Hilaria rigida</i>	23		
<i>Oryzopsis hymenoides</i>	0		
<i>Sporobolus cryptandrus</i>	0		
<b>Perennial Forbs</b>	<b>0</b>	<b>1 – 10%</b>	<b>Not Met</b>

The objectives were partially met at this key area. Objectives for total ground cover were met. The browse objective was not met. Currently there was 34% composition of browse and the objective is at least 38 % so just below the objective. The shrub objective was met with 9%. It should be noted that if the browse and shrub objectives were combined, the objective would just be met since the combined DPC would be 43-88%, and the combined current browse and shrub composition is 88%. The current shrub community provides habitat components (cover and shelter) for desert tortoise. The objective for perennial native grasses was met with 23%. There were no perennial forbs recorded at the last reading in 2015 so this objective was not met. However, as noted above, forbs fluctuate in abundance according to the winter and spring moisture. The Historic Climax Plant Community (R030XB214AZ) for this site is mixed desert shrub with the dominant shrubs being white bursage (*Ambrosia dumosa*), Nevada Mormon tea (*Ephedra nevadensis*) and white ratany (*Krameria grayi*). The grass objective is met. The key area is currently mid-seral (see Table B.12), meaning the browse and shrub component have not become very dominant over the grass. Over time, as shrubs/browse increase in composition, grass will decrease (at PNC little grass would be present).

### **Updated Land Health Evaluation**

The Beaver Dam Slope Allotment land health evaluation was made in accordance with the Arizona Standards and Guidelines for the Fundamentals of Rangeland Health (BLM 1997) and standard BLM methods for estimating ecological condition and current trend. Existing trend studies, ecological condition data, actual use, and utilization studies for the allotment were analyzed. The trend identified in the rangeland health assessment survey assessed erosion status, vegetative cover, vigor, species diversity, location of the most palatable plants in relation to access to a grazing animal, and general age classes.

The rangeland health evaluation conducted on the Beaver Dam Slope Allotment in 2012 showed all key areas are meeting Standard #1 (Upland Sites) (BLM 2012). Standard # 2 (Riparian-Wetland Sites) was met, and the riparian area was rated as properly functioning on the section of the Virgin River that passes along the southern boundary of the allotment in Pasture 3. The Virgin River segment within the allotment amounts to about 62 acres, and includes the wet zone, woody regeneration zone and the floodplain. Greenline and cross-section data shows healthy riparian vegetation. Willows are present and increasing even though tamarisk continues to dominate. Tamarisk beetles have been released upstream, in Utah to control this invasive species. Key Areas #4 and #6 were meeting Standard #3 (Desired Resource Conditions) in the 2012 evaluation. Key Areas #1 and #5 were partially meeting Standard #3 because of the low composition of perennial grasses and forbs. The IAT determined that livestock grazing was not the causal factor for partially meeting the DPC (Standard #3) objectives and that current livestock grazing would not be a factor in the areas achieving DPC objectives. The determination was based on ESI, utilization, trend, precipitation data and site visit. The potential for these sites to produce a high composition of perennial grass is low and at specific key areas may not be attainable (BLM 2012). All soils objectives were met. No significant impacts to soils or vegetation were noted during field visits conducted in connection with the evaluation.

This updated allotment monitoring report for the Beaver Dam Slope Allotment has the most current trend, utilization, ecological condition, and desired plant community objectives determination tables. See above for discussion on each key area – Tables B.13 – B.16 discuss DPC objectives for each key area. DPC objectives are partially met at each key area on the allotment. Table B.17 shows the overall trend based on updated trend data found in Tables B.1 – B.4. Ecological condition has been updated see Tables B.9 – B.12. Ecological conditions range from mid seral, late seral and PNC, showing good condition on the majority of the allotment. Two key areas (#1 and #4) are rated as PNC with a static trend showing that they are in a stable state at the upper end of their potential plant composition according to the ESI site guide for the ecological site. Key Area #5 is late seral with an upward trend. Overall trend for three key areas is rated as static so little +/- 10% change as compared to the base year. A steady state. One key area (#5) has an upward trend or a greater than 10% increase compared to the base year.

**Table B.17. Beaver Dam Slope Allotment Rangeland Health Data Summary.**

Allotment	Key Area	Ecological Site	Ecological Condition	Overall Trend
Beaver Dam Slope	#1	Limy Upland (Deep), 6 – 9” p.z.	PNC	Static
Beaver Dam Slope	#4	Limy Upland (Deep), 6 – 9” p.z.	PNC	Static
Beaver Dam Slope	#5	Coarse Sandy Loam (Limy), 6 – 9” p.z.	Late Seral	Up
Beaver Dam Slope	#6	Limy Upland, 6 – 9” p.z.	Mid Seral	Static

Trend data for Key Areas #1, 4, and 5 shows little change. This is a characteristic of a plant community in late seral or PNC seral stage.

Based on analyses of the updated allotment monitoring data and supporting documentation contained in the original land health evaluation report (BLM 2012), including partially meeting DPC objectives, resource conditions are continuing to make progress toward meeting applicable standards for rangeland health on the Beaver Dam Slope Allotment.

## APPENDIX C – Mormon Well Allotment Land Health Evaluation Report Update

The Mormon Well Allotment land health evaluation was completed in 2011. That evaluation showed that the allotment was making progress towards meeting the applicable standards for rangeland health. This update re-evaluates the allotment based on analysis of additional monitoring data that has been collected since the original evaluation was completed.

### Updated Monitoring Data

#### Trend

The trend of an area may be judged by noting changes in vegetation attributes such as species composition, density, cover, production, and frequency. Vegetation data is collected at different points in time on the same key area, and the results are then compared to detect change. The key species frequency, which is the ratio between the number of sample units that contain key species and the total number of sample units, compares the most recent data to the base year. Detailed tables for each key area with data by year and species is available below in Tables C.1 – C.5. Overall trend at a key area is determined by assessing the sum percentages of the following attributes: key species, live vegetation cover/basal cover, and ground cover (surface litter). Both basal cover and surface litter are important attributes when evaluating Standard #1 (Upland Sites) of the Arizona Standards for Rangeland Health (BLM 1997). Overall trend at the key area is the direction of change in frequency observed between the initial reading (base year) and the current reading, as depicted by the arrows, i.e., (↗) up, (↘) down, and (→) no apparent static or static. The threshold for a change in trend is +/- 10 percent.

Trend plots were established on three key areas (Figure A.6) on the Mormon Well Allotment in 1982 and 1989. These plots are usually read on a five-year interval. The most recent reading for these key areas was 2017 for Key Area #1 and 2016 for Key Area #2. Pace-frequency was read at Key Area #3 from 1982 – 2012. The most recent trend determination for Key Area #3 is from the 2012 pace-frequency transect. Key Area #3 was rated as PNC with an upward trend. Long term trend monitoring on the Arizona Strip Field Office is conducted in partnership with the University of Arizona. In 2012 the University of Arizona recommended discontinuing reading the pace-frequency transect and instead established and started reading line-intercept (percent cover) and belt density (density of plants per acre) transects at Key Area #3 – see Tables C.4 and C.5. Key Area #3 is a shrub dominated site with no detection of perennial grass in over 30 years of monitoring (BLM 2011). The line-intercept method is better suited to estimating cover of shrubs. Frequency is not suited to sparse vegetation because the required quadrat (sample) size is too large to be practical. The pace-frequency transect has not been re-read since 2012.

**Table C.1. Trend Data Mormon Well Allotment, Key Area #1.**

Key Area #1- Pace Frequency Method				
Year	Percent Frequency of Key Species	Percent Live Basal Vegetation	Percent Litter	Total
1989	67	2.5	19.5	89
1992	78.5	3	29	110.5
2007	37	2.5	14.5	54
2012	74	3	22	99
2017	86.5	1	28	115.5
<b>Overall Trend for Mormon Well Key Area 1: (↗) up</b>				

The trend for Key Area #1 was up from 1989 as compared to 2017. Data from 2017 showed an increase in percent frequency of key species, a slight decrease of live basal vegetation and an increase in litter.

**Table C.2. Trend Data Mormon Well Allotment, Key Area #2.**

<b>Key Area #2 – Pace Frequency Method</b>				
<b>Year</b>	<b>Percent Frequency of Key Species</b>	<b>Percent Live Basal Vegetation</b>	<b>Percent Litter</b>	<b>Total</b>
1982	23	1	14	38
1983	16	2	44	62
1986	24	2	34	60
1988	43	3	52	98
1991	20	15	16	51
2006	14	0	53	67
2011	20	3	43	66
2016	16	3	26	45
<b>Overall Trend for Mormon Well Key Area 2: (→) static</b>				

The trend for Key Area #2 was static from 1982 as compared to 2016. Data from 2016 showed a decrease in key species, a slight increase in live basal vegetation and an increase in litter.

**Table C.3. Trend Data Mormon Well Allotment, Key Area #3.**

<b>Key Area #3 – Pace Frequency Method (Percent Frequency)</b>				
<b>Year</b>	<b>Percent Frequency of Key Species</b>	<b>Percent Live Basal Vegetation</b>	<b>Percent Litter</b>	<b>Total</b>
1982	13	0	1	14
1983	21	2	42	65
1986	27	1	42	70
1989	31	2	29	62
1992	20	1	46	67
2007	7	0	17	24
2012	15	1	22	38
<b>Overall Trend for Mormon Well Key Area 3: (↗) up</b>				

The trend for Key Area #3 was up from 1982 as compared to 2012. Data from 2012 data showed a slight increase in key species, a slight increase in live basal vegetation and an increase in litter. As stated above, Key Area #3 is a shrub dominated site with no detection of perennial grass in over 30 years of monitoring. It was determined that setting a DPC objective for perennial grass for Key Area #3 could not be quantified based on the current and past state of the plant community. However, maintaining the desired composition of key browse species will ensure perennial forage for wildlife and livestock. The current functional groups of other plants provide cover habitat for desert tortoises and other wildlife species (BLM 2011). The “new” monitoring (line-intercept and belt density) data is shown in Tables C.4 and C.5.

**Table C.4. Trend Data Mormon Well Allotment, Key Area #3.**

Key Area #3 – Line-Intercept Transect (Percent Cover)			
Species	2012 Percent Cover	2017 Percent Cover	Change of Percent Cover
<b>Shrubs</b>			
<i>Ambrosia dumosa</i> *	3	2	Decreased by 1%
<i>Larrea tridentata</i>	7	10	Increased by 3%

\* Key Species

Percent cover read at the line-intercept transect is not directly comparable to percent frequency of the previous trend data. There have been two readings (2012 and 2017) of line-intercept transect and belt density transect at this key area, which is not enough readings on the new transects to make a trend determination. A slight decrease (1%) in *Ambrosia dumosa* was recorded during the five-year period 2012 - 2017. A slight increase (3%) in *Larrea tridentata* was recorded during the same period.

**Table C.5. Trend Data Mormon Well Allotment, Key Area #3.**

Mormon Well Allotment Key Area # 3 – Belt Density Transect (Plants per Acre)			
Species	2012 Number of plants per acre (density)	2017 Number of plants per acre (density)	Change of Plants per Acre
<b>Shrubs</b>			
<i>Ambrosia dumosa</i> *	796	944	Increased 148 plants per acre
<i>Krameria parvifolia</i> *	16	22	Increased 6 plants per acre
<i>Larrea tridentata</i>	283	269	Decreased 14 plants per acre
<i>Lycium andersonii</i>	44	15	Decreased 29 plants per acre
<b>Perennial Forbs</b>			
<i>Sphaeralcea sp.</i>	6	15	Increased 9 plants per acre

\* Key Species

The belt density transect showed an increase in plants per acre for *Ambrosia dumosa* and *Krameria parvifolia*, both palatable key forage shrub species. A decrease in plants per acre was recorded for *Larrea tridentata* and *Lycium andersonii* shrub species. *Sphaeralcea sp.*, a perennial forb, increased in plants per acre of the five-year period between 2012 and 2017.

### Utilization

Utilization is defined as the proportion of the current year's forage production that is consumed or destroyed by grazing animals (both livestock and wildlife). Average utilization levels of key forage species for these allotments should not exceed 45%.

Management of the allotment is based on a selection of key species. Key species for the Mormon Well Allotment are listed in Section 3.4.4 of this EA. Tables C.6-C.8 show percent utilization of key forage species by year read at each of the three key areas. Blank cells indicate no plants of that species were encountered in the transect. Average percent utilization by year is calculated by averaging the utilization readings for all key species read in a given year at a specific key area. Utilization was not read on any of the key areas in 2015 due to travel restrictions on this and surrounding allotments. Utilization on key species has ranged from 0 – 52%, with most readings well below 30%, which allows the species to maintain themselves in drought, even with grazing. In addition, livestock are removed from the allotment by March 15 each year, which allow for the growth of desert vegetation during the spring and summer without any grazing use. During 2008, utilization on Indian ricegrass was recorded at 52% for Key Area #1, which is over the 45% allowable level. This was the only reading at or above the allowable 45% utilization level. Average utilization for 2008 for all species read was 20%.

**Table C.6. Utilization Summary – Mormon Well Allotment, Key Area #1.**

Species	Year Utilization Data Collected										
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
<b>Shrubs</b>											
<i>Ambrosia dumosa</i>				7%	12%	Not read	4%	Not read	2%	12%	8%
<i>Ephedra nevadensis</i>	1%	7%	No use	16%	13%	Not read	10%	Not Read	5%	19%	10%
<b>Grasses</b>											
<i>Hilaria rigida</i>	13%	6%	17%	9%	13%	Not read	10%	Not read	4%	13%	10%
<i>Oryzopsis hymenoides</i>	52%	42%	30%	21%	12%	Not read	10%	Not read	2%	7%	8%
<i>Sporobolus cryptandrus</i>		26%				Not read		Not read			
<i>Average Percent Utilization by Year</i>	20%	19%	21%	16%	13%	Not read	5%	Not read	3%	12%	8%

**Table C.7. Utilization Summary – Mormon Well Allotment, Key Area #2.**

Species	Year Utilization Data Collected										
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
<b>Shrubs</b>											
<i>Ambrosia dumosa</i>	No use	No use	No use		22%	12%	10%	Not read	10%	17%	8%
<i>Ephedra nevadensis</i>		17%	No use	30%	30%	28%	10%	Not read	18%	14%	27%
<i>Ceratoides lanata</i>	16%	9%	23%	40%	34%	20%	38%	Not read	12%	13%	20%
<b>Grasses</b>											
<i>Hilaria rigida</i>	36%	26%	33%	35%	26%	18%	34%	Not read	18%	15%	17%
<i>Oryzopsis hymenoides*</i>							25%	Not read	6%	8%	20%
Average Percent Utilization by Year	21%	14%	32%	37%	26%	19%	35%	Not read	15%	14%	15%

**Table C.8. Utilization Summary – Mormon Well Allotment, Key Area #3.**

Species	Year Utilization Data Collected										
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
<b>Shrubs</b>											
<i>Acamptopappus sphaerocephalus</i>	Not read	Not read	Not read	5%	30%		Not read	Not read			
<i>Ambrosia dumosa *</i>	Not read	Not read	Not read	10%	22%	2%	Not read	Not read	3%	18%	19%
<i>Ephedra nevadensis*</i>	Not read	Not read	Not read				Not read	Not read			40%
<i>Krameria parvifolia *</i>	Not read	Not read	Not read		30%	2%	Not read	Not read		21%	15%
<i>Ceratoides lanata*</i>	Not read	Not read	Not read				Not read	Not read			
Average Percent Utilization by Year	Not read	Not read	Not read	11%	23%	2%	Not read	Not read	3%	19%	18%

Ecological Site Inventory Data – Ecological Condition

The tables below compare the most recent plant composition data from the trend plots to the desired plant community composition from the site guide for each ecological site at each key area. The site guide used



for the information below is the Soil Survey of Shivwits Area, Arizona, Part of Mohave County (NRCS 2004). It should be noted that the vegetative composition listed in the site guide is an average across the entire ecological site; variations within an ecological site (due to inclusions or transition zones) may result in an actual plant composition that is different from that listed in the site guide. Some of the Ecological Condition tables below list more than one Ecological Site Description (ESD) for that key area. In some cases, the older original ESD has been updated and given a different name but the code number has remained the same see Key Area #2 for example Limy Upland (Deep) 6 – 9” p.z. (R030XB215AZ) (Sandy Loam Upland 6 -9” p.z. Limy). The Limy Upland (Deep) 6 – 9” p.z. is the older version that was used for the S&G written in 2011. The Sandy Loam Upland 6 -9” p.z. Limy is the updated version of the same ESD with a slightly different name but both are linked by the same code R030XB215AZ. Some of the older ESDs are no longer available that is why the updated versions have been included.

Ecological condition of Key Area #1 (58% of the expected potential natural community) and Key Area #2 (65% of the expected potential natural community) are both late seral. Key Area #3 (80% of the expected potential natural community) rated as PNC. These plant communities are in accordance with the NRCS ecological site guides. Management is in place (including utilization levels and season of use) that would help ensure the native Mojave Desert plant species are maintained in the plant community.

**Table C.9. Mormon Well Allotment Ecological Site Inventory Data – Ecological Condition Key Area #1.**

<p align="center"><b>Key Area #1</b>  <b>Coarse Sandy Loam (Limy), 6 – 9” p.z. (R030XB205AZ)</b>  <b>(Sandy Loam Upland 6 – 10” p.z. Limy Subsurface, Gravelly)</b>  <b>Most recent monitoring data collected in 2017.</b></p>			
<b>Plant Species</b>	<b>Current Composition</b>	<b>Site Guide Composition</b>	<b>Current Score<sup>12</sup></b>
<b>Shrubs</b>			
<i>Acamptopappus sphaerocephalus</i> *	5%	1 – 5%	5
<i>Ambrosia dumosa</i> *	22%	20 – 35%	22
<i>Ephedra nevadensis</i> *	4%	0 – 1%	1
<i>Gutierrezia microcephala</i>	1%	1 – 5% (other shrubs)	1
<i>Krameria parvifolia</i> *	5%	1 – 2%	2
<i>Larrea tridentata</i>	6%	40 – 50%	6
<i>Psoralea fremontii</i>	1%	1 – 5% (other shrubs)	1
<b>Perennial Grasses</b>			
<i>Hilaria rigida</i> *	43%	5 – 10%	10
<i>Oryzopsis hymenoides</i> *	8%	0 – 3%	3
<i>Sporobolus cryptandrus</i>	4%	0 – 4%	4

<sup>12</sup> “Current score” = lower of either Column 2 (current composition) or Column 3 (site guide composition)

<i>Sporobolus flexuosus</i>	2%	5 – 15% (total grass group)	2
<b>Perennial Forbs</b>			
<i>Sphaeralcea sp.</i>	1%	0 – 1%	1
<b>Ecological Condition: Total of Current Score = Score: 58 –Late Seral (representative of 114 ac.)</b>			

\* Species used to judge utilization levels by cattle.

**Table C.10. Mormon Well Allotment Ecological Site Inventory Data – Ecological Condition Key Area #2.**

<b>Key Area #2</b>			
<b>Limy Upland (Deep) 6 – 9” p.z. (R030XB215AZ)</b>			
<b>(Sandy Loam Upland 6 – 9” p.z. Limy)</b>			
<b>Most recent monitoring data collected in 2016.</b>			
<b>Plant Species</b>	<b>Current Composition</b>	<b>Site Guide Composition</b>	<b>Current Score<sup>13</sup></b>
<b>Shrubs</b>			
<i>Ambrosia dumosa</i> *	22%	35 – 45%	22
<i>Krameria parvifolia</i> *	3%	1 – 5%	3
<i>Larrea tridentata</i>	55%	25 – 35%	35
<b>Perennial Grasses</b>			
<i>Hilaria rigida</i> *	20%	1 – 5%	5
<b>Perennial Forbs</b>			
<i>Sphaeralcea sp.</i>	< 1%	1 – 5%	< 1
<b>Ecological Condition: Total of Current Score = Score: 65 – Late Seral (representative of 1,308 ac.)</b>			

\* Species used to judge utilization levels by cattle.

**Table C.11. Mormon Well Allotment Ecological Site Inventory Data – Ecological Condition Key Area #3.**

<b>Key Area #3</b>			
<b>Limy Upland (Deep) 6 – 9” p.z. (R030XB215AZ)</b>			
<b>(Sandy Loam Upland 6 – 9” p.z. Limy)</b>			
<b>Most recent monitoring data collected in 2012 using the Pace Frequency Method.</b>			
<b>Plant Species</b>	<b>Current Composition</b>	<b>Site Guide Composition</b>	<b>Current Score<sup>14</sup></b>
<b>Shrubs</b>			
<i>Ambrosia dumosa</i> *	42%	35 – 45%	42

<sup>13</sup> “Current score” = lower of either Column 2 (current composition) or Column 3 (site guide composition)

<sup>14</sup> “Current score” = lower of either Column 2 (current composition) or Column 3 (site guide composition)

<i>Larrea tridentata</i>	52%	25 – 35%	35
<i>Lycium andersonii</i>	5%	0 – 3%	3
<b>Perennial Forbs</b>			
<i>Eriogonum inflatum</i>	0	0 – 2%	0
<b>Ecological Condition: Total of Current Score = Score: 80 – PNC (representative of 2,025 ac.)</b>			

\* Species used to judge utilization levels by cattle. 2012 was the last year that this key area was read with the Pace Frequency Method.

In summary, Key Area #1 and #2 are both in late seral ecological condition.

### Desired Plant Community Objectives

Desired Plant Community (DPC) Objectives for each key area are listed below and in Tables C.12 – C.14. The tables compare the most recent plant composition data from the trend plots to the desired plant community objectives that were established for each key area. DPC objectives were developed during the land health evaluation process by an interdisciplinary team of resource specialists (BLM 2011). The species composition objectives were developed by consulting the Ecological Site Guides, developed by the NRCS, and site-specific information of the potential of the site to produce vegetation. Site guides used are from the Soil Survey of Shivwits Area, Arizona (Part of Mohave County) (NRCS 2004). The DPC objectives implement RMP objectives and reflect vegetative composition and attributes important for desert tortoise habitat, as well as habitat requirements for other species. The objectives are set to be achieved within a time interval of 20 years from permit renewal. DPC objectives are expressed in figures of Composition by Weight (CBW). Composition data is collected using the Dry Weight Rank sampling method (BLM 2011).

Long-term monitoring of a site indicates what a particular area is capable of producing. Objectives were partially met at each key area, resource conditions are making progress toward meeting applicable standards for rangeland health (Standard #3 - Desired Resource Conditions). The DPC objectives for the Mormon Well Allotment key areas are:

#### Key Area #1

Ecological Site: Coarse Sandy Loam (Limy) 6-9-inch p.z.

- Maintain total ground cover at 15-20%.
- Maintain perennial native grass (big galleta, Indian ricegrass, and mesa dropseed) CBW at 15-25%.
- Maintain key browse species (white bursage, Mormon tea, and ratany) CBW at 35-45%.
- Maintain other native shrubs and trees CBW at 10-20%.
- Maintain forbs CBW at 1-10%.

**Table C.12. Desired Plant Community Objectives Determination Table – Key Area #1.**

<b>Key Area #1</b>			
<b>Ecological site: Coarse Sandy Loam (Limy) 6 – 9-inch p.z. (R030XB205AZ) (Sandy Loam Upland 6 – 10” p.z. Limy Subsurface, Gravelly) Most recent monitoring data collected in 2017.</b>			
<b>Plant Group (or Ground Cover)</b>	<b>Current Composition</b>	<b>Desired Plant Composition</b>	<b>Objective Met or Not Met</b>
<b>Total Ground Cover</b>	<b>32%</b>	<b>15 – 20%</b>	<b>Met (Exceeds)</b>

<b>Browse</b>	<b>31%</b>	<b>35 – 45%</b>	<b>Not Met</b>
<i>Ambrosia dumosa</i>	22		
<i>Ephedra nevadensis</i>	4		
<i>Krameria parvifolia</i>	5		
<b>Other Native Shrubs and Trees</b>	<b>13%</b>	<b>10 – 20%</b>	<b>Met</b>
<i>Acamptopappus sphaerocephalus</i>	5		
<i>Gutierrezia microcephala</i>	1		
<i>Larrea tridentata</i>	6		
<i>Psoralea fremontii</i>	1		
<b>Perennial Native Grasses</b>	<b>58%</b>	<b>15 – 25%</b>	<b>Met (Exceeds)</b>
<i>Hilaria rigida</i>	43		
<i>Oryzopsis hymenoides</i>	9		
<i>Sporobolus cryptandrus</i>	4		
<i>Sporobolus flexuosus</i>	2		
<b>Perennial Forbs</b>	<b>1%</b>	<b>1 – 10%</b>	<b>Met</b>
<i>Sphaeralcea</i> sp.	1		

This key area partially meets the objectives. The objective for total ground cover exceeds the objective. The objective for browse was not met – the current composition of browse is 31% which is just below the 35% objective. The objectives for other native shrubs and trees and forbs were met. The objective for perennial native grasses was exceeded. The Historic Climax Plant Community (ecological site R030XB205AZ) is dominated by desert shrub community with creosote bush (*Larrea tridentata*) and white bursage (*Ambrosia dumosa*) dominate with minor amounts of big galleta (*Hilaria rigida*) grass in small upland drainages. This key area is in Late Seral ecological condition (Table C.9); as the site progresses toward PNC, shrubs and browse should increase in composition.

This ecological site represents approximately 4% of the allotment (464 acres) but is one of the more productive and diverse sites on the allotment where the effects of livestock use on the vegetation community can be monitored. Maintaining ground cover at the desired level of 15 – 20% at the key area will support stable soil conditions necessary for long term conformity of Land Health Standard #1 (Upland Sites). Maintaining the desired composition of key browse and perennial grass species will ensure perennial forage for wildlife and livestock. The current functional groups of plants provide habitat for desert tortoise and other wildlife species. Big galleta (*Hilaria rigida*) and annual forbs are among the plant species considered important for the physiological requirements of the desert tortoise. In addition, the current functional groups of shrubs and trees provide cover for desert tortoise and other wildlife (BLM 2011).

### **Key Area # 2**

Ecological Site: Limy Upland Deep, 6-9-inch p.z.

- Maintain total ground cover at 15-20%.
- Maintain perennial native grass (big galleta and Indian ricegrass) CBW at 5-15%.
- Maintain key browse species (white bursage, winterfat, and ratany) CBW at 35-45%.
- Maintain other native shrubs and trees CBW at 40-50%.
- Maintain forbs CBW at 1-10%.

**Table C.13. Desired Plant Community Objectives Determination Table – Key Area #2.**

Key Area #2			
Ecological site: Limy Upland Deep, 6 – 9-inch p.z. (R030XB215AZ) (Sandy Loam Upland 6 – 9” p.z. Limy) Most recent monitoring data collected in 2016.			
Plant Group (or Ground Cover)	Current Composition	Desired Plant Composition	Objective Met or Not Met
<b>Total Ground Cover</b>	<b>29%</b>	<b>15 – 20%</b>	<b>Met (Exceeds)</b>
<b>Browse</b>	<b>25%</b>	<b>35 – 45%</b>	<b>Not Met</b>
<i>Ambrosia dumosa</i>	22		
<i>Ceratoides lanata</i>	0		
<i>Krameria parvifolia</i>	3		
<b>Other Native Shrubs and Trees</b>	<b>55%</b>	<b>40 – 50%</b>	<b>Met (Exceeds)</b>
<i>Larrea tridentata</i>	55		
<b>Perennial Native Grasses</b>	<b>20%</b>	<b>5 – 15%</b>	<b>Met (Exceeds)</b>
<i>Hilaria rigida</i>	20		
<i>Oryzopsis hymenoides</i>	0		
<b>Perennial Forbs</b>	<b>&lt; 1%</b>	<b>1 – 10%</b>	<b>Not Met</b>
<i>Sphaeralcea sp.</i>	<1		

This key area partially meets the objectives. The objective for total ground cover exceeds the objective. The objective for browse was not met – there was 22% *Ambrosia dumosa*, and 3% *Krameria parvifolia* but no *Ceratoides lanata* recorded at the last reading in 2016. The objective for other native shrubs and trees was exceeded (due to high composition of creosote bush, which provide cover for desert tortoise). It should be noted that if the browse and other native shrubs/trees objectives were combined, the objective would be met since the combined DPC would be 75-95%, and the combined current browse and other native shrub composition is 80%. This current shrub community provides habitat components (cover and shelter) for desert tortoise. The other 20% of the current plant community composition was perennial grass, which exceeds the objective. This 20% was *Hilaria rigida*, a warm season perennial native grass; it would be desirable to also have *Oryzopsis hymenoides*, a cool season native perennial grass, present, but it has not been recorded at this key area since 1991. Cool season grasses are not common in the Mojave Desert, so this species would likely always be rare in the plant community at this site, if present at all. The objective for perennial forbs was not met but as the site becomes more shrub dominated over time without disturbance, forbs make up a smaller composition. In addition, forbs fluctuate in abundance according to the winter and spring moisture so will be present some years and not present other years. The Historic Climax Plant Community (R030XB215AZ) is a desert shrub site; dominant species include creosote bush (*Larrea tridentata*) and white bursage (*Ambrosia dumosa*). Some perennial grasses are present in small upland drainages. This site may be a more well drained site that favors creosote bush over white bursage. Key Area #2 is in late seral ecological condition (EA Table C.10).

This ecological site represents approximately 25% of the allotment (3,333 acres). Maintaining ground cover at the desired level of 15 – 20% at the key area will support stable soil conditions. Maintaining the desired composition of key browse and perennial grass species will ensure perennial forage for wildlife and livestock. The current functional groups of plants provide habitat for desert tortoise and other wildlife species. Perennial grass and annual forbs are among the plant species considered important for

the physiological requirements of the desert tortoise. In addition, the current functional groups of shrubs and trees provide cover for desert tortoise and other wildlife (BLM 2011).

**Key Area # 3**

Ecological Site: Limy Upland Deep, 6-9-inch p.z.

- Maintain total ground cover at 15-20%.
- Maintain key browse species (white bursage and winterfat) CBW at 30-40%.
- Maintain other native shrubs and trees CBW at 55-65%.
- Maintain forbs CBW at 1-10%.

**Table C.14. Desired Plant Community Objectives Determination Table – Key Area #3.**

<b>Key Area #3</b>			
<b>Limy Upland (Deep) 6 – 9” p.z. (R030XB215AZ) (Sandy Loam Upland 6 – 9” p.z. Limy) Most recent monitoring data collected in 2017.</b>			
<b>Plant Group (or Ground Cover)</b>	<b>Current Composition</b>	<b>Desired Plant Composition</b>	<b>Objective Met or Not Met</b>
<b>Total Ground Cover</b>	<b>Not Read</b>	<b>15 – 20%</b>	
<b>Browse</b>	<b>20%</b>	<b>30 – 40%</b>	<b>Not Met</b>
<i>Ambrosia dumosa</i>	20		
<i>Ceratoides lanata</i>	0		
<i>Krameria parvifolia</i>	0		
<b>Other Native Shrubs and Trees</b>	<b>80%</b>	<b>55 – 65%</b>	<b>Met (Exceeds)</b>
<i>Larrea tridentata</i>	80		
<b>Perennial Forbs</b>	<b>0</b>	<b>1 – 10%</b>	<b>Not Met</b>

The 2017 reading was done with the line-point intercept method (percent cover) which did not read total ground cover so no reading is available. The previous years reading up through 2012 were read using the pace frequency method which is not directly comparable to each other.

The objectives are partially met at this key area. The objective for browse was not met with *Ambrosia dumosa* at 20%. The objective for other native shrubs and trees was met (exceeds) due to high composition (80%) of creosote bush, which provides cover and shelter for desert tortoise. Together shrubs (both browse and other shrubs) account for 100% of the composition of the key area. The objective for forbs was not met. As stated earlier, as the composition of shrubs (all kinds) increases towards PNC, forbs decrease. Forbs fluctuate in abundance according to the winter and spring moisture so will be present some years and not present other years. The Historic Climax Plant Community (R030XB215AZ) is a desert shrub site; dominant species include creosote bush (*Larrea tridentata*) and white bursage (*Ambrosia dumosa*). This site may be a more well drained site that favors creosote bush over white bursage. This site has reached a very stable PNC plant community (C.11); without disturbance it is not likely to change.

This ecological site is the same as Key Area #2 (Late Seral), representing approximately 25% of the allotment (3,333 acres). Key Area #3 (PNC) is a shrub dominated site with no detection of perennial grass in over 30 years of monitoring. It was determined that setting a DPC objective for perennial grass could not be quantified based on the current and past state of the plant community. However, maintaining

the desired composition of key browse species and other native shrubs and trees will ensure perennial forage and cover for wildlife, including habitat for desert tortoises. In addition, as with Key Area #2, maintaining ground cover at the desired level (15 – 20%) will support stable soil conditions (BLM 2011). As a site moves toward late seral or PNC the diversity or number of species present is often reduced. Management objectives for livestock grazing maybe set at a Mid Seral state which would likely have more grasses. A Mojave Desert site that is in late seral or PNC would be difficult to set back to an earlier seral state without some sort of disturbance which would risk introducing or spreading more non-native annual species.

## **Land Health Evaluation**

The Mormon Well Allotment land health evaluation was made in accordance with the Arizona Standards and Guidelines for the Fundamentals of Rangeland Health (BLM 1997) and standard BLM methods for estimating ecological condition and current trend. Existing trend studies, ecological condition data, actual use, and utilization studies for the allotment were analyzed. The trend identified in the rangeland health assessment survey assessed erosion status, vegetative cover, vigor, species diversity, location of the most palatable plants in relation to access to a grazing animal, and general age classes.

The 2011 rangeland health evaluation of the Mormon Well Allotment showed all key areas were meeting Standard #1 (Upland Sites) (BLM 2011). This allotment contains a riparian area, in the Mormon Well area of Beaver Dam Wash, which includes a large cottonwood gallery, although recent hydrological changes in the area have led to rapid loss of riparian vegetation. The riparian habitat that is present is located primarily on private and state land; the portion of Beaver Dam Wash which occurs on federal land (the very northern end) is dry most of the year and non-riparian due to water withdrawals for the private land. The Arizona Standards and Guidelines provide an exemption to Standard 2 (Riparian/ Wetland Sites) for areas with water withdrawals “permitted for construction, mining, or other similar activities” and that therefore do not provide for riparian or wetland habitat. Water from Beaver Dam Wash is withdrawn from the creek via water wells for livestock watering, as a private water source, and for domestic and irrigation uses. Thus, this area is not by definition a wetland/riparian area, so Standard # 2 is not applicable on this allotment. Key Areas #1 and #2 were meeting Standard #3 (Desired Resource Conditions) in 2011. Key Area #3 was partially meeting Standard #3 because of the low composition of perennial forbs. However, as stated earlier, since the site is at PNC with a high composition of shrubs (all kinds), the presence of forbs decreases. In addition, forbs fluctuate in abundance according to the winter and spring moisture so will be present some years and not present other years. The IAT determined that livestock grazing was not the causal factor for partially meeting DPC (Standard #3) objectives and that current livestock grazing would not be a factor in the areas achieving DPC objectives. The determination was based on ESI, utilization, trend, precipitation data and site visit. All soils objectives were met. No significant impacts to soils or vegetation were noted during the field visits in connection with the evaluation.

This updated allotment monitoring report for the Mormon Well Allotment has the most current trend, utilization, ecological condition, and desired plant community objectives determinations tables. See above for discussion on each key area – Tables C.12 – C.14 discuss DPC objectives for each key area. DPC objectives are partially met at each key area on the Mormon Well Allotment. Table C.15 shows the overall trend (based on updated trend data found in Tables C.1 – C.5) and ecological condition (see Tables C.9 – C.11). On the Mormon Well Allotment, the ecological condition for Key Area #1 is late seral with an upward trend; the ecological condition for Key Area #2 is late seral with a static trend, and the ecological condition for Key Area #3 is PNC with and upward trend. Overall the allotment is in good condition.

**Table C.15. Mormon Well Allotment Updated Rangeland Health Data Summary.**

Allotment	Key Area	Ecological Site	Ecological Condition	Overall Trend
Mormon Well	#1	Coarse Sandy Loam (Limy), 6 – 9” p.z.	Late Seral	Up
Mormon Well	#2	Limy Upland (Deep), 6 – 9” p.z.	Late Seral	Static
Mormon Well	#3	Limy Upland (Deep), 6 – 9” p.z.	PNC	Up

Based on analyses of the updated allotment monitoring data and supporting documentation contained in the original land health evaluation report (BLM 2011), including partially meeting DPC objectives, resource conditions are continuing to make progress toward meeting applicable standards for rangeland health on the Mormon Well Allotment.

**APPENDIX D - Historic Precipitation Report  
Beaver Dam Wash, Arizona Rain Gauge (NWS)**

Beaver Dam					Rain Gauge Number: 03	
Year	Fall	Winter	Spring	Summer	Annual Total	Annual Percentage
1952	0.92	1.81	3.53	1.24	7.50	104%
1953	0.95	0.98	0.66	0.73	3.32	46%
1954	0.86	2.62	2.18	1.61	7.27	101%
1955	1.11	2.38	0.22	3.41	7.12	99%
1956	1	2.17	0.3	0.63	4.10	57%
1958	0.09	0.49	1.1	2.06	3.74	52%
1959	3.24	2.05	5.18	0.65	11.12	154%
1967	1.12	1.09	1.09	2.3	5.60	78%
1968	2.51	2.48	0.65	0.95	6.59	92%
1969	0.46	5.32	0.87	0.81	7.46	104%
1970	0.6	1.02	0.93	1.6	4.15	58%
1971	0.88	2.4	2.09	0.84	6.21	86%
1972	1.14	2.06	0.22	2.91	6.33	88%
1973	2.67	2.97	2.48	1.38	9.50	132%
1974	0.81	1.1	0.91	0.92	3.74	52%
1975	2.72	1.76	2.6	0.59	7.67	107%
1976	1.34	1.83	1.34	1.05	5.56	77%
1977	1.31	0.67	2.5	1.3	5.78	80%
1978	0.04	4	4.94	2.11	11.09	154%
1979	2.64	4.69	2.58	0.74	10.65	148%
1980	0.74	5.28	2.14	1.05	9.21	128%



Beaver Dam					Rain Gauge Number: 03	
Year	Fall	Winter	Spring	Summer	Annual Total	Annual Percentage
1981	0.89	0.89	2.44	1.3	5.52	77%
1982	1.22	1.13	1.53	3.19	7.07	98%
1983	1.91	2.49	3.39	3.15	10.94	152%
1984	2.82	0.65	0.66	3.41	7.54	105%
1985	1.16	3.67	0.54	2.15	7.52	104%
1986	2.2	1.18	1.96	1.85	7.19	100%
1987	0.83	2.28	1.53	2.67	7.31	102%
1988	3.35	2.18	1.8	2.18	9.51	132%
1989	0.38	3	1.14	2.88	7.40	103%
1990	1.04	3.1	0.98	3.41	8.53	118%
1991	1.24	1	2.25	2.25	6.74	94%
1992	1.08	3.16	4.33	0.49	9.06	126%
1997	1.44	3.12	0.26	2.17	6.99	97%
1998	1.04	5.23	1.51	4.21	11.99	167%
1999	2.07	0.74	1	1.89	5.70	79%
2000	0	1.69	0.46	1.44	3.59	50%
2001	2.05	2.25	2.21	1.02	7.53	105%
2002	0.14	0.88	0.55	0.54	2.11	29%
2003	0.82	2.09	2.3	0.68	5.89	82%
2004	0.49	3.56	1.63	1.18	6.86	95%
2005	4.89	5.75	2.22	1.5	14.36	199%
2006	1.34	0.55	2.58	1.59	6.06	84%
2007	0.94	0.72	0.24	1.96	3.86	54%
2008	0.01	4.44	0.25	1.46	6.16	86%
2009	0.9	2.34	0.95	0.2	4.39	61%
2010	0.22	4.39	1.07	0.85	6.53	91%
2011	1.26	7.45	0.89			
2012	3.44	1.29	0.33			
2013	1.73	1.68	0.94	4.46	8.81	122%
2014	0.85	0.91	0.51	4.52	6.79	94%
2015	0.3	1.38	2.19	1.95	5.82	81%
2016	0.9	2.58	4.13	1.98	9.59	133%

All readings are in inches.

**Beaver Dam Slope, Utah BLM HOBO Rain Gauge**

Rain Gauge	Fall Average		Winter Average		Spring Average		Summer Average		Annual Average
	Percent of total	Inches	Percent of total	Inches	Percent of total	Inches	Percent of total	Inches	Inches
Beaver Dam, Slope, Utah (BLM HOBO; 2017/18)	16	1.19	48	3.56	9	0.66	27	2.05	7.46

All readings are in inches.

**APPENDIX E – Soil/Water Supplementary Information**

**Table E.1. Soil Map Unit Legend for Mormon Well Allotment adapted from Web Soil Survey (NRCS 2019).**

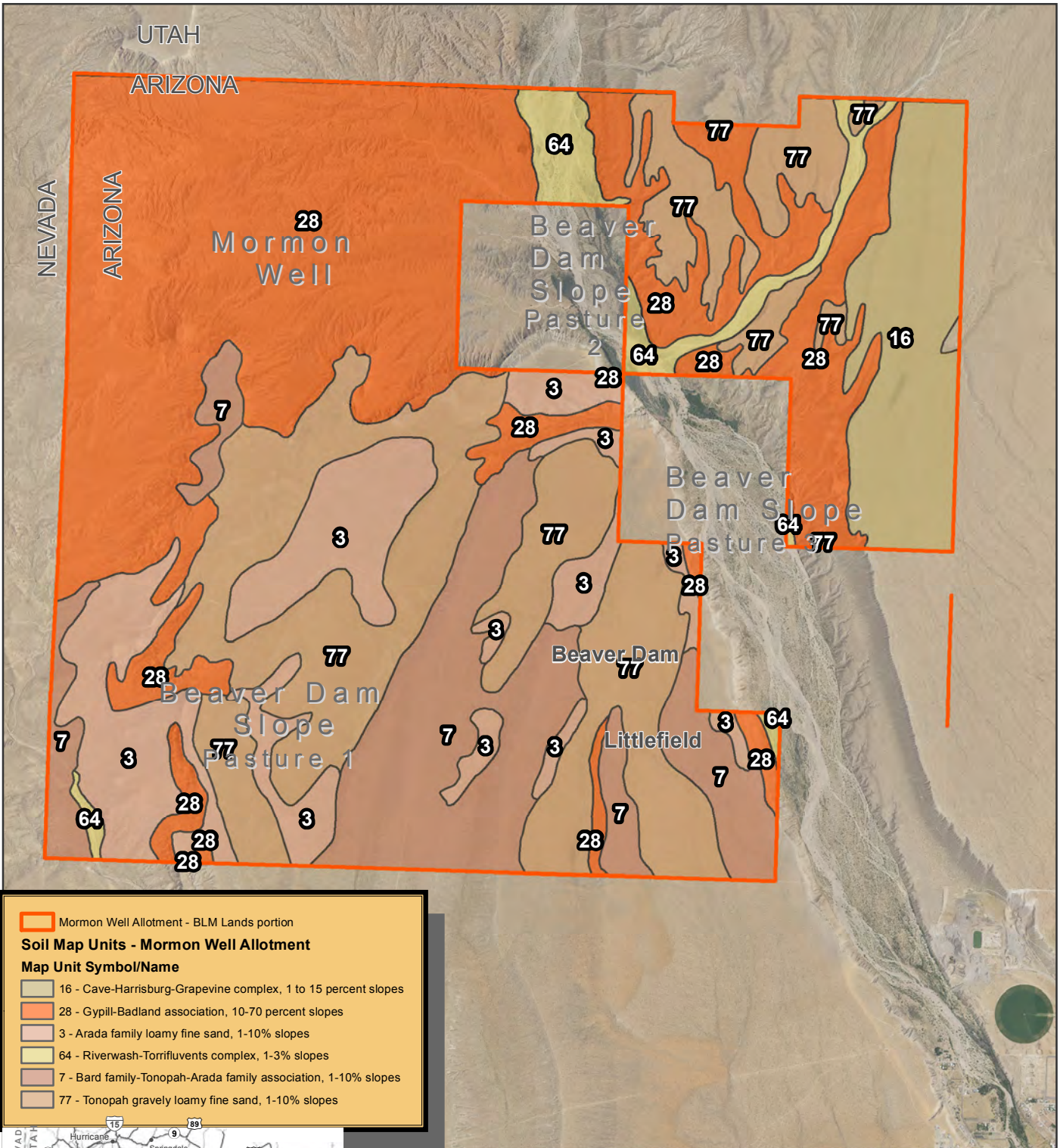
<b>Soil Map Unit Symbol</b>	<b>Soil Map Unit Name</b>	<b>% of Mormon Well Allotment</b>
3	Arada family loamy fine sand, 1-10% slopes	12.4
7	Bard family-Tonopah-Arada family association, 1-10% slopes	13.8
16	Cave-Harrisburg-Grapevine complex, 1-15% slopes	7.3
28	Gypill-Badland association, 10-70% slopes	38.6
64	Riverwash-Torrifluents complex, 1-3% slopes	3.0
77	Tonopah gravelley loamy fine, 1-3% slopes	24.6

**Table E.2. Soil Map Unit Legend for Beaver Dam Slope Allotment adapted from Web Soil Survey (NRCS 2019).**

<b>Soil Map Unit Symbol</b>	<b>Soil Map Unit Name</b>	<b>% of Beaver Dam Slope Allotment</b>
3	Arada family loamy fine sand, 1-10% slopes	8.0
4	Arizo gravelly sandy loam, 1-5% slopes, nonflooded	10.0
5	Arizo gravelly sandy loam, 1-5% slopes	2.0
7	Bard family-Tonopah-Arada family association, 1-10% slopes	11.9
16	Cave-Harrisburg-Grapevine complex, 1-15% slopes	16.2
28	Gypill-Badland association, 10-70% slopes	1.5
44	Hindu-Rock Outcrop-Gypill complex, 2-18% slopes	1.2
64	Riverwash-Torrifluents complex, 1-3% slopes	3.0
77	Tonopah gravelley loamy fine, 1-3% slopes	61.4
AMC	Arada fine sand, 2-8% slopes	2.0
ASC	Arada fine sand, hardpan variant, 2-8% slopes	2.5
BD	Badland	10.9
MOB	Mormon Mesa fine sandy loam, 0-8% slopes	22.3
Ty	Typic Torriorthents-Badland association	8.0



**Figure E.1. Soils Map - Mormon Well Allotment**  
 NEPA Number DOI-BLM-AZ-A010-2017-0039-EA  
 Bureau of Land Management - Arizona Strip District - Arizona Strip Field Office



**Mormon Well Allotment - BLM Lands portion**

**Soil Map Units - Mormon Well Allotment**

**Map Unit Symbol/Name**

- 16 - Cave-Harrisburg-Grapevine complex, 1 to 15 percent slopes
- 28 - Gypill-Badland association, 10-70 percent slopes
- 3 - Arada family loamy fine sand, 1-10% slopes
- 64 - Riverwash-Torrifluvents complex, 1-3% slopes
- 7 - Bard family-Tonopah-Arada family association, 1-10% slopes
- 77 - Tonopah gravely loamy fine sand, 1-10% slopes

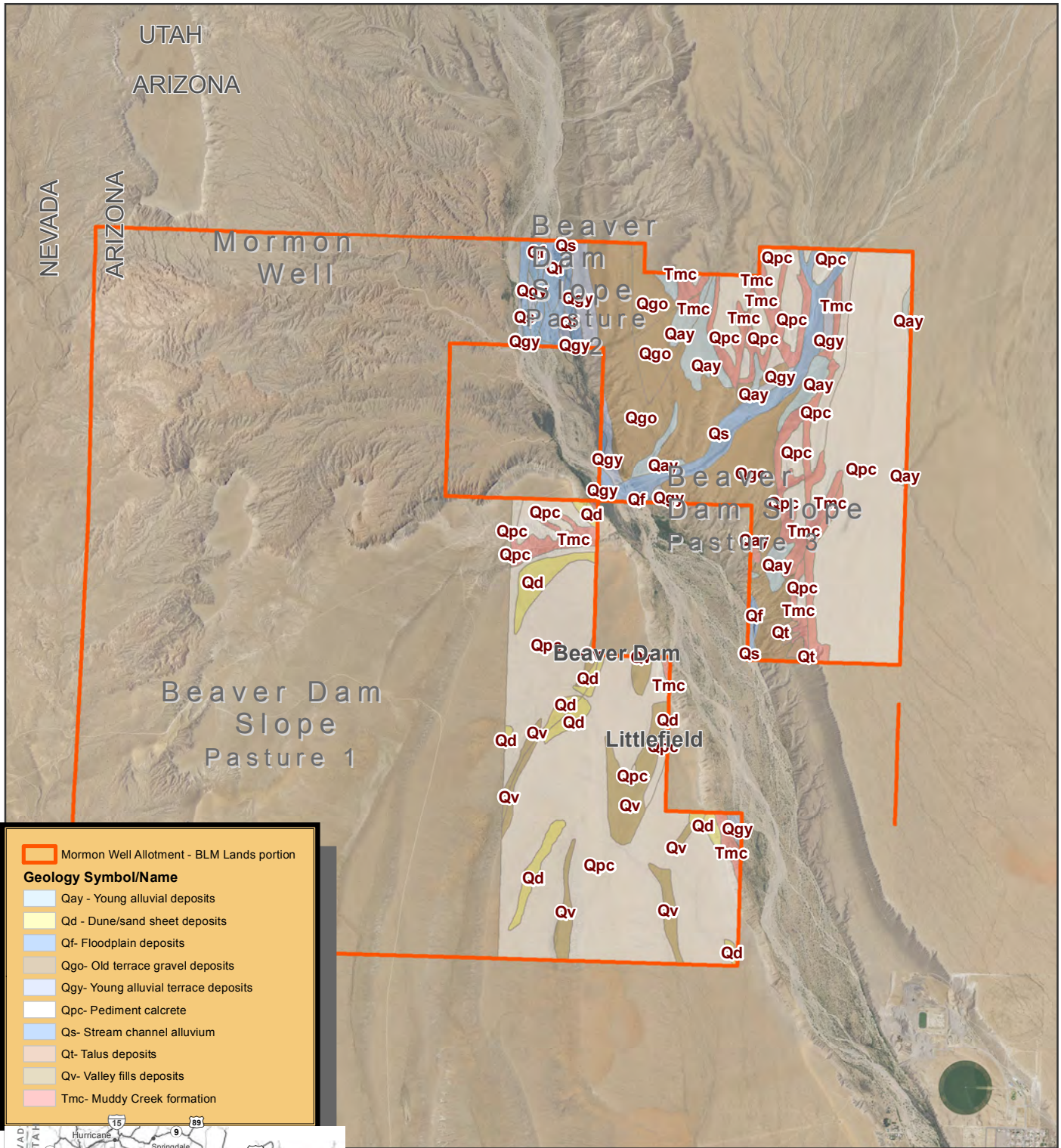


1:55,000  
 1 inch = 0.87 miles





**Figure E.2. Geology Map - Mormon Well Allotment**  
 NEPA Number DOI-BLM-AZ-A010-2017-0039-EA  
 Bureau of Land Management - Arizona Strip District - Arizona Strip Field Office



**Mormon Well Allotment - BLM Lands portion**

**Geology Symbol/Name**

- Qay - Young alluvial deposits
- Qd - Dune/sand sheet deposits
- Qf - Floodplain deposits
- Qgo - Old terrace gravel deposits
- Qgy - Young alluvial terrace deposits
- Qpc - Pediment calcrete
- Qs - Stream channel alluvium
- Qt - Talus deposits
- Qv - Valley fills deposits
- Tmc - Muddy Creek formation



1:60,000  
 1 inch = 0.95 miles

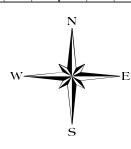
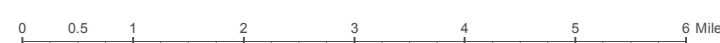
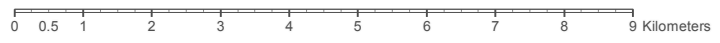
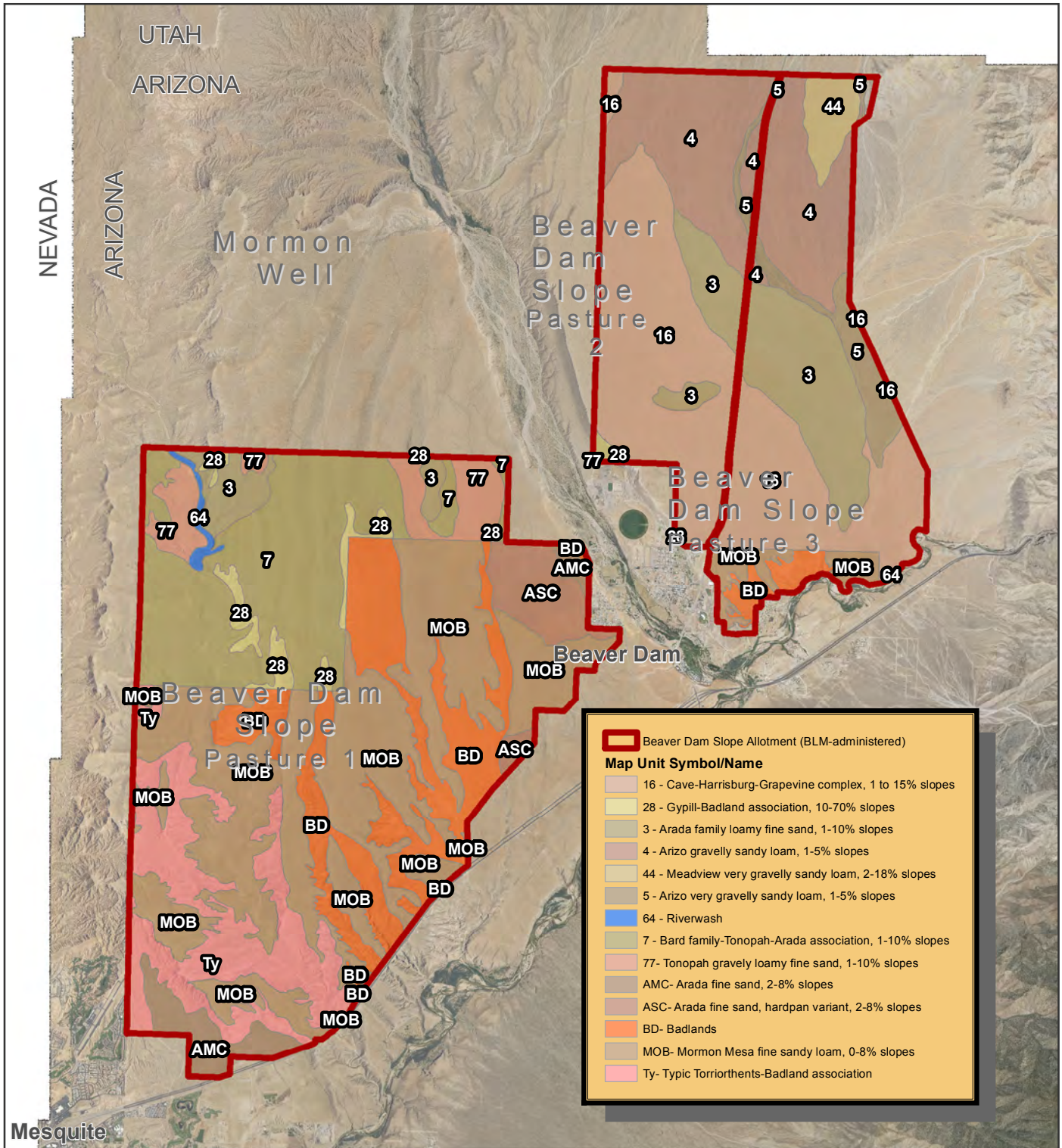




# Figure E.3. Beaver Dam Slope Allotment - Soils Map

NEPA Number DOI-BLM-AZ-A010-2017-0039-EA

Bureau of Land Management - Arizona Strip District - Arizona Strip Field Office



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1 inch = 1.74 miles

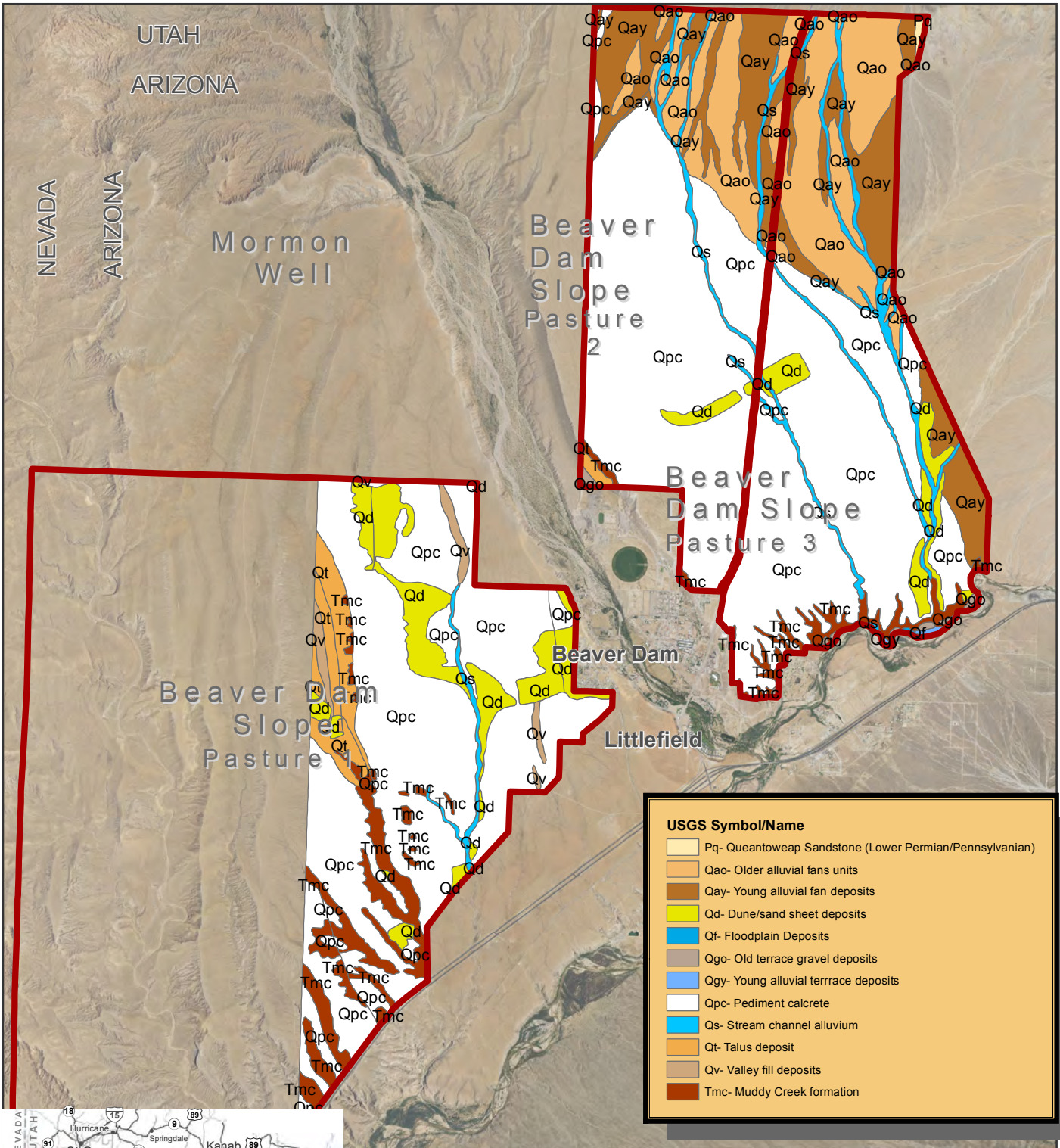
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Scale: 1:110,000 at 8.5x11 page output  
User: bmcullen  
Date: 11/20/2019



# Figure E.4. Geology Map - Beaver Dam Slope Allotment

NEPA Number DOI-BLM-AZ-A010-2017-0039-EA

Bureau of Land Management - Arizona Strip District - Arizona Strip Field Office



USGS Symbol/Name	
	Pq- Queantowep Sandstone (Lower Permian/Pennsylvanian)
	Qao- Older alluvial fans units
	Qay- Young alluvial fan deposits
	Qd- Dune/sand sheet deposits
	Qf- Floodplain Deposits
	Qgo- Old terrace gravel deposits
	Qgq- Young alluvial terrace deposits
	Qpc- Pediment calcrete
	Qs- Stream channel alluvium
	Qt- Talus deposit
	Qv- Valley fill deposits
	Tmc- Muddy Creek formation



1:90,000

1 inch = 1.42 miles

**APPENDIX F – Sensitive Species Excluded from Further Analysis**

**Table F.1. Sensitive Species Excluded from Further Analysis.**

<b>Species</b>	<b>Rationale for Excluding from Further Analysis</b>
House Rock Valley Chisel-toothed Kangaroo Rat <i>(Dipodomys microps leucotis)</i>	This species is endemic to House Rock Valley on the eastern side of the Arizona Strip and is not present in the project area.
Allen’s Big-eared Bat <i>(Idionycteris phyllotis)</i> Townsend’s Big-eared Bat <i>(Corynorhinus townsendii)</i> California Leaf-nosed Bat <i>(Macrotus californicus)</i> Greater Western Mastiff Bat <i>(Eumops perotis californicus)</i> Spotted Bat <i>(Euderma maculatum)</i> Arizona Myotis <i>(Myotis occultus)</i>	No direct impacts to roost sites such as caves, abandoned mineshafts, rock crevices, rock piles, and human structures are anticipated given that these sites are generally inaccessible to livestock. Indirect impacts from seasonal grazing on the allotments would not alter flying insect abundance or distribution. No measurable impacts (changes from the existing condition) would be expected from any of the alternatives analyzed in this EA.
Native Fish (5 species)	These species are restricted to the Virgin River and do not occur within the allotments. However, livestock may access the Virgin River from Pasture 3 of the Beaver Dam Slope Allotment. Since this pasture is only grazed from February 1 to March 15, two out of every six years, no measurable impacts from grazing would be expected.
Spring Snails (2 species)	These species are restricted to very small ranges at sites that are inaccessible to livestock and are not known to occur in the allotments.
Bald Eagle <i>(Haliaeetus leucocephalus)</i>	Bald eagles may rarely 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. The alternatives analyzed in this EA would have no impact on these food sources. No nests are located on the Arizona Strip and nesting habitat (large trees near open water) is nonexistent.
Peregrine Falcon <i>(Falco peregrinus)</i>	Nesting sites for peregrine falcons would not be impacted by livestock within the allotments because these sites are located on ledges in cliff faces that are inaccessible to livestock. Prey species for peregrine falcons, such as mourning doves and Eurasian collared doves, generally do well in human altered environments including grazed areas. Given the low levels of utilization and seasonal restrictions, vegetation in the allotments is sufficient to provide food and shelter requirements for populations of prey species for peregrine falcons.
Golden Eagle <i>(Aquila chrysaetos)</i>	Nesting sites for golden eagles would not be impacted by livestock within the allotments because these sites are located on ledges in cliff faces that are inaccessible to livestock. 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). Given the low levels of utilization and seasonal restrictions, vegetation in the allotments is sufficient to provide food and shelter requirements for populations of prey species golden eagles.
Ferruginous Hawk ( <i>Buteo regalis</i> )	Nesting habitat such as open grassland or shrubland with isolated trees is not present on the allotments. Indirect impacts from seasonal grazing on the allotments would not alter prey species abundance or distribution. No measurable impacts would be expected from any of the alternatives analyzed in this EA.
Pinyon Jay ( <i>Gymnorhinus cyanocephalus</i> )	Pinyon-juniper woodlands are not present on the allotments. No habitat alteration in pinyon-juniper overstory is proposed and pinyon pine seed crops would not be impacted.
Northern Goshawk ( <i>Accipiter gentilis</i> )	Habitat for this species is not present in the project area. On the Arizona Strip goshawks most frequently occupy ponderosa pine or pinyon-juniper forests. Their nest sites are typically located on north-facing slopes with canopy cover of 50% or greater.
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 the project area.
Arizona Toad ( <i>Anaxyrus microscaphus</i> )	Habitat in the allotments is limited to the Virgin River corridor and Beaver Dam Wash. These areas are lightly utilized by livestock on a seasonal basis. No measurable impacts to habitat or insect prey species would be expected from any of the alternatives analyzed in this EA.
Relict Leopard Frog ( <i>Lithobates onca</i> )	Habitat is currently restricted to a few isolated springs outside of the project area. Historic records show occurrence along the Virgin River, but this species is believed to be extirpated from the area.

## APPENDIX G - Mojave Desert Tortoise Monitoring

### Summary of Desert Tortoise Monitoring in Beaver Dam Slope DWMA

The recovery program for the Mojave population of the desert tortoise requires range-wide, long-term monitoring to determine whether recovery goals are met. Monitoring of this species has been occurring for many years. Before the tortoise was listed, populations were monitored either using strip transects (where indications of tortoise presence – live or dead tortoises, scats, burrows, or tracks – were converted to estimates of abundance based on transects conducted in areas of better-known tortoise density) or by using capture-recapture population estimates on a limited number of (usually) 1 square mile study plots. Although data have continued to be collected on transects and study plots in recent years, both methods suffer statistical deficiencies and logistical constraints that render them unsuited for monitoring trends in abundance applicable either range-wide or to individual recovery units (USFWS 2012b).

In 1999 the Desert Tortoise Management Oversight Group endorsed the use of line distance sampling for estimating range-wide desert tortoise density, and this methodology began to be used in 2001. Distance sampling methods use measurements taken from the center of the transect lines to tortoises to model detection as a function of distance from the path walked by sampling personnel. Density estimates from any brief window of time would be expected to detect only catastrophic declines or remarkable population increases. Therefore, the first five years of this monitoring (2001-2005) were not to document trends, but to gather information on baseline densities and year-to-year recovery unit to recovery unit variability.

Monitoring efforts since 2001 (since line-distance sampling began) have generated the following data (shown in Table G.1) to facilitate density estimates (USFWS 2006; 2009; 2012a; 2012b; 2013b; 2014d; 2015; 2016; 2018; 2019b).

**Table G.1. Beaver Dam Slope DWMA Desert Tortoise Monitoring Results**

Year	Area Monitored	Sampling Dates	# of live tortoises observed*	# of dead tortoises observed***	Density (per km <sup>2</sup> )	
					Beaver Dam Slope	NE Recovery Unit
2001	773 km <sup>2</sup>	April 10 – June 19	5**/0/0	0/0	5.6	2.4
2002	202 km <sup>2</sup>	April 16 – May 17	0	1/0	---	None provided
2003	Not monitored					3.7
2004		June 15 – June 16	0	1/0	---	1.2
2005	421 km <sup>2</sup>	April 13 – June 9	5/1/0	3/0	0.9	1.8
2006	Not monitored					
2007	478 km <sup>2</sup>	May 9 – May 30	6/1/0	No data provided	1.2	1.7
2008	2578 km <sup>2</sup>	April 12 – May 14	4/0/0	No data provided	1.1	0.9
2009	631 km <sup>2</sup>	April 29 – May 29	10/1/0	No data provided	3.2	3.4
2010	662 km <sup>2</sup>	April 23 – May 15	23/4/0	No data	3.3	3.2

				provided		
2011	751 km <sup>2</sup>	April 20 – May 10	23/3/4	No data provided	3.3	3.4
2012	819 km <sup>2</sup>	April 20 – May 10	38/5/3	No data provided	5.4	3.4
2013	683 km <sup>2</sup>	May 6 – May 24	17/0/4	0/1	2.6	None provided
2014	Not monitored					
2015	Not monitored					
2016	828 km <sup>2</sup>	May 19 – May 26	7/1/2	0/0	5.6	None provided
2017	828 km <sup>2</sup>	April 11- April 27	3/0/1	0/0	1.3	None provided
2018	Not monitored					

\* First number represents total number across the entire DWMA; second number represents number associated with the Beaver Dam Slope Allotment; third number represents number associated with the Mormon Well Allotment.

\*\* Note this discrepancy with the figure of 6 live tortoises described in the text above the table – information for the text is from the 2001-2005 Summary Report (USFWS 2006) while the 2001 information within the table is from the 2007 Annual Report (USFWS 2009).

\*\*\* First number represents number associated with the Beaver Dam Slope Allotment; second number represents number associated with the Mormon Well Allotment.

Results from the line distance sampling effort listed tortoise populations in the area as low. Density estimates from the monitoring are lower than estimates from earlier studies (Luckenbach 1982, Berry and Nicholson 1984). Precise comparisons cannot be made because the historical monitoring efforts were conducted using different techniques at different scales and with different goals. While annual estimates may be imprecise (due to a variety of factors such as vegetation that differentially obscures vision with distance, or different detection protocols used by individual crews), over a period of years any underlying trend in the number of tortoises should be obvious (USFWS 2012b).

## APPENDIX H – Public Comments and Responses

Comment No.	Commenter Name	Comment	Response
<b>Scoping Comments</b>			
<b>Beaver Dam Slope (BDS) Allotment Scoping Comments</b>			
BDS01	Western Watersheds Project	<p>The “Technical Recommendations,” to “A. Renew the grazing permit with current terms and conditions,” ignores “B. Continue to work with the [U.S. Fish and Wildlife Service, “USFWS”] to monitor the desert tortoise and implement best management practices that will assist the recovery of the species.” S&amp;G at 70. The USFWS has reminded the BLM repeatedly that both the 1994 Recovery Plan and the current, revised Recovery Plan identify livestock grazing as a primary threat and that most other grazing allotments in critical habitat in California and Nevada have been retired. Those that remain open are classified as ephemeral. It would seem that USFWS is recommending a similar management scheme for Beaver Dam Slope, but BLM is only promoting the status quo in the technical recommendations. We sincerely hope that the agency begins to take the recommendations of partner agencies in developing alternatives for this allotment in the forthcoming EA, including an option that would best promote the recovery of the desert tortoise: to retire the Beaver Dam Slope allotment.</p>	<p>The BLM worked closely with USFWS in the preparation of the land health evaluation for this allotment. USFWS was provided a draft of the land health evaluation, and provided extensive comments, which the BLM incorporated into the final report, and considered in developing this EA.</p> <p>The EA analyzes a range of alternatives including Alternative D – No Grazing (see EA Section 2.6). As part of the EA process, the BLM conducted formal consultation with USFWS on the proposed permit renewals. The Biological Opinion (see Appendix J) has been incorporated into the EA.</p>
BDS02	Western Watersheds Project	<p>BLM appears to believe that the timing of livestock grazing on the Beaver Dam Slope allotment is sufficient mitigation for the harmful impacts to desert tortoise. It uses the arbitrary dates of the “tortoise active season” from March 15 to October 15 to exclude consideration of livestock impacts ranging from trampling, burrow collapse, forage competition, and ATV use. S&amp;G at 37, 38, 50, 69, etc. This fails to acknowledge that changing climate may make those dates irrelevant and that, even in “normal” climate conditions, tortoise activity is a function of both temperature and size. Hatchlings, which have a relatively high surface to weight ratio, can take advantage of weaker sun to thermoregulate, and are active when weather permits in the winter. See Wilson, et al. (1999) Winter activity of juvenile desert</p>	<p>The EA thoroughly analyzes impacts to desert tortoise, not only from the proposed grazing, but also due to actions identified by commenter (see Sections 4.2.3 and 4.3.4). USFWS, in its biological opinion (see Appendix J) also addressed these actions.</p>

		tortoises in the Mojave desert. <i>J. Herpetology</i> 33(3): 496-501. (Available upon request.) The aforementioned study documented tortoises feeding in the winter as well, showing that livestock utilization competes with tortoise use whenever it occurs. If livestock grazing on the Beaver Dam Slope is affecting juvenile tortoise success and survival, it is affecting the recovery of the species as a whole.	
BDS03	Western Watersheds Project	The BLM relies on seasonal use patterns to ensure against competition for forage between native wildlife and nonnative livestock (S&G at 69) but fails to acknowledge that ephemeral vegetation production is also an artifact of the weather and that changing climate could be altering green up.	The BLM has measures in place to minimize competition between wildlife and livestock. For example, as described in EA Section 2.3.1, livestock would be moved to a different use area or removed from the allotments when utilization reaches the 45% threshold. In addition, the BLM would implement adaptive management, which allows for adjustment in 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 (see Section 2.3.3). An example of a situation that could call for adaptive management adjustments is drought conditions.
BDS04	Western Watersheds Project	The BLM is very dismissive of the potential for livestock crushing desert tortoise, either in or out of their burrows. A study of 341 tortoise shells from the Beaver Dam Slope (not to be confused with the Beaver Dam Slope allotment) revealed that cows crushed or stepped on more than one tortoise. See Coffeen, M. 1990. Report to State of Utah Natural Resources Division of Wildlife Resources, Cedar City, UT. The agency cannot dismiss this impact of livestock grazing in its analysis simply because it has not been documented on the allotment itself. If it can happen in Utah, it can happen in Arizona. BLM needs to consider the potential for livestock to step on juvenile tortoises who, as explained above, are active during winter.	The EA (Section 4.2.3.1) discusses the potential for livestock to trample tortoises, eggs, or their burrows. "Livestock are not likely to trample desert tortoise eggs ... on the Beaver Dam Slope Allotment since eggs are laid from mid-May through July and most or all would hatch before cattle would be turned out onto these allotments in October (Ernst et al. 1994). However, livestock may access portions of the Mormon Well Allotment until early June." Information from Coffeen (1990) and others were considered and referenced in this analysis.  See also response to Comment No. BDS02.
BDS05	Western Watersheds Project	Perennial, season-long grazing is inappropriate in this context; annual authorizations should be based on forage production and tortoise activity. A "hard look" in the forthcoming NEPA analysis should include an analysis of whether the arbitrary permit dates are relevant in this context.	The proposed season of use, (October 16 to March 15) is not season long grazing, and none of the alternatives propose season long grazing. In addition, please note that the alternatives where grazing is authorized include the term and condition that "Allowable use of key forage species in these allotments is no more than 45% of the current year's growth removed through grazing." The EA thoroughly analyzes

			impacts to desert tortoise from the proposed season of use (see Section 4.2.3).
BDS06	Western Watersheds Project	<p>Where the S&amp;G emphasizes the rest received in pastures 2 and 3, it doesn't emphasize the complete absence of rest in Pasture 1. S&amp;G at 5.</p> <p>Where BLM refers to pastures by number in the early part of the S&amp;G, it switches to describing them as "east pasture" and "middle pasture" later. S&amp;G at 52. This is confusing, as neither the map nor the narrative description permit the reader to easily understand which is which.</p> <p>Notably, 2 of the 4 key areas occur in Pasture 3, a pasture that only gets grazed for a short period every four years. S&amp;G at 5. Pasture 1, which is used every year and is the largest pasture on the allotment, has just one key area that reflects just a portion (&lt;half) of its total acreage. S&amp;G at 20. It does not seem that BLM has adequately monitored or assessed the impacts of livestock grazing on the Beaver Dam Slope based on this fact alone.</p>	<p>The inconsistent pasture labels in the land health evaluation referred to by the commenter has been corrected in the EA.</p> <p>The EA thoroughly analyzes impacts to resources within the allotments from the proposed livestock grazing. This includes an analysis of impacts to soils (see Sections 4.2.2 and 4.3.2), desert tortoise and other wildlife species (see Sections 4.2.3, 4.2.5, and 4.3.4), and vegetation (see Sections 4.2.4 and 4.3.3).</p> <p>See also response to BDS13.</p>
BDS07	Western Watersheds Project	<p>The S&amp;G claims the Desired Plant Community (DPC) objectives were developed by consulting site guides and site-specific information about the ecological sites in the allotment. S&amp;G at 20. They were developed during the evaluation process and the objectives are, "[S]et to be achieved within a time interval of 20 years from permit renewal. S&amp;G at 20. In essence, the BLM has set a new baseline for the "desired" plant community based on what is presently occurring and then giving itself two decades to meet whatever standards it still fails. This is unscientific and unsupported, and grazing use should be adjusted immediately to reflect conservation of the best habitat conditions for native wildlife and ecosystem health.</p>	<p>Ecological sites have the potential to support several different plant communities. Existing communities are the result of the combination of historic and recent uses and natural events. The interdisciplinary team used the ecological site guide descriptions for the allotments, and the transect data, including basal cover and relative composition, to detail a site-specific plant community for each key area, or desired plant community (DPC). DPC is defined as: "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" (SRM 1995). These DPCs, as listed in Section 2.2.3, reflect vegetative composition and attributes important for desert tortoise habitat, as well as habitat requirements for other species. The DPCs developed for the allotments are considered appropriate for each site.</p> <p>See also response to Comment No. BDS15 (below).</p>

BDS08	Western Watersheds Project	<p>The BLM sets the DPCs to a standard of Composition by Weight (CBW), but fails to acknowledge that it rarely, if ever, employs this monitoring method. There are no data sheets that demonstrate the BLM applied this to the Beaver Dam Slope allotment in developing the current S&amp;G, nor any documentation about how frequently the agency intends to conduct this type of monitoring.</p>	<p>Commenter is incorrect in asserting that composition data is “rarely, if ever” collected. As described in EA Section 4.4, composition data (expressed as composition by weight) is collected every 5 years for each allotment and was used to develop the DPCs.</p>
BDS09	Western Watersheds Project	<p>The BLM uses such indiscernible differences as 1 and 3 percent CBW to express “improvement” in key values. S&amp;G at 21. This is meaningless at the likely interval at which it will be conducted. The BLM should be simply improving its existing process in order to make use of the historical data as well rather than inventing a new process with inconsistent methodology.</p>	<p>The DPC objective commenter is referring to is “Increase native perennial grass (big galleta and Indian ricegrass) to between 1 and 3% CBW.” This refers to the goal of having between 1 and 3% of these grasses at Pasture 2, Key Area #1. The BLM uses a combination of historical data and current data. The DPC tables in EA Appendix B compare the most recent plant composition data from the trend plots to the desired plant community objectives that were established for each key area. This objective has been revised to read “maintain” rather than “increase” because the objective (based upon the most recent data from 2017) is being met.</p>
BDS10	Western Watersheds Project	<p>The S&amp;G report does not discuss the ground cover data included in Appendix A. S&amp;G at 86. In every case, live vegetation cover has decreased since the last monitoring episode, sometimes substantially so.</p> <p>When attempting to compare years, it became apparent that 2006’s precipitation data were not included in Appendix C. This makes it difficult to ascertain whether the recent downward trend could be attributed to variations in moisture and plant productivity. Please include all weather data in future analysis, including temperature data.</p>	<p>The ground cover data was accidentally included within the Arizona Standards and Guidelines Appendix A of the land health evaluation (at S&amp;G 86) – it should have been included in the trend data section. There was a short discussion of ground cover data included at the bottom of the table at S&amp;G 86. Also, see S&amp;G 26 and 27 for the method used to incorporate ground cover data into the overall trend determination.</p> <p>Appendix B of the EA (see Tables B.1 – B.4) includes ground cover in with the trend data for each key area. Ground cover data is used to determine overall trend.</p> <p>It appears that the precipitation report in Appendix C in the S&amp;G was mislabeled – it should have been labeled Beaver Dam Wash, Arizona instead of Slope Catchment. However, the data was correct. There is data for 2006 (see S&amp;G 98). In addition, this EA (Appendix D) includes historical precipitation data for the Beaver Dam Wash,</p>

			Arizona Rain Gauge. The last reading is 2016; after that the rain gauge was discontinued. Precipitation data for the allotments is now being collected from a BLM weather station in Beaver Dam Slope, Utah.
BDS11	Western Watersheds Project	<p>The S&amp;G’s utilization data are useless in context of the likely impacts of the full permitted use. As shown in Table 3, “Actual Use Data,” actual use on the allotment has averaged just 25 percent of the permitted levels between 2003 and 2011. S&amp;G at 25.</p> <p>The S&amp;G claims that utilization has been light. S&amp;G at 26. However, species like winterfat have been used at levels statistically indiscernible from the use levels established in the Biological Opinion even with the low numbers of livestock on the allotment. Id. For example, in 2011, winterfat was grazed at 37 percent in pasture 1 and at 40 percent in pasture 2. Actual use in 2011 was 23 percent of permitted use. S&amp;G at 25. Had BLM authorized full permitted use, it is likely that the utilization limits specified in the BO would have been very much exceeded. The BLM should analyze and disclose an alternative that limits livestock use levels that are likely to be adhered to in the forthcoming EA and acknowledge that it is likely to violate the terms of the consultation with FWS if it allows full permitted use. Moreover, the S&amp;G admits that improvements in ecological site conditions can only be anticipated “under current livestock management practices,” which would seem to indicate that the permitted levels of livestock grazing should be adjusted in the forthcoming renewal. S&amp;G at 68.</p>	<p>Utilization is defined as the proportion of the current year’s forage production that is consumed or destroyed by grazing animals (both livestock and wildlife). EA Appendix B contains utilization data for Beaver Dam Slope Allotment over the past 10 years (2008-2018). As shown in this appendix, utilization on key species in this allotment has ranged from 0 – 45%, with most readings well below 30%, which allows the species to maintain themselves in drought, even with grazing.</p> <p>Please note that the BLM has measures in place to ensure that utilization would not exceed the limit of 45%. As outlined in EA Section 2.3.1, livestock would be moved to a different use area or removed from the allotments when utilization reaches the 45% threshold.</p> <p>The BLM has analyzed a full range of alternatives in the EA (see Chapter 2), including reduced grazing (Alternative B) and no grazing (Alternative D). An alternative was also analyzed where grazing preference would be based upon a potential stocking level analysis (Alternative C). The potential stocking level analysis formula uses actual use, average utilization, and desired average utilization (which is 45% for this allotment) to calculate a potential stocking level. For Beaver Dam Slope Allotment, the potential stocking level would be 1,480 AUMs, which would be an increase of 583 AUMs.</p>
BDS12	Western Watersheds Project	<p>It is unclear why BLM includes utilization data for pastures that might not have been in use. The S&amp;G claims that Pastures #2 and #3 are only used every few years, but Table 4 includes annual utilization data for them nonetheless. It would be helpful to know if the rotation schedule has been followed and how that corresponds to the data that are presented. The utilization data are also not dated by season, so it is unclear whether utilization data are read when cattle have been present or not. Where BLM claims that</p>	<p>Utilization is defined as the proportion of the current year’s forage production that is consumed or destroyed by grazing animals (both livestock and wildlife). Utilization is often read at all key areas. Each pasture is visited as a part of allotment supervision and compliance, assuring that livestock are leaving the allotment when required either by the date required and/or when utilization limits are reached in each pasture or key area. The utilization limit for this allotment is 45%.</p>



		<p>utilization has been none to light, it is tacitly admitting that the monitoring is not detecting livestock impacts, <i>e.g.</i> S&amp;G at 33. Certainly, if livestock are on the allotment, and if each AUM is removing at least 800 lbs of vegetation each month, vegetation is being utilized. A failure to detect and measure this is a failure of methodology. The BLM should disclose what the cattle are eating and should adapt its monitoring to register these impacts.</p>	<p>Reviewing actual use reports for the Beaver Dam Slope Allotment shows that in most years actual use was not reported by pasture as it should have been. Through communications with permittees, the BLM does know that pasture rotations occur. We will work closer with permittees to ensure that rotations occur as outlined in the AMP, although it should also be noted that some flexibility in the order of pasture rotation may be required based on availability of water in certain years. In any case, the BLM does ensure that utilization does not exceed 45%. Utilization is read at the end of the grazing season, but interim checks of utilization may be made during the grazing season to ensure that maximum allowable utilization is not exceeded.</p> <p>See Appendix B in the EA. Tables B.5-B.8 show percent utilization of key forage species by year read at each of the four key areas. Blank cells indicate no plants of that species were encountered in the transect. Average percent utilization by year is calculated by averaging the utilization readings for all key species read in a given year at a specific key area. During the last ten-year period (2008 – 2018), no utilization readings above 45% were recorded on any of the four key areas in the Beaver Dam Slope Allotment. Utilization was not read on any of the key areas in 2015 due to travel restrictions on this and surrounding allotments.</p> <p>Livestock are herded between the three pastures and within the pasture so that grazing is spread out and not concentrated in any particular area.</p>
BDS13	Western Watersheds Project	<p>Appendix D only includes two data sheets for four key areas, and these have been reproduced in a format that makes them unreadable. However, the map shows six key areas. Where are the data and analyses for these key areas? It seems that the BLM has only conducted rangeland health assessments on two of four key areas, meaning it has not assessed erosion or soils or any other attribute on the majority of the lands of the allotment. It is unclear why there are not</p>	<p>Attempting to monitor 100% of any given rangeland is not practical. Instead, representative study sites are selected based on their ability to represent range conditions over much larger areas (University of Arizona 2010). Evaluation sites, or key areas as defined in Technical Reference 1734-4 (BLM 1999b), are indicator areas that are able to reflect what is happening on a larger area as a result of on-the-ground management actions. A key</p>

		<p>monitoring sites closer to livestock waters, given that livestock waters are high impact zones. If monitoring is being conducted over two miles away from water, this could explain the “none to slight” impact observed, i.e. that there is “none to slight” livestock use in these areas. The BLM should analyze and disclose this information in the forthcoming NEPA analysis.</p>	<p>area should be a representative sample of a large stratum, such as a pasture or grazing allotment. Locating a key area near a water source would not meet the criteria of representative of range conditions over a larger area.</p> <p>There are four active key areas in the Beaver Dam Slope Allotment (see EA Figure A.6). The locations of these key areas were selected based on their ability to represent range conditions over much larger areas. Appendix B provides updated trend, utilization, ecological condition, and desired plant community objectives data for the four active key areas in the allotment.</p> <p>There was a fifth key area established in Pasture 1 in 1970. Key Area 1 -3. It was read in 1970, 1976, and 1979. It was dropped likely because it was close to Key Area #4 in Pasture 1, which was also established in 1970 but has continued to be read. The discontinued key area was about one-half mile north of Key Area #4. Please refer to the map in EA Appendix A Figure A.6.</p>
BDS14	Western Watersheds Project	<p>The objectives for perennial grass are not met on half of the key areas. S&amp;G at 66 and 67. The BLM excuses itself by saying this might not be realistic but doesn’t describe how the key area differs from the rest of the ecological site that show much higher levels of perennial grass cover. Where the BLM relies on “future monitoring” to make this determination, it has failed to look backwards towards the monitoring that indicates native perennial grass species used to be more abundant on the same key areas. S&amp;G at 27-28. Where BLM points to upward trends of species on Key Area #6 in 2011, it has not indicated whether that was during or at the end of a four-year rest cycle. It’s apparent that BLM did not monitoring Key Area #4 or #2 in 2011, but according to utilization data these pastures were in use. The inconsistencies between what got monitored and when monitoring was conducted are very confusing, and since the monitoring is not clearly tied either temporally or spatially to actual use, it is difficult to understand BLM’s conclusions.</p>	<p>See EA Appendix B, Tables B.13 – B.16, that compare the most recent plant composition data from the trend plots to the desired plant community objectives that were established for each key area. Objectives for the key areas were partially met.</p> <p>The BLM read utilization at key areas #4 and #1 in 2011 (S&amp;G at page 26 Table 4 and Appendix B in the EA, Table B.5 and B.6) so monitoring of the allotment did occur. (Note that there is no Key Area #2 – see response to Comment No. BDS17.) Trend plots are generally read on a 5-year cycle so key areas #1 and #4 were last read in 2007; they were scheduled to be read in 2012 and they were (see Appendix B in the EA, Tables B.1 – B.4). Trend was read at key areas #5 and #6 in 2006 and 2011. See EA Section 4.4 for more information on the trend monitoring cycle. Occasionally monitoring may be done on a shorter or longer interval than planned, based upon funding or other factors.</p>

BDS15	Western Watersheds Project	<p>BLM seems to set its DPCs based on what is already at the site, instead of what could be at the site in the absence of livestock grazing. In this way, the BLM is not setting “objectives” but “subjectives” based on pre-existing conditions, and then patting itself on the back when it determines compliance. Therefore, “meeting” the objectives doesn’t really indicate attainment of rangeland health, just attainment of the <i>status quo</i>, which may or may not reflect what a healthy landscape would look like. There is no discussion of the allotment’s failure to meet the allotment management plan specific objectives, including the failure to increase vegetation cover, despite having had thirty years in which to accomplish it. (In fact, it’s not even clear that the BLM re-measured the same key areas, as the key areas for pastures 1 and 2 aren’t specifically identified. S&amp;G at 19-20.)</p>	<p>DPC objectives were developed during the land health evaluation process by an interdisciplinary team of resource specialists. The species composition objectives were developed by consulting the Ecological Site Guides, developed by NRCS, and site-specific information of the potential of the site to produce vegetation. Site guides used are from the Soil Survey of Shivwits Area, Arizona (Part of Mohave County) (NRCS 2004). The DPC objectives implement RMP objectives and reflect vegetative composition and attributes important for desert tortoise habitat, as well as habitat requirements for other species. The objectives are set to be achieved within a time interval of 20 years from permit renewal. DPC objectives are expressed in figures of Composition by Weight (CBW). Composition data is collected using the Dry Weight Rank sampling method (BLM 2012). (See EA Appendix B and Tables B.13 – B.16, which list the objectives for each key area, and show the current composition of DPCs and whether or not the DPC objectives are being met.)</p>
BDS16	Western Watersheds Project	<p>The way that BLM calculates trend is misleading, at best, and requires large declines to detect downward trajectories in species with low relative compositions. For example, where BLM claims that the trend for Key Area #4 on Pasture 1 is static, it fails to admit that most important species have actually declined from original monitoring or have disappeared completely. Only because of BLM’s +/- 10 pt system (which will never detect change in species that are infrequent in the first place) can the agency allege Key Area #4 is not declining. Looking at the downward changes of Joshua tree, bursage, ratany, cholla, winterfat, ricegrass, galleta, dropseed, goldeneye, and snakeweed, as well as declines in basal vegetation makes it very difficult to believe that this key area is truly in “static” condition.</p>	<p>See Appendix B and Appendix C in the EA (trend section of each appendix), which describe how the direction of overall trend at a key area is determined. Overall trend at a key area is determined by assessing the sum percentages of the following attributes: key species, live vegetation cover/basal cover, and ground cover (surface litter). Both basal cover and surface litter are important attributes when evaluating Standard #1 (Upland Sites) of the Arizona Standards for Rangeland Health (BLM 1997). Overall trend at a key area is the direction of change in frequency observed between the initial reading (base year) and the current reading, as depicted by the arrows, i.e., (↗) up, (↘) down, and (→) no apparent static or static. The threshold for a change in trend is +/- 10 percent. This is the accepted BLM practice for determining trend.</p> <p>Appendix B in the EA (Table B.1) shows the trend at Key Area #4. Percent frequency of key species in 1982 was 60 and in 2017 was 61. Percent live basal vegetation in 1982 was 3 in 2017 was 1. Percent litter in 1982 was 16 and 2017 it was 19.7. The overall trend</p>

			reading in 1982 was 79 and in 2017 is 81.7, a change of 2.7 percent, which is considered static.
BDS17	Western Watersheds Project	On Key Area #2, Pasture 2, bursage, creosote, cholla, turpentine bush, mormon tea, burrobush, Indian ricegrass, goldeneye, galleta, and Joshua tree have all declined. S&G at 28. Still, BLM defines this as “static.” BLM’s methodology should be supported with peer-reviewed literature.	<p>See response to Comment No. BDS16 about how the overall trend is determined.</p> <p>The S&amp;G at 28 overall trend was mis-labeled Pasture 2 (Key Area #2) was supposed to be Pasture 2 Key Area #1. This has been corrected in the EA. See Appendix B in the EA (Table B.2) that shows the percent frequency of key species in 1981 was 38 and in 2017 was 32. The percent live basal vegetation was 1 in 1981 and in 2017 it was still 1. The percent litter was 24 in 1981 and in 2017 it was 23. The overall trend reading in 1981 was 63 and it was 56 in 2017, a change of 7 percent which is static, or within the +/- 10 percent change threshold of the accepted BLM method for determining trend.</p> <p>See Section 4.4 of this EA for more information on trend monitoring.</p>
BDS18	Western Watersheds Project	On Key Area #5, Pasture 3, the BLM has apparently ignored it’s own system of determining trend to find this key area “upward.” S&G at 28. None of the species have increased more than 10 pts, and the only increase by BLM’s measure would be in surface litter. Id. The upward trend is unexplained and inconsistent with the way the agency appears to have determined trend on the other key areas. The improper methods cut both ways; if it can’t be used to determine a downward trend, it can’t be used to determine an upward trend.	<p>Please refer to EA Appendix B Table B.3 for the most recent trend data for Key Area # 5. Overall trend is upward.</p> <p>See response to Comment No. BDS16 about how the overall trend is determined.</p>
BDS19	Western Watersheds Project	Likewise, on Key Area #6, Pasture 3, the BLM has called the trend upwards even though the changes are, for the most part, within the +/- 10 pt frequency that should result in a “static” determination. S&G at 28. Where frequency has exceeded the arbitrary change threshold, it has been downward for winterfat (a key species) and upwards for red brome, and invasive species. Galleta also increased. However, on the balance, the “upward” trend is indefensible. (Both “upward” trends were determined in key areas in Pasture 3, a pasture that is only	<p>Refer to EA Appendix B Table B.4 for the most recent trend data for Key Area #6. Overall trend is static.</p> <p>See response to Comment No. BDS16 about how the overall trend is determined.</p>

		subjected to infrequent and short duration grazing.)	
BDS20	Western Watersheds Project	BLM includes a table of important forage and shelter plants for desert tortoise and claims, "Many of the perennial plants listed [in Table 2] are in the key areas." S&G at 23. However, the frequency data demonstrate otherwise. Of the grass species, only galleta and ricegrass are/were present in the key areas and both of these have decreased significantly in recent years. Of the shrubs, only white bursage, mormon tea, ratany, and creosote are present in the key areas, and most of these have declined as well. S&G at 28. (Creosote has remained stable and is generally unpalatable to livestock.) It does not appear, therefore, that BLM is monitoring important desert tortoise foods.	While the term "several" may have been more appropriate to use in the land health evaluation, it is important to note that 33% (3 of 9) of the grasses listed in the cited table are present in one or more of the key areas, while 57% (4 of 7) of the listed shrubs are present. No such statement is made in the EA.
BDS21	Western Watersheds Project	BLM attributes fluctuations in trend to drought conditions. If drought conditions are having such a great influence on vegetation production on key palatable species, the agency should be looking to adjust the stocking rate on the allotment, as carrying capacity will have likely also been reduced correspondingly.	There are many years that the permittees have not run full numbers of livestock because of drought conditions but have been taking voluntary reductions. See also response to Comment No. BDS11.
BDS22	Western Watersheds Project	It is unclear when the ecological site inventory was completed. The S&G provides ecological site inventory summaries for nine ecological sites but these do not correspond to the ecological sites monitored at key areas. S&G at 34. When was the ecological status determined and how? How does this correspond with the other monitoring data included in the S&G?	The Beaver Dam Slope Allotment Ecological Site Inventory was conducted in 1990 – 1992. The inventory was conducted across the entire allotment; some ecological sites made up small portions of the allotment, and not every site has a corresponding key area for monitoring. There are seven different ecological sites identified on the allotment. Some ecological sites have areas that are in different ecological status (i.e. PNC, late seral etc.). S & G Table 8 at 34. One site, accounting for 10% of the allotment, is unclassified. Ecological status listed in Table 8 was determined at the time of the inventory. S&G Table 7 shows the ecological sites that correspond with each key area. These ecological sites are the same sites as in S&G Table 8. The ecological status in S&G Table 7 was based on the most recent trend

			<p>– current composition data available when the S&amp;G was written.</p> <p>As stated, before Pasture 2 Key Area 2 was incorrectly labeled and should read Pasture 2 Key Area #1.</p> <p>See EA Appendix B (Ecological Site Inventory Data – Ecological Condition section) for an explanation of how the ecological condition is determined for each key area. EA Appendix B (Tables B.9 – B.12) shows the updated Ecological Condition Tables based on the most recent trend – current composition data. The dominant ecological sites on the allotment are limy upland (6 – 9: p.z.), limy upland deep (6 – 9” p.z.) and coarse sandy loamy upland (6 – 9” p.z.) which are monitored by the key areas (see EA Section 3.4.4). EA Table B.17 shows the current ecological site, ecological condition and overall trend for each key area.</p>
BDS23	Western Watersheds Project	<p>It is unclear why BLM believes that the objectives for Wildlife Habitat are being met. S&amp;G at 54. BLM has not addressed shelter or nesting sites for endemic wildlife species and instead seems to be relying solely on vegetation objectives to address animal communities. It is unclear how why the BLM believes DPCs address shelter and nesting sites, given that there are no overall live vegetation cover objectives in the DPCs (and given that anything but bare ground counts as cover in BLM’s data). There are no composition requirements for specific structural components. See, e.g. S&amp;G at 20-22. The S&amp;G references, “the current functional groups of shrubs and trees” that provide cover for desert tortoise and native wildlife, but there is no evidence that BLM is monitoring tree cover. Moreover, no animal data are included in the S&amp;G. Moreover, it is not clear that all native animals are self-sustaining populations.</p>	<p>The cited “Wildlife Habitat” objective from the land health evaluation is a Desired Future Condition taken from the RMP (DFC-WF-02). This RMP objective states that <i>“Native wildlife communities will be protected. A complete range of diverse, healthy, and self-sustaining populations of native animal species will occupy all available suitable habitats.”</i> The land health evaluation correctly states that the objective is being met because the DPC objectives developed for the allotment provide a mixture of shrubs, native perennial grasses, and forbs, thus ensuring healthy populations of native wildlife species. The land health evaluation does acknowledge that there remain problems with non-native vegetation (growth of red brome and Sahara mustard in wet years), but also notes that the allotment is in good shape overall (i.e., trend and ecological condition) and contains an intact Mojave Desert plant community with diverse vegetative structure; the overall condition of the habitat is good.</p> <p>The BLM is unsure what commenter is referring to by stating that “There are no composition requirements for specific structural components” in the DPCs and the DPCs do not “address shelter and nesting</p>

			<p>sites.” The DPCs specifically include objectives for browse and shrubs, which in the Mojave Desert provide shelter and nesting sites for wildlife. In addition, as shown in Tables 7 and 8 of the land health evaluation, the vegetative communities in the allotment are a mix of PNC and late seral stage, which provides a diversity of age classes, and a diversity of wildlife habitat. The “tree cover” statement referenced refers to “Joshua trees.” While the BLM does not monitor tree cover, it does collect composition and frequency data for all species present at the key areas, including Joshua trees.</p> <p>Tortoise population data are included in Table 10 of the land health evaluation. The BLM based its conclusions on the allotment providing for self-sustaining wildlife populations by considering the condition of the vegetative communities. Since monitoring data (ESI and trend data) demonstrate a stable (within normal variance) Mojave Desert plant community, and the majority of DPC objectives are being met, the BLM concluded that the allotment provides a diversity of wildlife habitat and provides many important forage and shelter plants, including creosote, bursage, ratany, and galleta</p>
BDS24	Western Watersheds Project	<p>We are concerned with BLM’s sensitive species as well as all native plants and animals that may be adversely affected by multiple-use management, including the Gila monster (<i>Heloderma suspectum</i>). Though the Beaver Dam Slope S&amp;G doesn’t mention it, the U.S. Fish and Wildlife Service recently admitted that the Gila monster population may be experiencing critical declines in the region of the allotment. 76 F.R. 36051. Habitat degradation, proliferation of noxious weeds, and altered fire ecology all impact this species; the forthcoming EA should examine the effect of livestock grazing in context of the numerous threats faced by Gila monster in the project area.</p>	<p>The critical declines in Gila monster numbers mentioned in the Federal Register were referring to the Utah population. The land health evaluation (and the EA) do not address Gila monsters because they are no longer considered sensitive.</p>
BDS25	Western Watersheds Project	<p>The forthcoming NEPA analysis should also include a discussion about how the unburned habitat for desert tortoise on the Beaver Dam Slope allotment have become increasingly important in light of the fires elsewhere in</p>	<p>The EA addresses the cumulative impacts on vegetation, including long-term effects from fire and how burning these plant communities would likely change vegetation</p>

		the species' range. The value of these lands for habitat has increased relative to their value for economically marginal and ecologically-damaging multiple uses.	composition and available forage for wildlife (see Section 4.3.3).
BDS26	Western Watersheds Project	The BLM describes the DPCs as encompassing consideration for, "[E]thnobotanicals for the Southern Paiute (Kaibab and Shivwits)" but does not describe how this was addressed. Which species is the BLM monitoring to ensure that these culturally significant plants persist on the Beaver Dam Slope allotment?	The cited text from the land health evaluation gives a list of key species and talks about the importance of each species, whether for forage, wildlife or medicinal/ethnobotanical or other uses. Vegetation on the allotment is monitored through long term trend and composition monitoring. See EA Section 3.4.4 which lists the key species and their importance.  See also response to Comment Nos. BDS13, BDS 14, BDS15 and BDS16.
BDS27	Western Watersheds Project	The BLM conducted a single PFC assessment on Segment 7 of the Virgin River. S&G Appendix D. This section "includes the south end of Beaver Dam Allotment." S&G at 45. Does it include the south end of the "east pasture" of the allotment or simply the south end? Also, the claims that livestock are having little or no effect on the riparian area should be substantiated with monitoring data (such as utilization data, etc.) and monitoring and condition assessments should be done when livestock are actually in the riparian area. The PFC assessment was conducted in January 2012. Livestock are not in the riparian pasture until at least February. S&G at 5. There is not enough information in the S&G to determine when the last time livestock were in the riparian pasture and whether the PFC relates to recent livestock use or not. There is no evidence to support claims about good water quality on the allotment. S&G at 49. There is no evidence that the suspended sediments in the water are not caused by grazing. S&G at 49. Evidence matters, as the Virgin River is critical habitat for a number of listed species.	The 2012 riparian PFC assessment was done on segment 7 of the Virgin River that runs along the bottom (south) edge of Pasture 3 (see S&G at 78 for map of the allotment). It was determined that this segment was properly functioning. PFC is a qualitative method to assess the condition of riparian and wetland areas. Woody riparian greenline transect data has also been collected (the most recent in 2006). No changes in grazing management have occurred since the PFC assessment and greenline transect data were collected, and ocular observations during allotment inspections have indicated a continued healthy presence of native riparian species.
BDS28	Western Watersheds Project	The S&G is confusing in its determination regarding Desired Future Condition –RP-01. The S&G states, "The majority of DPC objectives are being met," and goes on to discuss vegetation trends on the allotment. S&G at 53. It is unclear how this relates to the vegetation health of riparian areas in particular, since DPC objectives relate to the uplands.	The author of the land health evaluation was writing a summary for the entire Desired Plant Community section DFC-GM-01, DFC-VM-02, DFC-VM-26, and DFC-RP-1 S&G at 53.  RMP objective DFC-RP-01 (" <i>Riparian areas will consist of a diversity of vertical and horizontal structures, vegetative age classes, and endemic species.</i> ") is addressed by the



			riparian and proper functioning condition write-ups for Virgin River segment 7 (see pp. 45-46, 54, 104 and 105 of the land health evaluation report). The riparian area was found to be in Proper Functioning Condition and has a healthy presence of native riparian species which are increasing.
<b>Mormon Well (MW) Allotment Scoping Comments</b>			
MW01	Western Watersheds Project	Though the Mormon Well S&G doesn't mention it, the U.S. Fish and Wildlife Service recently admitted that the Gila monster population may be experiencing critical declines in the region of the allotment. 76 F.R. 36051. Habitat degradation, proliferation of noxious weeds, and altered fire ecology all impact this species; the forthcoming EA should examine the effect livestock grazing in context of the numerous threats faced by Gila monster in the project area.	See response to Comment No. BDS24.
MW02	Western Watersheds Project	The "Technical Recommendations," to "A. Renew the grazing permit with current terms and conditions," ignores "B. Continue to work with the [U.S. Fish and Wildlife Service, "USFWS"] to monitor the desert tortoise and implement best management practices that will assist the recovery of the species." S&G at 49. The USFWS has urged the BLM <i>not</i> to renew the grazing permit with the current terms and conditions. The USFWS has specifically recommended allowing for retirement of this grazing allotment, switching it to ephemeral use only, lowering utilization levels and improving monitoring of utilization- all recommendations and management practices that should be incorporated into the permit renewal process. We sincerely hope that the agency begins to take the recommendations of partner agencies in developing alternatives for this allotment in the forthcoming EA.	See response to Comment No. BDS01.
MW03	Western Watersheds Project	The S&G hints at the "closure of the range in Nevada." S&G at 22. What the forthcoming NEPA analysis should discuss is <i>why</i> that is, i.e. "Based on the Desert Tortoise Recovery Plan, livestock grazing in desert tortoise Areas of Critical Environmental Concern (ACEC) is not compatible with recovery of the desert tortoise and should be prohibited." Las Vegas RMP and ROD at 3. BLM's Arizona Strip has taken an entirely opposite (an unjustified) tack in allowing seasonal grazing to continue	See response to Comment No. BDS24.  In addition, please note that the alternatives (including those that authorize livestock grazing on this allotment) are in conformance with the Arizona Strip Field Office RMP – see Section 1.3 of the EA.

		on the Mormon Well allotment within the Beaver Dam Slope ACEC and Desert Wildlife Management Area (DWMA). Statements such as, “The BLM continues to implement best management practices that will assist in the recovery of the Mojave desert tortoise” are unsupported in light of BLM Arizona’s unwillingness to retire livestock grazing on this and other allotments.	
MW04	Western Watersheds Project	The failure to include important technical recommendations in the S&G is the tip of the iceberg, but signifies a failure to take a hard look at the ongoing problems with livestock grazing on these desert lands.	The purpose of the land health evaluation for the Mormon Well Allotment is to review the condition of the allotment by reviewing monitoring data, determine whether the allotment is meeting, making progress toward meeting, or not meeting the standards for rangeland health, and to make recommendations for future management of the allotment. The land health evaluation is not an environmental review document. Information from the land health evaluation, in combination with updated data, was analyzed in the EA. In addition, formal Section 7 consultation with the USFWS was conducted and a Biological Opinion was issued (see Appendix J of the EA).
MW05	Western Watersheds Project	The S&G claims the Desired Plant Community (DPC) objectives were developed by consulting site guides and site-specific information from the ecological sites in the allotment. S&G at 14. Unfortunately, Key Area #1’s ecological site (“Coarse Sandy Loam, 6 to 9 inch precipitation zone”) is not available online, and, indeed, may not exist.1 The NRCS only lists “Coarse Sandy Loam,” within the 10 to 13 inch p.z.. It is unclear how the DPCs for Key Area #1 were developed. Similarly, we were unable to find “Limy Upland Deep, 6 to 9” p.z., the ecological site for Key Areas #2 and #3. Without access to the NRCS site guides, it is difficult to understand how the DPCs were set.	Coarse Sandy Loam (Limy) 6 – 9 “p.z. (R030XB205AZ, August 17, 1994) ecological site is also known as Sandy Loam Upland 6 – 10” p.z. Limy Subsurface, Gravelly; it is an updated provisional ESD which is available online from the NRCS.  Limy Upland (Deep) 6 – 9” p.z. (R030XB215AZ, August 17, 1994) ecological site, also known as Sandy Loam Upland 6 – 9” p.z. Limy, is an updated provisional ESD that is also available online from the NRCS.
MW06	Western Watersheds Project	It is also difficult to understand, given the identical ecological sites on Key Areas #2 and #3, why the DPCs differ. On Key Area #3, the BLM has completely removed any objectives for perennial native grass, as it has for Key Area #2. S&G at 15-16. There are differences between the two sites for shrub and tree cover as well. It appears, based on BLM’s explanation in the S&G, that the agency anticipates maintaining an absence of perennial grasses on Key Area #3. It is not	See response to Comment No. BDS07.  Please also note that the DPC objectives were established and based upon monitoring data collected at each key area and the associated species in the ecological site guides. The ecological site has been updated to Sandy Loam Upland 6 – 9” p.z. Limy R030XB215AZ for both key areas #2 and #3. The state and transition model is not available yet but the Historic Climax Plant

		<p>clear how this squares with the needs of wildlife or whether the vegetation cover classes are sufficient to maintain soil health. It is also not clear how BLM’s claim that no perennial grasses had been detected on the site in over 25 years of monitoring (S&amp;G at 16) match with its own data for that report ricegrass on Key Area #3 in 2000. S&amp;G at 20. Rather, it seems like sufficient evidence that BLM sets its DPCs based on what is already at the site, instead of what could be at the site in the absence of livestock grazing. In this way, the BLM is not setting “objectives” but “subjectives” based on pre-existing conditions, and then patting itself on the back when it determines compliance. Therefore, “meeting” the objectives doesn’t really indicate attainment of rangeland health, just attainment of the <i>status quo</i>, which may or may not reflect what a healthy landscape would look like.</p>	<p>Community is dominated by desert shrubs including creosote bush and white bursage with some perennial grasses. The DPC objectives are also intended to provide forage and habitat components for other wildlife, forage for livestock, ground cover to protect the soils and watershed values, and ethno-botanicals for the Southern Paiute (Kaibab and Shivwits).</p> <p>In setting the species composition levels of each functional group, it is recognized that all species vary in levels across a given site and over time. A range is therefore given for each species due to this natural variance, which is shown in the vegetation data in S&amp;G Appendix C and Table 5. Key areas 2 and 3 also exhibit the range of natural variability that exists within the same ecological site. While Key Area #3 is a shrub-dominated site with no perennial grass component, Key Area #2 has a composition of big galleta above that found in the ecological site guide (see land health evaluation pp. 16 – 17).</p> <p>Ecological sites are not homogeneous – there may be combinations or inclusions of other range sites, meaning the plant community present (and/or expected) may be different even across the same mapped ecological site. In addition, different areas may have a different history of use or may be in a different ecological state.</p> <p>The cited section of the land health evaluation report that references ricegrass (p. 20 of that report) is the utilization data, and does record utilization of ricegrass in 1982, 1983, and 2000. This shows that there was some present – it could be one ricegrass plant or a few that showed use. The trend transect is a permanent transect while utilization is not read on a fixed permanent transect. If there are few ricegrass plants in a key area they may not be documented in the trend transect. Those few plants may also not be seen from year to year when reading the utilization. With only a few plants there may be years when the plant is present but not seen. The utilization tables have four possible outcomes. Species is present and there has been utilization, species is present and no utilization is</p>
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			observed, species is present but is not observed, or species is not present in the key area. Please see EA Appendix C, Tables C.6 – C.8, for the last ten years of utilization data. There was no utilization of grasses recorded in the period 2008 – 2018.
MW07	Western Watersheds Project	The S&G states, confusingly, “[Key] species are selected for their similarity to other grasses and browse species that occur in the allotment.” S&G at 4. Key species are supposed to be species that are on the allotment, to be used for measuring use and trend. Using similar species is insufficient.	Key species identified for this allotment are species present in the plant community on the allotment and are representative of the potential natural communities for the specific sites.
MW08	Western Watersheds Project	The actual use data included in the S&G is not concurrent with the monitoring data collected by the agency, and so it is difficult to determine how use corresponds with impacts. The agency reports actual use from 2002-2009. S&G at 18. Utilization data are reported for just a subset of these years, including 2010. S&G at 19. The S&G does not disclose when utilization data were collected, but given that all grazing takes place during plant dormancy, utilization should be monitored again at the end of the grazing period to ensure that remaining plant availability is sufficient to meet the needs of desert Tortoise and the terms of the Biological Opinion. Biological Opinion for the Arizona Strip Resource Management Plan at 113.	Please see EA Appendix C, Table C.6 – C.8 for the last ten years of utilization data.  Utilization is read at the end of the grazing season, but interim checks of utilization may be made during the grazing season to ensure that maximum allowable utilization is not exceeded.
MW09	Western Watersheds Project	It appears that the most recent actual use matches the active grazing/suspended use reported elsewhere. S&G at 3. Vegetation data are reported from 2007 on Key Areas #1 and #3 (S&G at 74, 78) from 2006 on Key Area #2 (S&G at 76). In 2006, actual use was substantially lower than the permitted use, which creates questions about the accuracy of conditions they represent. S&G at 18. In 2007, the BLM collected vegetation data halfway through the grazing season, despite the fact that plants were dormant and the full impact of livestock hadn’t been manifest yet.	The actual use data commenter refers to is found in Table 3 of the land health evaluation. Yes, the permittees used all of their authorized AUMs in 2009. The vegetation data you referred to at S&G 74, 76, and 78 are summary data sheets of the long-term trend data that are read on a 5-year schedule. The numbers show the percent frequency of plant species within the quadrats on study transect (presence or absence of a plant species) and has nothing to do with annual utilization levels. It also shows the percent ground cover. See Table 4 Utilization Data) on pp. 19 – 20 of the land health evaluation report. Utilization is the proportion of current years’ forage production that is consumed or destroyed by grazing animals. Table 4 includes utilization data for 2006 and 2007 for key areas #1 and #2, and 2006 utilization data for key area #3. Utilization is read at the end

			of the grazing season but interim checks of utilization may be made during the grazing season. Trend may be read any time of year, as long as the plants can be identified. Please see Section IV. B. 4. (Trend) in the land health evaluation report for an explanation of trend data methods.
MW10	Western Watersheds Project	BLM provides vegetation cover data in support of its trend determination for Key Area #2 in 2011, but these data are not reflected in the appendix containing the data spreadsheets. S&G at 21, 76-77. Moreover, it appears that the BLM went back out in 2011 to collect data on Key Area #2 simply to offset the declining conditions apparent in 2006. We would be very interested in knowing how the 2011 data correspond to precipitation and actual use.	The trend data summary for Key Area #2 does not include the 2011 reading (see pp. 76 and 77 of the land health evaluation report. Table 5 (p. 21) of the land health evaluation report lists 2011 trend data for Key Area #2, to include percent ground cover.  See EA Appendix C for current trend and utilization data for the Mormon Well Allotment key areas. Precipitation data can be found in Appendix D of the EA. The BLM uses the most current data available for the land health evaluation report or EA analysis. Trend study points are read every five years (EA Section 4.4), so a trend study that was read in 2006 would be scheduled to be read again in 2011, which was the case for this allotment (see EA Appendix C, Table C.2).
MW11	Western Watersheds Project	The way that BLM calculates trend is misleading, at best, and requires large declines to detect downward trajectories in species with low relative compositions. For example, where BLM claims that the trend for Key Area #2 is upward, it fails to admit that over the same period as Key Area #1, a number of important species disappeared completely. The recent trend is downward, which is important to reverse. Where BLM claims that status quo grazing is meeting the Standards and Guidelines, it is failing to address issues like disappearing perennial grasses on Key Areas #1 and #2, or declining ground cover on Key Area #3. These changes are significant, and BLM is skewing the recent trends by including conditions from 30 years ago without contextualizing conditions with longterm livestock use of the allotment.	See response to Comment No. BDS16.
MW12	Western Watersheds Project	The S&G abandons species composition objectives identifying diverse native plant species and instead adopts generic composition goals based on type of plant. S&G at 14-16. For example, on Key Area #1, rather than list specific objectives for white bursage, Mormon Tea, and ratany, the BLM	Please refer to Table 10 in the land health evaluation (p. 47) which discusses the DPC objective determination that groups species into functional/structural groups such as perennial grass or key browse species. It is common for the BLM to express DPC objectives in functional groups – plant

		<p>has lumped them all together and required that they meet a 35-45 % CBW objective. Ibid. This method dispenses with the need for diversity; a single species of the three could meet the objective and BLM still wouldn't be ensuring for adequate nutrition for desert tortoise or its own objective of species' diversity. Moreover, instead of identifying species-by-species trend on each key area, the BLM has simply provided the public with overall trend determinations. S&amp;G at 21. These trends are unsupported by the data and BLM's conclusions (and methodology) are highly suspect. For example:</p> <ul style="list-style-type: none"> <li>• On Key Area #1, BLM determined the trend to be static, despite the fact that all but 2 species experienced declines on the allotment. S&amp;G at 21. It added new species in 2007 that it apparently believes offsets the loss of native grasses. Ibid.</li> <li>• It is unclear why BLM didn't collect monitoring data on all key areas in 2011, but the fact that it only has data for Key Area #2 in that year looks suspiciously like the agency was trying to offset the downward trend that would have been obvious had the timeline ended in 2006. In 2006, every species except creosote had declined. S&amp;G at 21. (It is also unclear what "groundcover" is.)</li> <li>• Key Area #3 was determined to be trending upwards despite the fact that none of the species trended upward. S&amp;G at 21.</li> </ul>	<p>functional types are sets of plants exhibiting similar responses to environmental conditions and disturbance. They are thus more useful than using individual species in the interpretation of plant response and resource use (Duckworth et al. 2000). It is very difficult to manage large areas (such as a grazing allotment) for specific species because variations within such a large area can be quite dramatic (even within a single ecological site). By contrast, managing by functional groups allows range managers to study patterns of vegetation responses from plant groups that have similar life history strategies and responses to environmental stress and disturbance (McIntyre et al. 1999), which is more useful on the allotment scale. Please note that Table 10 in the land health evaluation does list the individual species within those groups and their current composition and compares it to the desired plant composition. See EA Appendix C, Tables C.12 – C.14, for the updated tables using the most recent trend data.</p> <p>See EA Appendix C, Tables C.1 – C.3, for the current trend data. Key Area #1 trend was upward, Key Area #2 trend was static, and Key Area #3 trend was upward. Please see response to Comment No. BDS16 concerning how trend is determined. Over time new plant species may become established or may disappear from the trend transect. That appears to have been the case at Key Area #1. In this case, more species were being detected adding to the diversity of the site. That is a function of conducting long-term permanent trend transect monitoring. Key areas #1 and #3 were read in 2007, with subsequent readings occurring in 2012 and again in 2017. Key Area #2 was read in 2006 and again in 2011 and 2016. Trend study points are read every five years (see EA Section 4.4).</p>
MW13	Western Watersheds Project	<p>The methodology for determining trend is improper. First, none of the data are robust enough to make trend determinations because of the margin of error. Second, BLM should explain why it uses a 10+/- points for determining trend on species that may never be that frequent but are nonetheless important. See S&amp;G at 20. This skews the</p>	<p>Permanent frequency trend plots are an accepted Bureau methodology for monitoring key species that may be utilized by livestock or wildlife (see Section 4.4 of this EA). Please see response to Comment No. BDS16.</p>

		actual detection of adverse trends in vegetation data for species such as wolfberry on Key Area #3, which has nearly disappeared and could do so entirely without being identified as having a downward trend because the initial reading was not above 10 points. S&G at 21. Some of these rare and infrequent species are those more susceptible to grazing disturbance, and yet their obliteration is still considered a “static” condition.	Appendix C in the EA, Table C.3, shows the trend at Key Area #3. Percent frequency of key species in 1982 was 13 and in 2012 was 15. Percent live basal vegetation in 1982 was 0 in 2017 was 1. Percent litter in 1982 was 1 and 2017 it was 22. The overall trend reading in 1982 was 14 and in 2017 is 38, a change of 24 percent, which is an upward trend. EA Tables C.4 - line intercept (percent cover) and C.5 belt density (plants per acre) show the most recent trend data for Key Area #3.
MW14	Western Watersheds Project	The S&G also does not disclose the distance to water of the key areas. The S&G admits that the federal lands in the allotment are more than a mile from water. S&G at 22. What it doesn’t admit is whether the key areas are representative of areas of use or non-use. If these areas are lightly used because of the location, the downward trend of most native species is worrisome.	See EA Figure A.4 for locations of range improvements on the allotments, and Figure A.6 for locations of key areas on the allotments.  See also response to Comment No. BDS13.
MW15	Western Watersheds Project Western Watersheds Project	The forthcoming NEPA analysis should also include a discussion about how the unburned habitat for desert tortoise on the Mormon Well allotment have become increasingly important in light of the fires elsewhere in the Northeastern Mojave Recovery Unit. The value of these lands for habitat has increased relative to their value for economically-marginal and ecologically-damaging multiple uses.  BLM includes a table of important forage and shelter plants for desert tortoise and claims, “Many of the perennial plants listed [in Table 2] are in the key areas.” S&G at 17. However, the frequency data demonstrate otherwise.	See response to Comment Nos. BDS20 and BDS25.
MW16	Western Watersheds Project	According to the vegetation data in Appendix C, of the perennial grasses, Galleta grass ( <i>Hilaria rigida</i> ) has declined on Key Area #1, decreased substantially on Key Area #2, and wasn’t encountered on Key Area #3. Bush muhly ( <i>Muhlenbergia porterii</i> ) wasn’t encountered on any of the key areas. Indian ricegrass ( <i>Oryzopsis hymenoides</i> ) wasn’t encountered on two key areas where it has been in the past, and apparently was never frequent enough to be detected on the third. Sand dropseed ( <i>Sporobolus cryptandrus</i> ) hasn’t been encountered on Key Area #1 since 1992, and appeared just once on Key Area #2 in 1988. Desert needlegrass ( <i>Stipa</i>	See EA Appendix C for the most current vegetation data for the Mormon Well Allotment.

		speciosa) isn't listed as ever having been encountered on any of the key areas.	
MW17	Western Watersheds Project	Of the shrubs, frequency of white bursage ( <i>Ambrosia dumosa</i> ) has decreased significantly on Key Area #3. Blackbrush ( <i>Coleogyne ramosissima</i> ) hasn't been encountered on any of the key areas. California buckwheat ( <i>Eriogonum fasciculatum</i> ) presently occurs on just one key area. Mormon tea ( <i>Ephedra</i> sp.) has declined on Key Area #1 and has disappeared from Key Area #3. It was never encountered on Key Area #2. Spiny hopsage ( <i>Grayia spinosa</i> ) has disappeared from Key Area #2, the only key area it was ever recorded on. Ratany ( <i>Krameria parvifolia</i> ) increased on Key Area #1, been maintained at low levels on Key Area #2, and disappeared from monitoring data on Key Area #3. Creosote ( <i>Larrea tridentata</i> ), a species unpalatable to livestock, has decreased its frequency on Key Area #1, but otherwise appears stable.	See EA Appendix C for the most current vegetation data for the Mormon Well Allotment.
MW18	Western Watersheds Project	Data on the forb species aren't collected consistently enough to make any determinations about how they are faring on the Mormon Well allotment. However, what is clear is that the clear majority of species that desert tortoise rely on are declining in frequency on the allotment, and the BLM should take a hard look at compounding other impacts to the species with reauthorized livestock grazing. The conclusion that objectives relating to the availability of forage and shelter plants are being met is unsupported. S&G at 41.	Forb data is collected when the trend studies are read. Site guides for Key Area #1 give perennial forbs 0 -1% composition. Key Area # 2 gives perennial forbs 1 – 5% and Key Area #3 gives perennial forbs 1 – 5%. It is important to note that forbs fluctuate in abundance according to the winter and spring moisture so will be present some years and not present other years. Please also note that permitted livestock use on the allotment is from October 15 to March 15, which allows for the growth of desert vegetation during the spring and summer without any grazing use, resulting in ephemeral plant growth for forage for desert tortoise with minimal competition from livestock, thus giving tortoises a better chance at obtaining important food sources.  See EA Appendix C (Tables C.12 – C.14) for the most current DPC objective determinations for each key area. Objectives are partially met at each key area.
MW19	Western Watersheds Project	The ecological status data for the key areas on the Mormon Well allotment are representative of far fewer acres than the allotment contains. S&G at 25. It is unclear how the BLM determined the ESD for all the acres in the allotment. S&G at 26. It is also unclear how the allotment is managed for	The Ecological Site Inventory (ESI) for the Mormon Well Allotment was conducted in 1990. The inventory was conducted across the entire allotment; some ecological sites made up small portions of the allotment, and not every site has a corresponding key area for monitoring. Table 8 (p. 26 in the



		<p>seasonal rest. The S&amp;G states that cattle are moved to private or state land after the grazing season on the public lands. It is not clear that these lands are fenced out, or whether there are impacts to federally-listed species from grazing on the private lands. BLM must be forthcoming with this information in the EA, <b>and</b> should consider the cumulative impacts of this management.</p>	<p>land health evaluation report) gives a summary of the of the Mormon Well ESI data. There are eight ecological sites identified. Some ecological sites have areas that are in different ecological status (i.e. PNC, late seral etc.). Table 7 gives the ecological site for each key area.</p> <p>The grazing system for the allotment is discussed in the EA (see Section 2.3.1). Livestock are not on the allotment year-round, including on the State or private land. Private and State lands within the Mormon Well Allotment are not fenced separately. As described in Section 3.4.1 of this EA, starting March 15 water sources on the public lands are turned off and livestock are herded to the State and private land where the permittee has a private well and permitted use of the well on State lands. Livestock could leave State or private land and go back to public lands on the allotment but after March 15 there is no water on public lands.</p> <p>Chapter 4 of the EA fully analyzes direct, indirect, and cumulative impacts of four proposed alternatives.</p>
MW20	Western Watersheds Project	<p>BLM’s analysis of the threats to desert tortoise from livestock grazing in the S&amp;G is dismissive and improper. An absence of evidence is not evidence of absence, and just because BLM hasn’t documented livestock trampling on the Mormon Well and adjacent allotments doesn’t suffice to explain away the possibility. S&amp;G at 29. Livestock are discussed as a threat in the 1994 Recovery Plan for the species, as well as the current draft revision. The BLM seems entirely unwilling to acknowledge this and mitigate this threat.</p>	<p>The EA (Section 4.2.3.1) discusses the potential for livestock to trample tortoises, eggs, or their burrows. “Livestock are not likely to trample desert tortoise eggs under Alternative A on the Beaver Dam Slope Allotment since eggs are laid from mid-May through July and most or all would hatch before cattle would be turned out onto these allotments in October (Ernst et al. 1994). However, livestock may access portions of the Mormon Well Allotment until early June.” Information from Coffeen (1990) and others were considered and referenced in this analysis.</p>
MW21	Western Watersheds Project	<p>It is unclear why BLM believes that objective DFC-GM-02 is being met. S&amp;G at 37. Livestock use is considered incompatible with the recovery of desert tortoise. This is inconsistent with the “other resource needs” on the Mormon Well allotment.</p>	<p>The cited RMP objective (DFC-GM-02) states that “<i>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 they are productive for all rangeland values. Where needed, public rangeland ecosystems will be improved to meet objectives.</i>” The land health</p>

			<p>evaluation correctly states that the objective is being met because livestock grazing (i.e., season of use, utilization levels, etc.) is managed to maintain or improve the ecological condition of the allotment. Permitted livestock use is from October 15 to March 15. This allows for the growth of desert vegetation during the spring and summer without any grazing use, resulting in ephemeral plant growth for forage for desert tortoise and other wildlife species with minimal competition from livestock. In addition, the DPC objectives developed for the allotment provide a mixture of shrubs, native perennial grasses, and forbs, thus ensuring diverse vegetation communities and habitat for wildlife species, including desert tortoise. The land health evaluation notes that the allotment is in good shape overall (i.e., trend and ecological condition) and contains an intact Mojave Desert plant community with diverse vegetative structure; the overall condition of the habitat is good.</p> <p>The BLM has conducted formal consultation with the USFWS on the proposed permit renewals (see EA Section 5.4). The current Mormon Well grazing system was analyzed, including the state and private lands within the allotment, and USFWS issued a BO on the project (see Appendix J).</p>
MW22	Western Watersheds Project	<p>It is unclear why BLM believes the allotment is meeting the Desired Plant Community objectives listed on pages 37 and 38 of the S&amp;G. Where BLM claims that the allotment provides habitat for a diversity of wildlife (including avian species, reptiles, and large and small mammals), it has not provided any evidence to support its claim. The BLM is assuming that the now-generic categories of plant types in certain ratios will meet the needs of the ecological community, but the S&amp;G has not, in fact, supported this with quantitative data. It is not clear that the Mormon Well allotment “produces” wildlife habitat, clean water, and functional watersheds because the BLM has not measured any of those attributes. Moreover, BLM’s conclusions about native plants communities being stable and not overrun by exotics except in wet years is not supported</p>	<p>See EA Appendix C for up to date vegetation monitoring data for the Mormon Well Allotment. Tables C.12 – C.14 (DPC objectives) are partially met at the three key areas.</p> <p>See also response to Comment No. BDS23.</p> <p>When conducting monitoring studies (trend and composition), the BLM records all species encountered in the transects, including invasive species. As stated previously (see response to Comment No. BDS14), trend and composition data are generally collected on a 5-year cycle (see Section 4.4 of the EA for more information on monitoring).</p>

		by the agency’s monitoring, which neither measures annuals by native/invasive/ exotic denominators nor has been conducted in the “wet years.”	
MW23	Western Watersheds Project	<p>The S&amp;G admits that 2005 was a “wet year” and that red brome and Sahara mustard were widespread on the Beaver Dam Slope and Mormon Well allotments. S&amp;G at 36. None of the monitoring occurred in 2005. As noted elsewhere, “Stability” as BLM is defining it is ecologically meaningless; the assumption that grazing on the Mormon Well allotment is not contributing to infestations of exotic species defies scientific evidence to the contrary and fails to address the concurrent increase in grazing during wet years that distributes seeds, damages soils, and increases the problem.</p>	<p>The BLM acknowledges there was a gap in reading trend studies on the Mormon Well Allotment. As shown in Appendix C, Key Areas #1 and #3 were read in 1992 then again in 2007. Key Area #2 Table C.2 was read in 1991 then again in 2006. Trend is generally read on a 5-year cycle; this monitoring is now back on this this cycle.</p> <p>The amount of grazing authorized by the Mormon Well permits (AUMs, season of use, and allowable utilization level) did not change in wet years such as 2005 versus average or dry years (see S&amp;G Table 3 Actual Use Data for the Mormon Well Allotment). In 2005, 371 AUMs or 88% of the permitted AUMs were used. While it is true that actual use may be higher during wet years, there is still a maximum number of AUMs that can be on the allotment during the grazing season (as shown on the grazing permits), and maximum utilization does not change from the authorized 45%.</p> <p>See EA Table 3.3 – Invasive, Non-native Species discussion. Invasive non-native annual grasses (red brome, cheatgrass and Mediterranean grass) and annual mustards are present in some areas on both allotments. Occurrence and density of annual plants is known to vary from year to year depending on the amount and timing of moisture and temperature. As stated in that table, proper range practices can help prevent the spread of undesirable plant species (Sheley 1995). The BLM acknowledges that disturbance, fire, and livestock grazing can provide opportunities for the establishment and spread of invasive annual grasses. Research by Douglas et al. (1990) and Hunter (1991) shows that cheatgrass can readily invade areas that have not been disturbed and do not have livestock influence. Proper grazing use which maintains stable plant communities (as is the case in the these allotments – the majority of the public lands within the allotments are in late seral or PNC, which</p>

			<p>are a very stable condition) should minimize or have no effect on the spread of invasive non-native species. The renewal of the grazing permits and continued livestock grazing are therefore not anticipated to increase the rate at which invasive species are spread throughout the area.</p> <p>Noxious weed treatments will continue throughout the allotments as weeds are detected.</p>
MW24	Western Watersheds Project	<p>It is unclear why BLM believes that the objectives for Wildlife Habitat are being met. S&amp;G at 38. BLM has not addressed shelter or nestings sites for endemic wildlife species and instead seems to be relying solely on vegetation objectives to address animal communities. No animal data are included in the S&amp;G. Moreover, it is not clear that all native animals are self-sustaining populations. The affirmation of AGFD doesn't suffice to excuse a lack of real site-specific monitoring data.</p>	<p>See response to Comment No. BDS23.</p>
<b>Comments on Preliminary EA</b>			
EA01	Western Watersheds Project	<p>WWP has several concerns about this Environmental Analysis, which we outline more fully below. In short, the EA here is insufficiently critical of the need for grazing on allotments that are also designated critical habitat for the Mojave Desert tortoise. The impacts of grazing on wildlife habitat have not been adequately analyzed. Wildlife habitat is a precious resource on this allotment and this fact is not adequately considered. The BLM has failed to recognize that livestock grazing on this allotment is not an activity the permittee is assured of engaging in, but is something that two of the permittees should have been very clearly aware of given that they became permittees recently when one of the permits was transferred to the two of them in 2018.</p>	<p>The EA analyzes a range of alternatives including issuing new grazing permits with no changes (Alternative A), issuing new permits with reduced grazing (Alternative B), issuing new permits with increased grazing (Alternative C), and issuing new permits with no authorized AUMs (Alternative D) – see EA Chapter 2. The EA fully analyzes the direct, indirect, and cumulative impacts of all of the proposed alternatives on wildlife and wildlife habitat, including threatened and endangered species (see Sections 4.2.3, 4.2.5, and 4.3.4). The “need” for the action described in Section 1.2 does not state that grazing is an “assured” activity. Instead, the stated need is to respond to the permittees’ applications for grazing on these allotments and to “consider whether to renew, renew with modifications, or not renew the grazing permits, in accordance with all applicable laws, regulations, and policies.”</p>
EA02	Western Watersheds Project	<p>As stated in the EA, “[t]he purpose of this action is to provide for livestock grazing opportunities on public lands where consistent with meeting management objectives, including the Arizona Standards for Rangeland Health and Guidelines for Livestock Grazing Management and the</p>	<p>See response to Comment No. EA01.</p>

		Arizona Strip Field Office RMP.” EA at 8, internal citations omitted. It is important for the BLM to recognize, and clearly state in the EA, that the need for this project should be to determine <i>whether or not</i> to continue livestock grazing on the allotment, not to simply provide for livestock grazing on public lands.	
EA03	Western Watersheds Project	The BLM is precluded from a Finding of No Significant Impact (FONSI) for this project because the impacts to the Mojave Desert tortoise are significant and require the more thorough environmental evaluation found in an Environmental Impact Statement.	The presence of a federally listed species does not automatically make the impacts of a proposed action significant. The BLM analyzed direct, indirect, and cumulative impacts to desert tortoise and its critical habitat from the proposed alternatives (see Sections 4.2.3 and 4.2.4). In addition, the BLM conducted formal consultation with USFWS, and USFWS issued a Biological Opinion (see Appendix J).
EA04	Western Watersheds Project	WWP recommends that the BLM analyze: 1) an alternative that eliminates livestock grazing from all critical habitat for the Mojave Desert tortoise; 2) an alternative that prohibits livestock grazing within the Areas of Critical Environmental Concern; and 3) an alternative that extends the limits on the livestock grazing season (perhaps November 15 – January 15) to better capture the time of year that desert tortoise may be active.	Eliminating livestock grazing from all Mojave Desert tortoise critical habitat and Areas of Critical Environmental Concern (ACEC) is beyond the scope of this EA. This current analysis is on renewing grazing permits for the Beaver Dam Slope and Mormon Well allotments only.  The EA does analyze a no grazing alternative (Alternative D) – see Section 2.6 for the description of the no grazing alternative. However, this “no grazing” alternative would only apply to the Beaver Dam Slope and Mormon Well allotments.  The BLM consulted with the USFWS as a part of the ASFO RMP process and through that process determined the season of use to be 10/15 – 3/15 in desert tortoise habitat. Applicable RMP decisions on this are MA-GM-10 and MA-AC-14(DT) – see EA Section 1.3. The BLM again consulted with USFWS for this current EA, with the grazing season of use remaining at 10/15 – 3/15. The Biological Opinion issued by USFWS for this action states that the action is not likely to jeopardize the continued existence of the Mojave Desert tortoise, and is not likely to destroy or adversely modify designated critical habitat for Mojave desert tortoise (see Appendix J).
EA05	Western Watersheds Project	WWP is very concerned that the BLM is moving forward with this project based on extremely outdated information. Issues on	WWP submitted comments on the land health evaluation report in April 2012 and those comments are considered scoping comments for this EA (see comments

		<p>this allotment were identified through a scoping process and field visit that took place in 2008. EA at 11. Now, more than ten years after scoping and field visits, it is inappropriate for the BLM to base the EA on outdated issues and information. WWP recommends that the BLM re-scope this project and revisit the allotment to gather up-to-date information. This is critically important given that in 2008 the BLM acknowledged that “the potential exists for deterioration in ecological condition if proper livestock grazing practices are not followed.” EA at 12.</p>	<p>addressed above in this public comment and response table.</p> <p>Monitoring data has continued to be collected on both allotments. See EA Appendix B for updated monitoring data for the Beaver Dam Slope Allotment and Appendix C for updated monitoring data for the Mormon Well Allotment. These appendices include the most recent monitoring data for each allotment. Also see EA Section 3.2.2, which discusses the land health evaluations (BLM 2011 and 2012) as well as the updated ecological condition and overall trend for each key area on each allotment.</p> <p>While it is true that there is a potential for deterioration in ecological condition with improper grazing practices, our current monitoring shows that this is not the case. Resource conditions are continuing to make progress toward meeting applicable standards for rangeland health.</p>
EA06	Western Watersheds Project	<p>Please provide information on the date the grazing permits that are subject to this EA expired. Did they expire sometime around 2008 (the time of scoping for this project)? On what date did the permittees submit applications for renewal? How long have livestock been grazing on this allotment without a valid permit?</p>	<p>All of the permittees on both allotments have valid grazing permits. Livestock have not been grazing on either allotment without a valid permit.</p>
EA07	Western Watersheds Project	<p>We are concerned that the field visits that took place in 2008 occurred during the late fall and winter months. The BLM must explain how visits during these months (January and November) provided an accurate assessment of the amount of forage grazed throughout the year. How did the timing of these field visits reveal percent forage utilization during the rest of the year? How did the timing of these field visits reveal impacts to wildlife, especially the desert tortoise?</p>	<p>Authorized grazing season for these allotments runs from 10/16 – 3/15, year-round grazing is not authorized. Utilization monitoring is conducted on the allotments most years. See EA Appendices B and C for the utilization monitoring summaries for each key area on both allotments. Observations during the land health evaluation field trips, combined with long-term monitoring (trend and composition) and short-term monitoring (annual utilization) information at key areas, is used to make determinations of rangeland health. Evaluations are not based on data from a single field trip. Utilization is measured using the grazed class method and is read after grazing is completed for the season. Spot checks of utilization may also be made during the grazing season to check for the need to make pasture moves or allotment removal based on the 45% maximum</p>

			<p>utilization limit and to avoid overuse in an area.</p> <p>See also response to Comment No. BDS23.</p>
EA08	Western Watersheds Project	<p>Contrary to the statement found in the EA that the alternatives are in conformance with the RMP, only <i>one</i> of the alternatives is in actual compliance – Alternative D. EA at 8. The BLM has failed to provide evidence that it is possible to maintain healthy, sustainable ecosystems where livestock grazing occurs, as required by the RMP at DFC-GM-01: “Healthy, sustainable rangeland ecosystems will be maintained or improved to meet Arizona’s Standards for Rangeland Health (1997), and produce a wide range of public values such as wildlife habitat, livestock forage, recreation opportunities, clean water, and functional watersheds.” BLM has not provided any information or evidence that clean water or functional watersheds can co-exist with livestock grazing Arizona.</p>	<p>Commenter makes an incorrect statement concerning lack of RMP conformance of the alternatives.</p> <p>Both allotments are meeting Standard #1 (Upland Sites) and Standard #2 (Riparian-Wetland Sites) where applicable. See EA Section 3.2.2 and Appendices B and C that were updated based on current monitoring data. Section 3.2.2 states that “Based on analyses of the updated allotment monitoring data and supporting documentation contained in each original evaluation report (BLM 2012 and BLM 2011), including partially meeting DPC objectives, resource conditions are continuing to make progress toward meeting applicable standards for rangeland health,” which meets the objectives described in the cited RMP objectives. See also response to Comment Nos. BDS23 and MW21.</p> <p>The scope of this EA analysis is confined to impacts from permit renewals on the Beaver Dam Slope and Mormon Well allotments, not across all of Arizona.</p>
EA09	Western Watersheds Project	<p>WWP asks BLM to provide evidence that the project area does in fact include lands that have healthy, sustainable ecosystems or clean water and functioning watersheds. We also request that BLM provide peer reviewed scientific support for the position that livestock grazing improves these natural values.</p>	<p>See response to Comment No. EA08.</p>
EA10	Western Watersheds Project	<p>Notably, the BLM has not listed any RMP provisions in the EA other than those focused on livestock management. All RMP provisions regarding wildlife present in the project area, threatened and endangered species, grasslands, and watershed health should have been included in the EA in addition to the livestock grazing focused provisions. The BLM must evaluate this project through more than the single lens of compliance with grazing provisions in the RMP. Doing so will provide a more complete analysis of the</p>	<p>The last paragraph in EA Section 1.3 states “It has also been determined that the alternatives would not conflict with other decisions throughout the RMP.”</p> <p>See also response to Comment No. EA15 below – the applicable cited RMP decisions have been added to EA Section 1.3 per commenter’s suggestion.</p>

		impacts of livestock grazing on a myriad of natural resources.	
EA11	Western Watersheds Project	As an example of a shortcoming in the analysis as a result of the myopic view of RMP compliance that is focused only on livestock issues: the U.S. Fish and Wildlife Service Biological Opinion and Incidental Take Statement (BiOp and ITS) from 2008, and included as Appendix A of the RMP for the Arizona Strip Field Office, indicate that over a period of 20 years approximately 30 desert tortoises would be injured or killed by project authorizations. RMP Appendix A at A-3. Today, more than 10 years have passed since this ITS was provided. Yet, BLM has not provided any information regarding the number of desert tortoises “taken” by BLM authorized projects and the public therefore has no information regarding the accuracy of the U.S. Fish and Wildlife Service predictions regarding take and cannot understand how livestock grazing is impacting the desert tortoise. This EA does not even provide an estimate of the number of desert tortoise that have been “taken” on the allotments that are the subject of this EA.	Documented incidents of take are reported to the USFWS. The BLM does not have an estimate of take that may have occurred in this specific area, but we are not aware of any that have occurred due to project authorizations. This current project was consulted on with the USFWS and USFWS issued a Biological Opinion which is included as Appendix J in this EA.
EA12	Western Watersheds Project	Information about the level of take of desert tortoise in the project area and throughout the area managed by the Arizona Strip Field Office must be provided before this project can proceed to ensure compliance with the RMP, the Endangered Species Act, and in consideration of the relevant Biological Opinion.	See response to Comment No. EA11.
EA13	Western Watersheds Project	Another example, and also from Appendix A of the RMP (at A-9 – A-10), are the reasonable and prudent measures the BLM must take to protect the desert tortoise: <b><i>Desert Tortoise</i></b> The following reasonable and prudent measures are necessary and appropriate to minimize take of desert tortoise: 2. BLM shall take measures to eliminate or minimize take of desert tortoises resulting from livestock grazing. A. The BLM shall monitor compliance with livestock removal from those allotments with	2A.) The BLM conducts compliance inspections of both allotments. If livestock are observed on either allotment outside of the authorized use dates, permittee(s) are contacted to remove livestock and the BLM follows up to ensure that this has occurred.  2B.) The BLM regularly conducts utilization monitoring on both of these allotments see EA Section 4.4 Monitoring. Allowable utilization is 45% on both allotments. Utilization on the Beaver Dam Slope Allotment from 2008-2018 has been below



		<p>seasonal restrictions (October 15 to March 15) and/or compliance on required pasture moves in the allotments managed with deferred grazing and take prompt action to resolve unauthorized grazing uses.</p> <p>B. The BLM shall monitor compliance with the established key forage use threshold of 45 percent current annual growth on allotments with desert tortoise habitat to ensure that over-utilization of forage does not occur.</p> <p>C. The BLM shall complete proposed fencing to implement proposed management changes and to exclude livestock from areas identified for closure in a timely manner.</p> <p>4. <i>BLM shall submit annual reports as described in Reporting Requirements, below. Specifically for desert tortoises, the report shall briefly document for the previous calendar year actions taken to implement these terms and conditions, surface-disturbing activities authorized, the effectiveness of these terms and conditions at reducing take of desert tortoise, actual acreage of desert tortoise habitat disturbed, numbers of tortoises taken, including animals injured or killed, the number of desert tortoises excavated from burrows, the number of desert tortoises moved from construction sites, and information on individual desert tortoise encounters.</i> The report shall make recommendations for modifying or refining these terms and conditions to enhance desert tortoise protection and reduce needless hardship on the BLM and users of public lands. (Emphasis added.)</p>	<p>45%. The Mormon Well Allotment during the same period had one occurrence at Key Area #1 of 52% use on ricegrass in 2008. Over utilization has not been a problem on either allotment. See EA Appendix B (Tables B.5 – B.8) and Appendix C (Tables C.6 – C.8) for utilization data collected on both allotments. See also response to Comment Nos. BDS11, BDS12, and MW11.</p> <p>2C.) The BLM erected the tortoise barrier fencing along Highway 91 (referenced in RMP decision MA-AC-06(DT) in 2009; this fence is regularly inspected to ensure it is still in properly functioning condition.</p> <p>RMP decision MA-TE-36 references “exclusion fences or other methods ... to ensure areas unavailable to grazing will not be grazed.” There are no “unavailable” areas on these allotments, and no fences proposed on these allotments. If Alternative D (No Grazing) is selected, it would apply to the entire allotment so there would be no need for additional fencing to implement that decision.</p> <p>4. The BLM does submit an annual report to the USFWS Arizona Ecological Services Field Office with the required desert tortoise, conservation measures, and terms and conditions information.</p>
EA14	Western Watersheds Project	<p>The EA does not contain any reference to these RMP provisions and there is no information in the EA regarding any reasonable and prudent measures that are required as part of this pending permit.</p> <p>Furthermore, the 51,984 acre Beaver Dam Slope ACEC contains “[h]abitat essential for maintaining species diversity and critical habitat for the threatened desert tortoise, of national worth and distinctiveness. Desert tortoises are fragile resources, rare, irreplaceable, unique, threatened, and</p>	<p>The RMP is incorporated by reference in the EA.</p> <p>EA Section 2.2.1 describes the ACEC being managed for the threatened desert tortoise and Mojave Desert Ecological Zone, as also discussed in the RMP. This EA section also describes the designated critical habitat for desert tortoise. See also EA Section 3.4.3. Section 4.2.3 discusses impacts to Mojave Desert tortoise and its critical habitat from the proposed alternatives. Please note that</p>

		<p>vulnerable to adverse change. Threats include loss of habitat, mortality from vehicle and OHV use, collection, disease, and predation.” RMP Appendix H at H-1. The EA, as currently drafted, fails to acknowledge the national importance of the desert tortoise, despite the following statement from the RMP:</p> <p>The Beaver Dam Slope ACEC for protection of threatened desert tortoise and Mojave Desert Ecological Zone values will be enlarged to 51,984 acres. Boundary adjustments will incorporate areas of critical habitat, desert tortoise habitat previously in the Virgin River Corridor ACEC, and lower quality habitat not previously included in the ACEC. <i>Desert tortoise needs will be considered the highest priority in resolving resource conflicts in the Beaver Dam Slope ACEC.</i></p> <p>See SD-TE-09, RMP at 2-43, emphasis added.</p>	<p>desert tortoise needs were given the “highest priority” in these allotments in the RMP when seasonal restrictions on grazing (10/15-3/15) were established.</p>
EA15	Western Watersheds Project	<p>There are other areas where the EA does not include important information from the RMP: The Desired Future Conditions for the Mojave Desert Ecological Zone include</p> <p>DFC-VM-28: Endemic animal species such as desert tortoise and chuckwalla will be present and thriving with more than adequate food, water, and cover resources;</p> <p>DFC-VM-29: Treatment emphasis will be to reduce the proliferation of nonindigenous annual plant species, reduce fire intensity and frequency, and improve tortoise structural and forage habitat components. RMP at 2-21.</p> <p>The Desired Conditions for the desert tortoise generally include the following, found at RMP 2-43.</p> <p>DFC-TE-09: the Mojave population of desert tortoise will be recovered and delisted;</p> <p>DFC-TE-10: There will be no net loss in the quality or quantity of desert tortoise habitat within the ACECs or WHA (see Map 2.4);</p> <p>DFC-TE-11 Desert tortoise populations within the ACECs and Desert Wildlife Management Area (DWMA) will be healthy and self-sustaining. Populations will be stable or increasing. Population declines will be halted;</p> <p>DFC-TE-12: Desert tortoise populations outside of the ACECs and WHA will be healthy and stable. Declines in the WHA will be minimized to the extent possible through mitigation:</p>	<p>The following RMP DFCs have been added to EA Section 1.3:</p> <p>DFC-VM-27: Endemic animal species such as desert tortoise and chuckwalla will be present and thriving with more than adequate food, water, and cover resources. (This is the correct number for this DFC; DFC-VM-28 is a different one).</p> <p>DFC-TE-09</p> <p>DFC-TE-10</p> <p>DFC-TE-11</p> <p>DFC-TE-12</p> <p>DFC-TE-13</p> <p>DFC-TE-14 is a different one than the one you have listed. What commenter listed as DFC-TE-13 and 14 are duplicates. DFC-TE-14 in the RMP is as follows: “Habitat connectivity will be maintained, providing sufficiently frequent contact between tortoises to maintain genetic diversity.” This one has been added to EA Section 1.3.</p> <p>All of these objectives for management of desert tortoise are addressed in the EA analysis (see Chapter 4, Sections 4.2.3, 4.2.4 – which addresses vegetation, and 4.3.4).</p> <p>DFC-VM-29 addresses vegetation treatments. This DFC is therefore not</p>

		<p>DFC-TE-13: Desert tortoise habitat will provide sufficient forage and cover attributes to support thriving populations of the species;</p> <p>DFC-TE-14: Desert tortoise habitat will provide sufficient forage and cover attributes to support thriving populations of the species.</p> <p>The EA for this project fails to mention any of these highly relevant RMP provisions which must be complied with for this project. Therefore, the BLM must amend the EA (or, preferably, develop an EIS) and provide the public with an analysis regarding compliance with these provisions, specifically resolving any real or potential resources conflicts to protect the Mojave Desert tortoise.</p>	<p>applicable to this EA analysis because no treatments are proposed.</p>
EA16	Western Watersheds Project	<p>When will the public have an opportunity to review the Allotment Management Plan for the Mormon Well Allotment?</p>	<p>There currently is no allotment management plan (AMP) for the Mormon Well Allotment and there is no plan to develop one because there is only one pasture in the allotment. The permit renewal decision made as a result this EA analysis for the two authorizations on the Mormon Well Allotment would outline grazing management practices on any new permits issued. This would include season of use, number of AUMs authorized and terms and conditions. This also applies should the no grazing alternative be selected.</p>
EA17	Western Watersheds Project	<p>When will the public have an opportunity to review the Biological Opinion or Biological Assessment for this project?</p>	<p>The USFWS Biological Opinion on this grazing permit renewal EA can be found in Appendix J.</p>
EA18	Western Watersheds Project	<p>The EA fails to acknowledge, analyze or discuss the impact of non-active season use impacts to tortoise. Tortoise are known to be active outside the “active season” and the impacts of livestock grazing to the tortoise during the non-active season must be analyzed.</p>	<p>EA Section 3.4.3 discusses when desert tortoises are active, including occasional activity outside 3/15-10/15.</p> <p>EA Section 4.2.3.1 discusses direct and indirect effects of livestock grazing on desert tortoise. The Biological Opinion issued by USFWS (see Appendix J) also addresses occasional activity of tortoises outside 3/15-10/15.</p>
EA19	Western Watersheds Project	<p>In 2008, the Beaver Dam Slope allotment was in a “maintain” management status and the current management was “deferred.” RMP Appendix C at C-1. The AUMs in 2008 were set at 897.</p> <p>RMP Appendix D at D-7. Also in 2008, Mormon Well was in a “winter” management</p>	<p>Alternative A – Proposed Action proposes no changes to the number or kind of livestock, or season of use for these allotments (Beaver Dam Slope and Mormon Well allotments). Livestock grazing would occur during the established season of use, and with the number of AUMs limited to the current active preference shown in Table 2.1</p>

		<p>with an Improve management status. RMP Appendix C at C-2. The authorized AUMs in 2008 were set at 420. RMP Appendix D at D-5.</p> <p>The Beaver Dam Slope Allotment has not been used for five of the past ten years, begging the question (not asked nor answered by BLM) – why do the AUMs need to be increased on a seldom used allotment?</p> <p>Additionally, this past non-use results in a proposed <i>increase</i> in AUMs for all alternatives except the no grazing alternative. However, BLM does not analyze this <i>actual increase in AUMs</i> and instead has framed the alternatives as a reduction in use. This is incorrect and renders the analysis in the EA invalid.</p>	<p>and Table 2.2, by authorization. The total number of active AUMs for the Beaver Dam Slope Allotment shown in EA Table 2.1 is 897, and 420 for the Mormon Well Allotment, as shown in EA Table 2.2. This is the same as listed in the RMP. Please note that actual use may vary from year to year, based upon weather and other environmental conditions, up to the maximum active AUMs specified on the grazing permit. This would not change under the proposed action.</p> <p>The grazing system for the Beaver Dam Slope Allotment would remain a deferred rotation grazing system under the three alternatives where active AUMs would be authorized (Alternatives A, B, and C). See Figure 2.1, which displays the three-pasture deferred rotation schedule.</p> <p>The season of use for both allotments would continue to be October 16 – March 15.</p> <p>It is incorrect to state that the “Beaver Dam Slope Allotment has not been used for five of the past ten years...” Actual use for the period 2008 – 2017 ranged from 11 – 40% (see EA Table 2.7). There were no years the allotment reported no use.</p> <p>The comment that “this past non-use results in a proposed increase in AUMs for all alternatives except the no grazing alternative” is inaccurate. Only Alternative C (Potential Stocking Level Analysis) proposes an increase in AUMs. Actual use and average utilization data are used to calculate a potential stocking level, which in this case, if Alternative C were selected, would result in an increase of AUMs on both allotments. See EA Section 2.5 and Table 2.7. The other alternatives analyzed in the EA do not propose an increase in AUMs.</p> <p>Alternative A (Proposed Action) would leave the AUMs the same as the current permits. Alternative B would reduce active preference (AUMs) by 73% on the Beaver Dam Slope Allotment and by 3% on the Mormon Well Allotment (see EA Table 2.5 and Table 2.6). Alternative D (No Grazing) would authorize zero AUMs on both</p>
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			allotments. All of the 897 active AUMs on the Beaver Dam Slope Allotment and all of the 420 active AUMs on the Mormon Well Allotment would be suspended.
EA20	Western Watersheds Project	There is nothing in the EA that acknowledges, discloses, nor discusses recent permit transfers. This information must be disclosed, analyzed, and the public provided an opportunity to comment upon this issue.	There are not any permit transfers proposed in any of the alternatives analyzed in the EA. A recent permit transfer on the Beaver Dam Slope Allotment was disclosed (see Section 2.4 Alternative B, which discusses a permit transfer that was completed in 2018 that changed the number of authorizations from three to four on the allotment).
EA21	Western Watersheds Project	The BLM must disclose and analyze the level of trespass livestock that has occurred on both allotments.	This is outside the scope of this EA. Should trespass occur, it is dealt with through an administrative process.
EA22	Western Watersheds Project	Where Federal Land Policy Management Act 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.	The BLM agrees that simply because the RMP identified these allotments as “available for grazing” does not mean livestock use cannot be adjusted in accordance with all applicable laws, regulations, and policies (see EA Section 1.2). In order to consider whether to renew, renew with modifications, or not renew the grazing permits, the BLM has completed this EA to analyze and disclose potential direct, indirect, and cumulative impacts on a variety of resources. In addition, the BLM engaged in formal Section 7 consultation with the USFWS concerning potential impacts to threatened and endangered species that may occur in the allotments and surrounding area. (See EA Appendix J for the Biological Opinion issued by USFWS.) The BLM made the EA available for public review and comment see EA Section 5.2 – Summary of Public Participation.
EA24	Center for Biological Diversity (CBD)	The Center has engaged in the planning process for this area and also regarding these and other grazing allotments renewals that are proposed on allotments that overlap federally designated critical habitat for the federally threatened and declining Agassiz’s desert tortoise. It is important that this renewal process include the best available science and analyze and identify clear management criteria to implement needed conservation efforts to aid recovery of the desert tortoise throughout these allotments to preserve the unique biological and cultural resources of this area for generations to come.	See response to Comment Nos. EA01, EA04, EA05 and EA22.  The alternatives analyzed in this EA incorporate actions to ensure the health of rangeland resources (including desert tortoise and its critical habitat) is preserved or improved. For example, the alternatives including the following management actions:  <u>Beaver Dam Slope ACEC</u> “In accordance with RMP decision MA-GM-07, allowable use of key forage species in these allotments is no more than 45% of the current years’ growth removed through grazing. Move dates (i.e. removal of

			<p>livestock from a pasture or the allotment) may be adjusted if monitoring indicates maximum utilization has been reached or due to unusual climatic conditions, fire, flood, or other acts of nature. If maximum utilization is reached on key species or areas in either 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/allotment (after consultation with the permittees), as deemed necessary by the BLM. Additionally, the season of use for both allotments would continue to be October 15 through March 15, in accordance with RMP decisions MA-GM-10 and MA-AC-14(DT).”</p> <p>Utilization levels are monitored by the BLM (EA Appendix B and C), as is compliance with the Terms and Conditions of the permits which includes the season of use October 15 – March 15 with no ephemeral extensions. See EA Sections 1.3, 2.2.1, and 2.3.2.</p>
EA25	CBD	<p><b>Alternative D is the Only Viable Alternative</b>  Under the current grazing strategy, Alternative A - No Action Alternative, the 2017 data shows that this Recovery Unit has the least viable desert tortoise population with the lowest density. Therefore the evidence shows that the current strategy, Alternative A, is unviable. As the EA notes (at pg. 40), the most current line distance sampling documented by the USFWS indicates that the density of desert tortoise in the Beaver Dam Slope Recovery Unit, where both the Beaver Dam Slope and the Mormon Well grazing allotments are located, is only 1.3 tortoises/km<sup>2</sup>. In fact, the Beaver Dam Slope Recovery Unit is currently the Recovery Unit with the lowest density of any Recovery Unit in the range of the listed species. The current density of desert tortoise in the Beaver Dam Slope Recovery Unit is well below the necessary density of 10 adult tortoises/square mile (3.86 adult tortoise/square kilometer) for a population to be viable based on the U.S. Fish and Wildlife Service’s Population Viability Analysis. Over the last ten years, the desert tortoise</p>	<p>Comment noted.</p> <p>See response to Comment Nos. EA01 and EA03.</p> <p>The BLM disagrees that Alternative D is the only viable alternative. The analysis contained within this EA indicates that all of the alternatives would meet the purpose and need of providing livestock grazing opportunities on these allotments while achieving or making significant progress toward achievement of land health standards and RMP objectives. The BLM formally consulted with USFWS on the action (see EA Section 5.4) and USFWS issued a Biological Opinion on August 29, 2019 (see EA Appendix J).</p>

		populations were monitored by USFWS in eight years of those years. Only two of the eight years were population densities detected at levels that were viable (EA at pg. 40-41).	
EA26	CBD	The Center supports Alternative D – No Grazing Alternative and urges the BLM to adopt this alternative for the benefits that it provides to the desert tortoise through the removal of competition for naturally sparse desert resources with cattle. Livestock grazing has been known to be an impact to desert tortoise for decades. Indeed, the only recent successful recovery of desert tortoise populations has been documented in the western Mojave Desert through the implementation of stringent conservation measures including but not limited to the long-term removal of livestock. Therefore, the Center urges the BLM to adopt a Alternative D and eliminate grazing on these allotments until the desert tortoise populations have recovered.	Comment noted. Please see response to Comment No. EA 25.
EA27	CBD	Alternative B – Reduced Grazing may provide some reduced impacts to desert tortoise but should not be selected for several reasons. First, because the current density of desert tortoise is below population viability level now, all impacts that affect desert tortoise should be removed until populations return to a density that supports desert tortoise recovery. Secondly, none of the grazing Alternatives, including Alternative B, address or factor in impacts from climate change which are modeled to increase temperature and may increase summer precipitation, exacerbating other impacts to desert tortoise and its critical habitat (e.g., the spread of non-native plants, increased N2 deposition, etc.). Alternative B also failed to include an annual maximum stocking rate that would be assessed each year based on range condition.	<p>Comment noted.</p> <p>Commenter incorrectly states that “Alternative B failed to include an annual maximum stocking rate that would be assessed each year based on range condition.” The alternatives analyzed in this EA, including Alternative B, incorporate actions to ensure the health of rangeland resources (including desert tortoise and its critical habitat) is preserved or improved, such as adjusting move dates (i.e. removal of livestock from a pasture or the allotment) if monitoring indicates maximum utilization has been reached or due to unusual climatic conditions, fire, flood, or other acts of nature.” The “annual maximum stocking rate” under Alternative B would be as stated in Section 2.4 of this EA.</p> <p>See also response to Comment Nos. BDS02, EA18, and EA24.</p>
EA28	CBD	Alternative C- Increased Grazing should be rejected because it would increase impacts to desert tortoise and critical habitat as is shown based on the data presented in this comment letter alone.	EA Section 4.2.3.3 describes the direct and indirect impacts to Mojave Desert tortoise, southwestern willow flycatcher and yellow-billed cuckoo. Section 4.3.4 analyzes cumulative effects to wildlife. See also response to Comment No. EA25.

EA29	CBD	Because the Beaver Dam Slope Recovery Unit desert tortoise population is currently not dense enough to be viable or sustainable at the current population level, the BLM is obligated to remove any and all controllable impacts that threaten the desert tortoise. By selecting Alternative D, the No Grazing Alternative, one known threat to the desert tortoise will be eliminated, thereby aiding recovery to this declining species in a key part of its range.	See response to Comment No. EA25.
EA30	Desert Tortoise Council (DTC)	We note that as of 2017 the tortoise populations in the Beaver Dam Slope Critical Habitat Unit are below population viability (1.3 adults/km <sup>2</sup> ; Allison and McLuckie 2018; USFWS 2018), which suggests there are ongoing external factors negatively affecting tortoise survival and recruitment in this area. One of these factors is very likely to be the use of critical habitat for livestock grazing. <b>Therefore, we support Alternative B: reduced grazing for the next 10-year term based on actual use during the previous term.</b>	Comment noted.
EA31	DTC	We note that no grazing (Alternative D) would be the best scenario for desert tortoises, but given BLM's need to manage varied stakeholder interests, we support Alternative B in the spirit of compromise. Alternative B would limit the total number of active animal unit months (AUMs) to give tortoise populations a chance to recover. We support BLM's modification of the terms and conditions to limit the amount of forage removal to 45% of annual growth and the imposed limit of grazing to months where the tortoise is less active.	Please note that all alternatives that would authorize grazing (Alternatives A, B, and C) include the same terms and conditions, including those mentioned in the comment. See Section 2.3.2 of the EA 2.3.2 (Terms and conditions of grazing permits for both allotments).
EA32	DTC	There is extensive scientific evidence that shows the effects of grazing are long-lasting and not confined to the periods of grazing per se. Effects include soil compaction, reduction of water infiltration, erosion, introduction of invasive plants, and changes in fire behavior. Further, livestock trample perennial shrubs, changing vegetation communities (Webb and Steilstra 1979; Berry and Nicholson 1984; McClaran and Anable 1992). For these reasons, we strongly oppose Alternative C, which would increase AUMs by 65% on Beaver Dam Slope and 188% on Mormon Well allotment above the present permitting levels. For the management of these allotments to be effective, BLM must	See EA Chapter 4 (Environmental Consequences) for a discussion on the effects to each resource by alternative. This analysis discussion includes potential impacts to soils, water infiltration, erosion, compaction, and wildlife including threatened, endangered, and sensitive animal species, including Mojave Desert tortoise, vegetation, and invasive, non-native plant species.  See EA Section 4.4 (Monitoring) for a description of long term and short-term monitoring and methods the BLM would use to monitor grazing use and permit compliance. The monitoring addressed in



		adequately monitor these allotments to ensure that the terms and conditions of habitat suitability for the desert tortoise and designated critical habitat are in compliance.	this section is sufficient to identify changes in vegetation as a result of livestock grazing activities. See EA Appendix B (Beaver Dam Slope Allotment) and Appendix C (Mormon Well Allotment) monitoring data. The BLM conducts compliance monitoring to assure compliance with permit terms and conditions see EA Section 2.3.2. This includes season of use and allowable utilization levels. In addition to the above-described methods, there are efforts in place to inventory for noxious weed establishment and treat weeds as they are discovered (see EA Table 3.3).
EA33	Grazing Permittees (GP)	As permittees of the Beaver Dam Slope and Mormon Well Allotments, we would be in favor of Alternative A (proposed action) – for our 10 year renewal of the above mentioned allotments.	Comment noted.
EA34	GP	We would like to make comments regarding monitoring and adaptive management. 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 would be when you have heavy winter and spring moisture where fuel build up puts the entire range in high fire danger. In 2007 the entire range burned which created issues for the habitat for the threatened and endangered species.	<p>The EA (in Section 4.3) lists the wildland fire history in these allotments, and Section 4.3.3 discusses the cumulative impacts of past, present, and reasonably foreseeable future actions (including fires) on vegetation. As documented in these sections of the EA, no large wildfires have occurred on the allotments during the period of 1980-2017. There is always a risk of wildfire and it is likely that there will be wildfire starts sometime in the reasonably foreseeable future. Wildfire does put the critical habitat for the desert tortoise at risk.</p> <p>In some years with above average moisture in the winter and spring, annual plants, particularly invasive annual grasses such as red brome, will grow in large quantities across the allotments, dry out, and produce large quantities of fine fuel across both allotments. The amount of annual vegetation is quite variable from year to year depending on the amount and timing of moisture. These annual grasses are palatable to livestock for a short time when they are green. Stocking levels of livestock would have to be increased to high levels to intensely graze the entire allotment to try and reduce the fire hazard; at the same time, that level of grazing would likely damage perennial grasses, forbs, and shrubs which are very important components of desert tortoise habitat.</p>

EA35	GP	Ephemeral extensions could have been used to graze down the fuel build up of perennial grass which could have saved thousands of acre of habitat.	<p>As listed in EA Section 1.3, RMP decision No. MA-GM-10 states: “Season of use on the following livestock grazing allotments with desert tortoise habitat will be from October 15 through March 15, with no authorization of ephemeral extensions:</p> <ul style="list-style-type: none"> <li>Beaver Dam Slope</li> <li>Highway</li> <li>Mormon Well</li> <li>Littlefield Community (Littlefield Slope Pasture only)</li> <li>Mesquite Community (Littlefield Slope Pasture only)”</li> </ul> <p>These allotments are therefore not available for ephemeral extensions due to the desert tortoise habitat. An RMP amendment and re-initiation of formal consultation with the USFWS would be needed to change the RMP to allow for ephemeral extensions on the Beaver Dam Slope and Mormon Well Allotments. That is beyond the scope of this permit renewal EA.</p>
EA36	GP	In many areas, officials are trying to get rid of invasive plant species – we refer to an AP article in St George Daily Spectrum 4/29/19. “A new program is being piloted this summer in which cows will be fenced into acres of phragmite growth in order to graze it down. While it doesn’t completely eradicate the weeds, it does allow for native plants to come back in its place.”	This article refers to a pilot program being tried on the shores of Utah Lake, near Provo, Utah. The prescribed grazing is a part of a group of treatments including machines that crush, mow, and mulch the phragmites, a large perennial wetland grass (up to 15 feet tall). Original article Associated Press 4/27/2019 <i>Officials try new techniques to fight invasive plant species</i> . That type of pilot program is not being implemented in areas of desert tortoise critical habitat, nor would it, in our opinion, be appropriate to do so. See also response to Comment No. EA35.
EA37	GP	We have the same situation on the 2 allotments – within this EA. We have tall, perennial grass that could be grazed – which is full of protein and good for cows, and avoid fuel build up which put the entire range in fire danger.	Prescribed grazing a wetland near Utah Lake is not comparable to grazing in the Mojave Desert, within critical habitat for the desert tortoise. The “areas of tall perennial grass” mentioned in the comment are likely referring to big galleta grass, which occur in patches in both allotments. It would be problematic to concentrate livestock to just those areas. Concentrating livestock could cause excess trampling of cryptogamic soils leading to more erosion or wind scour, and potential adverse effects to desert tortoise habitat elements. See also response to Comment Nos. EA34, EA35 and EA36.



**Appendix I**  
**United States Department of the Interior**  
**Fish and Wildlife Service**  
**Arizona Ecological Services Office**  
9828 North 31<sup>st</sup> Avenue, Suite C3  
Phoenix, Arizona 85051



**In reply refer to:** Telephone: (602) 242-0210 Fax: (602) 242-2513  
AESO/SE  
02EAAZ00-2019-F-0543

August 29, 2019

Memorandum

**To:** Field Manager, Bureau of Land Management, Arizona Strip Field Office, St. George, Utah

**From:** Field Supervisor, Arizona Ecological Service Field Office

**Subject:** Biological Opinion for the Proposed Beaver Dam Slope and Mormon Well Allotments Grazing Permit Renewals

Thank you for your request for formal consultation with the U.S. Fish and Wildlife Service (FWS) pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. § 1531-1544), as amended (Act). We received your request April 19, 2019, via electronic mail on the same day. At issue are effects that may result from the proposed Beaver Dam Slope and Mormon Well Allotments Grazing Permit Renewals located in Mohave County, Arizona. The proposed action may affect the threatened Mojave desert tortoise (*Gopherus agassizii*) and its designated critical habitat.

You also concluded that the project “may affect, but is not likely to adversely affect” the endangered southwestern willow flycatcher (*Empidonax traillii extimus*) and its critical habitat, the threatened yellow billed-cuckoo (*Coccyzus americanus*) and its proposed critical habitat, the endangered Virgin chub (*Gila seminuda*) and its critical habitat, and the endangered woundfin (*Plagopterus argentissimus*) and its critical habitat. Additionally, you requested technical assistance for the Virgin spinedace (*Lepidomeda mollispinis mollispinis*), which has a conservation Agreement and Strategy to help manage and reduce threats to the species. Effects of the proposed action to the Virgin spinedace are similar to effects to the Virgin chub and woundfin; therefore, we combined our analysis of all three fish into one, concise, discussion. We concur with your determinations and include our rationales in Appendix A.

You also determined that the action would have “no effect” on the endangered California condor (*Gymnogyps californianus*), the threatened Mexican spotted owl (*Strix occidentalis lucida*), and

the endangered Yuma Ridgeways Rail (*Rallus obsoletus yumanensis*). “No effect” determinations do not require our review; therefore, we do not address these species further.

We base this biological opinion (BO) on information provided in the April 2019 biological assessment (BA), electronic mail exchanges, telephone conversations, and other sources of information. Literature cited in this biological opinion is not a complete bibliography of all literature available on the species of concern, livestock grazing, maintenance activities, and their effects, or on other subjects considered in this opinion. A complete record of this consultation is on file at this office.

### **Consultation History**

- December 11, 2018: You submitted a draft BA for our review.
- December 17, 2018: We submitted comments on your draft BA.
- March 27, 2019: You submitted a second draft BA for our review.
- April 8-11, 2019: We exchanged emails clarifying the effects analysis for the flycatcher and cuckoo.
- April 11, 2019: We submitted comments on your second draft BA.
- April 19, 2019: You requested initiation of formal consultation.
- May 13, 2019: We provided you a letter acknowledging receipt of all information.
- July 17, 2019: We changed the determinations for the flycatcher and cuckoo based on further discussions with you.
- July 30, 2019: We submitted the draft BO for your review.
- August 12, 2019: We received your comments on the draft BO.
- August 13, 2019: We incorporated your comments into our BO.
- August 23, 2019: We sent you a few additional edits in the BO to review.
- August 27, 2019: We received your review of the edits and incorporated your edits.

## BIOLOGICAL OPINION

### DESCRIPTION OF THE PROPOSED ACTION

Under the proposed action, the Bureau of Land Management (BLM) is proposing to issue four new grazing permits for the Beaver Dam Slope Allotment and two new permits for the Mormon Well Allotment (Figure 1). All permit renewals for both allotments are for a period of 10-years. The season of use for both allotments is outside the desert tortoise active season to promote the conservation of the Mojave desert tortoise. The BLM will authorize grazing on both allotments from October 15-March 15 on BLM-managed lands. Both allotments include private land and land managed by the BLM and the Arizona State Land Department (ASLD); however, the private and ASLD-managed lands within the Mormon Well Allotment are not subject to the same October 15-March 15 season of use as the BLM-managed portions of this allotment. Private and ASLD-managed lands within the Mormon Well Allotment are considered part of this consultation due to their interrelated and interdependent actions to the BLM-managed portions of the Mormon Well Allotment. There is no proposed increase or decrease in amount of livestock placed on either of these allotments. Allowable use on key forage species in both allotments is 45 percent.

### Grazing System

#### *Beaver Dam Slope Allotment*

The Beaver Dam Slope Allotment consists of three pastures (Figure 1), all of which have desert tortoise critical habitat and are within the Beaver Dam Slope Area of Critical Environmental Concern (ACEC). A portion of the Virgin River Corridor ACEC runs along the southern edge of Pasture 3. This section of the Virgin River is outside of the allotment; however, it is accessible to livestock when they are present in the pasture because there is no fence to keep them out. Fewer than 10 head of livestock typically enter the river; however, the permittees check their livestock regularly and herd them out of the river bottom. Water sources placed in the uplands of this pasture help keep livestock out of the river.

The grazing rotation for this allotment is a deferred rotation system, with grazing occurring between October 15 and March 15. The permittee will use the large pasture (Pasture 1) every year from October 15 through January 31. Use for the remainder of the grazing season (February 1 - March 15) then rotates each year between Pasture 1 and the two smaller pastures (Pasture 2: west of Highway 91, and Pasture 3: east of Highway 91). The six-year rotation is as follows:

- Year 1: Livestock graze Pasture 2 from February 1 - March 15.
- Year 2: Livestock graze Pasture 3 from February 1 - March 15.
- Year 3: Livestock graze Pasture 1 the entire season of October 15 - March 15 during the third year.
- Year 4: Livestock graze Pasture 1 from October 15 - January 31, and Pasture 3 from February 1 through March 15.
- Year 5: Livestock graze Pasture 2 from February 1 through March 15.
- Year 6: Livestock graze Pasture 1 from October 15 - March 15.

This system provides spring and summer rest every year for Pasture 1, and nearly four years of continuous rest for both Pastures 2 and 3, all while following seasonal restrictions for grazing in desert tortoise habitat, including critical habitat. The livestock do not use the allotment from March 16 through October 14 every year, thus allowing for seven months of rest every year. There are four separate grazing permittees with authorizations to graze the Beaver Dam Slope Allotment. The four permittees will follow the same three pasture rotation. Some flexibility in the rotation schedule may be required based on availability of water in certain years.

### *Mormon Well Allotment*

The allotment consists of one BLM-managed pasture and a combination of private and ASLD-managed lands. The permittee with authorization 0201071 also holds the ASLD grazing lease for ASLD-managed lands within the Mormon Well Allotment, including Beaver Dam Wash. This permittee also owns private land within the allotment that livestock graze. The livestock use the BLM portion of the allotment from October 15 to March 15, then the permittee moves them to the ASLD-managed lands and private lands through the rest of the spring. There are no fences that would prevent livestock from accessing BLM-managed land after March 15; however, livestock are encouraged to remain on ASLD-managed lands and private land during this time by manipulating water sources. The permittee removes livestock completely from the ASLD-managed lands and private land by early June. These livestock do not graze the allotment again until October 15, when they return to the BLM-managed lands.

### **Monitoring and Adaptive Management**

The proposed action includes adaptive management, which provides a variety of management options to adjust management decisions and actions to meet desired conditions as determined through monitoring. BLM resource specialists will monitor the allotments over the 10-year term of the grazing permits. Modification of livestock grazing management on the allotments will occur in cooperation with the permittee if monitoring indicates a lack of achieving desired conditions (e.g. utilization levels exceeding 45 percent) and current livestock grazing practices are causing non-attainment of resource objectives. 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 long-term basis. 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.

BLM resource specialists have also monitored and will continue to monitor the neighboring Littlefield Community Allotment along the Virgin River. The permittee monitors the Virgin River because livestock can access the river, as previously described. Monitoring in this area is similar to that described above regarding utilization levels and, thus far, has indicated that livestock are not having significant effects to riparian vegetation along the Virgin River.

### **Conservation Measures**

The proposed action includes the following conservation measures for the new grazing permits

for the both allotments:

- Allowance of nutritional livestock supplements, including protein, minerals and salt. However, dispersal of any supplement must be a minimum of 0.25 mile from any known water sources, riparian areas, populations of special status plant species, winterfat dominated sites, cultural or any sensitive sites.
- Season of use for the Beaver Dam Slope and the BLM-managed lands on the Mormon Well Allotments will be from October 15 through March 15 to promote conservation of Mojave desert tortoise.

In addition to the conservation measures above, several conservation measures were included as part of the proposed action for the 2007 Biological Opinion for the Arizona Strip BLM Resource Management Plan (22410-2007-F-0463). The BLM implements these conservation measures for all site-specific projects and associated consultations; therefore, those relevant conservation measures are part of this proposed action (see Appendix B).

### **Action Area**

The action area is defined as all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action (50 CFR § 402.02). In delineating the action area, we evaluated the farthest-reaching physical, chemical, and biotic effects of the action on the environment. The Beaver Dam Slope Allotment and Mormon Well Allotment are located in Mohave County, Arizona on lands managed by the BLM's Arizona Strip Field Office. Both allotments are within the Beaver Dam Slope ACEC, and a small portion of the Virgin River Corridor ACEC is within the Beaver Dam Slope Allotment. We describe the conditions for each allotment below; however, we will refer to both allotments, combined, as the action area since the effects of the proposed action will be similar for both allotments.

#### *Beaver Dam Slope Allotment*

The Beaver Dam Slope Allotment encompasses 32,764 acres (133 square kilometers [sq km]) of BLM-managed land, ASLD-managed land, and private land. BLM-managed land includes 31,774 acres (129 sq km). ASLD-managed land includes 748 acres (3.0 sq km) and private land includes 242 acres (1.0 sq km). The allotment is located in the northwestern boundary of the Arizona Strip in northwestern Arizona, less than one mile from the communities of Littlefield and Beaver Dam, Arizona. The west edge of the proposed allotment is the Nevada state line with Arizona. The Virgin River flows through the south boundary of the allotment. Utah borders the allotment on the north and Nevada to the west. The southern boundary is Interstate 15, the Virgin River, and private land around the town of Beaver Dam, Arizona. It is adjacent to the Mormon Well Allotment on the north and the west. The elevation ranges from 3,060 feet in the north to 1,720 feet in the southern most part. Topography varies from a gentle southeasterly sloping flat in the northeastern half of the allotment to flat broken by several washes of varying sizes in the southwest. Slope is slight (three to five percent) over most of the allotment, with the exception of steep slopes in conjunction with the washes located in the southwest portion of the allotment. A portion of allotment boundary fence is missing along the boundary with the Virgin River in Pasture 3. Livestock have access to the Virgin River and the adjoining allotment; therefore, we are including the Virgin River for 1.5 miles downstream to the confluence with

Beaver Dam Wash in the action area for the Beaver Dam Slope Allotment. This portion of the action area includes all 32,764 acres (133 sq km) of land within the proposed allotment and the Virgin River as previously described.

### *Mormon Well Allotment*

The Mormon Well Allotment encompasses 16,031 acres (65 sq km) of BLM-managed land, ASLD-managed land, and private land. BLM-managed land includes 13,060 acres (53 sq km). ASLD-managed land includes 2,811 acres (11 sq km) and private land includes 160 acres (0.6 sq km). Private land is small in this allotment; however, it contains habitat for the desert tortoise and it will be grazed during the tortoise's active season (March 16-October 14), although livestock will be removed from these lands by approximately June 1. This allotment is also in the northwest corner of Arizona, bordered on the north by Utah and on the west by Nevada. Its southern and eastern boundaries are the Beaver Dam Slope Allotment. It is approximately three miles northwest of the town of Beaver Dam, Arizona. Beaver Dam Wash runs through the allotment primarily on private and ASLD-managed lands. The elevation ranges from 1,940 feet to 2,760 feet, with the lowest point near the southeastern corner on ASLD-managed land in Beaver Dam Wash.

This portion of the action area includes all 16,032 acres (65 sq km) of land within the proposed allotment and the Virgin River as previously described. We do not anticipate any effects occurring outside of the allotment boundaries for this allotment. Areas outside the allotment boundaries are also grazing allotments on BLM-managed land in Arizona, Utah, and Nevada. We will address effects from actions associated with those allotments in separate consultations.

## **STATUS OF THE SPECIES AND CRITICAL HABITAT**

The information in this section summarizes the rangewide status of each species considered in this BO. Further information on the status of these species, including a comprehensive status of the species, can be found in the administrative record for this project, documents on our web page ([Arizona Ecological Services Office Documents by Species](#)), and in other references cited in each summary below.

### **Mojave Desert Tortoise**

We listed the desert tortoise populations north and west of the Colorado River in Arizona and Utah (excluding the Beaver Dam slope population) as endangered under an emergency rule on August 4, 1989 (54 FR 42270). Subsequently, the entire Mojave population of the desert tortoise west of the Colorado River in California and Nevada, and north of the river in Arizona and Utah, including the Beaver Dam slope, was listed as a threatened species on April 2, 1990 (55 FR 12178).

The FWS signed the Desert Tortoise (Mojave Population) Recovery Plan (Recovery Plan) (USFWS 1994) on June 28, 1994. We signed the revised recovery plan on May 6, 2011 (USFWS 2011). The Recovery Plan (USFWS 2011) contains a complete description of the range, biology, and ecology of the desert tortoise. In the revised recovery plan, we identified



five recovery units (RU); the Beaver Dam Slope and Mormon Well allotments fall within the Northeast Mojave RU. In 2003, the FWS convened the Desert Tortoise Recovery Plan Assessment Committee (DTRPAC) to assess the science supporting the Desert Tortoise Recovery Plan. The DTRPAC Report (Tracy *et. al.* 2004) produced a number of findings and recommendations that served as the basis for the recovery plan revision (USFWS 2011). In particular, this report recognized that threats to the desert tortoise have cumulative, synergistic, and interactive effects, and that tortoise recovery depends on managing multiple threats. The DTRPAC Report also recognized that the distribution of tortoise populations may be in metapopulations rather than in single, large populations within RUs and it is important to protect the corridors between habitat patches, in addition to reducing threats. Tortoise metapopulations require areas of suitable habitat for recovery, but these areas may be periodically vacant of tortoises. The revised recovery plan identifies tortoise conservation areas outside of critical habitat that are essential for the conservation and recovery of the species (USFWS 2011).

The desert tortoise is an arid land reptile associated with desert scrub vegetation types; primarily creosote bush (*Larrea tridentata*) flats, washes, and hillside slopes or bajadas. A robust herbaceous component to the shrubs and cacti of the creosote bush vegetation type is an important component of suitable habitat. Within these vegetation types, desert tortoises potentially can survive and reproduce where their basic habitat requirements are met: a sufficient amount and quality of forage species; shelter sites for protection from predators and environmental extremes; suitable substrates for burrowing, nesting, and over-wintering; various plants for shelter; and adequate area for movement, dispersal, and gene flow.

Desert tortoises are most active during the spring and early summer when annual plants are most common. Additional activity occurs during warmer fall months and occasionally after summer rainstorms. In Arizona, tortoises are active from approximately March 15 through October 15; however, depending upon weather conditions, they can be active outside of this period as well. Desert tortoises spend the remainder of the year in burrows, escaping the extreme summer conditions of the desert.

Desert tortoise home range sizes vary with respect to location and year. Over its lifetime, each desert tortoise may require more than 1.5 square miles of habitat and make forays of more than seven miles at a time (Berry 1986). During droughts, tortoises forage over larger areas, increasing the likelihood of injury or fatality through encounters with humans and predators. Direct loss of tortoises has occurred from illegal collection by humans for pets or consumption, upper respiratory tract disease (URTD), predation on juvenile desert tortoises by common ravens (*Corvus corax*) and kit foxes (*Vulpes macrotis*), and collisions with vehicles on paved and unpaved roads. Other threats affecting the desert tortoise include loss of habitat from construction projects such as roads, housing and energy developments, and conversion of native habitat to agriculture. Off-highway vehicle (OHV) use is also a threat to the species, resulting in crushed tortoises, crushed burrows, and the destruction of tortoise habitat (USFWS 2011).

Livestock grazing activities have degraded additional habitat throughout the range of the tortoise. Fire is an increasingly important threat because it degrades or eliminates habitat (see Appendix D, USFWS 1994). Following wildfire, native plant species are often replaced by invasive, non-native species such as red brome (*Bromus rubens*) and cheat grass (*Bromus tectorum*), resulting

in long-term habitat degradation or loss. Over 500,000 acres of desert lands burned in the Mojave Desert in the 1980s and approximately 500,000 acres burned in the northeastern Mojave Desert, including in Arizona, in 2005. Over 20,000 acres of Mojave desert burned on the Arizona Strip in 2006. No significant fires have burned in the Northeast Mojave RU since 2006.

In the 1970s, tortoise researchers established permanent plots to monitor tortoise populations, and some of these plots were surveyed through 2002; however, they were not monitored using consistent methods; therefore, population trends could not be established (USFWS 2006). The FWS began using line distance sampling to monitor populations across the range of the desert tortoise in 2001 and we have continued using this method, establishing population trends. Based on this data, tortoise populations have declined significantly in four of the five RUs (USFWS 2015). The Northeast Mojave RU is the only recovery unit that has shown an upward trend for tortoise populations; however, population numbers are still low and below viable population levels (USFWS 2015).

Mojave desert tortoise management in Arizona is covered primarily by the Arizona Strip resource management plans (RMPs) for BLM lands in northern Arizona (Arizona Strip Field Office Resource Management Plan and Grand Canyon-Parashant National Monument Resource Management Plan). We issued a (BO) for the implementation of these RMPs (file number 22410-2007-F-0463). That BO considered the effects of BLM management in their RMPs on the conservation value of critical habitat. The Mojave desert tortoise is the primary species covered by the Clark County Multiple Species Habitat Conservation Plan (HCP) in Clark County, Nevada and the FWS evaluated critical habitat units in Clark County in the analysis for that permit (RECON 2000). Completion of the Washington County HCP in Utah occurred prior to critical habitat designation; however, consultations for Federal actions in that area consider the effects to critical habitat. Effects to critical habitat for Mojave desert tortoise are fully included either by existing section 7 consultations or by the existing HCPs. Conservation actions for the species include protection for individuals and habitat.

#### *Critical Habitat*

Critical habitat for this species occurs within the action areas and the proposed action may affect it. The FWS designated critical habitat in 1994 (59 FR 5820-5846, also see corrections at 59 FR 9032-9036). We designated twelve areas in Arizona, California, Nevada, and Utah as critical habitat in 1994 and based these critical habitat units (CHUs) on recommendations for DWMA's outlined in the draft Recovery Plan (USFWS 1993). The BLM also identified these DWMA's as Areas of Critical Environmental Concern (ACECs) across the range of the tortoise for tortoise conservation. The Grand Canyon-Parashant National Monument, a BLM-managed monument in Arizona, removed DWMA's and ACECs because the monument objectives offer higher levels of protection than DWMA and ACEC designations. Some CHUs extend across State lines and we list below for each state in which they occur. The units are:

- Arizona: Beaver Dam Slope, Gold Butte-Pakoon
- California: Fremont-Kramer, Superior-Cronese, Ord-Rodman, Chuckwalla, Pinto Mountain, Chemehuevi, Ivanpah, Piute-Eldorado
- Nevada: Piute-Eldorado, Mormon Mesa, Gold Butte-Pakoon, Beaver Dam Slope
- Utah: Beaver Dam Slope, Upper Virgin River

The FWS drew critical habitat unit boundaries to optimize reserve design; therefore, the CHUs may contain both "suitable" and "unsuitable" habitat. We define suitable habitat as areas that provide the primary biological features (PBFs) of desert tortoise critical habitat:

- Sufficient space to support viable populations within each of the five RUs and provide for movements, dispersal, and gene flow;
- Sufficient quantity and quality of forage species and the proper soil conditions to provide for the growth of such species;
- Suitable substrates for burrowing, nesting, and overwintering;
- Burrows, caliche caves, and other shelter sites;
- Sufficient vegetation for shelter from temperature extremes and predators; and,
- Habitat protected from disturbance and human-caused mortality.

All lands in the CHUs had been affected by past land management activities to some degree at the time of CHU designation. Designation of most CHUs as DWMAs/ACECs has aided in protection of these areas, particularly by limiting off-highway vehicle use and other ground-disturbing activities, and reducing or eliminating wild burros and livestock grazing in many units. Livestock grazing still occurs throughout critical habitat in Arizona and Utah.

Wildfires in 2005 resulted in significantly detrimental effects to tortoise critical habitat. Much of the Southwest received nearly twice the average annual winter-spring precipitation that year, which resulted in lush vegetative growth during spring and summer. When this grass dried out, it provided extensive fuel for large wildfires that burned across southwestern Utah, southern Nevada, and northwestern Arizona during summer 2005. Wildfires burned 124,782 acres (505 sq km) of critical habitat, approximately 11 percent of the critical habitat in the Northeast Mojave RU. These fires burned off most vegetation in these areas, with a loss of forage available for Mojave desert tortoise and loss of shrubs to provide shelter from temperature extremes and predators.

#### *Previous Consultations*

Given the wide-range of this species, several Federal actions affect this species every year. Section 7 consultations since 1994 on various human actions have addressed the effects of those actions on the conservation value of the critical habitat units. The most recent major consultation on the Mojave desert tortoise in California was on the California Desert Conservation Area Plan (USFWS 2002), which contained a summary of the status of the species and its critical habitat in California. In Nevada, consultations with three BLM offices (Las Vegas, Ely, and Battle Mountain) addressed most effects to tortoises and designated critical habitat from land management practices. Consultations in Arizona and Utah have been minimal in recent years. These consultations are located at [Arizona Ecological Services Office Documents by Species](#) or by contacting our [Utah Ecological Services Office](#).

## **ENVIRONMENTAL BASELINE**

The environmental baseline includes past and present effects of all Federal, State, or private actions in the action area, the anticipated effects of all proposed Federal actions in the action area

that have undergone formal or early section 7 consultation, and the effects of State and private actions that are contemporaneous with the consultation process. The environmental baseline defines the current status of the species and its habitat in the action area to provide a platform to assess the effects of the action now under consultation.

### **Status of the desert tortoise and critical habitat within the action area**

The Beaver Dam Slope and Mormon Well allotments occur wholly within the Beaver Dam Slope CHU, which is in the Northeast Mojave RU. Both allotments contain suitable tortoise habitat throughout their combined 48,796 acres (197 sq km). Rangewide monitoring data collected in 2017 found that the population density for the Beaver Dam Slope CHU is approximately 1.3 tortoises per sq km (USFWS 2018), which is the lowest tortoise density across its range. This is a significant decrease from 2016, when we estimated 5.6 tortoises per sq km (USFWS 2016). Biologists did not conduct monitoring within the Beaver Dam Slope CHU in 2018 (Allison 2019). The 2017 monitoring used several transects throughout the CHU to determine tortoise density. Nine of those transects were within both allotments (USFWS 2017). The monitoring located one tortoise in the southeast corner of Pasture 1 in the Beaver Dam Slope Allotment and one tortoise within a mile of the northwest corner of the allotment. Monitoring efforts also found one dead tortoise just north of these allotments in the Utah portion of this CHU. Using the number of tortoises per sq km (1.3), we can calculate an estimate of how many tortoises may occur within the allotment. As previously stated, there are 48,796 acres (197 sq km) of desert tortoise habitat in the project area based on elevation and other habitat parameters (BLM 2019); therefore, we estimate there may be as many as 152 tortoises within the action area based on the tortoise density data provided from the 2017 range wide monitoring (USFWS 2018). However, there could be more depending on pockets of higher density areas within the allotment. It is also reasonable to assume that tortoise numbers may be greater than 152 tortoises based on the home range and movement data described above. Tortoises outside the allotments could be using habitat within the action area if it is within their home range or they are foraging, especially during periods of drought (Berry 1986).

Livestock grazing has also been ongoing in the action area since before the listing of the tortoise; however, we have not conducted formal consultation with the BLM for this ongoing action. Previous grazing management in both allotments followed the same management prescriptions as described in the proposed action for this consultation. Additionally, BLM limits OHV travel to existing roads, trails, and washes in the action area, but occasionally unauthorized travel occurs off these existing routes.

#### *Critical habitat*

As previously described, the action area occurs wholly within the Beaver Dam Slope CHU, within the Northeast Mojave RU. The Beaver Dam Slope CHU is one of 12 CHUs throughout the range of the tortoise. The FWS (2010) modeled the habitat throughout all CHUs to determine how many acres actually contain the PBFs and, therefore, are suitable tortoise habitat. All 12 CHUs contain approximately 5,802, 987 acres of suitable tortoise habitat with PBFs. The Beaver Dam Slope CHU contains approximately 202,499 acres (3.4 percent) of suitable tortoise habitat (with PBFs) throughout the range of the tortoise.

Approximately 34,107 acres within the total action area (both allotments) are designated critical habitat for the desert tortoise, and all PBFs described above are present throughout (BLM 2018). The Beaver Dam Slope Allotment contains approximately 18,076 acres of CH, and the Mormon Well Allotment contains approximately 16,032 acres of CH. The action area accounts for approximately 16 percent of the critical habitat containing PBFs available to tortoises in the CHU and approximately one-half percent of the modeled tortoise habitat containing PBFs rangewide. All 18,076 acres of CH in the Beaver Dam Slope Allotment would only be grazed during the tortoise inactive season, approximately October 15-March 15. Approximately 13,060 acres of CH in the Mormon Well Allotment would be grazed only during the tortoise inactive season; however, approximately 2,971 acres of ASLD-managed and private lands would be grazed during the active season. This accounts for approximately 1.5 percent of the total CH available throughout the Beaver Dam Slope CHU and less than one-half percent of the modeled tortoise habitat containing PBFs rangewide. As stated earlier, there is no fencing on ASLD and private lands to ensure that livestock using the Mormon Well allotment do not access CH on BLM-managed lands during the tortoise active season (mid-March through early June). However, we expect minimal livestock access to CH on BLM-managed lands in the Mormon Well Allotment during the tortoise active season due to the use of water and salt to keep them concentrated on ASLD-managed and private lands during this period.

## **EFFECTS OF THE ACTION**

Effects of the action refer to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated and interdependent with that action, which will be added to the environmental baseline. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration. Indirect effects are those that are caused by the proposed action and are later in time, but are still reasonably certain to occur.

### **Mojave Desert Tortoise**

We are analyzing the effects of livestock grazing on the tortoise and its critical habitat for both allotments together rather than by allotment since the effects are similar. We will analyze the difference between livestock management between the two allotments separately. The Revised Recovery Plan for the Mojave Desert Tortoise recommends prohibiting livestock grazing from conservation areas as a recovery action (USFWS 2011). Specifically, the Recovery Plan states that there is no evidence that livestock grazing will restore habitat or prevent fire in Mojave Desert environments. Livestock grazing may help create and maintain habitat for native species where: 1) the grassland ecosystem is highly productive; and 2) native grazers and browsers co-existed with tortoises. The Mojave Desert is neither highly productive, nor is it an environment that historically supported native grazers (USFWS 2011). The Revised Recovery Plan recommends experimentally testing flexible grazing practices, such as allowing or reducing grazing during specific times of the year (e.g., after ephemeral forage is gone or during winter only) or under certain environmental conditions (e.g., grazing following a specified minimum amount of winter rain) (USFWS 2011). The livestock management on the two allotments does

not follow these recommendations, in that the action area is within a conservation area and the proposed grazing practices are not experimental. However, although the action area includes a designated tortoise conservation area and the livestock grazing is not experimental, the proposed action is making an effort to use seasonal grazing, monitoring, and adaptive management to reduce effects to desert tortoise and their habitat.

In general, grazing practices can change vegetation composition and abundance, cause soil erosion and compaction, reduce water infiltration rates, and increase runoff (Robinson and Bolen 1989, Waser and Price 1981, Holechek *et al.* 1998, and Loftin *et al.* 2000), leaving less water available for plant production (Dadkahn and Gifford 1980). Fleischner (1994) summarized the ecological effects of grazing in three categories: (1) alteration of species composition of communities, including decreases in density and biomass of individual species, reduction of species richness, and changing community organization; (2) disruption of ecosystem functioning, including interference in nutrient cycling and ecological succession; and, (3) alteration of ecosystem structure, including changing vegetation stratification, contributing to soil erosion, and decreasing availability of water to biotic communities. All these ecological effects have the potential to decrease the fitness of the tortoise through loss of forage, sheltering sites, and nesting sites (Esque *et al.* 2014).

Both cattle and desert tortoises consume annual forbs and grasses in the spring if winter precipitation is sufficient for annual production (Burkhardt and Chamberlain 1982, Burge and Bradley 1976, Coombs 1979, Minden 1980, Esque 1994). During dry winters and other seasons, cattle consume primarily perennial shrub and grass species, such as white bursage, range ratany, and big galleta grass. Outside of the spring months or in dry years when winter annual plants are not available, desert tortoise diets comprise a greater percentage of shrubs, perennial grasses, and dried annuals (Henen 1992; Turner *et al.* 1984; Nagy and Medica 1986; Hohman and Ohmart 1980).

All three pastures in the Beaver Dam Slope Allotment and BLM-managed lands within the Mormon Well Allotment would only be available for grazing from October 15 through March 15, which is outside of the tortoise active season. This seasonal restriction would reduce some forage competition for winter annual plants, which exhibit most growth in April and May (Beatley 1974). Livestock would be feeding upon what early winter annual growth may be available, plus perennial shrubs and grasses, at this time. If overgrazing and reduction in availability of perennial plants occurs, desert tortoise would have less perennial forage in the summer when it is needed most (Jarchow and May 1989, Nagy and Medica 1986). If winter precipitation does not produce winter annual growth, desert tortoises exiting hibernation must feed upon perennial shrubs and grasses and what dried annual vegetation is still available after livestock have been grazing in the area. The established forage use threshold of 45 percent current annual growth will help reduce direct competition for forage between cattle and desert tortoises and simultaneously reduce the chances of habitat degradation.

ASLD-managed lands and private lands within the Mormon Well Allotment, all containing suitable tortoise habitat, would be available for livestock grazing during the tortoise active period. Livestock will be removed from BLM-managed lands within the Mormon Well Allotment and moved to ASLD-managed and private land from March 16 through approximately

June 1. This will result in direct competition with tortoises for forage and a reduction in tortoise shelter sites, thus increasing the potential to decrease the fitness of the tortoise through loss of forage and sheltering sites (Esque *et. al.* 2014), as previously described. As previously described, livestock in the Mormon Well allotment will still have access to CH on BLM-managed lands during the tortoise active season from mid-March through early June due to lack of fencing to keep them contained on ASLD-managed and private lands. Livestock accessing BLM-managed lands during the tortoise active season could lead to further reduction in available forage and shelter sites. Livestock access to CH on BLM-managed lands in the Mormon Well Allotment during the tortoise active season is expected to be minimal due to the use of water and salt to keep them concentrated on ASLD-managed and private lands. Livestock will be removed from ASLD-managed and private land in starting approximately June 1; therefore, competition for resources and reduction of shelter sites will be reduced for the remainder of the tortoise active season.

Habitat degradation in the Mojave Desert, through loss of microbiotic soil crusts (soils containing algae, lichen, fungi, etc.) due to livestock grazing, is a great concern (Floyd *et al.* 2003). Grazing can disturb soil crusts and other fundamental physical factors in landscapes. For example, climatologists and ecologists have attributed increasing soil surface temperatures and surface reflectivity in the Sonoran Desert to grazing-related land degradation (Balling *et al.* 1998 in Floyd *et al.* 2003). Biological soil crusts provide fixed carbon on sparsely vegetated soils. Carbon contributed by these organisms helps keep plant interspaces fertile and aids in supporting other microbial populations (Beymer and Klopatek 1991 in Floyd *et al.* 2003). In desert shrub and grassland communities that support few nitrogen-fixing plants, biotic crusts can be the dominant source of nitrogen (Rychert *et al.* 1978 in Floyd *et al.* 2003). Additionally, soil crusts stabilize soils, help to retain moisture, and provide seed-germination sites. Soil crusts are effective in capturing wind-borne dust deposits, and have been documented contributing to a 2- to 13-fold increase in nutrients in southeastern Utah (Reynolds *et al.* 2001 in Floyd *et al.* 2003). The presence of soil crusts generally increases the amount and depth of rainfall infiltration (Loope and Gifford 1972 in Floyd *et al.* 2003). Livestock grazing will likely disrupt soil crusts, thus leading to disruption of habitat for the desert tortoise. As soil crusts are degraded, surrounding soils are likely to decrease in their ability to provide nutrients for the forage and vegetation used by tortoises for shelter. Furthermore, the degradation of soil crusts can lead to a decrease in the recruitment of vegetation that provides both forage and shelter for tortoises. As described above, the degradation of soil crusts has the potential to decrease the fitness of the tortoise through loss of forage and sheltering sites (Esque *et. al.* 2014).

Grazing can also lead to the proliferation of nonnative, invasive species such as cheatgrass (*Bromus tectorum*) and red brome (*B. rubens*). Livestock can spread weeds (Brooks 2009), and both abundance and diversity of native plants and animals is lower in grazed areas as compared to ungrazed habitat in the Mojave Desert (Brooks 2000). The loss of soils crusts also contributes to the proliferation of nonnative species. Additionally, a significant reduction in the overall resiliency of the tortoise may occur, especially if the spread of these nonnative grasses leads to other stochastic events, such as wildfire. Studies have also shown that, in most cases, dominance of *Bromus* increases following cessation of grazing in Warm Deserts, such as the Mojave Desert, and the net long-term effects of livestock grazing are generally favorable for invasive plants (Brooks and Pyke 2002; Brooks *et. al.* 2007). This also leads to an increased risk of wildfire in

tortoise habitat. As described above, fire degrades tortoise habitat through the loss of forage and sheltering sites. Although grazing can help promote the spread of nonnative weeds such as cheatgrass and red brome, and their spread is a threat to the tortoise and its habitat, we do not know how much livestock contribute to the spread of nonnative vegetation.

The proposed monitoring and adaptive management aspect of the proposed action is anticipated to help reduce the long-term effects of grazing on tortoise habitat. Modification of livestock grazing management on the allotment will occur in cooperation with the permittee if monitoring indicates a lack of achieving desired conditions and current livestock grazing practices are causing non-attainment of resource objectives. 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 long-term basis, thus reducing the long-term effects of grazing on tortoise habitat.

Cattle have trampled desert tortoises and their burrows, but the frequency of trampling, or how this affects tortoise populations is unclear. Direct fatality or injury may occur if cattle step on tortoises, their eggs, tortoise burrows, or shelter sites (Burge 1977; Berry 1989; Avery and Neibergs 1993; USFWS 1994). These direct effects can occur when grazing occurs during the desert tortoise inactive period. We have reports of cases of trampling on the Arizona Strip; however, the frequency with which trampling occurs is unknown. Trampling has been documented twice on the Beaver Dam Slope, within the Beaver Dam Slope CHU in Nevada, in 1988 (Coffeen 1990) and in 1991 (BLM 1991). Although we have no documentation that trampling has occurred within the action area, it is reasonable to assume it could occur in the action area. We do not anticipate trampling to affect individual tortoises when they are active since grazing throughout most of the action area will occur during the tortoise inactive season; however, trampling could occur within the Mormon Well allotment on ASLD-managed and private lands since those areas will be grazed when tortoises are active. Livestock may also trample tortoises on BLM-managed lands within the Mormon Well Allotment, since livestock will have access; however, we anticipate this to be rare due to management actions (salt and water placement) intended to concentrate livestock away from BLM-managed lands during this time. Additionally, livestock are not likely to trample desert tortoise eggs since egg laying occurs from mid-May through July and most or all would hatch before the permittee puts cattle onto those pastures in mid-October (Ernst et. al. 1994). Crushing burrows could occur when livestock use these allotments during the tortoise inactive season, resulting in tortoises being crushed inside their burrows, similar to what happened on the Beaver Dam Slope in 1988 (Coffeen 1990). We also anticipate tortoise fatalities and injuries to be low due to the low density of tortoises in this area. As previously noted, the 2017 range wide monitoring data indicate that the population density for the Beaver Dam Slope CHU is approximately 1.3 tortoises per sq km, which is the lowest tortoise density of all CHUs throughout the range of the tortoise (USFWS 2018).

### **Critical Habitat**

As stated above, the Revised Recovery Plan for the Mojave Desert Tortoise recommends prohibiting livestock grazing from conservation areas (which include critical habitat) as a recovery action (USFWS 2011). Effects to the PBFs of critical habitat would be similar to those



habitat-related effects described above. The proposed action may affect the quantity and quality of forage species and the proper soil conditions to provide for the growth of such species. Damage to burrows, nesting sites, and other shelter sites could occur. Livestock grazing, especially during dry conditions, may affect vegetation for shelter from temperature extremes and predators. Effects to habitat protected from disturbance and human-caused mortality would occur since the effects described above include possible tortoise fatality. Furthermore, invasive plant species may increase, causing additional degradation of critical habitat in the area.

Despite the negative aspects associated with livestock grazing in critical habitat for the tortoise, livestock grazing in critical habitat will occur outside of the most abundant period for winter annual Mojave Desert vegetation in this area for most of the two allotments, approximately April-May (Beatley 1974), which is the most important forage source for tortoises. This should reduce the competition for forage between livestock and tortoises as well as allowing some growing-season recovery of the PBFs associated with sufficient forage and shelter sites. We anticipate that the utilization rate of 45 percent will reduce the long-term effects to the PBFs of critical habitat associated with sufficient forage and shelter sites. Grazing that occurs on ASLD-managed and private lands within the Mormon Well Allotment from March 16 through early June will occur when the most important forage source is available for tortoises. Grazing these areas during this time will reduce the availability of PBFs associated with forage availability and vegetation shelter from temperature extremes and predators. A reduction in these PBFs is likely to decrease the fitness of the tortoise (Esque *et. al.* 2014); however, these lands account for approximately 1.5 percent of CH available throughout the Beaver Dam Slope CHU and, thus, account for a small portion of the PBFs available to tortoises.

The proposed monitoring and adaptive management aspect of the proposed action is anticipated to help reduce the effects of grazing on the PBFs of designated critical habitat. Modification of livestock grazing management on the allotments will occur in cooperation with the permittee(s) if monitoring indicates a lack of achieving desired conditions and current livestock grazing practices are causing non-attainment of resource objectives. 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 long-term basis, thus reducing the long-term effects of grazing on the PBFs of critical habitat.

## **CUMULATIVE EFFECTS**

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. We do not consider future Federal actions that are unrelated to the proposed action in this section because they require separate consultation pursuant to section 7 of the Act.

### **Mojave Desert Tortoise and Critical Habitat**

Most land management within the action area is by Federal agencies; therefore, most activities that could potentially affect these species are Federal activities and would be subject to additional section 7 consultation. Grazing on ASLD-managed and private lands within the action area are considered part of the overall allotment management plan and, are also subject to additional section 7 consultation. The increasing human population in nearby communities has

resulted in an increase in recreational activity in the analysis area. Recreational pursuits, particularly OHV use can cause disturbance to individual tortoises and their habitat. As previously mentioned, BLM limits OHV travel to existing roads, trails, and washes, but occasionally unauthorized travel occurs off these existing routes. Increased human presence, noise, and harassment can all disturb wildlife, particularly ground dwelling species with low mobility such as the tortoise. In addition, tortoise mortality may increase due to increased predation, primarily in response to human-provided subsidies of food, water, and nesting sites.

Unmanaged OHV use can result in the degradation of the PBFs of critical habitat for the tortoise. Research has documented a decrease in vegetation used for both shelter forage in the presence of OHV use in the Mojave Desert (Vollmer *et. al.* 1976). Soil compaction is one of the first established and most important effects of OHV use (Luckenbach 1975; Ouren and Coffin 2013). This compaction can lead to the loss of substrates for burrowing, nesting, and sheltering. The loss of PBFs associated with vegetation for sheltering and foraging and substrates used for burrowing, nesting, and sheltering can have significant long-term effects to tortoises using the critical habitat within the action area. Although OHV use off designated routes is likely low, the cumulative effects to critical habitat can increase significantly when combined with the effects of livestock grazing described above. This can have a significant effect on the function of these PBFs within the Beaver Dam Slope CHU and, therefore, affect the ability of this CHU to provide conservation and recovery for the tortoise.

## **JEOPARDY AND ADVERSE MODIFICATION ANALYSIS**

Section 7(a)(2) of the ESA requires that federal agencies ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat.

### **Jeopardy Analysis Framework**

Our jeopardy analysis relies on the following:

“Jeopardize the continued existence of” means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR 402.02). The following analysis relies on four components: (1) Status of the Species, which evaluates the range-wide condition of the listed species addressed, the factors responsible for that condition, and the species’ survival and recovery needs; (2) Environmental Baseline, which evaluates the condition of the species in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the species; (3) Effects of the Action (including those from conservation measures), which determines the direct and indirect effects of the proposed federal action and the effects of any interrelated or interdependent activities on the species; and (4) Cumulative Effects, which evaluates the effects of future, non-federal activities in the action area on the species. The jeopardy analysis in this biological opinion emphasizes the range-wide survival and recovery needs of the listed species and the role of the action area in providing for those needs. We

evaluate the significance of the proposed Federal action within this context, taken together with cumulative effects, for the purpose of making the jeopardy determination.

### **Destruction/Adverse Modification Analysis Framework**

Past designations of CH have used the terms PCEs, PBFs or “essential features” to characterize the key components of CH that provide for the conservation of the listed species. The new CH regulations (79 FR 27066) discontinue use of the terms “PCEs” or “essential features,” and rely exclusively on use of the term “PBFs” for that purpose because that term is contained in the statute. However, the shift in terminology does not change the approach used in conducting a destruction or adverse modification analysis, which is the same regardless of whether the original designation identified PCEs, PBFs, or essential features. For those reasons, we view references to PCEs or essential features as synonymous with PBFs. All of these terms characterize the key components of CH that provide for the conservation of the listed species.

The final rule revising the regulatory definition of “destruction or adverse modification of critical habitat” became effective on March 14, 2016 (81 FR 7214). The revised definition states: “Destruction or adverse modification means a direct or indirect alteration that appreciably diminishes the value of critical habitat for the conservation of a listed species. Such alterations may include, but are not limited to, those that alter the physical or biological features essential to the conservation of a species or that preclude or significantly delay development of such features.”

Similar to our jeopardy analysis, our adverse modification analysis of critical habitat relies on the following four components: (1) the Status of Critical Habitat, which evaluates the range-wide condition of designated critical habitat in terms of PBFs, the factors responsible for that condition, and the intended recovery function of the critical habitat overall; (2) the Environmental Baseline, which evaluates the condition of the critical habitat in the action area, the factors responsible for that condition, and the recovery role of the critical habitat in the action area; (3) the Effects of the Action, which determine the direct and indirect effects of the proposed federal action and the effects of any interrelated or interdependent activities on the PBFs and how they will influence the recovery role of affected critical habitat units; and (4) Cumulative Effects, which evaluate the effects of future, non-federal activities in the action area on the PBFs and how they will influence the recovery role of affected critical habitat units.

### **Conclusion**

After reviewing the current status of the Mojave desert tortoise and its designated critical habitat, the environmental baseline for the action area, the effects of the proposed Beaver Dam Slope and Mormon Well Allotments Permit Renewals, and the cumulative effects, it is our biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the Mojave desert tortoise and is not likely to destroy or adversely modify designated critical habitat for Mojave desert tortoise. We base this conclusion on the following:

#### Mojave Desert Tortoise

- Livestock grazing on the Beaver Dam Slope Allotment will occur outside of the tortoise active season, approximately March 15 – October 15. This should reduce the competition for forage resources with tortoises because of livestock grazing and, therefore, not preclude the recovery or conservation of tortoises.
- Livestock grazing on BLM-managed lands within the Mormon Well Allotment will occur outside of the tortoise active season, approximately March 15 – October 15. This should reduce the competition for forage resources with tortoises because of livestock grazing and, therefore, not preclude the recovery or conservation of tortoises.
- Livestock grazing in critical habitat will mostly occur outside of the most abundant period for winter annual Mojave Desert vegetation in this area (April-May), which is the most important forage source for tortoises. This should reduce the competition for forage between livestock and tortoises as well as maintain sufficient vegetation for shelter sites and, therefore, allow for the long-term maintenance of the PBFs associated with forage and shelter resources. This grazing management will not preclude the ability of critical habitat to contribute to the recovery and conservation of the Mojave desert tortoise.
- Livestock grazing in the Mormon Well Allotment that will occur in critical habitat during the most abundant period for winter annual Mojave Desert vegetation in this area (April-May) will occur on approximately 1.5 percent of the CH available throughout the Beaver Dam Slope CHU and less than one-half percent of the CH available across the range of the tortoise. The proposed action will not diminish the ability of this CHU to contribute to the conservation and recovery of the tortoise.
- The action area accounts for approximately 16 percent of the critical habitat containing PBFs available to tortoises in the Beaver Dam Slope CHU and approximately one-half percent of the modeled tortoise habitat containing PBFs rangewide. However, we do not anticipate this project to diminish the ability of critical habitat to recover or conserve the Mojave desert tortoise. The proposed livestock management will allow for the retention of PBFs in critical habitat within the two allotments, thus allowing critical habitat within the action area to continue to contribute to the recovery and conservation of the tortoise. Furthermore, there are sufficient PBFs present in the surrounding critical habitat unit; therefore, we expect that the Beaver Dam Slope Critical Habitat Unit to continue to contribute to the conservation and recovery of the tortoise at its current level.

We based the conclusions of this biological opinion on full implementation of the project as presented in the Description of the Proposed Action section of this document, including any Conservation Measures that were incorporated into the project design.

## **INCIDENTAL TAKE STATEMENT**

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. “Take” is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. “Harm” is further defined (50 CFR § 17.3) to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. “Harass” is defined (50 CFR § 17.3) as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which

include, but are not limited to, breeding, feeding or sheltering. We define “Incidental take” as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by the BLM so that they become binding conditions of any permit issued to the livestock permittees, as appropriate, for the exemption in section 7(o)(2) to apply. The BLM has a continuing duty to regulate the activity covered by this incidental take statement within their authorities. If the BLM (1) fails to assume and implement the terms and conditions or (2) fails to require the livestock permittees to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permits, the protective coverage of section 7(o)(2) may lapse. In order to monitor the effect of incidental take, the BLM must report the progress of the action and its effect on the species to the FWS as specified in the incidental take statement [50 CFR § 402.14(i)(3)].

## **AMOUNT OR EXTENT OF TAKE**

### **Mojave Desert Tortoise**

Take of the Mojave desert tortoise is reasonably certain to occur from livestock grazing on ASLD-managed and private lands associated with the Mormon Well Allotment. Livestock grazing on these lands will occur during the tortoise active period (March 16-October 14, especially during the most abundant period for winter annual Mojave Desert vegetation in this area (April-May), which is the most important forage source for tortoises. As previously described, grazing during this period can result in decreased fitness for tortoises as livestock directly compete with tortoises are actively searching for forage. Fitness of tortoises may also be reduced as vegetation used by tortoises for shelter is reduced from livestock grazing while tortoises are active. Livestock may also trample a tortoise, especially juvenile tortoises, which may be harder to avoid. These situations may result in possible injury or death of tortoises.

- We are authorizing the lethal take of up to three adult, hatchling, or juvenile Mojave desert tortoises in the Mormon Well Grazing Allotment over the ten-year life of the permit because of livestock grazing. We do not anticipate frequent livestock encounters with tortoises because tortoise densities are so low in this area. Incidental take would be exceeded if more than three tortoise fatalities occur due to livestock grazing during the tortoise active period within the Mormon Well Grazing Allotment. These fatalities may not be easy to detect without monitoring of the area when livestock are grazing during the tortoise active season.

## **EFFECT OF THE TAKE**

In this biological opinion, the FWS determines that this level of anticipated take is not likely to result in jeopardy to the Mojave desert tortoise or destruction or adverse modification of its critical habitat for the reasons stated in the Conclusions section.

## REASONABLE AND PRUDENT MEASURES

The following reasonable and prudent measure is necessary and appropriate to minimize take of Mojave desert tortoise:

1. The BLM shall monitor incidental take resulting from the proposed action and report to the FWS the findings of that monitoring.

## TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the Act, the BLM must comply with the following terms and conditions, which implement the reasonable and prudent measure described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

The following terms and conditions implement reasonable and prudent measure #1:

- 1.1 The BLM shall monitor the project area and other areas that the project may affect to ascertain take of individuals of the species and/or effects to its habitat that causes harm or harassment to the species. The BLM and FWS will develop the monitoring plan collaboratively. The BLM and FWS will develop the plan by December 31, 2019. The monitoring plan should define the monitoring needed, when staff would collect data, what areas would be included, and how existing monitoring transects may/may not contribute to this plan.
- 1.2 The BLM shall submit annual monitoring reports to the Arizona Ecological Services Field Office by December 15 beginning in 2020. These reports shall briefly document for the previous calendar year the effectiveness of the terms and conditions and locations of listed species observed, and, if any are found dead, suspected cause of fatality. The report shall also summarize tasks accomplished under the conservation measures and terms and conditions. The report shall make recommendations for modifying or refining these terms and conditions to enhance listed species protection.
- 1.3 The BLM shall notify our office of any grazing-related tortoise fatalities documented within the Mormon Well Grazing Allotment. The report should include the estimated age class, size, and sex of the tortoise. Additionally, any circumstances that can be determined regarding the fatalities should be included. The BLM shall notify our office within 48 hours of discovering the fatalities, or as soon as possible.

Review requirement: The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the effects of incidental take that might otherwise result from the proposed action. If, during the course of the action, the level of incidental take is exceeded, such incidental take would represent new information requiring review of the reasonable and prudent measures provided. The BLM must immediately provide an explanation

of the causes of the taking and review with the AESO the need for possible modification of the reasonable and prudent measures.

### **Disposition of Dead or Injured Listed Species**

Upon locating a dead, injured, or sick listed species initial notification must be made to the FWS's Law Enforcement Office, 4901 Paseo del Norte NE, Suite D, Albuquerque, NM 87113; 505-248-7889) within three working days of its finding. Written notification must be made within five calendar days and include the date, time, and location of the animal, a photograph if possible, and any other pertinent information. The notification shall be sent to the Law Enforcement Office with a copy to this office. Care must be taken in handling sick or injured animals to ensure effective treatment and care, and in handling dead specimens to preserve the biological material in the best possible state.

### **CONSERVATION RECOMMENDATIONS**

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

1. We recommend that BLM continue to assist Lake Mead National Recreation Area; other BLM offices in Utah, Nevada, and California; and other land managers in the Northeast Mojave RU in the development of regional planning efforts to implement the recovery plan, and in the integration of those plans with the Arizona Strip RMPs that address the Mojave desert tortoise (Arizona Strip Field Office RMP and Grand Canyon-Parashant National Monument RMP).
2. We recommend that BLM fully implement the Revised Desert Tortoise Recovery Plan and subsequent revisions of the plan.
3. We recommend that BLM manage activities so that they do not contribute to the proliferation of predators within desert tortoise habitat.
4. We recommend that BLM only construct new wildlife guzzlers in desert tortoise habitat that are designed to exclude desert tortoises, and if sufficient forage is available.
5. We recommend that the BLM coordinate and collaborate with other local, State, and Federal agencies as well as private groups to sponsor and/or assist with public education regarding desert tortoise conservation to enhance public support for conservation activities. Target groups for education and outreach may include OHV groups, hunting groups, Home Owner Associations, scout troops, public schools, libraries, and other audiences and venues associated with regional land use and/or educational programming.

6. We recommend that the BLM construct livestock exclusion fencing along Pasture 3 of the Beaver Dam Slope Allotment to keep livestock out of the Virgin River and, therefore, habitat for the southwestern willow flycatcher, yellow-billed cuckoo, and the Virgin River fishes.
7. We recommend that the BLM construct livestock exclusion fencing along private property and ASLD-managed lands of the Mormon Well Allotment to keep livestock off of BLM-managed lands during the tortoise active season.

In order to keep the FWS informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the FWS requests notification of the implementation of any conservation recommendations.

### REINITIATION NOTICE

This concludes formal consultation on for the Beaver Dam Slope and Mormon Well Allotments. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

In keeping with our trust responsibilities to American Indian Tribes, we encourage you to continue to coordinate with the Bureau of Indian Affairs in the implementation of this consultation and, by copy of this biological opinion, are notifying the following Hopi, Chemehuevi, and Colorado River Indian Tribes of its completion. We also encourage you to continue to coordinate the review of this project with the Arizona Game and Fish Department.

We appreciate the BLM's efforts to identify and minimize effects to listed species from this project. For further information, please contact Brian Wooldridge (928) 556-2106 or Shaula Hedwall (928) 556-2118. Please refer to the consultation number 02EAAZ00-2019-F-0543 in future correspondence concerning this allotment.

*Shaula J. Hedwall*  
for Jeffrey A. Humphrey

cc (electronic):

Fish and Wildlife Biologists, U.S. Fish and Wildlife Service, AZ (Attn: Shaula Hedwall,  
Greg Beatty, Susan Sferra)

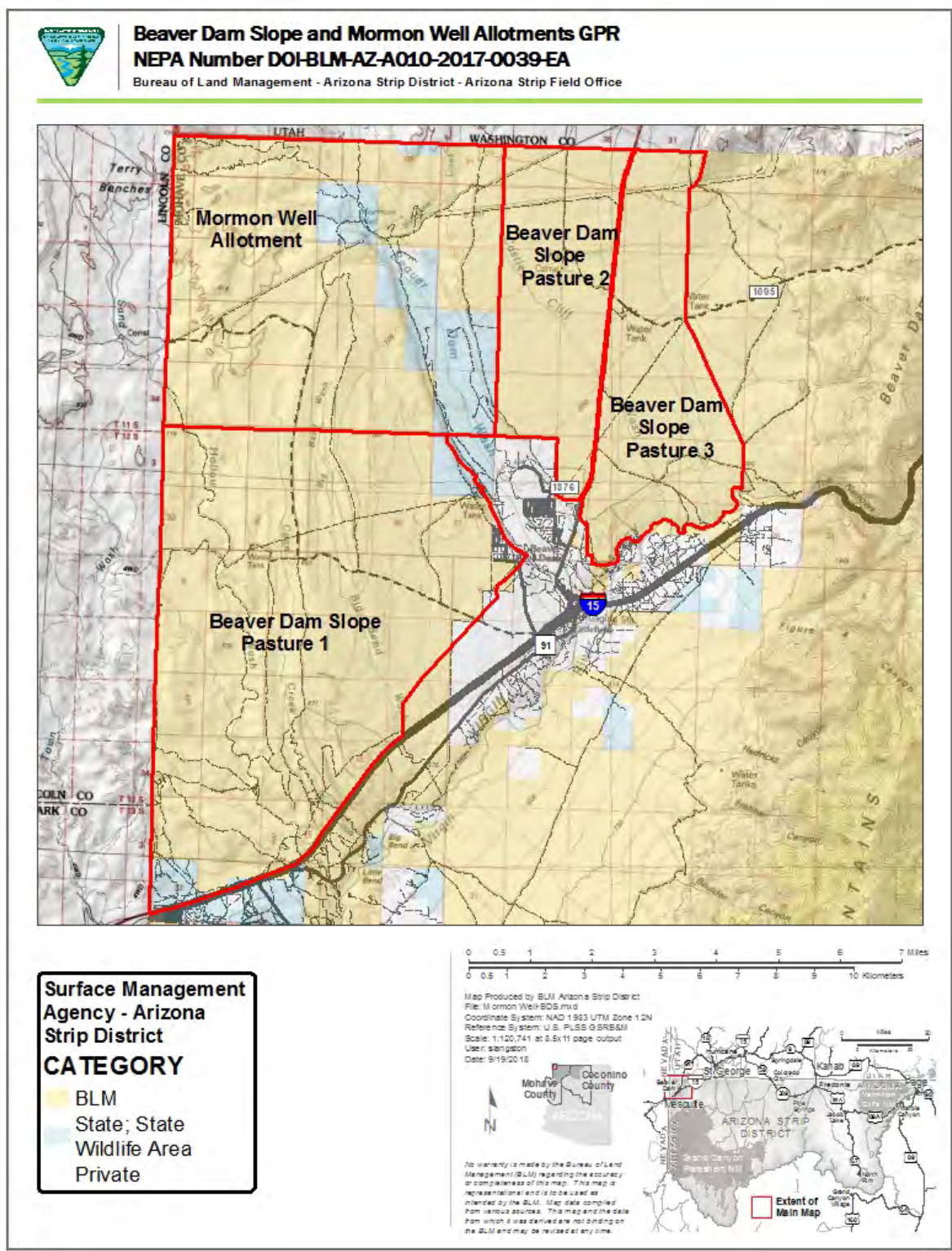
Field Office Manager, Arizona Strip Field Office, Bureau of Land Management, St. George,  
UT (Attn: Jeff Young)



State Director, Bureau of Land Management, Phoenix, AZ (Attn: Elroy Masters)  
Chief, Habitat Branch, Arizona Game and Fish Department, Phoenix, AZ  
Supervisor, Region 2, Arizona Game and Fish Department, Flagstaff, AZ (Attn: Rob Nelson)  
Director, Hopi Cultural Preservation Office, Kykotsmovi, AZ  
Director, Resource Center, Chemehuevi Tribe, Havasu Lake, CA  
Cultural Compliance Technician, Museum, Colorado River Indian Tribes, Parker, AZ  
Environmental Specialist, Environmental Services, Western Regional Office, Bureau of  
Indian Affairs, Phoenix, AZ

# FIGURES

## Figure 1. Map of the Beaver Dam Slope and Mormon Well Allotments with Pastures



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## APPENDIX A: CONCURRENCES

We concur with your determination that the proposed action “may affect, but is not likely to adversely affect” the Virgin chub and its critical habitat, the woundfin and its critical habitat, the Virgin spinedace, the southwestern willow flycatcher and its critical habitat, and the yellow-billed cuckoo and its proposed critical habitat for the following reasons:

### Virgin River Fishes and Critical Habitat

We are combining our concurrence for the Virgin chub and woundfin because they occupy similar habitats and the effects to each species and their critical habitat are similar. We are also including the Virgin spinedace in our analysis. Virgin spinedace is a species covered by a conservation agreement that includes the spinedace habitat in the Virgin River. Virgin spinedace occur in the action area, so there is a likelihood of effects similar to those for the Virgin Chub and woundfin occurring from implementation of the proposed project.

- Recent monitoring for the Virgin River fishes have indicated low numbers of fish throughout the Virgin River in Arizona; therefore, the likelihood of fish being present within the action area and directly affected by livestock activity is discountable.
- Fewer than 10 livestock will have limited access to the Virgin River for approximately six weeks between February 1 and March 15, which is outside of the spawning season for these fish. Furthermore, these livestock will only have access to the Virgin River only two years out of the six year-rotation system. Additionally, upland water sources will limit the number of livestock that enter the river. Because livestock have limited access to the Virgin River for a short duration of time, effects to habitat for the Virgin River fish will be insignificant and discountable.
- Livestock will not significantly alter the PBFs of critical habitat for the Virgin River fish. The limited access and duration of livestock in the Virgin River, as described above, will result in insignificant and discountable effects to the PBFs of critical habitat.

### Southwestern Willow Flycatcher and Critical Habitat

- Fewer than 10 livestock will have access to the Virgin River for approximately six weeks between February 1 and March 15, which is outside of the breeding and migration season for the flycatcher. If livestock access the Virgin River, permittees will herd their livestock out of the area. Furthermore, livestock will have access to the Virgin River only two years out of the six year-rotation system. Additionally, upland water sources will limit the number of livestock that enter the river. Because livestock are few in numbers, and have limited access to the Virgin River for a short duration of the breeding season, livestock will have minimal effects to the southwestern willow flycatcher and any effects to its habitat are insignificant.
- Because there are few livestock that will have limited and short duration access to Virgin River and riparian habitat, we expect insignificant effects to flycatcher critical habitat PBFs (river function) and PCEs (riparian vegetation and insects). Monitoring by the BLM indicates that livestock are not affecting the growth of riparian habitat when they enter the Virgin River.



### Western Yellow-Billed Cuckoo and Proposed Critical Habitat

- Fewer than 10 livestock will have access to the Virgin River for approximately six weeks between February 1 and March 15, which is outside of the breeding and migration season for the cuckoo. If livestock access the Virgin River, permittees will herd their livestock out of the area. Furthermore, livestock will have access to the Virgin River only two years out of the six year-rotation system. Additionally, upland water sources will limit the number of livestock that enter the river. Because livestock are few in numbers, and have limited access to the Virgin River for a short duration of the breeding season, livestock will have minimal effects to the yellow-billed cuckoo and any effects to its habitat are insignificant.
- Because there are few livestock that will have limited and short duration access to Virgin River and riparian habitat, we expect insignificant effects to the PCEs of proposed cuckoo critical habitat. Monitoring by the BLM indicates that livestock are not affecting the growth of riparian habitat when they enter the Virgin River.

## **APPENDIX B: DESERT TORTOISE CONSERVATION MEASURES FROM 2007 RMP BIOLOGICAL OPINION**

The following conservation measures were part of the proposed action for the 2007 Biological Opinion for the Arizona Strip BLM Resource Management Plans (22410-2007-F-0463). These conservation measures are relevant to the proposed action and should be implemented accordingly.

DT-1.A. For each authorized project<sup>1</sup>, BLM and/or NPS will designate a field contact representative (FCR) who will be responsible for overseeing compliance with these conservation measures and for coordination on compliance with the FWS. The FCR will be a qualified biologist approved by BLM and/or NPS, and will have the authority and the responsibility to halt all project activities that are in compliance with these conservation measures. These individuals will have a copy of these conservation measures while on the work site.

DT-1.D.3. Only biologists authorized and permitted by the Service and Arizona Game and Fish Department will handle desert tortoises. Additional biologists could be authorized if BLM and/or NPS submits the name(s) of the proposed authorized biologist(s) to the Service for review and approval at least 15 days prior to the onset of activities that could result in a take. Minimum requirements for authorized biologists include attending the Desert Tortoise Council's training course for handling desert tortoises and/or training by an authorized biologist. Authorized biologists must have all valid state and federal permits.

DT-1.D.4. The authorized biologist will maintain a record of all desert tortoises encountered during project activities. This information will include for each desert tortoise:

1. The locations and dates of observation
2. General condition and health, including injuries and state of healing and whether animals voided their bladders
3. Location moved from and location moved to
4. Diagnostic markings (i.e. identification numbers of marked lateral scutes)

Desert tortoises that are handled will be marked for future identification. An identification number (using the acrylic paint/epoxy technique) will be placed on the 4th costal scute (Fish and Wildlife Service 1992). No notching of scutes or replacement of fluids with a syringe is authorized.

DT-1.E. If a tortoise or clutch of tortoise eggs is found in a project area, to the extent practicable activities will be modified to avoid injuring or harming it. If activities cannot be modified, the tortoise/clutch will be moved from harm's way by an the authorized biologist the minimum distance possible within appropriate habitat to ensure its safety

from death, injury, or collection associated with the project or other activities. The authorized biologist will have some discretion to ensure that survival of each relocated desert tortoise/clutch is likely. Desert tortoises/clutches will not be translocated to lands outside the administration of the Federal government without the written permission of the landowner. Handling procedures for desert tortoises and their eggs will adhere to protocols outlined in Desert Tortoise Council (1994 with 1996 revisions).

DT-1.G. A desert tortoise education program will be presented to all project personnel that may encounter tortoises; such as employees, inspectors, supervisors, contractors, and subcontractors; prior to initiation of activities that may result in disturbance of desert tortoise habitat or death or injury of desert tortoises. The education program will include discussions of the following:

1. legal protection of the desert tortoise and sensitivity of the species to human activities;
2. a brief discussion of desert tortoise distribution and ecology;
3. the terms and conditions of applicable biological opinions;
4. project features designed to reduce adverse effects to desert tortoises and their habitat, and to promote the species' long-term survival;
5. protocols during encounters with desert tortoises and associated reporting requirements; and,
6. the definition of take and penalties for violations of Federal and State laws.

DT-1.L. Project vehicle use will be limited to designated routes (existing routes prior to designation) to the extent possible.

DT-1.M. At no time will vehicle or equipment fluids be dumped on public lands. All accidental spills must be reported to BLM and NPS and cleaned up immediately, using the best available practices according to the requirements of the law. All spills of federally or State-listed hazardous materials that exceed reportable quantities will be promptly reported to the appropriate State agency and the BLM and NPS.

DT-1.N. Vehicles associated with BLM-authorized projects traveling on unpaved roads in desert tortoise habitat will not exceed speed limits established by the BLM as necessary to protect desert tortoises. These speed limits will generally not exceed 40 mph even on the best-unpaved roads but may be much less than this on some roads.

DT-1.P. Unleashed dogs will be prohibited in project areas.

- DT-1.R. To reduce attraction of potential desert tortoise predators, project sites in desert tortoise habitat will be maintained in a sanitary condition at all times; waste materials at those sites will be placed in covered receptacles and disposed of promptly at an appropriate waste disposal site. "Waste" refers to all discarded matter, including, but not limited to, human waste, trash, garbage, refuse, oil drums, petroleum products, ashes, and equipment. All reasonable effort will also be taken to reduce or eliminate water sources associated with project activities that might attract ravens and other predators.
- DT-1.S. After completion of the project, trenches, pits, and other features in which tortoises could be entrapped or entangled, will be filled in, covered, or otherwise modified so they are no longer a hazard to desert tortoises.