

**ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED
EIGHT MILE GAP PIPELINE COMPLEX PROJECT
ON THE ARIZONA STRIP FIELD OFFICE COCONINO COUNTY, AND
KANAB FIELD OFFICE KANE COUNTY, UTAH
(DOI-BLM-AZ-AZ010-2016-0028-EA)**

Prepared by

U.S. Department of the Interior
Bureau of Land Management
Arizona Strip Field Office
345 East Riverside Drive
St. George, Utah 84790-6714

February 22, 2018

Chapter 1

INTRODUCTION

1.1 Background

The Arizona Strip Field Office and Kanab Field Office of the Bureau of Land Management (BLM), along with Roger M. Pugh and Kathleen R. Pugh Family Trust, Bunting Family Trust, Paul O. Mangum and Ferril G. Heaton, the ranchers who hold the grazing permits, have been working cooperatively to improve grazing management within the Eight Mile Gap, Eight Mile Pass, Button, Chatterly and Muggins Flat Allotments.

In order to provide safe, reliable sources of water for livestock (see section 1.2 below), construction of one new water pipeline, (approximately 11.29 miles collectively, 2.54 of which cross private lands), is proposed in the Eight Mile Gap, Eight Mile Pass, Button, Chatterly and Muggins Flat Allotments. The project would be funded by the grazing permittees with possible additional funding by the Arizona Strip Grazing Advisory Board.

This environmental assessment (EA) has been prepared to disclose and analyze the environmental consequences of the proposed pipeline project on the subject allotments. This analysis provides information as required by the BLM implementing regulations for the National Environmental Policy Act (NEPA), the Taylor Grazing Act, and the Federal Land Policy Management Act (FLPMA) to determine whether to authorize construction of this project. This EA also serves as a tool to help the authorized officers make an informed decision that is in conformance with the Arizona Strip Field Office Resource Management Plan (RMP) (BLM 2008a) and the Kanab Field Office RMP (BLM 2008c). The EA is a site-specific analysis of potential impacts that could result with the implementation of a proposed action or alternatives to the proposed action. The EA assists the BLM in project planning and ensuring compliance with the NEPA, and in making a determination as to whether any “significant” impacts could result from the analyzed actions. “Significance” is defined by NEPA and is found in the Code of Federal Regulations (CFR) at 40 CFR 1508.27. An EA provides evidence for determining whether to prepare an environmental impact statement (EIS) or a statement of “Finding of No Significant Impact” (FONSI). If the decision maker determines that this project has “significant” impacts following the analysis in the EA, then an EIS would be prepared for the project. If not, a decision record (DR) in accordance with 43 CFR 4160 may be signed for the EA approving the selected alternative. A DR, including a FONSI statement, documents the reasons why implementation of the selected alternative would not result in “significant” environmental impacts (effects) beyond those already addressed in the Arizona Strip Proposed RMP/Final EIS RMP (BLM 2007) and the Kanab Field Office proposed RMP/Final EIS (BLM 2008d)

1.2 Purpose and Need

Water wells on Chatterly, Muggins Flat, and Button allotments had water samples taken on May 29, 2013 after livestock developed blindness, some resulting in death. It was suspected that the water might be the causal factor so liver samples and four well water samples were hand delivered to the Utah Veterinary Diagnostics lab (Utah Veterinary Diagnostics lab Final Report 2013). Three of the four water samples tested high for sodium, barium and magnesium. Because of these results, tests for sulfates were also performed. All four well samples tested high for sulfates. The recommendation from the lab was that the water wells were unusable because sulfates are extremely difficult to remove from water. Sulfate poisoning was the main factor in abandonment of the four water sources. A water source for the proposed pipeline was located off the Johnson Canyon culinary water pipeline. The purpose of this project is to satisfy the new need for water in these allotments.

Eight Mile Gap (KFO, UT)

The Eight Mile Gap Allotment consists of 539 acres of federal land, 0 acres of state land, and 11 acres of private land totaling 550 acres. It contains one pasture and is used seasonally in winter/spring. The only water source currently within the allotment is one earthen reservoir. This earthen reservoir does not guarantee reliable water on an annual basis due to the unreliability of scattered summer rainfall events and capabilities of reservoir storage. In addition, Johnson Wash runs through the allotment but is an ephemeral wash and is not a reliable water source.

The BLM along with Bunting Brothers, grazing permittee, have proposed to run a pipeline from a hydrant located on private property. The water supplied to the hydrant is piped from existing wells on private property. This pipeline would supply water as a main trunk line to all allotments addressed in this EA. One trough would be located at T. 44 S., R. 5 W., Sec. 10. This trough would be located in Utah slightly north of the state line boundary fence line, and would be located on BLM land. It would supply water to cattle on the Eight Mile Gap Allotment. This new water source would give the permittee more reliability for use during the season of use.

The land health assessment for this allotment was completed in 2001 and it was determined that the allotment was in late seral, with static trend. This additional water source would result in more uniform utilization of forage while the ephemeral Johnson Wash flows, which should aid in maintaining land health. There was no determination from the 2001 land health assessment of whether the allotment was meeting standards or not.

Eight Mile Pass (KFO, AZ)

The Eight Mile Pass Allotment contains 363 acres of federal land, 0 acres of state land, and 0 acres of private land totaling 363 acres. It contains one pasture and is used seasonally in spring. The only water source currently within the allotment is Johnson Wash which is ephemeral and is not a reliable water source for livestock and wildlife.

The BLM along with Bunting Brothers, grazing permittee, have proposed to install one trough to

be located at T. 42 N., R. 1 W., Sec. 34. This trough would be located in Arizona slightly south of the state line boundary fence line, and would be located on BLM land. It would supply water to the Eight Mile Pass Allotment. This new water would better control livestock distribution, achieve more uniform utilization of key forage species and give the permittee more reliability for pasture use during the season of use.

The land health assessment for this allotment was completed in 2003 and was found to be in mid-seral, with a downward trend. This additional reliable water source would result in more uniform utilization of forage (while not exceeding the maximum utilization level of 50%), which should aid in improving land health. There was no determination from the 2003 land health assessment of whether the allotment was meeting standards or not.

Button (ASFO, AZ)

The Button Allotment contains 4,500 acres of federal land, 640 acres of state land, and 520 acres of private land totaling 5,660 acres. It utilizes a three pasture deferred rotational system on BLM lands and is used seasonally in winter/spring. It also has one private pasture within the allotment which the permittee uses outside the scope of the rotation system. The only sources of water on the Button Allotment are provided by a private well on private property and large earthen ponds or reservoirs built along dry washes or drainages throughout the allotment. Although many of these ponds are strategically located throughout for good distribution of livestock, it does not guarantee reliable water on an annual basis due to the unreliability of scattered summer rainfall events and capabilities of reservoir storage. It then makes it difficult for the permittee and BLM to best plan and adhere to this grazing system. The private well was tested at the same time as the wells on Paul O. Mangum's private property and Ferril G. Heaton's private property. The data showed that the well was toxic to livestock.

In an effort to provide safe water, better control livestock distribution, achieve more uniform utilization of key forage species and give the permittee more reliability for pasture use in this grazing system, the BLM along with Roger M. Pugh and Kathleen R. Pugh Family Trust, grazing permittee, have proposed to continue the pipeline from Eight Mile Gap and Eight Mile Pass Allotments in order to supply water to four new troughs. One trough would be located on private land at (T. 41 N., R. 1 W., Sec. 10). The second trough and water lot with wildlife passable fencing would be located on BLM land at (T. 41 N., R. 1 W., Sec. 15). The third trough would be located on Private land at (T. 41 N., R. 1 W., Sec. 21) at the end of a .25 mile spur line spurring from the main line at the second proposed trough location. The fourth trough would be located on BLM land (at T. 41 N., R. 1 W., Sec. 22). These new water sources in separate pastures would promote better livestock distribution, achieve more uniform utilization of key forage species (while not exceeding the maximum utilization level of 50%), give the permittee more reliability for pasture use in this grazing system during the season of use and provide clean water.

The land health assessment for this allotment was completed in 2006 and it was determined that the allotment was making significant progress toward meeting the applicable standards for rangeland health. The assessment identified the desired plant community objectives for the Button Allotment and determined that these objectives are being met. The allotment is not meeting

standards due to the Jocity and Clayhole soils along Johnson wash. These soils generally are devoid of perennial vegetation and only support annual vegetation due to the properties within these soil types. As the assessment suggests, perennial vegetation should increase to some degree on these soil types as the permittee and BLM improve distribution of water sources and additional water sources would result in more uniform utilization of forage, which should aid in maintaining the desired plant composition objective identified in the land health evaluation.

Chatterly (AZ)

The Chatterly Allotment contains 4,170 acres of federal land, 640 acres of state land, and 80 acres of private land totaling 4,890 acres. It has three pastures, one of which is private land, that are used seasonally in the winter and spring. The water sources currently within the allotment is Johnson Wash which is ephemeral and earthen reservoirs which are not reliable water sources for livestock and wildlife. There is existing infrastructure (i.e. pipeline, troughs and storage tanks) but are unavailable to use due to the toxicity of the well water. The private land within the Chatterly allotment contains a well that, according to the data from the water quality test, was found to be toxic to livestock, so there is a need for safe and reliable water.

In an effort to provide clean water, better control livestock distribution, achieve more uniform utilization of key forage species and give the permittee more reliability for pasture use in this grazing system, the BLM along with Ferril G. Heaton, grazing permittee, would run a pipeline for approximately 4.65 miles. This pipeline would originate on private and terminate on federal land, crossing federal, and private land. The pipeline would supply existing troughs and storage tank currently not in use due to toxicity levels. One new trough and storage tank would be located on BLM land at (T. 41 N., R. 1 E., Sec. 18).

The land health assessment for this allotment was completed in 2007 and was found to meet all applicable standards for rangeland health. These reliable and safe water sources would result in more uniform utilization of forage (while not exceeding the maximum utilization level of 50%) and provide reliability to the grazing schedule.

Muggins flat (AZ)

The Muggins Flat Allotment contains 11,088 acres of federal land, 800 acres of state land, totaling 11,888 acres. It has four pastures, one of which is private land, that are used seasonally in the winter. The water sources currently within the allotment are Johnson Wash which is ephemeral and earthen reservoirs which are not reliable water sources for livestock and wildlife. There is existing infrastructure (i.e. pipeline, troughs and storage tanks) but are unavailable to use due to the toxicity of the well water. The private land within the Muggins Flat allotment contains a well that according to the data from the water quality test, was found to be toxic to livestock, so there is a need for safe and reliable water.

In an effort to provide clean water, better control livestock distribution, achieve more uniform

utilization of key forage species and give the permittee more reliability for pasture use in this grazing system, the BLM along with Paul O. Mangum, grazing permittee, would run a spur pipeline off the proposed main pipeline. This spur would be approximately .48 miles long and would originate and terminate on federal land. One new trough would be located on BLM land at (T. 41 N., R. 1 E., Sec. 13).

The land health assessment for this allotment was completed in 2005 and was found to meet all applicable standards for rangeland health. These reliable and safe water sources would result in more uniform utilization of forage (while not exceeding the maximum utilization level of 50%) and provide reliability to the grazing schedule.

Summary

The purpose of the proposed projects is not to increase permitted use, or animal unit months (AUMs), but to encourage and achieve better livestock distribution within the above mentioned BLM grazing allotments. The proposed projects would also provide additional water sources for wildlife (including mule deer and pronghorn). The *Arizona Strip Interdisciplinary Mule deer Management Plan 2015-2019*, which was developed jointly by the BLM and Arizona Game and Fish Department (AGFD) states that “water distribution should be improved in [Unit 12B] by utilizing both cooperative projects and wildlife catchments” (AGFD and BLM 2015). The *Arizona Statewide Pronghorn Management Plan* (AGFD 2009) identifies a number of management objectives, including objectives related to fences and water availability. It should be noted that habitat management for non-listed, non-game species are typically provided in the form of supplemental benefits from actions designed to address other, targeted (i.e., threatened, endangered, candidate, or game species). These most often take the form of water developments or vegetative treatment projects. Thus, other wildlife species (along with mule deer and pronghorn) would benefit from the proposed water projects by improving water distribution and improving habitat use by these species as well, which are also objectives contained within the Arizona Strip Field Office RMP (BLM 2008a).

1.3 Conformance with Land Use Plan

The proposed action described in Chapter 2 is in conformance with the *Arizona Strip Field Office RMP*, approved on January 29, 2008 (BLM 2008a) and the Kanab Field office RMP, approved in October 2008 (BLM 2008c). The proposed action is consistent with the following decisions contained within these plans.

1.3.1 Arizona Strip Field Office RMP

The following decisions are from Table 2.3 in the RMP (2008a) regarding Vegetation and Fuels Management:

- **DFC-VM-04:** Ecological processes and functions will be protected, enhanced, and/or restored by allowing tools that are necessary and appropriate to mitigate adverse impacts of allowable uses and undesirable disturbances, and contribute to meeting the Standards

for Rangeland Health.

- **MA-VM-14:** Construction equipment, fire vehicles, and/or vehicles from outside the Arizona Strip Field Office used to implement authorized projects and/or uses, will be required to be cleaned (using air, low-pressure/high volume, or high-pressure water) prior to initiating the project. Vehicles leaving the area and later returning to continue the project will require re-cleaning.

The following decisions are from Table 2.4 in the RMP (2008a) regarding Wildlife and Fish Management.

- **DFC-WF-03:** Forage, water, cover, and space will be available to wildlife of sufficient quality and quantity to support productive and diverse wildlife populations.
- **DFC-WF-04:** All waters will be safely available to wildlife.
- **DFC-WF-12:** Mule deer habitat will provide the necessary forage, water, cover, and shelter components for healthy, self-sustaining populations within the range of natural variability.
- **DFC-WF-17:** Water sources within mule deer habitat will be safely accessible to deer and other wildlife.
- **DFC-WF-20:** Pronghorn habitat will provide the necessary forage, water, cover, and shelter components for healthy, self-sustaining populations within the range of natural variability.
- **DFC-WF-24:** Water sources within pronghorn antelope habitat will be safely accessible to pronghorn and other wildlife.

1.3.2 Kanab Field Office RMP

The following decisions are from the RMP (2008c) regarding Wildlife and Fish Management

- **WL-19** Continue to work with UDWR and conservation organizations to establish additional water developments, subject to NEPA consideration, and maintain existing water developments to improve wildlife distribution and encourage habitat use by native wildlife species and introduced non-native species.
- **WL-20** Authorize construction of wildlife habitat improvement projects (including water developments and vegetation treatments) to meet wildlife goals and objectives, provided that the project complies with NEPA, ESA and other applicable laws and policies.

- **WL-22** Develop present use area water needs for wildlife as capabilities exist; maintain water throughout the spring and fall in existing and new livestock range improvements (e.g., tanks and pipelines).

It has also been determined that the proposed action would not conflict with other decisions throughout these plans.

1.4 Relationship to Statutes, Regulations, or Other Plans

This EA has been prepared in accordance with the requirements of NEPA and any additional Federal, State, and local statutes or laws that may be relevant to the proposed action, such as those cited below.

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

The proposed action is consistent with the Arizona Strip Interdisciplinary Mule Deer Management Plan (AGFD and BLM 2015), which states (on pages 10 and 11 of the plan) that "Perennial [water] sources are generally lacking, and man-made sources such as livestock tanks, water catchment facilities and spring developments provide the bulk of water sources available for mule deer. It has been demonstrated on the Arizona Strip that improving water distribution improves distribution and habitat use by mule deer and has positive impacts on populations."

The project area is located in both Kane County, Utah and Coconino County, Arizona. The proposed action is consistent with both county plans (*Kane County, Utah Resource Management Plan* adopted March 23, 2015 and *Coconino County Comprehensive Plan* adopted September 2003). While the type of actions proposed in this EA are not specifically addressed in either of the County Plans, management of public lands is addressed. Kane County's plan states, "Both the Forest Service and the BLM are required to manage the lands under their jurisdiction pursuant to the principles of "multiple use" and "sustained yield". Coconino County's plan in "Our vision for our future" under community partnerships (page 3) states in part: "We support good resource-management practices, a process that we facilitate by interacting with state, federal, and tribal agencies during the development of each other's plans and policies. Building on our successes, we create strategic partnerships to implement plans that enhance the values we cherish" (Coconino County 2003). The proposed action does not conflict with decisions contained within either of the plans.

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

- Federal Land Policy and Management Act of 1976 (43 United States Code [USC] 1707 et seq.);
- Endangered Species Act of 1973 (ESA), as amended;
- Section 106 of the National Historic Preservation Act of 1966, as amended;
- Native American Graves Protection and Repatriation Act of 1990 (25 USC 3001-3013; 104 Stat. 3048-3058)
- Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds.

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. A summary of the issues and the rationale for analysis are given below.

- **Vegetation:** Disturbance to vegetation could occur during construction, including the potential loss of shrubs, grasses, and forbs along the footprint of the pipelines. Maintenance could also result in minor trampling along the pipelines. However, providing new (and more reliable) waters would result in more uniform utilization of forage, which should aid in maintaining or achieving the desired plant composition objectives identified for each allotment.
- **Wildlife, Including Big Game Species, Migratory Birds, and Sensitive Species:** Disturbance to wildlife, including migratory birds and sensitive species, could occur during construction caused by the potential short-term loss of vegetation for food and cover, and short-term noise and soil compaction from construction. Long-term effects to wildlife could result from having new reliable sources of water.
- **Livestock Grazing:** The proposed pipelines with water troughs would provide reliable clean and safe sources of water being available for the grazing of livestock. This would help to improve the distribution of the livestock by having the waters scattered throughout the subject pastures, while enabling use of different portions of the pastures at different times, thus enhancing grazing systems.

Chapter 2

PROPOSED ACTION AND ALTERNATIVES

This EA focuses on the proposed action and no action alternatives. The no action alternative is considered and analyzed to provide a baseline for comparing the impacts of the proposed action. One additional alternative was considered, but eliminated from further analysis. It is described in Section 2.3 along with rationale for not being further considered.

2.1 Alternative A - Proposed Action

This alternative includes construction of one pipeline in the Eight Mile Gap, Eight Mile Pass, Button, Chatterly and Muggins Flat Allotments. The proposed pipeline would consist of 1¼-inch high density polyethylene pipe buried 18 to 24 inches deep using a ripper tooth attached to a track vehicle. The pipeline would be installed by driving a crawler tractor with the ripper tooth attached and lowered into the ground across the route of the pipeline. This would loosen the soil and allow for the pipe to be more easily installed as the tractor makes a second pass to install the pipeline. The pipeline would be installed along a 15-foot wide path; however, actual disturbance would only occur at the dozer tracks and a 12 to 16-inch point of impact from the ripper tooth. Troughs placed along this pipeline would be constructed using heavy equipment sized tires and secured to the proposed location using concrete. Wildlife escape ramps would be secured in each trough before it is filled. No new structures would be placed around these water facilities. No onsite camping by construction crew(s) would be necessary.

The water source for the troughs/pipeline is the community of Johnson Canyon culinary water wells (four wells, three active on private and one inactive on BLM) and pipeline to which the permittee would have a meter.

All of these water sources are currently developed (i.e., they already exist); the proposed pipeline would simply tap into this existing source.

The proposed action includes future maintenance activities for the life of each project, which is expected to be at least 20-50 years. The exact maintenance requirements are not known but are expected to include annual inspections using all-terrain vehicles or pick-up trucks along the pipeline route for minor repairs, as well as digging to find and repair leaks or clogs in the pipe. The main pipeline would run through Eight Mile Gap, Eight Mile Pass, Button, Chatterly, and Muggins Flat allotments.

Eight Mile Gap (UT)

The pipeline on the Eight Mile Gap Allotment would originate and begin at an existing pipeline and hydrant on private land in Utah in the southeast quarter of T. 44 S., R. 5 W., sec. 10, Gila & Salt River Base Meridian, within the Eight Mile Gap pasture. The pipeline would extend

southeast approximately .41 miles along a BLM maintained road, where a new water trough would be placed at the Utah / Arizona stateline boundary fence in the southeast quarter of T. 44 S., R. 5 W., sec. 10. A trough would be placed on both sides of the fenceline separating the Eight Mile Gap and Eight Mile Pass Allotments, approximately 50 feet away on both sides. The north trough would provide water to the Eight Mile Gap Allotment, while the south trough would provide water to the Eight Mile Pass Allotment (see below). This water would be available for wildlife yearlong. See Appendix A for the location of the proposed pipeline and trough.

Eight Mile Pass (AZ)

The south trough described above would provide water to the Eight Mile Pass Allotment. The pipeline would then extend southeast along a BLM maintained road approximately 1 mile where it would enter private lands at the southeast quarter of T. 41 N., R. 1 W., sec. 34. See Appendix A for the location of the proposed pipeline.

Button (AZ)

After leaving the Eight Mile Pass Allotment, the proposed pipeline would then extend approximately 4.5 miles across a mix of private and federal land within the Button Allotment. Upon entering the Button Allotment, the pipeline would extend south for approximately 1.25 miles on private land, primarily along an existing road. A trough would be located on private land at T. 41 N., R. 1 W., Sec. 10. The pipeline continues on for another 0.25 miles on BLM land, then enters another private land parcel. At this point the pipeline would tee in two directions, the west line and the southeast line (which occurs primarily in the Chatterly Allotment).

The west pipeline would cross approximately 0.28 miles of private land before re-entering BLM lands, rejoining a road, and continuing south, paralleling the east boundary of state land. Once approaching the southeast corner of state land, the proposed pipeline would leave the road and go cross country for approximately 1.27 miles, crossing Johnson Wash, and terminating at T. 41 N., R. 1 W., sec. 22. In addition, a 0.25 mile spur line would extend off of the pipeline at the southeast corner of the state land, go directly east for 0.25 miles and terminate with a trough on private land at T. 41 N., R. 1 W., Sec. 15. A trough and water lot would be located at the point where this short spur line leaves the main pipeline. The waters provided by the pipeline would be available to wildlife yearlong. In summary, the waters in the Button Allotment would be found at the following locations: one trough would be located on private land at T. 41 N., R. 1 W., Sec. 10; one trough and water lot with wildlife passable fencing would be located on BLM land at T. 41 N., R. 1 W., Sec. 15; one trough would be located on private land at T. 41 N., R. 1 W., Sec. 15, and one trough would be located on BLM land at T. 41 N., R. 1 W., Sec. 22, as shown on the map in Appendix A.

Chatterly (AZ)

From the tee described above for the Button Allotment, the southeast pipeline continues for approximately 4.6 miles to an existing pipeline and trough. This pipeline would originate on private

land and terminate on federal land. It would run southeast for about a mile (within the Button Allotment), following a road through private land. The proposed pipeline then enters the Chatterly Allotment, and continues onto BLM land. Once entering federal land the pipeline would continue southeast for about 3.64 miles, terminating at an existing trough and pipeline in T. 41 N., R. 1 E., Sec. 18. The proposed pipeline is located in T. 41 N., R. 1 W. Sec. 11, 13, 14, 24 and T. 41 N., R. 1 E., Sec. 17, 18, 20, as shown on the map in Appendix A. In addition, a trough and storage tank would be located at T. 41 N., R. 1 E., Sec. 18. The southeast pipeline would also have a 0.5 mile spur pipeline that occurs entirely on federal land. The 0.5 mile spur would be located in T. 41 N., R. 1 W., Sec. 13, 24. A new trough is proposed at T. 41 N., R. 1 W., Sec. 24.

Muggins flat (AZ)

The 0.5 mile spur pipeline as described above would provide water to the Muggins Flat Allotment. Paul O. Mangum, grazing permittee, would run a pipeline off the proposed main pipeline for approximately .5 miles south. This spur would originate on federal land and terminate on federal land. The pipeline would be located in the southeast quarter of T. 41 N., R. 1 W., Sec. 13, 24. A new trough is proposed at T. 41 N., R. 1 W., Sec. 24. See Appendix A for the location of the proposed pipeline.

2.1.1 Best Management Practices

The following best management practices (BMPs) are included in the proposed action in an effort to minimize the impacts of the proposed action to social and natural environmental resources. The following are practices to be implemented for all of the proposed projects.

- Construction would be limited to daylight hours to minimize impacts to wildlife.
- Open trenches have the potential to trap and injure wildlife. During pipeline construction these risks would be mitigated by minimizing the length of time trenches are left open, providing escape avenues (lateral trenches) for wildlife when left overnight, and inspecting the trenches prior to backfill activities.
- Construction activities would be limited to periods when the soil and ground surface are not wet in order to avoid soil compaction.
- Soil disturbance associated with construction activities would be limited to the 15 foot wide route of each proposed pipeline project.
- Construction activities would be conducted in a manner that would minimize disturbance to existing vegetation by limiting vegetation thinning and restricting construction activities to a 15 foot wide path.
- During construction vehicular traffic would be restricted to existing roads or along the 15 foot wide route of each proposed project.

- All efforts would be made to conceal each pipeline route where it leaves an existing road. Concealment would include placement of natural materials to create barriers and masking the pipeline route so that it does not become a new public road.
- At no time would vehicle or equipment fluids (including motor oil and lubricants) be dumped on public lands. All accidental spills would be reported to the authorized officer and be cleaned up immediately, using best available practices and requirements of the law, and disposed of in an authorized disposal site. All spills of federally or state listed hazardous materials which exceed the reportable quantities would be promptly reported to the appropriate agency and the authorized officer.
- Vehicles and equipment would be power washed off-site before construction activities begin to minimize the risk of spreading noxious weeds. This would include cleaning all equipment before entering the Arizona Strip or the Kanab Field Office. The project areas would be monitored by the BLM and permittees for noxious weeds for two years following completion of the project.
- The project sites would be cleaned up at the end of each day the work is being conducted (e.g., trash removed, scrap materials picked up); waste materials would be disposed of promptly at an appropriate waste disposal site. "Waste" means all discarded matter including, but not limited to, human waste, trash, garbage, refuse, oil drums, petroleum products, ashes, and equipment. "Waste" also includes the creation of micro-trash such as bottle caps, pull tabs, broken glass, cigarette butts, small plastic, food materials, bullets, bullet casings, etc. No micro-trash would be left at project sites to minimize the likelihood of condors visiting the site. BLM staff may conduct site visits to the area to ensure adequate clean-up measures are taken.
- Any cultural (historic/prehistoric site or object) or paleontological resource (fossil remains of plants or animals) discovered within the project areas would immediately be reported to the Arizona Strip Field Office Manager, the Kanab Field Office Manager, or their designee. All operations in the immediate area of the discovery shall be suspended until written authorization to proceed is issued. An evaluation of the discovery shall be made by a qualified archaeologist or paleontologist to determine appropriate actions to prevent the loss of significant cultural or scientifically important paleontological values.
- If in connection with this work any human remains, funerary objects, sacred objects, or objects of cultural patrimony as defined in the Native American Graves Protection and Repatriation Act (Public Law 101-601; 104 Stat. 3048; 25 U.S.C. 3001) are discovered, operations in the immediate area of the discovery would stop, the remains and objects would be protected, and the Arizona Strip Field Office Manager or the Kanab Field Office Manager (or their designee) would be immediately notified. The immediate area of the discovery would be protected until notified by the respective Field Office Manager (or their designee) that operations may resume.

- The work crew chief must notify the BLM wildlife team lead (435- 688- 3373) if California condors visit the worksite while construction is underway. Project activities would be modified or delayed where adverse effects to condors may result.
- If an active bird nest is located along any of the project routes, the Arizona Strip Field Office Manager or the Kanab Field Office Manager (or their designee) would be immediately notified in order to develop appropriate measures to avoid disturbance to the nesting birds.
- Any hollow metal and/or plastic (PVC) pipes and posts used or stored temporarily during construction or left permanently in place would be capped to prevent birds, small mammals, or reptiles from becoming entrapped.
- No smooth or barbed wire t-posts structures would be used to strengthen the integrity of the troughs to keep them from moving. Instead, heavy equipment sized tires would be secured using concrete. This would facilitate ingress and egress of wildlife, particularly bat species.
- No hazing or harassment of wildlife is permitted.
- Wildlife escape ramps would be secured in each trough before it is filled.

2.1.2 Monitoring

Monitoring under the proposed action would consist of a BLM staff member inspecting the project site during the construction phase of the project to ensure compliance with the BMPs listed in Section 2.1.1. Monitoring by BLM personnel for the invasion of noxious weeds would continue for a minimum of two years following completion of the project. The projects would be monitored on a yearly basis by the grazing permittees to ensure the pipelines and troughs are functioning properly. In addition, rangeland monitoring (to evaluate compliance, utilization, composition, and long-term trend) would continue in these affected pastures and allotments which would help determine the effectiveness of the projects. This rangeland monitoring would also include inspections of the pipeline routes to determine if public use is occurring such that the routes are becoming new “roads” and therefore if additional mitigation (beyond concealment of the routes using natural materials as barriers) is necessary.

2.2 Alternative B - No Action

Under the no action alternative, the proposed pipeline and troughs would not be installed private or BLM administered lands. Grazing would continue in the above mentioned allotments without the addition of any new waters to promote better livestock distribution and more uniform utilization. The lethal water quality issue would remain the same and livestock would continue to rely on earthen reservoirs for water.

2.3 Alternatives Considered but Eliminated from Detailed Analysis

2.3.1 Construct Earthen Reservoirs

Earthen reservoirs would be constructed instead of installing the pipeline and new water troughs. This would likely not result in reliable water sources due to the scattered, unreliable rainfall events that tend to occur on the Arizona Strip. Construction of reservoirs would also create a larger area of disturbance on vegetation and soil. The success of these reservoirs would be a risk regarding holding capabilities based upon the soil type in which they would be built and that soil's ability to retain water. This alternative would therefore not address the purpose and need for action, and was not carried forward for detailed analysis.

CHAPTER 3

AFFECTED ENVIRONMENT

The purpose of this chapter is to describe the existing environment potentially affected by one of the alternatives in order to assist the reader in understanding the existing situation. The affected environment of this EA was considered and analyzed by an interdisciplinary team of resource specialists. Table 3.1 (following pages) 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 and discussed in Section 3.2 of this EA include the relevant physical, social and biological conditions that may be impacted with implementation of the proposed action, and provides the baseline for comparison of impacts described in Chapter 4.

3.1 General Setting

The proposed pipelines traverse a total of approximately 8.5 miles of public and private land throughout the area administered by the Arizona Strip and Kanab Field Offices. 3.75 of the 8.5 miles would cross BLM administered land with the remaining crossing private. The project areas are located in the Great Basin Ecological Zone (Sagebrush Communities). The proposed project lies outside of Grand Canyon-Parashant and Vermilion Cliffs National Monuments.

3.2 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. These elements are identified in Table 3.1, along with the rationale for determination on potential effects. If any element was determined to potentially be impacted it was carried forward for detailed analysis in this EA. If an element is not present or would not be affected, it was not carried forward for analysis. Table 3.1 also contains other resources and elements 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 in this document.

Table 3.1. 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 Quality	NI	The project area are located 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. The proposed action would result in temporary, localized deterioration of air quality because of the operation of equipment, particularly the crawler tractor while installing the pipe. These emissions would be temporary and would cease once the pipelines and water troughs are installed. Neither alternative would cause Class II standards to be exceeded. The alternatives would therefore not measurably impact air quality.
Areas of Critical Environmental Concern	NP	The proposed project area is not located within an Area of Critical Environmental Concern.
Environmental Justice	NI	The proposed action would have no disproportionately high or adverse human health or other environmental effects on minority or low income segments of the population. The proposed action would have no effect on low income and minority populations because none exist near the project area.
Farmlands (Prime or Unique)	NP	There are no prime or unique farmlands within the project area.
Floodplains	NI	No actions are proposed that would result in permanent fills or diversions, or affect the function of floodplains or special flood hazard area.
Native American Religious Concerns	NI	The proposed action would not limit access to any ceremonial use of Indian sacred sites, or adversely affect the physical integrity of any such site. During coordination and consultation with the American Indian Tribes that claim cultural affiliation to northern Arizona or southern Utah, no Native American religious concerns have been identified in relation to the proposed action or in the project area.
Threatened, Endangered or Candidate Plant Species	NI	<u>Button Allotment:</u> <i>Pediocactus sileri</i> occurs in two small populations in this allotment where the proposed project would occur. These populations occur approximately .5 miles and 1 mile to the west and north of the proposed pipeline extension and troughs. The pipeline would follow an existing road for portions of the route as shown in Appendix A to minimize new disturbance. The proposed pipeline and troughs would avoid these populations and therefore would not directly affect these plants. BLM has made significant efforts to conserve Siler pincushion cactus, including conducting numerous habitat surveys and documenting locations, refining the species range, and establishing long-term monitoring plots that continue to be monitored on a yearly basis.

Resource	Determination	Rationale for Determination
		Through yearly monitoring of these established plots BLM has determined that cattle have had minor impacts to the species, even those much closer to water than that proposed in this project. The pipeline route has been surveyed by the special status plants specialist and no cacti were found within the proposed pipeline route or proposed trough locations. It should also be noted that cattle already can access the area where improved livestock distribution is sought – the proposed project would simply ensure a reliable water source, not introduce grazing into an area where it has not previously occurred. The northern population of Siler pincushion cactus is located 1 mile north of the existing earthen reservoir in the pasture. Next to this reservoir are a trough and storage tank which are supplied with water from an existing windmill and pipeline whose water tested positive for sulfates. The proposed pipeline would simply supply a reliable, good quality water source to the existing water infrastructure at this location, not develop a new watering location. The southern population of Siler pincushion cactus is located approximately .6 miles west of an existing earthen reservoir whose reliability is lacking. A trough is proposed .87 miles northeast of the reservoir which would provide a more reliable water source to the pasture and pull cattle further away from the population. An additional trough is proposed in this same pasture but further southeast where there are no waters currently located. This trough would be located approximately 1.5 southeast of the population, and would also pull cattle further away.. The two trough placements are designed to provide reliable waters which would improve livestock distribution throughout the pasture with an emphasis on pulling cattle away from the Siler pincushion population. Long term monitoring of Siler pincushion cactus indicates that populations of this plant are influenced by timing and amount of precipitation received. It is therefore determined that the proposed pipeline extension and troughs, while present in the same pasture as the plant populations, would not affect this plant. There are no other ESA-listed plant species that occur in the project area.
Threatened, Endangered or Candidate Animal Species	NI	The proposed project area do not lie within any critical habitat that has been designated or proposed under the ESA. The California condor may occasionally fly over or feed in these allotments at any time of year. California condors are federally listed as endangered and a population of these condors was reintroduced on the Arizona Strip in 1996. This population is designated as experimental non-essential under Section 10(j) of the ESA.

Resource	Determination	Rationale for Determination
		Condors are strictly scavengers and prefer to eat large, dead animals such as mule deer, elk, pronghorn, bighorn sheep, cattle, and horses. Condors range widely, easily covering over 100 miles in a day, and their current range includes the entire Arizona Strip. Although condors may either fly over or feed within the allotments, they have not been observed doing so. In addition, stipulations (i.e., best management practices) are incorporated into the proposed action (concerning site clean-up and no harassment of wildlife) that would minimize the likelihood of impacts to condors. Thus, no effect to this species is expected from the proposed action. No suitable canyon habitat is present within the allotments for Mexican spotted owls, and none are known to nest in or near any of these allotments. No impacts on this species from the proposed action are therefore anticipated. No other federally listed animal species are known or suspected to occur in or near the project area.
Cultural Resources	NI	A BLM archaeologist conducted a Class III inventory of the proposed project area. No cultural resources were encountered within the proposed project area. If cultural resources are encountered during construction of the pipelines, routes would be altered to avoid impacting them. Cultural resources project files – BLM-010-2012-05; BLM-010-2015-41 and BLM-010-2018-13 – contain documentation of compliance with Section 106 of the National Historic Preservation Act. Construction and use of the proposed range facilities would not affect any known cultural resources. No indirect impacts to historic properties are expected because the project area is in gently rolling terrain with no potential for features that could be impacted by livestock (rock shelters, rock art or standing architecture). In addition, the project area, and the allotments in which it occurs, has been grazed for more than 150 years; during the period from approximately 1870 to 1934, hundreds of wild horses and thousands of sheep and cattle were allowed to indiscriminately graze and heavily use these areas. With passage of the Taylor Grazing Act (TGA) in 1934, livestock numbers and grazing areas (i.e., allotments) were first allocated and established. Current livestock numbers are substantially lower now than prior to passage of TGA. The proposed project would not open up “new areas” to livestock use, but rather would distribute cattle more evenly across the various pastures for more uniform utilization. In the event that significant cultural resources are found to be adversely impacted due to construction and use of the proposed range facilities, preventative and mitigation measures would be determined on a site-specific basis, and then implemented.
Invasive, Non-native Species	NI	The invasive annual grass, <i>Bromus tectorum</i>, is common throughout the region. Cheatgrass is not on the Arizona or Utah Noxious Weed list. However it can be a very invasive non-native grass species. Proper range practices can help prevent the spread of undesirable plant species

Resource	Determination	Rationale for Determination
		(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 these allotments – see discussion on rangeland health in Section 3.3.1.1 of this EA) should minimize or have no effect on the spread of cheatgrass and other invasive non-native species. <u>Eightmile Gap Allotment:</u> There are no known populations of noxious weeds within this allotment. <u>Eightmile Pass Allotment:</u> There are no known populations of noxious weeds within this allotment. <u>Button Allotment:</u> There are several known small populations of Scotch thistle on the Button Allotment. There are also several small and single plant populations that were located in 2015 along the Winter Road in gulleys and washes. These populations will continue to be monitored and treated as necessary. None of the populations are directly within the pipeline route. <u>Chatterly Allotment:</u> There are known populations of Scotch thistle, Whitetop and Russian knapweed located on the allotment. The Whitetop is not directly within the pipeline route. However, the knapweed and Scotch thistle is located within the route right next to an existing pipeline, trough and reservoir. The populations have been there for a long time and are continually monitored and treated yearly. These populations are mainly located near the mouth of the reservoir where there is more moisture during spring and early summer. If approved, these infestations would be treated prior to seeding out and pipeline installation. In addition, any equipment would be cleaned prior to and following installation. <u>Muggins flat:</u> There are known populations of Russian knapweed and Scotch thistle within the area surrounding Johnson reservoir. These populations are treated and monitored yearly.

Resource	Determination	Rationale for Determination
		<u>Summary:</u> We recognize that many things including livestock can be a vector to spreading noxious weeds. However, through compliance inspections, utilization monitoring, long-term trend monitoring, site visits, cooperative weed management days, and discussions with permittees, we detect and treat any new infestations while treating existing infestations. It is important to note that cattle already can access the areas where improved livestock distribution is sought – the proposed project would distribute cattle more evenly across each subject pasture for more uniform utilization, rather than allow livestock grazing to occur in “new areas” which have never been before available to livestock use. No impacts from the proposed action are therefore anticipated.
Wastes (hazardous or solid)	NP	Measures to prevent the spillage of hazardous materials have been built into the proposed action (see Section 2.1.1). No hazardous materials issues are therefore anticipated.
Water Quality (drinking / ground)	NI	The proposed pipelines would carry water from wells to livestock/wildlife drinking troughs. This water would not be used for human consumption. The water source is already developed and actions proposed in this EA would not alter the current situation, and therefore would not affect water quality.
Wetlands / Riparian Zones	NP	There are no wetlands/riparian zones in or near the project area.
Wild and Scenic Rivers	NP	There are no river segments within the project area that are designated, eligible, or suitable as wild, scenic, or recreational under the Wild and Scenic Rivers Act.
Wilderness	NP	The proposed project is not located within designated wilderness.
Livestock Grazing	PI	The purpose of the proposed water developments is to provide more reliable waters in the affected pastures/allotments, and to provide water that is clean and non-lethal, which would result in more uniform distribution of livestock and utilization of forage throughout all the allotments involved in this project. This issue is therefore analyzed in detail in this EA.
Woodland / Forestry	NI	The proposed pipeline routes would avoid trees wherever possible, so alteration of the forest structure would not occur, other than potential removal of a few individual trees. The proposed action would therefore not affect the availability of, or access to, these resources.
Vegetation	PI	Impacts to vegetation along the route of the proposed pipelines would occur during installation. Some brush would be crushed as vehicles travel along the route and some plants would be torn up by the ripper tooth as the pipe is placed in the ground. This issue is therefore analyzed in detail in this EA.
BLM or State Sensitive Plant Species	NI	There are no known populations of BLM or State sensitive plant species within the project area. The proposed action would therefore not affect this resource.

Resource	Determination	Rationale for Determination
Wildlife (including sensitive species and migratory birds)	PI	Short term disturbance to wildlife could occur during construction and maintenance activities caused by noise, presence of humans, impacts to vegetation causing the loss of food and shelter to small rodent and reptile populations, and destruction of burrows caused by the installation of the pipelines. This issue is therefore analyzed in detail in this EA.
Soil Resources	NI	Passage of rubber tires and cleats from the crawler tractor could cause some soil compaction in the short term. However, since construction activities would be limited to periods when the soil is dry, soil compaction in the project area is not anticipated to occur. The ripper tooth would loosen soil along the route of the pipelines for a width of four inches to two feet. After one or two years the original vegetation should be regrown, which would protect soils from erosion.
Recreation	NI	Disturbance to the recreating public (including displacement of users) is unlikely as this area is not a popular destination for tourists or the recreating public.
Visual Resources	NI	The proposed project area is mostly within Visual Resource Management Class 3 with some Class 2 around the Dominguez-Escalante Historic Trails and some Class 4 near the Navajo McCullough powerline. The objective of Class 3 is to partially retain the existing character of the landscape with now more than moderate changes to the landscape. Management activities may attract attention but should not dominate the view of the casual observer. The objective of Class 2 is to retain the existing character of the landscape. Management activities may be seen but should not attract attention of the observer. The objective of Class 4 is to provide for activities that require major modification of the landscape. Once the proposed project is completed the pipeline routes would be visible due to the removal of vegetation. This is short-term until vegetation becomes re-established. Since the waterline is being buried the project should easily meet the objectives of Class 2, 3 and 4.
Geology / Mineral Resources / Energy Production	NI	The proposed action would not affect geology, mineral resources, or energy production as it would not close any areas to mineral development or alter any known geological feature.
Paleontology	NP	No paleontological resources are known to occur in the project area.
Lands / Access	NI	The proposed project would intersect with the Navajo-McCullough Power line, AZA-004606. Notification to the grant holder will be required. Access to public lands would not be altered or impaired by implementation of the proposed action. No other lands issues have been identified in connection with the proposed action.
Fuels / Fire Management	NI	No hazardous fuel reduction or fuels management projects are proposed for the area. Installation of the pipelines would not affect fire and fuels management.

Resource	Determination	Rationale for Determination
Socio-economic Values	NI	The economic base of the Arizona Strip is mainly ranching with a few gypsum/selenite and uranium mines. Nearby communities are supported by tourism (including outdoor recreation), construction, mining activities, and light industry. The social aspect involves remote, unpopulated settings with moderate to high opportunities for solitude. Construction of the proposed water developments would have little impact on the local economy or social aspect of the region since there would be no displacements or disruption to established businesses or uses of the area. Two or three people could receive short-term employment to install the pipelines. However, the proposed action would not affect the economy overall.
Wild Horses and Burros	NP	The proposed project area is not within a wild horse or burro herd management areas, and no wild horses or burros occur within any of the allotments addressed in this EA.
Wilderness characteristics	NP	The proposed project area is not located within any area containing the three wilderness characteristics of naturalness, opportunities for solitude, or outstanding opportunities for primitive and unconfined recreation, or within any area managed to maintain these wilderness characteristics.

3.3 Resources Brought Forward for Analysis

3.3.1 Vegetation

The proposed project, in the Eight Mile Gap, Eight Mile Pass, Button, Chatterly and Muggins Flat allotments is located within the Great Basin Ecological Zone (Sagebrush Communities). Vegetation in sagebrush communities of this ecological zone consists of shrub dominated communities, primarily Wyoming big sagebrush (although some scattered pinyon pine and juniper trees can also be present). A thriving community of native grasses and forbs occur within this zone as well, including galleta, Indian ricegrass, needle and thread, squirreltail and globemallow.

3.3.1.1 Land Health Evaluations

As previously described in Section 1.2 of this EA, land health evaluations have been completed for each of the allotments included in this EA analysis. Although the land health evaluations for the Eight Mile Gap and Eight Mile Pass allotments (managed by the Kanab Field Office) are complete, there is no determination statement for the evaluation report. The report did however acknowledge that the Eight Mile Gap Allotment was in late seral ecological condition (good). The Eight Mile Pass Allotment rated 40 acres late seral ecological condition (good) and the remaining acres as mid seral ecological condition (fair). Table 3.2 summarizes the land health evaluation determination recommended by the interdisciplinary assessment team for these allotments.

Table 3.2. Land Health Evaluation Determination

Allotment Name	Allot. #	Recommended Determination
Eight Mile Gap (UT)	24035	No determination
Eight Mile Pass (AZ)	5304	No determination
Button (AZ)	5308	Making significant progress toward meeting applicable standards for rangeland health.
Chatterly	5307	Meet all applicable standards for rangeland health
Muggins flat	5313	Meet all applicable standards for rangeland health

Button Allotment

The land health evaluation for this allotment was signed on May 19, 2006. It was recommended by the interdisciplinary assessment team that the allotment was making significant progress toward meeting the applicable standards for rangeland health – the causal factor for not meeting desired resource conditions at these sites was due to the high composition of sagebrush and corresponding low composition of herbaceous species. Long-term trend monitoring in conjunction with composition and utilization monitoring conducted since the evaluation document was signed reconfirm the 2005 land health evaluation determination.

Chatterly

The land health assessment for this allotment was completed in September 20, 2007 and was found to meet all applicable standards for rangeland health.

Muggins Flat

The land health assessment for this allotment was completed in June 24, 2005 and was found to meet all applicable standards for rangeland health.

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

Wildlife populations in the project area are typical of the Colorado Plateau Grassland and Shadscale/Saltbush Shrubland communities.

3.3.2.1 Big Game Species

Mule Deer (*Odocoileus hemionus*)

Mule deer can be found throughout most of the Arizona Strip. Concentrations occur on Black Rock and Poverty Mountains, on Mt. Trumbull, in the Buckskin Mountains, and in the Kanab Creek area. Typical mule deer habitat is rough, steep canyons sparsely vegetated with brushy pockets that carve their way down through open grasslands. Mule deer often bed in juniper thickets or other shrubby areas.

AGFD has categorized habitat characteristics for mule deer within the state. Habitat categories are based on several factors such as topography, forage and cover, availability of water, and limiting factors such as prohibitive fencing. The project area is located within the “Winter Crucial” habitat category. AGFD considers the mule deer population across the Arizona Strip to be stable and increasing.

Water sources can have a major influence on the distribution and movements of deer in semi-arid environments (Watkins et al. 2007), particularly in summer (Rosenstock et al. 2004). During summer, does are often distributed closer to water than bucks, presumably because of their increased need for water during lactation (Boroski & Mossman 1996). Water developments appear to increase mule deer populations (deVos & Clarkson 1990). Thus, numerous waters have been developed to improve mule deer distribution across the landscape and to sustain healthy populations.

Pronghorn (*Antilocapra americana*)

Pronghorn were historically present on the Arizona Strip but were extirpated in the late 1800s. The BLM and the AGFD began reintroduction efforts in 1961 resulting in a current population estimate of approximately 425 individuals across the Arizona Strip. Since reintroduction, pronghorn populations have been cyclic – their numbers have increased and decreased in a direct relationship to precipitation. During periods of drought, poor fawn survival results in low recruitment; conversely, during normal to above normal precipitation years, fawn survival and recruitment increase.

Pronghorn habitat in the project area consists primarily of grassland communities with areas of saltbush, sagebrush, and scattered juniper. Pronghorn habitat on the Arizona Strip is rated by quality from unsuitable to high (Ockenfels et al. 1996). Habitat quality in the project area is rated as “Low” to “Moderate”.

3.3.2.2 Migratory Birds

The Migratory Bird Treaty Act of 1918 protects against the take of migratory birds, their nests, and eggs, except as permitted. An MOU between the BLM and USFWS states that the BLM shall: “At the project level, evaluate the effects of the BLM’s actions on migratory birds during the NEPA process, if any, and identify where take reasonably attributable to agency actions may have a measurable negative effect on migratory bird populations, focusing first on species of concern, priority habitats, and key risk factors. In such situations, BLM will implement approaches lessening such take.” (BLM & USFWS 2010)

The USFWS is mandated to identify species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under the Endangered Species Act. The USFWS *Birds of Conservation Concern 2008* (USFWS 2008) is the most recent effort to carry out this mandate. Bird species considered for the Birds of Conservation Concern include nongame birds, gamebirds without hunting seasons, subsistence-hunted nongame birds in Alaska, ESA candidate, proposed, and recently delisted

species. Birds of Conservation Concern found on the Arizona Strip within the habitat type of the project area are summarized in Table 3.3.

Table 3.3 USFWS Birds of Conservation Concern Found in the Project Area.

Species	Habitat Type in the Project Area
Ferruginous Hawk	Open grassland or shrubland with isolated trees (typically juniper) for nesting. (<i>BLM Sensitive, see section 3.2.2.3</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 3.2.2.3</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 3.2.2.3</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.
Burrowing Owl	Sparsely vegetated grassland or shrubland with existing burrows excavated by badgers, rabbits, or ground squirrels. (<i>BLM Sensitive, see section 3.2.2.3</i>)
Bendire's Thrasher	Favors open habitat with scattered junipers, cliffrose, and sagebrush. An uncommon breeder on the Arizona Strip.
Brewer's Sparrow	Breeds in sagebrush shrublands, but can be found in a variety of open habitats and riparian areas during migration and winter. Typically only nests on the Arizona Strip during years of high precipitation, otherwise breeding occurs to the north. Fairly common in large migrating flocks in spring and fall, otherwise uncommon on the Arizona Strip.
Cassin's Finch	Small flocks sporadically occur in higher-elevation pinyon-juniper woodlands during the non-breeding season. Found in higher elevation habitat types such as ponderosa pine during the breeding season. Uncommon on the Arizona Strip.

3.3.2.3 Sensitive Species

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

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

All federally-designated candidate species, proposed species, and delisted species in the 5 years following delisting are included as BLM sensitive species. Based on occurrence records and

monitoring data, the sensitive species that may occur within the project area and that may be affected by actions proposed in one of the alternatives presented in Chapter 2 are displayed in Table 3.4.

Table 3.4

Species	Potential for Occurrence
Allen's Big-eared Bat (<i>Idionycteris phyllotis</i>)	May Occur
Townsend's Big-eared Bat (<i>Corynorhinus townsendii</i>)	May Occur
Spotted Bat (<i>Euderma maculatum</i>)	May Occur

Additional sensitive species may also occur within the project area. However, it has been determined by BLM wildlife biologists that these species would not be affected by actions proposed in this EA. These species are therefore not addressed further in this document. Table 3.5 lists the sensitive species that will not be discussed in further detail, along with the rationale for their exclusion from further analysis. Additionally, impacts to sensitive species found outside the project area were not analyzed.

Table 3.5

Species	Rationale for Excluding from Further Analysis
Greater Western Mastiff Bat (<i>Eumops perotis californicus</i>)	The largest bat occurring in the United States. Found in desert scrub near cliffs, preferring rugged rocky canyons with abundant crevices. Colonies prefer crevices to ten or more feet. These bats prefer to wedge themselves in the backs of cracks or crevices where they narrow down considerably. Because its wing structure is adapted for fast and straight-line flight, it is unable to drink from water sources less than 100 feet long, such as the proposed livestock troughs.
California Leaf-nosed Bat (<i>Macrotus Californicus</i>)	This species typically occurs mostly in Sonoran desert scrub at elevations between 160–3,980 feet. Primarily roosts in mines, caves, and rock shelters. Prefer roost sites with a large ceiling area and flying space. Unlikely to occur - vegetation in the project area is not similar to those areas where this species is typically found and the project area is above the known elevational range of this species.
Arizona Myotis (<i>Myotis occultus</i>)	Found near water in ponderosa pine and oak-pine woodlands habitat, and in desert areas with riparian forests or permanent water. Most commonly occurs at 6,000–9,200 feet but has been found at 150–1,000 feet. Unlikely to occur - vegetation in the project area is not similar to those areas where this species occurs; this species is typically found near water along the Mogollon Rim from Flagstaff to the New Mexico border.

Cave Myotis (<i>Myotis velifer</i>)	Typically found in desert scrub vegetation with creosote, brittlebush, palo verde and cacti. Roosts in caves, tunnels, and mine shafts, and under bridges within a few miles of water. Primarily occurs south of the Mogollon Plateau between 300 to 5,000 feet. Feeds on small moths, weevils, antlions and small beetles. Unlikely to occur - vegetation in the project area is not similar to those areas where this species is typically found.
House Rock Valley Chisel-toothed Kangaroo Rat (<i>Dipodomys microps leucotis</i>)	This species is endemic to the House Rock Valley on the eastern side of the Arizona Strip and is not present in the project area.
American Peregrine Falcon (<i>Falco peregrinus</i>)	No nesting sites would be impacted by construction activities and no potential nest sites would be altered by the proposed action. Habitat for peregrine falcon prey species would not be altered. Prey species may benefit from additional water sources, but corresponding positive impacts to peregrine falcons would be immeasurable.
Golden Eagle (<i>Aquila chrysaetos</i>)	No nesting sites would be impacted by construction activities and no potential nest sites would be altered by the proposed action. Prey species may benefit from additional water sources, but corresponding positive impacts to golden eagles would be immeasurable.
Ferruginous Hawk (<i>Buteo regalis</i>)	No nesting sites would be impacted by construction activities and no potential nest sites would be altered by the proposed action. Prey species may benefit from additional water sources, but corresponding positive impacts to ferruginous hawks would be immeasurable.
Western Burrowing Owl (<i>Athene cunicularia hypugea</i>)	No nest sites are located in the project area. Habitat for burrowing owl prey species would not be altered by the proposed action.
Pinyon Jay (<i>Gymnorhinus cyanocephalus</i>)	No habitat alteration in pinyon-juniper overstory is proposed and pinyon pine seed crops would not be impacted. Pinyon jays have been documented using artificial water sources on the Arizona Strip.
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 forests. Their nest sites are typically located on north-facing slopes with canopy cover of 50% or greater (Reynolds et al. 1992).
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.
Bald Eagle (<i>Haliaeetus leucocephalus</i>)	Bald eagles may be found in the project area during the winter months. Carrion and easily scavenged prey items provide important sources of winter food in terrestrial habitats that are away from open water, such as the existing catchment locations. The proposed action would have no impact on food sources. No nests are located on the Arizona Strip and nesting habitat (large trees near water) is extremely limited.
Native Fish (5 species)	These species are restricted to the Virgin River, Paria River, and Kanab Creek and do not occur within the project area.
Spring Snails (4 species)	These species are restricted to very small ranges and do not known to occur in or near the project area.

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

Allen's big-eared bats usually inhabit forested areas of the mountainous southwest and are relatively common in pine-oak forested canyons and coniferous forests; however, they also may occur in non-forested, arid habitats. At most sites where this species occurs, cliffs, outcroppings, boulder piles, or lava flows are found nearby. Day roosts may include rock shelters, caves, trees and mines. Seasonal movements and winter whereabouts and activities are unknown (Best et al. 2007). Their elevational distribution ranges from 1,320 to 9,800 feet, and their main food source is small moths gleaned from surfaces or in flight (AGFD 2001). This bat is known to use stock ponds as water and food sources (Herder 1996). Allen's big-eared bats have been captured at 10 mist-net locations on the Arizona Strip.

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

The Townsend's big-eared bat uses a variety of habitats, almost always near caves or other roosting areas. It can be found in pine forests and arid desert scrub habitats. When roosting it does not tuck itself into cracks and crevices, like many bat species do, but prefers large open areas. It specializes in eating moths and other insects such as beetles, flies and wasps (Arizona-Sonora Desert Museum 2011). In Arizona, summer day roosts are found in caves and mines from desertscrub up to woodlands and coniferous forests. Night roosts may often be in abandoned buildings. In winter, they hibernate in cold caves, lava tubes and mines mostly in uplands and mountains from the vicinity of the Grand Canyon to the southeastern part of the state (AGFD 2003b). These bats prefer to hang from open ceilings in caves or mines and do not use crevices.

Townsend's big-eared bats have been captured at 28 mist-net locations on the Arizona Strip and have been recorded by acoustic monitoring stations on the Paria Plateau.

Spotted Bat (*Euderma maculatum*)

Spotted bats have been found from low desert in southwestern Arizona to high desert and riparian habitats in northwestern Arizona and Utah to conifer forests in northern Arizona and other western states. They are found in desert scrub, riparian, pinyon-juniper, and montane coniferous forests at elevations up to 8,670 feet. They roost in small cracks found in cliffs and stony outcrops. These bats forage on large flying insects, primarily moths (AGFD 2003a). Spotted bats have been captured at 11 mist-net locations on the Arizona Strip.

3.3.3 Livestock Grazing

The proposed project area is within the Arizona Strip and Kanab Field Offices and consists of the Eight Mile Gap, Eight Mile Pass Button, Chatterly and Muggins flat grazing allotments. Table 3.6 lists the season of use and allowable stocking rate for each of these allotments.

Table 3.6 Allotment Seasons of Use and Stocking Rates

Allotment Name	Allot. #	Season of Use	Active AUMs	Permitted Use Livestock #s	Grazing System
Eight Mile Gap (UT)	24035	12/1-04/30 (Winter/Spring)	15	3 cows	One pasture no grazing system
Eight Mile Pass (AZ)	05304	4/27-5/20 (spring)	17	21 cows	One pasture no grazing system
Button	05308	Seasonal (Winter/Spring) 11/15-05/31	278	54 cows	Three pasture deferred
Chatterly	05307	Seasonal (Winter/Spring) 11/1-05/31	323	55 cows	Three pasture deferred
Muggins flat	05313	Seasonal (Winter/Spring) 12/1-03/31	305	88 horses	Four pasture deferred

Eight Mile Gap Allotment

This allotment contains a single pasture; it is used seasonally in the winter/early spring. The area being grazed is rested from May 1 to November 30 of each year. This system allows both cool and warm season plants to grow (to replenish root reserves and increase plant vigor) and set seed every season.

As described in Section 1.2 of this EA, the only water source currently within the allotment is one earthen reservoir. This earthen reservoir does not guarantee reliable water on an annual basis due to the unreliability of scattered summer rainfall events and capabilities of reservoir storage. Although Johnson Wash runs through the allotment, it is an ephemeral wash and is not a reliable water source.

Eight Mile Pass Allotment

This allotment contains a single pasture; it is used seasonally in the spring. It is currently grazed from April 27 to May 20. The cattle are then transferred to summer and winter range in Utah and the Kaibab National Forest from May 20 to April 27 of the next year. By using this system, the allotment is rested through the summer growing season every year (which benefits warm season grasses) and allows new seedlings to become established and provides time for plants to build carbohydrate reserves and recover vigor before being grazed again.

As described in Section 1.2 of this EA, the only water source currently within the allotment is Johnson Wash which is ephemeral and is not a reliable water source for livestock and wildlife.

Button Allotment

This allotment uses a three pasture “deferred rest rotation system”. A fourth not included in the rotation system is a private pasture that is used as a gathering and shipping pasture. This allows for flexibility while taking into consideration which pastures need deferment or rest based on past use (timing, intensity and duration) and vegetative response to seasonal precipitation patterns (timing, duration, amount and widespread vs. isolated storms). The rotation grazing system

allows pastures to be rested at different times every year.

The main sources of water, since the wells were found to contain high sulfates, on the Button Allotment are provided by large earthen ponds or reservoirs built along dry or ephemeral washes or drainages throughout the allotment. Although many of these ponds are strategically located throughout pastures for good distribution of livestock, it does not guarantee reliable water on an annual basis due to the unreliability of scattered summer rainfall events and capabilities of reservoir storage. This makes it difficult for the permittee and the BLM to best plan and adhere to this grazing system and can result in uneven distribution of livestock across the allotment.

Chatterly Allotment

This allotment uses a three pasture “deferred rest rotation system”. This allows for flexibility while taking into consideration which pastures need deferment or rest based on past use (timing, intensity and duration) and vegetative response to seasonal precipitation patterns (timing, duration, amount and widespread vs. isolated storms). The rotation grazing system allows pastures to be rested at different times every year.

The main sources of water, since the wells were found to contain high sulfates, on the Chatterly Allotment are provided by large earthen ponds or reservoirs built along dry or ephemeral washes or drainages throughout the allotment. Although many of these ponds are strategically located throughout pastures for good distribution of livestock, it does not guarantee reliable water on an annual basis due to the unreliability of scattered summer rainfall events and capabilities of reservoir storage. This makes it difficult for the permittee and the BLM to best plan and adhere to this grazing system and can result in uneven distribution of livestock across the allotment.

Muggins Flat Allotment

This allotment uses a four pasture “deferred rest rotation system”. This allows for flexibility while taking into consideration which pastures need deferment or rest based on past use (timing, intensity and duration) and vegetative response to seasonal precipitation patterns (timing, duration, amount and widespread vs. isolated storms). The rotation grazing system allows pastures to be rested at different times every year.

The main sources of water, since the wells were found to contain high sulfates, on the Muggins Flat Allotment are provided by large earthen ponds or reservoirs built along dry or ephemeral washes or drainages throughout the allotment. Although many of these ponds are strategically located throughout pastures for good distribution of livestock, it does not guarantee reliable water on an annual basis due to the unreliability of scattered summer rainfall events and capabilities of reservoir storage. This makes it difficult for the permittee and the BLM to best plan and adhere to this grazing system and can result in uneven distribution of livestock across the allotment.

Chapter 4

ENVIRONMENTAL CONSEQUENCES

The potential consequences or effects of each alternative are discussed in this chapter. Only impacts that may result from implementing the alternatives are described in this EA. If an ecological component is not discussed, it is because BLM resource specialists have considered effects to the component and found the proposed action would have minimal or no effects (see Table 3.1). The intent of this analysis is to provide the scientific and analytical basis for the environmental consequences.

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

4.1 VEGETATION

4.1.1 Impacts of Alternative A – Proposed Action

Table 4.1 shows the total number of acres of short-term disturbance per allotment under this alternative.

Table 4.1 Acres of short-term disturbance

Allotment Name	Acres Disturbed*	Percent of Allotment
Eight Mile Gap	.90 (.80 of .90 previously disturbed, i.e. follows road)	.002
Eight Mile Pass	1.4 (1.30 of 1.40 previously disturbed, i.e. follows road)	.004
Button	10.36 (2.90 of 10.36 previously disturbed, i.e. follows road)	.18
Chatterly	8.4 (7.9 of 8.4 previously disturbed, i.e. follows road)	.17
Muggins flat	1.4 (1.4 of 1.4 previously disturbed, i.e. follows road)	.01
Total Acres Disturbed	22.46 (14.3 of 22.46 previously disturbed, i.e. follows road)	

* Calculated for the pipeline portion of the proposed action, as troughs and tank placement are next to roads or at existing earthen reservoirs where ground disturbance has already occurred.

A crawler tractor with ripper tooth attached and lowered into the ground would be driven across the pipeline route in order to loosen the soil and allow for the pipe to be more easily installed as the tractor makes a second pass over the route to install the pipeline. Under the best management practices described in Section 2.1.1 of this EA, construction activities would be limited to periods when the soil and ground surface are not wet in order to avoid soil compaction. This would minimize the potential for any soil compaction to occur. In addition, actual disturbance would only occur in the path of the dozer tracks and a 12 to 16-inch point of impact from the ripper tooth. Due to the small impact area and the presence of existing perennial vegetation (forbs, grasses and shrubs), the need for rehabilitation (i.e. reseeding) was not deemed necessary. Crushed vegetation would respond and recover quickly, as would re-establishment with perennial vegetation in the disturbed areas, a result of existing seed sources nearby. All of these factors would thus facilitate perennial vegetative recovery and response in disturbed areas.

Troughs placed along this pipeline would be constructed using heavy equipment sized tires and secured to the proposed location using concrete. Vegetation in the small 10 foot diameter of trough placement would be lost. One storage tank would be placed at a strategic location along the Chatterly line. A ¼ acre area would be disturbed and lost.

Plants live in ecosystems full of herbivores that range from small insects to large grazing animals. Losing leaves or stems to herbivores is a common event in the life of a rangeland plant. For rangeland plants to remain healthy and productive, enough vegetation must remain after grazing so that plants can photosynthesize and manufacture energy to produce more leaves, stems, and seeds. Plants also need to produce and store energy such as starches and sugars in roots and crowns to successfully start the next season of growth. Only when too much of the plant is removed does the plant suffer in a way that yields lasting detrimental effects. Substantial damage to rangeland plants generally only occurs under repeated and heavy grazing (University of Idaho 2011).

Livestock can directly affect vegetation by reducing plant vigor, decreasing or eliminating desirable forage species, increasing soil instability and erosion, reducing water quantity and quality, and causing loss of, or injury to, individual plants from trampling, particularly near water developments. Long-term changes in vegetation may result if livestock use consistently exceeds established allocations. 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 Utah and Arizona Standards for Rangeland Health and Guidelines for Livestock Grazing Management.

Range plants evolved to withstand grazing and can withstand a heavy grazing event if done in the right season and if plants are given enough time to recover after grazing. Thus, plants can withstand removal of a part of their current year's growth and still achieve normal growth the following year. Most rangeland grasses and forbs can have 40-50% of their leaves and stems removed every year and still remain healthy and productive. In general, light use is considered less than 40%, moderate 40-65%, and heavy greater than 65% of biomass removed.

Eight Mile Gap and Eight Mile Pass Allotments each have a single pasture with a specific season of use while the Button, Chatterly and Muggins Flat Allotments utilizes a deferred rest rotation system, which allows for periodic rest of each pasture to increase plant vigor and thus minimize adverse effects to vegetation. However, the “success” of the grazing systems relies on the presence of reliable water sources – water must be present in and across each pasture in order for a system to be fully implemented. The proposed action would result in more reliable water sources in each of the subject allotments, and therefore benefit vegetation throughout each allotment as described above.

We acknowledge that high use would occur on vegetation near troughs; however, the scope of these impacts would be limited because the new troughs would be either located at existing reservoirs or along existing roads, and the majority of the proposed pipeline locations would also be where disturbance to vegetation has already occurred. The high use near waters would be offset by better distribution of livestock grazing particularly in the Button and Chatterly Allotments and also provide a reliable safe source for the allotments from the proposed projects. Overall utilization would be more uniform throughout the pastures and would not exceed 50%. This more uniform distribution and utilization would allow the vegetation in the pastures to maintain at or better progress toward its natural potential by increasing plant diversity and vigor. Thus, ecological status of these allotments would be maintained and/or improved. In addition, in order to minimize public use of the proposed pipelines as new roads, all efforts to conceal any pipeline route that leaves an existing road would be made. Concealment would include placement of natural materials to create barriers and mask the pipeline route so that it does not become a new public road. Allotment inspections would include monitoring of the pipeline routes to determine if public use is occurring, and therefore if additional mitigation is required. Travel along the pipeline route should only occur during the annual inspection of the pipeline, allowing vegetation to re-establish once construction is complete.

4.1.2 Impacts of Alternative B – No Action

Under this alternative, no pipeline or troughs would be installed, so the acreages listed in Table 4.1 would receive no additional impacts. No vegetation would be crushed or trampled by rubber tires from trucks or cleats from tractors, and no vegetation would be uprooted by the ripper tooth from pipeline installation. However, the overall condition of vegetation particularly in the Button, and Chatterly Allotment may not improve, or may not improve as quickly, since the same livestock distribution and patterns would persist that currently exist. Additionally, Eight Mile Gap, Eight Mile Pass and Muggins flat Allotments would not have reliable safe sources of water. These impacts would not be offset by better distribution by livestock, and the associated more uniform utilization in each allotment from the water developments proposed in Alternative A. This would not allow the vegetation in each subject pasture to better progress toward its natural potential. Thus, ecological status for these pastures would remain the same, or would progress more slowly. Permittees in the Eight Mile Gap, Eight Mile Pass, Button, and Chatterly Allotments would not have reliable and/or safe waters to utilize.

4.2 WILDLIFE, INCLUDING MULE DEER, PRONGHORN, MIGRATORY BIRDS, AND SENSITIVE SPECIES

4.2.1 Impacts of Alternative A – Proposed Action

Wildlife populations in general and mule deer, pronghorn, and migratory birds in particular depend on reliable water sources. When ambient temperatures are high, survival and productivity of wildlife could be adversely affected by a lack of water. In semi-arid regions such as the project area, water can be beneficial in combination with adequate foraging areas (Rosenstock et. al.1999). Wildlife will traditionally use man-made water sources during the hottest, driest months of the year when natural water sources may dry up. These proposed waters would be available for wildlife yearlong. Short-term disturbance to wildlife could occur during construction and maintenance activities caused by noise, presence of humans, impacts to vegetation causing the loss of food and shelter to small rodent and reptile populations, and destruction of burrows caused by the installation of the pipelines.

4.2.1.1 Big Game Species

Mule Deer

Construction activities would result in some short-term disturbance to habitat (see acres of disturbance per allotment listed in Table 4.1). After construction is completed, the area of long-term disturbance would be minimal. The proposed improvements have been designed to minimize impacts to vegetation by restricting construction activities to the 15-foot wide route. This is a negligible loss of habitat, compared with the relative amount of habitat available in the surrounding landscape. In addition, there would not be any conflicts with livestock for forage as sufficient forage for mule deer would be provided by ensuring that utilization limits (of no more than 50% of current year's growth) are not exceeded (see discussion on impacts to vegetation in Section 4.1.1).

The proposed new water sources would meet the objectives stated in the *Arizona Strip Interdisciplinary Mule deer Management Plan 2015-2019* (AGFD and BLM 2015) pertaining to water availability and distribution (i.e., yearlong water availability and distribution in this part of Unit 12B would be indreased). In addition, any fences constructed around the waters would be built to AGFD wildlife specifications in order to ensure safe passage by mule deer and other wildlife species. While there would be more impact to vegetation (i.e., habitat) close to water, the scope of these impacts would be limited because the majority of new troughs would either be located at existing reservoirs or along existing roads, and the majority of the proposed pipeline locations would also be along existing roads, where disturbance to vegetation has already occurred. (See Section 4.1.1 for more detailed discussion on impacts to vegetation from the proposed action.) The grazing management system identified for each allotment would continue to be followed, and with more reliable waters within each affected pasture, more uniform distribution and utilization would occur across the pasture, thus reducing long-term effects close to each water.

Mule deer would likely avoid the construction areas and be temporarily displaced during work periods. Construction activities and human presence would result in a localized and temporary increase in noise that would likely cause mule deer to temporarily avoid the vicinity. Although deer would temporarily be displaced, once the pipelines are completed and troughs are installed, the availability of water would be improved and made available yearlong, which would improve distribution and use in the area. The long-term benefits of four additional consistent water sources for mule deer would outweigh any short-term adverse impacts that could result from construction.

Pronghorn

Impacts to pronghorn would be similar to those described for mule deer. Pronghorn would likely avoid the construction areas and be temporarily displaced during work periods. Construction activities and human presence would result in a localized and temporary increase in noise that would likely cause pronghorn to temporarily avoid the vicinity. Although pronghorn would be temporarily displaced once the pipelines are completed and troughs are installed, the availability of water would be improved (including being available year-long). This would be particularly beneficial to does during fawning and lactation periods when physiological stresses are greatest. In addition, the long-term benefits of four additional consistent water sources for pronghorn would outweigh any short-term adverse impacts that could result from construction.

4.2.1.2 Migratory Birds

Migratory birds would likely avoid the construction areas and be temporarily displaced during work periods. Construction activities and human presence would result in a localized and temporary increase in noise that would likely cause migratory birds to temporarily avoid the vicinity. If construction occurs in early spring, short-term impacts to migratory birds could impact individual birds that arrive early to breeding sites and could lead to abandonment of early breeding and/or nesting attempts. Equipment associated with construction may also generally affect migratory birds as a result of noise. The increased noise and construction activity would occur only in the short term. In the long-term, occasional maintenance would have a negligible impact to migratory birds since these activities would only be occasional and intermittent.

Impacts to migratory birds would be minimized by implementing the best management practices listed in Section 2.1.1. (i.e., measures would be taken to protect active bird nests and activities would be limited to daylight hours). Additionally, by minimizing disturbance to vegetation, migratory birds would have access to the vegetation for cover and as an area to forage once construction is complete.

Upon completion of each proposed water development, migratory birds would benefit in the long-term by having reliable water sources for drinking and bathing. Wildlife escape ramps would be secured in each trough before it is filled.

4.2.1.3 Sensitive Species

Allen's Big-eared Bat, Townsend's Big-Eared Bat, and Spotted Bat

Habitat for these bat species would not be impacted because none of the proposed project sites contain suitable roosting habitat such as rock shelters, caves, mines, or cliff crevices. Disturbance from construction activities would not impact foraging because work would be conducted during daylight hours.

The installation of four water troughs on BLM land in the project area could enhance the foraging efforts of these species by providing sources of drinking water (Taylor & Tuttle 2007). These troughs would be placed at an adequate distance from fence lines to provide a clear flight path for bats to utilize these water sources. The proposed water troughs could also benefit these bat species by a localized increase in the amount of insects near these water sources.

4.2.2 Impacts of Alternative B – No Action

4.2.2.1 Big Game Species

Mule Deer and Pronghorn

Under this alternative, no construction activities would occur. Therefore, there would be no disturbances including noise or human presence to disrupt these species, and no disturbance to vegetation resulting from installation of the range improvements. No additional water sources would be constructed. Mule deer and pronghorn would not benefit by increased water distribution within the allotments/pastures from the proposed water projects.

4.2.2.2 Migratory Birds

Under this alternative, no construction activities and, therefore, no additional ground disturbance would occur. Opportunities for migratory birds to forage, migrate, or breed would not be adversely impacted because no construction activities, including noise or human presence, and associated ground disturbance would occur. However, no additional water sources for wildlife (including migratory birds) would be constructed. Thus, these species would not benefit by improved water availability and distribution from the proposed water project.

4.2.2.3 Sensitive Species

Allen's Big-eared Bat, Townsend's Big-Eared Bat, and Spotted Bat

No additional water troughs would be installed to enhance the foraging habitat of these species. Lack of available water in the area (when livestock ponds go dry during periods of drought) could limit availability of prey in localized areas since their main food source are moths and other insects that congregate around water.

4.3 LIVESTOCK GRAZING

4.3.1 Impacts of Alternative A – Proposed Action

Implementation of the proposed action would result in more uniform distribution of cattle within the subject allotments (Eight Mile Gap, Eight Mile Pass, Button, Chatterly, Muggins Flat). The pipeline with water troughs would provide safe and reliable sources of water being available at appropriate times for the grazing of livestock, which would help to distribute livestock more evenly throughout the subject pastures by having the waters scattered throughout and being able to use different portions of the pastures at different times, thus providing the permittees more reliability for pasture use in the established grazing systems.

Eight Mile Gap Allotment

The allotment contains one pasture and is used seasonally in winter/spring. The only water source currently within the allotment is one earthen reservoir. This earthen reservoir does not guarantee reliable water on an annual basis due to the unreliability of scattered summer rainfall events and capabilities of reservoir storage. In addition, Johnson Wash runs through the allotment but is an ephemeral wash and is not a reliable water source.

The proposed pipeline extension and trough at the southwest corner of the allotment would provide a reliable water in the pasture and more dependable for the permittee.

Eight Mile Pass Allotment

The allotment contains one pasture and is used seasonally in spring. The only water source currently within the allotment is Johnson Wash, which is ephemeral and is not a reliable water source for livestock and wildlife. Adding an additional reliable water source in this area (i.e., the proposed pipeline and trough) would result in a reliable water source and more dependable for the permittee.

Having reliable water helps ensure that grazing occurs as planned, which should help maintain the desired plant composition objectives that were identified in the land health evaluation and therefore rangeland health within the pasture (see Section 4.1.1).

Button Allotment

The allotment is divided into three pastures and uses a deferred rotational system and is used seasonally in winter/spring. It also has one private pasture within the allotment which the permittee uses outside the scope of the rotation system. The only sources of water on the Button allotment are provided by large earthen ponds or reservoirs built along dry washes or drainages throughout the allotment. Although many of these ponds are strategically located throughout for good distribution of livestock, it does not guarantee reliable water on an annual basis due to the unreliability of scattered summer rainfall events and capabilities of reservoir storage. It then

makes it difficult for the permittee and BLM to best plan and adhere to this grazing system.

The project has been proposed in an effort to provide a clean, reliable source of water, better control livestock distribution, achieve more uniform utilization of key forage species and give the permittee more reliability for pasture use in this grazing system. It would provide reliable water across the allotment in an effort to achieve more uniform livestock distribution, and therefore more uniform utilization of key forage species. This would give the permittee more reliability and flexibility for pasture use in his grazing system while also allowing for more reliable rest for the other pastures.

Chatterly Allotment

The allotment is divided into three pastures and uses a deferred rotational system and is used seasonally in winter/spring. One of the three pastures is private land. Sources of water on the Chatterly allotment are provided by the ephemeral Johnson wash as well as large earthen ponds or reservoirs built along dry washes or drainages throughout the allotment. Although many of these ponds are strategically located throughout for good distribution of livestock, it does not guarantee reliable water on an annual basis due to the unreliability of scattered summer rainfall events and capabilities of reservoir storage. It then makes it difficult for the permittee and BLM to best plan and adhere to this grazing system. The private land parcel also has a well that is no longer useful due to the toxicity levels of sulfates in the water.

The project has been proposed in an effort to provide a clean, reliable source of water, better control livestock distribution, achieve more uniform utilization of key forage species and give the permittee more reliability for pasture use in this grazing system. It would provide clean, safe and reliable water across the allotment in an effort to achieve more uniform livestock distribution, and therefore more uniform utilization of key forage species. This would give the permittee more reliability and flexibility for pasture use in his grazing system while also allowing for more reliable rest for the other pastures.

Muggins Flat Allotment

The allotment is divided into four pastures, one of which is private land, and uses a deferred rotational system and is used seasonally in winter/spring. The only sources of water on the Muggins Flat allotment are Johnson Wash which is ephemeral and earthen reservoirs which are not reliable water sources for livestock and wildlife. There is existing infrastructure (i.e. pipeline, troughs and storage tanks) but are unavailable to use due to the toxicity of the well water. The private land within the Muggins Flat allotment contains two wells that according to the data from the water quality test, were found to be toxic to livestock. This then makes it difficult for the permittee and BLM to best plan and adhere to this grazing system.

The project has been proposed in an effort to provide a clean, reliable source of water, better control livestock distribution, achieve more uniform utilization of key forage species and give the

permittee more reliability for pasture use in this grazing system. It would provide reliable water across the allotment in an effort to achieve more uniform livestock distribution, and therefore more uniform utilization of key forage species. This would give the permittee more reliability and flexibility for pasture use in his grazing system while also allowing for more reliable rest for the other pastures.

4.3.2 Impacts of Alternative B – No Action

Under the no action alternative, no new safe and reliable water sources would be constructed on any of the subject allotments; livestock grazing in the Eight Mile Pass, Eight Mile Gap, Button, Chatterly and Muggins Flat allotments would therefore continue as at present. Permittees on the Eight Mile Pass, Eight Mile Gap, Button, and Chatterly Allotments would have to haul water when reservoirs do not catch and hold water or when Johnson Wash doesn't flow. Livestock use on the Button, Chatterly and Muggins Flat Allotments would continue to be distributed unevenly across the subject pastures – cattle, horses and mules would continue to graze primarily near current water sources (if available), which would in turn continue to receive a disproportionate share of the grazing throughout the allotment and pastures. Overall utilization across each pasture would not exceed 50%, although this utilization would be unevenly distributed as other areas of the allotments would receive little grazing. The permittees would continue to round up the cattle and move them to other areas of each pasture, but the cattle would drift back to the areas nearest current water sources. In addition, not having safe and reliable water sources would continue to make it difficult for the permittees to adhere to the established grazing systems during times when the earthen reservoirs are dry, due to the unreliability of scattered summer rainfall events and capabilities of reservoir storage.

4.4 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 section of the EA attempts to qualify and quantify the impacts to the environment that result from the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future actions. These impacts can result from individually minor but collectively important actions taking place over a period of time.

There are other uses and activities occurring on the lands within and adjacent to the project areas besides livestock grazing (i.e., recreation, mining, etc.). Specific actions that have occurred, are occurring, or are likely to occur in the reasonably foreseeable future include:

- Recreation – Recreation activities occurring throughout the project areas involve a broad spectrum of pursuits ranging from dispersed and casual recreation to organized, BLM-permitted group uses. Typical recreation in the region includes off-highway vehicle (OHV) driving, scenic driving, hunting, hiking, wildlife viewing, horseback riding, camping, backpacking, mountain biking, geocaching, picnicking, night-sky viewing, and photography. The Arizona Strip is known for its large-scale undeveloped areas and remoteness, which provides 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.

- Northern Arizona Withdrawal – On July 21, 2009, the Department of the Interior published notice of the Secretary of the Interior’s proposal to withdraw approximately 1 million acres of land in northern Arizona from locatable mineral entry under the Mining Law of 1872 [30 United States Code (USC) 22–54], subject to valid existing rights. On January 9, 2012, the Record of Decision was signed by the Secretary to implement the withdrawal. The withdrawal was in response to increased mining interest in the region’s uranium deposits, as reflected in the number of new mining claim locations that were filed in the mid-2000s, and concern over potential impacts of uranium mining to the Grand Canyon watershed, adjacent to Grand Canyon National Park. The Button Allotment is included in the withdrawal area. Leasable and salable mineral resources are not subject to the withdrawal.
- Mining and Mineral Resources – Public lands on the Arizona Strip Field Office are generally open to mineral development (see above for a discussion on the Northern Arizona Withdrawal). The primary economic mineral resource in the area consists of locatable mineral deposits, including breccia pipe deposits (i.e., vertical collapse features formed from the collapse of karst solution caverns in the underlying Redwall limestone). A variety of precious metals (including copper and silver) are found within breccia pipes.

However, it is the presence of uranium minerals within breccia pipes that has been of the most interest over the past half century. There are currently two uranium mines operating on the Arizona Strip, the Arizona One Mine and Pinenut Mine, both located west of Kanab Creek and approximately 35 miles southwest of Fredonia, Arizona (outside all of the allotments addressed in this EA). A new uranium mine is proposed approximately 25 miles south-southeast of Colorado City, Arizona; development of this mine is subject to a validity determination due to its location within the Northern Arizona Withdrawal (see above). Should the associated claims be validated, and subsequently developed, approximately 20 acres would be disturbed at the mine site, along with associated infrastructure (powerlines and access roads).

Other potential mineral resources in the project areas are leasable minerals (including oil and gas, and geothermal resources) and salable minerals (consisting primarily of sand and gravel, and stone). In the vicinity of the project area, the potential for geothermal resources is low and the potential for oil and gas is moderate; the potential for sand, gravel and stone is high. Several authorized mineral material sites occur in the vicinity of the project area.

- Vegetation Treatments:

➤ ***Possible Future Treatments:***

Closed stands of sagebrush around Eight Mile Gap and Eight Mile Pass. It has been proposed that the herbicide Spike be used to reduce the amount of sagebrush and

pinyon-juniper in this area and allow the native grasses to increase. This would increase ground cover and decrease the potential for soil loss due to erosion in the area. No environmental review for this project has been initiated to date.

4.4.1 Vegetation

Vegetation on the Arizona Strip has gone through dramatic changes since the 1870s 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 process would help ensure grazing practices are conducted in a manner to maintain or improve the ecological health of the area. This would also ensure diverse and natural plant communities are maintained, wildlife habitat is maintained or improved, erosion is reduced, and water quality is maintained. The objectives developed to manage for healthy rangelands have a goal of keeping the entire ecosystem healthy and productive in order to ensure that it yields both usable products and intrinsic values, and rangeland management practices. In addition, practices currently being implemented (such as weed control efforts) would act to prevent and control the spread of invasive plant species.

Continuing gypsum and uranium mining in the region, as well as use of mineral material sites in the area, would cumulatively affect vegetation through the loss of vegetation, higher rates of erosion and sedimentation in drainages/waterways, increased deposition of dust on vegetation adjacent to roadways (i.e., haul routes), and introduction and spread of invasive plants. Reclamation activities would counter some of the reduction in vegetative cover, and preventative measures to inhibit the spread of invasive species could curtail infestation by species such as Scotch thistle.

The effects of the proposed range facilities have been analyzed under the “Direct and Indirect Effects” section of this chapter. Since livestock grazing occurs throughout the area, and range facilities are routinely constructed/maintained to support this grazing, it is reasonable to assume that impacts similar to those identified earlier in this chapter would occur elsewhere in the area. However, given the fact that neither of the alternatives proposes to increase the level of grazing or otherwise alter established grazing systems in any of the allotments addressed in this EA, it is anticipated that neither of the alternatives would result in cumulative impacts to vegetation resources when added to other past, present, and reasonably foreseeable activities in the area.

4.4.2 Wildlife, Including Mule Deer, Pronghorn, Migratory Birds, and Sensitive Species

Wildlife may be affected by other activities occurring within and adjacent to the allotments addressed in this EA, including mineral development and various dispersed recreational activities. Mineral development has led to reduction of habitat quality and physical disturbance in a variety of habitats. Mining-related activities in the area include ongoing operations at the Arizona One mine, reclamation of Kanab North and Pinenut mines, both of which are located on the Kanab Plateau several miles outside of any of the subject allotments, and the potential for several additional future mines. Impacts to wildlife species from uranium mining activities were fully analyzed in the Northern Arizona Proposed Withdrawal EIS. This analysis stated that “Given the relatively

small area of surface impact, it is anticipated that none of the alternatives [including the proposed withdrawal] would result in significant cumulative impacts to migratory birds [and wildlife resources] when added to other past, present, and reasonably foreseeable activities in the proposed withdrawal area” (BLM 2011).

Recreational pursuits, particularly OHV use, can cause disturbance to wildlife species and their habitats. Humans can disturb wildlife in a variety of ways. Disturbance can come from vehicle noise, wildlife being chased, or the mere presence of humans. Different species, and individuals within species, react differently to disturbances. The type of reaction also differs with time of year, location of disturbance in relation to breeding sites, type of disturbance, and duration of disturbance. 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 allotments discussed in this EA. Impacts vary by species and by the location, level of use, and speed of travel over the road.

The effects of livestock grazing, including development and use of range improvements, on wildlife resources in the subject allotments have been analyzed under the “Direct and Indirect Effects” section of this chapter. Since livestock grazing occurs throughout the area, and range facilities are routinely constructed/maintained to support this grazing, it is reasonable to assume that impacts similar to those identified earlier in this chapter would occur elsewhere in the area. This additive impact may affect wildlife habitat or corridors by altering vegetation associations at specific locales. The vegetation communities in the area, and the health of the region as a whole, are important for the survival of many native species. However, given the relatively limited surface impacts from these activities, it is anticipated that cumulative impacts from past, present, and reasonably foreseeable future actions will not result in cumulatively significant impacts. In addition, neither of the alternatives proposes to increase the level of grazing or otherwise alter established grazing systems in any of the allotments addressed in this EA. It is therefore anticipated that neither of the alternatives would result in cumulative impacts to wildlife when added to other past, present, and reasonably foreseeable activities in the area.

4.4.3 Livestock Grazing

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

In response to these problems, livestock grazing reform began in 1934 with the passage of the Taylor Grazing Act. Subsequent laws, regulations, and policy changes have resulted in adjustments in livestock numbers, season-of-use changes, and other management changes. Given the past experiences with livestock impacts on public land resources, as well as the cumulative impacts that

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

In the long-term, as the population of the surrounding area increases (which would increase the use of public lands), conflicts between livestock grazing and these other uses could arise. Resolving conflicts may require adjustments and/or restrictions placed on livestock grazing management. Other factors also influence livestock grazing operations, such as climatic and market fluctuations. A six-year drought in the region occurred between 1998 and 2004 and dramatically affected livestock grazing operations on the Arizona Strip, resulting in virtually all cattle being pulled from the public lands in 2004. Similar fluctuations in livestock numbers would likely occur in the future. However, since neither of the alternatives proposes to increase the level of grazing or otherwise alter established grazing systems in any of the allotments addressed in this EA, it is anticipated that neither of the alternatives would result in cumulative impacts to livestock grazing when added to other past, present, and reasonably foreseeable activities in the area.

Chapter 5

CONSULTATION AND COORDINATION

5.1 SUMMARY OF PUBLIC PARTICIPATION

This section summarizes the process used to involve individuals, organizations, and government agencies in the preparation of this EA. The public was notified of the proposed action by sending a scoping letter on August 31, 2016 to all interested parties inviting public comments on the proposed action. No public comment responses were received.

5.2 LIST OF PREPARERS AND CONTRIBUTORS

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

Table 5.1 List of BLM Preparers/Reviewers

Name	Title	Responsible for the Following Program
Gloria Benson	Tribal Liaison	Tribal Concerns
Lorraine Christian	Arizona Strip Field Office Manager	Project Oversight
Brandon Boshell	Assistant Field Manager	Project Oversight
Amanda Harrington	Assistant Field Manager	Lands and Realty & Minerals
Shawna Dao	Realty Specialist	Lands and Realty
Rody Cox	Geologist	Geology / Paleontology
Jonathon Jasper	Outdoor Recreation Planner	Recreation, Wilderness, Visual, Resources
John Herron	Archaeologist (Retired)	Cultural Resources
David Van Alfen	Archaeologist	Cultural Resources
Jace Lambeth	Rangeland Management Specialist	Special Status Plants
Ben Ott	Rangeland Management Specialist	Project Lead -Rangeland Management
Brian McMullen	Soil Scientist	Soil, Water, Air
Richard Spotts	Environmental Coordinator (Retired)	NEPA Compliance
Kevin Schoppmann	Rangeland Management Specialist	Rangeland Management, Vegetation, Weeds, Standards and Guidelines
Shawn Langston	Wildlife Biologist	Wildlife Management
Jeff Young	District Lead Wildlife Biologist	Wildlife Management
John Sims	Supervisory Law Enforcement	Law Enforcement

Table 5.2. Non-BLM EA Reviewers

Name	Agency/Organization	Title
Bunting Family Trust	Rancher	Grazing permittee on Eight Mile Gap and Pass Allotments
Roger M. Pugh	Rancher	Grazing permittee on Button Allotment
Paul O. Mangum	Rancher	Grazing permittee on Muggins Flat Allotment
Ferril G. Heaton	Rancher	Grazing permittee on Chatterly Allotment
Luke Thompson	AGFD	
Rob Nelson	AGFD	
Daniel Bulletts	Kaibab Paiute Tribe	
Dawn Hubbs	Hualapai Tribe	

Chapter 6

LITERATURE CITED

- Arizona Game and Fish Department and Bureau of Land Management (AGFD and BLM). 2015. *Arizona Strip Interdisciplinary Mule deer Management Plan, 2015-2019*. Tim Shurtliff AGFD Wildlife Manager GMU 13B Luke Thompson AGFD Wildlife Manager Supervisor Tom McCall AGFD Game Specialist Jeremy Felish AGFD Wildlife Manager GMU 13A Tim Carlson AGFD Wildlife Manager, GMU 12B Tom Denniston Wildlife Biologist Grand Canyon-Parashant National Monument Whit Bunting BLM Rangeland Resource Team Lead Arizona Strip.
- Arizona Game and Fish Department (AGFD). 2009. *Arizona Statewide Pronghorn Management Plan*. Phoenix, Arizona.
- Arizona Game and Fish Department (AGFD). 2001. *Idionycteris phyllotis*. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix.
- Arizona Game and Fish Department (AGFD). 2003a. *Euderma maculatum*. Unpublished Abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, Arizona.
- Arizona Game and Fish Department (AGFD). 2003b. *Corynorhinus townsendii pallescens*. Unpublished abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix.
- Arizona-Sonora Desert Museum. 2011. Animal Fact Sheet: Townsend's Big-Eared Bat. Available at: <http://www.desertmuseum.org/kids/bats/townsend.php>. Accessed March 24, 2011.
- Best, T.L., M.J. Harvey, and J.S. Altenbach. 2007. Available at: <http://www.msb.unm.edu/mammals/batcall/accounts/accountsbase/idiiphy.html>. Accessed December 21, 2007.
- Boroski, B.B. and A.S. Mossman. 1996. Distribution of Mule Deer in Relation to Water Sources in Northern California. *The Journal of Wildlife Management* 60:770-776.
- Bureau of Land Management (BLM), U.S. Department of the Interior. 2007. *Proposed Resource Management Plan/Final EIS for the Arizona Strip Field Office, the Vermilion Cliffs National Monument, and the BLM Portion of the Grand Canyon-Parashant National Monument*. Bureau of Land Management, Arizona Strip Field Office.
- Bureau of Land Management (BLM). U.S. Department of the Interior. 2008a. *Arizona Strip Field*

- Office Record of Decision and Resource Management Plan*. Arizona Strip Field Office, St. George, Utah.
- Bureau of Land Management (BLM). U.S. Department of the Interior. 2008b. *National Environmental Policy Act Handbook*, H-1790-1. Washington, DC.
- Bureau of Land Management (BLM). U.S. Department of the Interior. 2008c. *Kanab Field Office Record of Decision and Resource Management Plan*. Kanab Field Office, Kanab, Utah.
- Bureau of Land Management (BLM). U.S. Department of the Interior. 2008d.
- Bureau of Land Management (BLM) and U.S. Fish and Wildlife Service (USFWS), U.S. Department of the Interior. 2010. Memorandum of Understanding (MOU) between the U.S. Department of the Interior Bureau of Land Management and the U. S. Fish and Wildlife Service to Promote the Conservation of Migratory Birds. Washington D.C. 13 pp.
- Bureau of Land Management (BLM). U.S. Department of the Interior. 2011. *Northern Arizona Proposed Withdrawal Final Environmental Impact Statement*. Bureau of Land Management, Arizona Strip District, St. George, Utah.
- Coconino County. 2003. *Coconino County Comprehensive Plan*. Prepared by the Coconino County Community Development Department, Flagstaff, Arizona.
- deVos, Jr., J.C. and R.W. Clarkson. 1990. A historic review of Arizona's water developments with discussions on benefits to wildlife, water quality and design considerations, p. 157-165. In: G.K. Tsukamoto and S.J. Stiver (eds.), *Proc. Wildlife Water Development Symposium*, 30 Nov.-1 Dec. 1988, Las Vegas, Nev. Nevada Chapter The Wildlife. Soc., USDI BLM, and Nevada Dept. Wildlife.
- Herder, Michael, 1996. *Northern Bat Roost Inventory*. Heritage Grant Report No. 196035. Prepared for Arizona Game and Fish Department.
- Holechek, J.L. 1981. Livestock Grazing Impacts on Public Lands: A Viewpoint. *Journal of Range Management* 34(3): 251-254.
- Kane County, 2015. *Kane County Utah Resource Management Plan*, prepared by Kane County Commission, Kane County Staff, Kane County Resource Development Committee, Resource Development Steering Committee, Kane County Land Use Authority.
- Loeser, M.R., T.D. Sisk, T.E. Crews. 2007. Impact of grazing intensity during drought in an Arizona grassland. *Conservation Biology* 21(1): 87-97.

- Ockenfels, R.A., C.L. Ticer, A. Alexander, and J.A. Wennerlund. 1996. A landscape-level pronghorn habitat evaluation model for Arizona. Ariz. Game and Fish Dep. Tech. Rep 19, Phoenix. 50pp.
- Reynolds, R.T., R.T. Graham, M.H. Reiser, R.L. Bassett, P.L. Kennedy, D.A. Boyce, Jr., G. Goodwin, R. Smith, and E.L. Fisher. 1992. *Management Recommendations for the Northern Goshawk in the Southwestern United States*. General Technical Report RM-217. Fort Collins, Colorado: U.S. Forest Service, Rocky Mountain Forest and Range Experiment Station.
- Rosenstock, S.S., W.B. Ballard, and J.C. de Vos, Jr. 1999. *Viewpoint: Benefits and Impacts of Wildlife Water Developments*. Journal of Range Management 52: 302-311.
- Rosenstock, S.S., M.J. Rabe, C.S. O'Brian, and R.B. Waddell. 2004. Studies of Wildlife Water Developments in SW Arizona: wildlife use, water quality, wildlife diseases, wildlife mortalities, and influences of native pollinators. Arizona Game and Fish Dept., Research Branch Technical Guidance number 8, Phoenix, AZ.
- Sheley, R. L. 1995. Integrated Rangeland Weed Management. *Rangelands* 17(6): 222-223.
- Sprinkle, J., M. Holder, C. Erickson, A. Medina, D. Robinett, G. Ruyle, J/ Maynard, S. Tuttle, J. Hays Jr., W. Meyer, S. Stratton, A. Rogstad, K. Eldredge, J. Harris, L. Howery, W. Sprinkle. 2007. *Dutchman Butte Revisited – Examining Paradigms for Livestock Grazing Exclusion*. Society for Range Management: Vol. 29, No. 6, pp. 21-34.
- Taylor, D.A.R., and M.D. Tuttle. 2007. Water for Wildlife: A Handbook for Ranchers and Range Managers. Bat Conservation International. 20 pp.
- University of Idaho, Rangeland Center. 2011. Rangelands – An Introduction to Wild Open Spaces. Prepared in collaboration with the Idaho Rangeland Resource Commission. Moscow, Idaho. pp. 12.
- U.S. Fish and Wildlife Service (USFWS), U.S. Department of the Interior. 2008. Birds of Conservation Concern 2008. United States Department of Interior, Fish and Wildlife Service, Division of Migratory Bird Management, Arlington, Virginia. 85 pp. [Online version available at <<http://www.fws.gov/migratorybirds/>>]
- Utah Veterinary Diagnostic Lab Final Report. 2013.
- Watkins, B.E., C. J. Bishop, E. J. Bergman, A. Bronson, B. Hale, B. F. Wakeling, L. H. Carpenter, and D. W. Lutz. 2007. *Habitat Guidelines for Mule Deer: Colorado Plateau Shrubland and Forest Ecoregion*. Mule Deer Working Group, Western Association of Fish and Wildlife Agencies.

Young, J.A. and C.D. Clements. 2007. Cheatgrass and Grazing Rangelands. *Rangelands* 29(6):15-20.

List of Acronyms

AGFD	Arizona Game and Fish Department
AUM	Animal Unit Month
BLM	Bureau of Land Management
BMP	Best Management Practice
CFR	Code of Federal Regulations
DR	Decision Record
EA	Environmental Assessment
EIS	Environmental Impact Statement
ESA	Endangered Species Act
FONSI	Finding of No Significant Impact
FLPMA	Federal Land Policy and Management Act
KFO	Kanab Field Office
NEPA	National Environmental Policy Act
OHV	Off-Highway Vehicle
RMP	Resource Management Plan
TGA	Taylor Grazing Act
USC	United States Code

Appendix A

