



United States Department of Agriculture

Miller Pasture Water Pipeline Extension

Final Environmental Assessment



Forest Service

Kaibab
National Forest

Williams
Ranger District

June 2017

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**MILLER PASTURE WATER PIPELINE EXTENSION
Final Environmental Assessment
Williams Ranger District
Kaibab National Forest
Coconino County, Arizona**

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For Electronic Documents, Visit: http://www.fs.fed.us/nepa/nepa_project_exp.php?project=50864

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Chapter 1: Project Background and Purpose and Need for Action

Introduction

The Miller Pasture Water Pipeline Extension area is located on the Williams Ranger District, Kaibab National Forest (KNF)—within the Miller Pasture of the Ebert Allotment—southeast of Valle, Arizona. The legal description of the project area is: T25N R3E Section 1, 12, &13, Gila and Salt River Baseline and Meridian, Coconino County, Arizona.

The Ebert Allotment is managed under a Term Grazing Permit. The current 10-year Term Grazing Permit (#07895) is for 100 cow/calf pairs and 4 horses from November 1 to April 30 per the 1991 Grazing CE. The Ebert Allotment (5,410 acres) is made up of four pastures including: Miller (1,628 acres), Daves (1,589 acres), White Hills (1,235 acres), and Fix (958 acres). Livestock are managed through a rest rotation management system, where at least one pasture has an entire year to grow without being grazed. The scheduling of pasture use varies from year to year, dependent, in part, on that year's precipitation and pasture conditions, and the previous years' utilization. The current season's pasture rotation and scheduled on/off dates are outlined in the Annual Operating Instructions (AOI). Adaptive management techniques which include changing pasture on/off dates, pasture rotation, and authorized number of livestock are used to help meet desired conditions on the allotment.

The purpose of this Environmental Assessment (EA) is to analyze the potential effects of activities proposed in this project on natural and cultural resources of the KNF and determine whether these effects may significantly impact the quality of the human environment. If significant effects are found to be likely, further analysis in an Environmental Impact Statement (EIS) will be conducted. By preparing this EA, the KNF is fulfilling Forest Service policy and direction to comply with the National Environmental Policy Act (NEPA).

Additional documentation, including specialist reports, correspondence, and public comment letters, can be found in the project record maintained by the Kaibab National Forest. These records are available for public review pursuant to the Freedom of Information Act (FOIA) (5 U.S.C. 552).

Project Area

The Williams Ranger District surrounds the city of Williams, approximately 35 miles west of the City of Flagstaff and approximately 60 miles south of Grand Canyon National Park. The majority of the Williams District is contained within Coconino County, with a small portion of the southwest area of the District falling within Yavapai County.

The majority of the allotment is relatively flat allowing for easy livestock movement. Soils are generally developed from extensive igneous rocks or limestone and/or sandstone parent material. The climate for this area is considered semi-arid with the average precipitation ranging from 14 to 17 inches per year.

Figure 1-1. Miller Pasture Pipeline extension vicinity map.

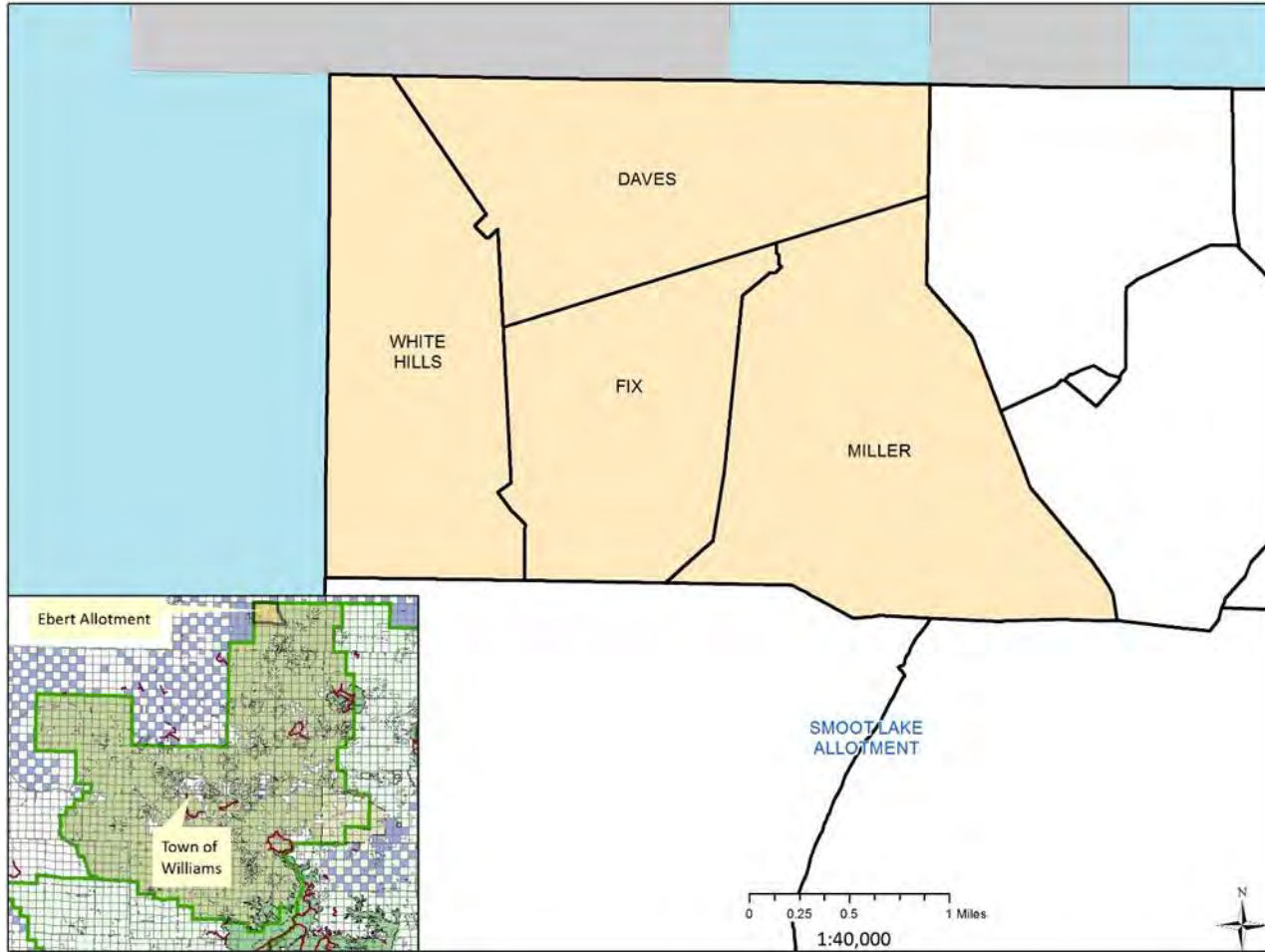
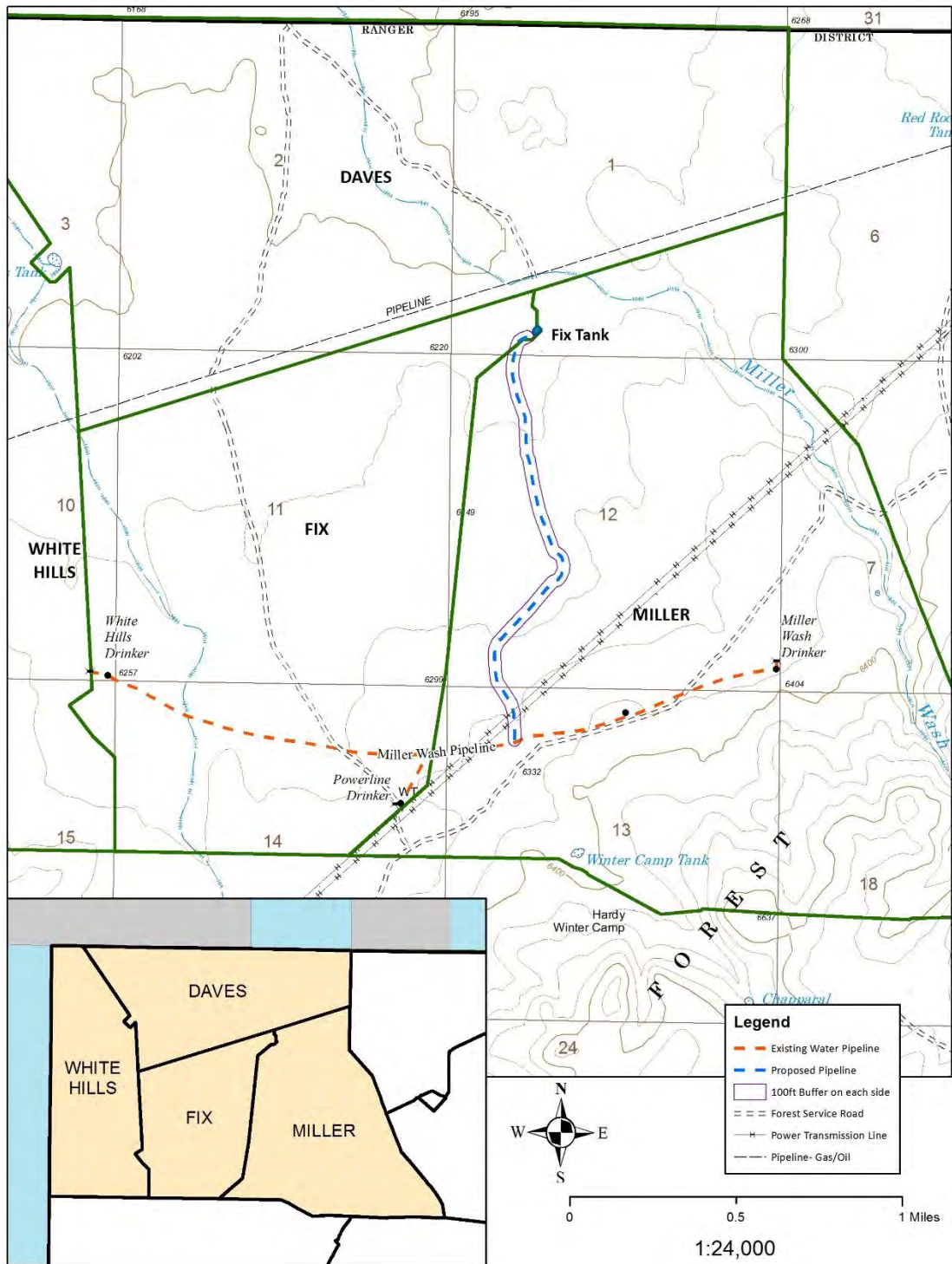


Figure 1-2. Approximate location of the Miller Pasture Pipeline Extension.



Existing and Desired Conditions

Existing Conditions

Limited reliable water sources on the Ebert Allotment lead to reduced livestock management flexibility and distribution. Cattle tend to graze closer to water sources, leaving areas of the allotment inaccessible by cattle during times of limited water availability. Miller Pasture has several water sources, including stock tanks, but they are not reliable due to the limited amount of precipitation the allotment receives. Currently there is a livestock water pipeline that connects Miller Wash Storage Tank to White Hills Drinker, which is 2.5 miles from east to west; Fix stock tank is the most reliable water source within the Ebert Allotment because of its ability to hold water year round. The grazing permittee hauls water to the Miller Wash livestock water pipeline—along Forest Service Road (FSR) 87—that distributes the water throughout Miller and Fix Pasture to the three existing drinkers (see figure 1-2). During times of adverse weather conditions the permittee cannot haul water to the pipelines, leaving the cattle to utilize the four stock tanks on the allotment. Hauling water under adverse weather conditions causes damage to roads in the allotment, leading to a decrease in water hauling capabilities, and leaving livestock with limited water in the allotment, increasing the amount of cattle in one location.

Desired Conditions and Guidelines

This project is consistent with the desired conditions and guidelines outlined on the KNF Land and Resource Management Plan (2014) for the following resource areas, Wildlife, Soils and Watershed, Rare Plants, Rangeland and Nonnative Invasive Species. Desired conditions and Guidelines for the previously stated resources can be found below. Cultural Resources and Lands and Minerals desired conditions will not be listed here due to no impacts to the resource.

Soils and Watershed

Desired Conditions

- Accelerated soil loss is minimal, especially on sensitive or highly erodible sites.
- Logs and other woody materials are distributed across the surface to maintain soil productivity.
- Water quality meets or surpasses State of Arizona or Environmental Protection Agency water quality standards for designated uses. Water quality meets critical needs of aquatic species.

Guidelines

- Projects should incorporate the national best management practices for water quality management and include design features to protect and improve watershed condition.
- In disturbed areas, erosion control measures should be implemented to improve soil conditions.

Wildlife

Desired Conditions

- Pinyon-juniper communities occur as a shifting mosaic interspersed with openings across the landscape. The configuration of vegetation and openings provides foraging and browsing opportunities for wildlife, and enough sighting distance and hiding cover for pronghorn to escape predators.
- Native wildlife species are distributed throughout their potential natural range.
- Habitat is available at the appropriate spatial, temporal, compositional, and structural levels such that it provides adequate opportunity for breeding, feeding, nesting, and carrying out other critical life cycle needs for a variety of vertebrate and invertebrate species.
- Grasses, forbs, and shrubs provide forage, cover, fawning, and nesting sites.
- Interconnected forest and grassland habitats allow for movement of wide ranging species and promote natural predator-prey relationships, particularly for strongly interactive species.
- Human-wildlife conflicts are minimal. Hunting, fishing, and other wildlife based recreation opportunities exist, but do not compromise species populations or habitat.

- Threatened, endangered, and sensitive species have quality habitat, stable or increasing populations, and are at low risk for extirpation.

Guidelines

- The pinyon-juniper vegetation communities (pinyon-juniper grassland, shrubland, or woodland) should be determined before developing project proposals to ensure the applicable desired conditions are applied.
- Restoration efforts should emphasize the retention of groups of mature trees where they occurred historically.
- Where pinyon-juniper obligate species occur (e.g. gray vireo), project design should retain key habitat features including snags, and partially dead or dying trees, and downed logs.
- Pinyon-juniper communities should maintain tree densities that maximize herbaceous plant growth and wildlife species diversity typical for their respective community subtype.
- Project design for vegetation management activities should prioritize treatment areas along known wildlife corridors, in the wildland-urban interface, and in historic openings.
- Restoration treatments in pinyon-juniper should be rotated over time and various successional stages to maximize wildlife habitat and diversity.

Nonnative Invasive Species

Desired Conditions

- Invasive species are contained and/or controlled so that they do not disrupt the structure or function of ecosystems or impact native wildlife.

Guidelines

- All ground-disturbing projects should assess the risk of noxious weed invasion and incorporate measure to minimize the potential for the spread of noxious and invasive species. New populations should be detected early, monitored, and treated as soon as possible.
- Treatment approaches should use integrated pest management (IPM) practices to treat noxious and nonnative invasive species. IPM includes manual, biological, mechanical, and herbicide/pesticide treatments.
- Use of pesticides, herbicides, and biocontrol agents should minimize impacts on non-target flora and fauna.

Rare Plants

Desired Conditions

- Habitat and refugia are present for narrow endemics or species with restricted distributions and/or declining populations.
- Threatened, endangered, and sensitive species have quality habitat, stable or increasing populations, and are at low risk for extirpation.

Guidelines

- Project design should incorporate measures to protect and provide for rare and narrow endemic species where they are likely to occur.

Rangeland

Desired Conditions

- There are opportunities to engage in ranching activities and graze livestock on NFS lands. These activities contribute to the stability and social, economic, and cultural aspects of rural communities.
- Grasses and forbs provide adequate forage for permitted livestock.
- Livestock use is consistent with other desired conditions.

Management Direction

The Land and Resource Management Plan for the Kaibab National Forest (USDA 2014a) outlines desired conditions, standards, guidelines, and objectives for resources, uses, goods, services, and management areas on the KNF. The Miller Pasture Water Pipeline Extension Project is designed to make progress toward desired

conditions and meet objectives set forth in the Forest Plan, as described above. Where necessary, project design criteria and mitigation measures are included to facilitate progress toward desired conditions or ensure consistency with the standards and guidelines set forth in the plan.

In addition to the LRMP, Desired Conditions, Standards and Guidelines, management direction for this project comes from the following:

Forest Plan

The Land and Resource Management Plan for the Kaibab National Forest (USDA 2014a) outlines desired conditions, standards, guidelines, and objectives for resources, uses, goods, services, and management areas on the KNF. The Miller Pasture Pipeline Extension Project is designed to make progress toward desired conditions and meet objectives set forth in the Forest Plan, as described above. Where necessary, project design criteria and mitigation measures are included to facilitate progress toward desired conditions or ensure consistency with the standards and guidelines set forth in the plan. A complete description of the desired conditions and guidelines for the proposed activities can be found in the Land and Resource Management Plan for the Kaibab National Forest.

National Forest Management Act

The National Forest Management Act (NFMA) of 1976, as amended, requires development of land and resource management plans and governs administration on National Forests. As described above, this project complies with the Kaibab National Forest Plan and thus NFMA.

National Environmental Policy Act

The National Environmental Policy Act (NEPA) of 1969 requires Federal agencies to consider the environmental consequences of proposed actions and solicit input from State and local governments, Indian tribes, the public, and other Federal agencies during their decision making processes. This EA satisfies the environmental effects analysis requirement, and also describes the agencies and persons consulted in development and analysis of the project.

Multiple-Use Sustained-Yield Act

The Multiple-Use Sustained-Yield Act of 1960 states that it is the policy of Congress that the national forests are established and shall be administered for outdoor recreation, range, timber, watershed, wildlife, and fish purposes, and authorizes and directs the Secretary of Agriculture to develop and administer the renewable surface resources of the national forests for the multiple use and sustained yield of products and services. This project is designed to satisfy the requirements of this act.

We prepared this environmental assessment (EA) to determine whether implementation of the livestock water pipeline extension may significantly affect the quality of the human environment and thereby require the preparation of an environmental impact statement (EIS). By preparing this EA, we are fulfilling agency policy and direction to comply with the National Environmental Policy Act (NEPA). For more details of the proposed action, see the Proposed Action and Alternatives section of this document. Additional resource-specific management direction can be found in Chapter 3 and the resource specialist reports in the project record.

Purpose and Need for Action

The purpose of this project is to authorize the construction of a water pipeline in a manner consistent with Forest Plan objectives and desired conditions. There is a need to provide a more reliable source of water to the Miller, Fix, and White Hills Pastures while discontinuing regular use of FSR 87 to protect resources.

The road currently used for hauling livestock water is of a minimal design standard. As a result, frequent traffic tends to damage the road through rutting and compaction that can concentrate and redirect surface water flows. Eroded sediments can be transported directly to ephemeral stream channels where the road crosses ephemeral

drainages. Installation of the Miller Pasture Water Pipeline Extension will reduce traffic for hauling water on this road, thereby reducing resource damage to soils, water quality, and watershed condition.

With the implementation of this project there will be optimal distribution of livestock throughout the allotment pastures. This is due to the continual delivery of water via the proposed pipeline to existing livestock watering troughs. On the Ebert Allotment, there are four stock tanks which may only hold water during certain times of the year. Fix tank, located in Miller Pasture, is the most reliable water source for the Ebert Allotment, allowing the cattle to consistently utilize the water on the northern side of the allotment. Daves tank, located in White Hills Pasture, Miller Wash tank in Miller pasture, and Winter Camp tank in Miller pasture are less reliable sources of water for livestock.

The existing water system consists of one storage tank accessible only by FSR 87, a water pipeline extending through Miller, Fix and White Hills Pastures, and three drinkers, one for each of the aforementioned pastures (Figure 1-2). The drinkers in Fix and White Hills Pastures are the only water sources for those pastures. Typically, even during wet years, reliable water sources and water distribution through the pastures are limited, and during times when FSR 87 is impassable cannot be delivered to the storage tank and dispersed to the appropriate pastures. This may result in the inability to graze livestock in Fix and White Hills Pastures due to lack of water, and a reduction in the distribution of livestock in Miller Pasture as the water sources for this pasture decrease from two to one.

Public Involvement

Public involvement for the Miller Pasture Pipeline Extension project began on February 15, 2017, with the scoping period. The Arizona Daily Sun newspaper published the scoping notice for the public on February 14. During this scoping period there were a total of five comments, most of which were in support of the project. There were no issues or concerns identified during scoping. There were a few clarification questions presented by the public—who was paying for the pipeline, would wildlife have access to the water, what will happen to the HDPE pipe in the ground, and will there be inspections of the project during and after implementation to ensure that the permittee is cleaning up after themselves. Any questions asked during the scoping period regarding the project have been further explained throughout this document. Organizations that commented during the scoping period include Coconino Sportsmen's and 22 organizations in the Arizona Sportsmen for Wildlife Conservation. This preliminary Environmental Assessment is available for formal public review for a period described in a cover letter and legal notice providing interested parties with information on the review process. The legal notice to comment was posted in the Arizona Daily Sun on May 2, 2017 initiating the comment period on May 3, 2017. During the comment period we received one comment from Arizona Sportsmen for Wildlife Conservation in support of the project.

Tribal Consultation

The following tribes were consulted during the development of this project:

- Havasupai Tribe
- Hopi Tribe
- Hualapai Tribe
- Kaibab Band of Paiute Indians
- Navajo Nation
- Pueblo of Zuni
- Yavapai-Prescott Indian Tribe

The tribes were notified by email, as well as the EA was available for discussion during the quarterly coordination meeting. No replies were received.

Chapter 2: Proposed Action and Alternatives

Introduction

This chapter describes the no action alternative and the proposed action developed to meet the purpose and need for action identified in Chapter 1. When developing alternatives we considered the potential environmental consequence of both actions.

Process Used to Develop Alternatives

The projects interdisciplinary team (shown below) considered all information presented in this EA in the development of the alternatives including the purpose and need for action, the desired conditions and guidelines for the related action, laws regulations, and policies for National Forest Lands, scoping comments, and the professional judgement of the resource specialists. No Action and Proposed Action are the minimum alternatives required. No other alternatives were developed because no issues were identified during the scoping or comment period. The following specialists were used to design the project to avoid environmental impacts.

Interdisciplinary Team

Danelle D. Harrison	District Ranger
Victoria Payne	Team Leader; NEPA specialist; Writer/Editor
Travis Largent	Wildlife Biologist
Christopher MacDonald	Soils and Watersheds
Neil Weintraub	Cultural Resources
Cherie Owens	Range Management
Autumn Olsen	Rare Plants
Lena Hite	Nonnative Invasive Species
Mike Lyndon	Tribal Relations

Alternatives Analyzed

Alternative 1 – No Action

Under the No Action Alternative the proposed livestock water pipeline extension would not be constructed, FSR 87 would continue to be the only route to access the current pipeline system. This would result in a continual use of the road through various types of inclement weather conditions that would damage the overall road structure and lead to a continued deterioration of soil, vegetation, and hydrologic conditions in the immediate area. At times, when the permittee cannot deliver water to the pipeline, cattle grazing throughout the Miller Pasture would be more centralized due to Fix tank being the only water source in the pasture, resulting in an uneven livestock distribution in this pasture. Additionally, livestock would be unable to graze Fix and White Hills Pastures when water is unavailable, limiting the adaptive management actions that could be used on this allotment. Uneven livestock distribution may lead to high utilization levels (over 50%) in localized portions of the pastures resulting in a temporary reduction in canopy cover and plant biomass in areas frequented by livestock. Over the course of many years, repeated high utilization in the same locations may lead to a reduction in vegetation ground cover, increasing soil erosion, and compaction. Heavier utilization levels may lower annual production of forage plants available to livestock, reducing capable range acres on the KNF.

Alternative 2 – Proposed Action

The Williams Ranger District, KNF, proposes the construction of an approximately 1.5 mile water pipeline extension to the existing Miller Pasture Water pipeline. The potential area of surface disturbed by the equipment operation will be approximately 12 feet wide and 1.5 miles long for a total of 2.2 acres of disturbance. To ensure

that the pipeline can be placed in an alignment which minimizes resource impacts, construction may occur within a 200 foot buffer. The water pipeline would extend north from the existing pipeline that runs from east to west. In order to place the pipeline in the ground the permittee will be using a bulldozer to dig 30-36 inches by 3 feet wide below the ground to prevent the pipeline from freezing during cold periods. After the trench has been established, the 1 ½” diameter HDPE Polyethylene pipe will be placed into the trench by attaching the pipeline to the backend of the bulldozer to allow for an effective way to lay the pipeline in the trench and then buried. The grazing permittee would provide all the labor and supplies for the proposed improvement. Upon completion of this project the water pipeline would be added to the list of structural range improvements which is part of the Term Grazing Permit under ownership of the Forest Service. The permittee would assume the responsibility for maintenance. The proposed action would result in a more reliable water supply to the existing drinkers, allowing for more consistent use of Fix and White Hills Pastures and adaptive management of the allotment, and help keep livestock distribution in Miller Pasture consistent throughout the grazing season. More flexibility for adaptive management and consistent livestock distribution would help move range resources towards desired conditions outlined in the Ebert Allotment Categorical Exclusion and LRMP (2014). Improved condition of upland vegetation and an increase in the reliability of a water source would also benefit wildlife. Implementation of the proposed action would decrease the amount of traffic on the FSR 87 for hauling water minimizing resource damage to soils, water quality, and watershed condition.

Project Design Criteria, Monitoring, and Mitigations measures

The Interdisciplinary Team has identified an initial list of project design criteria, monitoring, and mitigation measures to minimize the environmental consequences of implementing the proposed action. This would include:

1. Surveying for rare, narrow and endemic, and Forest Service Sensitive plant species within the pipeline buffer and flagging any found populations. Flagging the known populations would allow for the pipeline to be designed to bypass them.
2. All equipment would be cleaned and inspected prior to entering Forest Service lands for protection against invasive plants. Project area will also be surveyed prior to installation for invasive plants and after the pipeline extension is installed. Areas of known invasive species populations may be avoided by heavy equipment prior to project start date.
3. Slash will, also, be placed in areas of disturbance after the pipeline is installed to prevent soil erosion and allow for plant recovery within the disturbed area.
4. Junipers along the pipeline will be cut by FS personnel, if needed, to prevent creating a larger disturbance by pushing over trees with a bulldozer.
5. Pinyon pine will be retained for wildlife habitat in the process of installing the pipeline.
6. In order to protect the pipeline during road maintenance after installation, the pipeline will be marked with a sign on either side of the road, outside the road prism, to help prevent potential damage.
7. During the process of the project, the Rangeland specialist will monitor the area to ensure that the permittee is following the information provided in the AOI.
8. Should any previously unidentified cultural materials be discovered during project implementation, work must cease immediately and the South Zone Archaeologists must be contacted to initiate the consultation process as outlined in the Advisory Council on Historic Preservation Regulations (36 CFR Part 800.13) (R2017030700015).

Implementation

Implementation of this project will occur after the appropriate waiting period once the Decision Notice and Finding of No Significant Impact (FONSI) have been signed.

Chapter 3: Affected Environment Environmental Effects

Introduction

This chapter summarizes the physical, and biological environments of the project area, which is located on the Williams District of the Kaibab National Forest. Chapter 3 of this document provides an analysis of the potential effects of implementing the no action alternative or the proposed action. Each resource area used the best available science to discuss the affected environment and environmental consequences of the no action alternative and the proposed action and the best available science was considered throughout the discussions presented within this chapter. The information presented in this chapter is a summary of the specialists' report located in the project record. For the purpose of this analysis all acres are considered approximate.

Wildlife

Based on the project location, project boundary, and habitat characteristics, the potential for project related activities resulting in an adverse effect on a wide range of focal wildlife species were analyzed. Species analyzed include those listed under the Endangered Species Act, Forest Service Sensitive Species, Kaibab National Forest Management Indicator Species, and migratory birds.

Relevant Laws, Regulations, and Policy

The LRMP provides standards and management actions in Pinyon-juniper communities. This report was written in compliance with all relevant laws, regulations and policy. A full list of the relevant laws, regulations, and policy that apply to this project can be found in the project record (Largent, 2017).

Federal Law

1. Endangered Species Act
2. Bald and Golden Eagle Act

Executive Orders

3. The Migratory Bird Treaty Act (1919)
 - a. Makes it illegal for anyone to take, possess, import, export, transport, sell, purchase, barter, or offer for sale, purchase, or barter, any migratory bird, or the parts, nests, or eggs of such a bird except under the terms of a valid permit issued pursuant to Federal regulations. The migratory bird species protected by the Act are listed in 50 CFR 10.13 (USFWS)
 - b. **Conservation Measure 1:** Schedule all vegetation removal, trimming, and grading of vegetated areas outside of the peak bird breeding season to the maximum extent practicable. Use available resources, such as internet-based tools (e.g., the FWS's Information, Planning and Conservation system and Avian Knowledge Network) to identify peak breeding months for local bird species; or, contact local Service Migratory Bird Program Office for breeding bird information (USFWS)

Affected Environment

The following Threatened, Endangered, Forest Service Sensitive, Management Indicator and Migratory Bird Species were evaluated to determine if the species and/or suitable habitat occur in the project area. If not, the

species will not be considered further in this analysis. If so, then the species will be evaluated for potential effects as a consequence of the No Action and Proposed Action Alternative.

Species Listed Under the Endangered Species Act

Endangered Species	
Scientific Name	Common Name
<i>Gymngyps californianus</i>	California condor
<i>Mustela nigripes</i>	black-footed ferret

Table 3.1 Endangered species that have potential habitat in the projects vicinity.

For the species listed above, we found that the proposed project would not have an effect on their populations. We have concluded that other species listed under the Endangered Species Act would not be affected because the project area is outside of their range and/or the project site lacks suitable habitat. There are no known condor nest sites in the project area, nor are there sites where condors are known to roost. Black-footed ferrets occupy prairie dog burrows and utilize prairie dogs as a main food source. Surveys revealed no prairie dog colonies within the project area and there is no record of black-footed ferrets ever occurring in the project area. Therefore, these species will not be considered further in this analysis.

Forest Service Sensitive Species

Forest Service Sensitive Species	
Scientific Name	Common Name
<i>lithobates pipiens</i>	northern leopard frog
<i>Haliaeetus leucocephalus</i>	bald eagle
<i>Accipiter gentilis</i>	northern goshawk
<i>Falco peregrinus</i>	American peregrine falcon
<i>Athene cucularia</i>	burrowing owl
<i>Euderma maculatum</i>	spotted bat
<i>Idionycteris phyllotis</i>	Allen’s lappet-browed bat
<i>Corynorhinus townsendii pallescens</i>	Pale Townsend’s big-eared bat
<i>Mictotus mogollonensis</i>	Navajo Mogollon vole

Table 3.2 Forest Service Sensitive Species with habitat that overlaps the project area.

Under further analysis it was found that the project area could disrupt activities, but would have no effect on habitat. This determination was found due to the absence of suitable habitat. The Forest Service Sensitive species program is designed to assist the Forest Service to maintain biodiversity on National Forests and Grasslands and help maintain viable populations of existing native and desired non-native species.

Management Indicator Species

Management Indicator Species (MIS) are species that represent a habitat type; if a MIS is present then habitat must be available. The Kaibab National Forest has four designated MIS; **Grace’s warbler** (*Dendroica graciae*) for ponderosa pine mature clumps within stands, **western bluebird** (*Sialia Mexicana*) for understory development within openings in mature ponderosa pine, **pronghorn antelope** (*Antilocapra Americana*) for grassland, and **ruby-crowned kinglet** (*Regulus calendula*) for mature overstory in frequent fire mixed-conifer. The project area contains one MIS; Pronghorn antelope.

Pronghorn antelope

Pronghorn antelope prefer wide open grasslands with little tree cover and typically 10% or less slope but occasionally they will use areas with up to a 20% slope. Vegetative structure including grasses, forbs, and small shrubs is generally less than 18 inches in height. Arizona pronghorn will sometimes use savannah habitats when

the canopy cover averages less than 20%. Pronghorn are a grassland animal but normally grass makes up a small portion of the diet. Forbs and small shrubs are of primary importance in the pronghorn diet (Brown and Ockenfels 2007). Pronghorn require free water during biologically stressful periods to supplement moisture obtained by diet alone (Clemente et al. 1995; Tluczek 2012). Reliable water sources during years where livestock are on the Miller Pasture will likely result in direct positive effects to habitat quality within the project area. Soil disturbance in alternative 2 as a result of digging/trenching will likely reduce browse availability of forage for a temporary period of time, resulting in a direct negative effect in habitat quality within the project area.

Migratory Birds

Migratory birds were evaluated for the following habitats: grassland, pinyon-juniper grasslands, pinyon-juniper sagebrush, and pinyon-juniper woodlands. Numerous migratory bird species occur within the project area and several species are evaluated in the Forest Service Sensitive Species section. Effects were also evaluated for bird species of conservation concern. Species of conservation concern were identified as Arizona Partners in Flight Priority Species (Latta et al. 1999) and U.S. Fish and Wildlife Service Birds of Conservation Concern (USFWS 2008) that potentially occur in the project area. There are no designated Important Bird Areas within the project boundaries, therefore there are no concerns for migratory birds for this project.

Arizona Partners in Flight Priority Species and U.S. Fish and Wildlife Service Birds of Concern that are known to occur or potentially occur in the project area are located in table 3.3.

Migratory Birds	
Scientific Name	Common Name
<i>Dendroica graciae</i>	Grace's warbler
<i>Contopus cooperi</i>	olive-sided flycatcher
<i>Empidonax wrightii</i>	gray flycatcher
<i>Empidonax occidentalis</i>	Cordilleran flycatcher
<i>Progne subis</i>	purple martin
<i>Dendroica nigrescens</i>	black-throated gray warbler
<i>Buteo regalis</i>	ferruginous hawk
<i>Aquila chrysaetos</i>	golden eagle
<i>Buteo Swainsoni</i>	Swainson's hawk
<i>Falco mexicanus</i>	prairie falcon
<i>Otus flammeolus</i>	flamulated owl
<i>Melanerpes lewis</i>	Lewis's woodpecker
<i>Vireo vicinior</i>	gray vireo
<i>Gymnorhinus cyanocephalus</i>	pinyon jay
<i>Phainopepla nitens</i>	phainopepla
<i>Cardellina rubrifrons</i>	red-faced warbler
<i>Baeolophus ridgwayi</i>	juniper titmouse
<i>Spizella breweri</i>	Brewer's sparrow

<i>Toxostoma bendirei</i>	Bendire's thrasher
<i>Ammodramus savannarum</i>	grasshopper sparrow
<i>Oreoscoptes mantanus</i>	sage thrasher
<i>Amphispiza belli</i>	sage sparrow
<i>Carpodacus cassinii</i>	Cassin's finch

Table 3.3 Migratory Birds with potential habitat in the project area.

Species most likely affected by the proposed activities are species that nest or forage on the ground and in low shrub vegetation. The Proposed Action could result in limited unintentional take of migratory birds during project implementation. Implementation of Alternative 2 could result in unintentional take for some individuals but would not result in a measurable negative effect to migratory bird populations.

Environmental Consequences

Alternative 1 – No Action

Under the No Action alternative, there would not be any impact, direct or indirect effect on the Threatened or Endangered, Forest Service Sensitive Species, or Migratory Birds in the project area.

Alternative 2 – Proposed Action

The proposed project activities will not have a direct nor indirect effect on the aforementioned endangered species. There is potential for individuals to be impacted but the proposed activities will not likely lead to listing or loss of viability for Forest Service Sensitive Species. There may be a temporary negative effect to individual migratory birds, but will increase the habitat quality based on reduction in resource damage when soil becomes saturated.

Cumulative Effects

This section summarizes the combined effects of the Miller Pasture Water Pipeline Project with past, present, and reasonably foreseeable future actions occurring on the Williams Ranger District. The cumulative effects analysis area is the project area with a two mile spatial buffer. South Zone Grassland Restoration EA will help thin encroaching trees, improving habitat quality for numerous wildlife species. Livestock grazing can have a negative effect on potential wildlife habitat by removing ground cover. The Travel Management Rule can have an impact on foraging, nesting, and general movements of wildlife. The cumulative effects of these projects would have a positive effect to pronghorn antelope habitat, no effect to Threatened and Endangered Species, temporary impact to Forest Service Sensitive Species, and a negative temporary impact to Migratory birds.

Conclusion

It is my determination that the Miller Pasture Water Pipeline Extension would not adversely effect, nor result in the take of any Black-footed ferrets or California Condors. All other species listed under the Endangered Species Act have a range outside the project area and/or the project site lacks suitable habitat. It is, also, my determination that there would be no adverse effects, nor will there be a loss in species viability for Northern Goshawk and the Burrowing owl. There would be a direct negative effect on pronghorn antelope habitat quality, but these impacts are considered temporary, and are relatively small based on the size and scope of the project. I have determined that there is potential for unintentional take or temporary adverse effects on individuals, but there would be no loss in species viability, or a trend toward Federal listing for the Bald Eagle, Spotted Bat, Allen's lappet-browed bat, Townsend's big-eared bat, Navajo Mogollon vole, and migratory bird populations.

Soils and Watershed

Analyses of environmental consequences to soils and watershed resources that may result from implementation of each alternative (No Action and Proposed Action) were conducted using information contained in the Terrestrial Ecosystem Survey (TES) of the KNF (Brewer et al. 1991), the Watershed Condition Framework, the Kaibab National Forest Land and Resource Management Plan (2014), information obtained from other KNF resource specialists, other agency reports, and available literature. Geospatial analysis was used to quantitatively and qualitatively assess soils and watershed conditions using Geographic Information Systems (GIS) data obtained from a variety of sources. The full analysis can be found in the Soils and Watershed Report in the project record (MacDonald, 2017).

Water Quality, Quantity and Watershed Condition

Effects to water quality will be assessed qualitatively by alternative by comparing predicted direct, indirect, and cumulative effects by major land disturbing activities within the project area. A watershed condition assessment was completed in 2011 for all sixth-level subwatersheds in the proposed project area as part of a Forest-level assessment of watershed condition (Potyondy and Geier, 2010). Watershed conditions were re-evaluated in 2016 to account for changes in watershed conditions due to restoration treatments, road decommissioning, wildfires, and other agents of change since the initial assessment.

The only water body in the immediate vicinity of the project area is Fix Tank, which is located at the north end of the proposed pipeline location. This tank is primarily used for livestock watering, but also provides water for wildlife. Fix Tank is approximately 0.26 acres in size and contains approximately 0.6 acre feet of water. The tank was installed in 1936. There is an ephemeral drainage located to the south of Fix Tank that drains into the tank. This drainage is approximately 1,080 feet long and flows northwest toward Fix Tank. There are eight ephemeral tributaries to this drainage.

The Miller Wash Headwaters subwatershed has a condition rating of 1.8 (functional – at risk) for NFS lands within the subwatershed. Reasons for this condition rating include: a) the fire regime condition class is departed from reference condition, b) infrequent road maintenance, and c) presence of invasive or noxious weeds (bull thistle (*Cirsium Vulgare*)).

The Rio Tank subwatershed has a condition rating of 1.9 (also functional – at risk, but slightly better than Miller Wash Headwaters). Reasons for this condition rating include: a) infrequent road maintenance, and b) the fire regime condition class is slightly departed from reference conditions.

Soils

For soils resources, the units of measure of effects to soils will be the acres of ground and soil profile disturbance from equipment use. The units of measure for watershed resources are sediment delivery to ephemeral drainages or changes to channel morphology, displayed as embeddedness, changes in channel sinuosity, downcutting or incision, and bank failure or slumping. For water quality measures, no measurements will be taken to determine water quality.

MAP UNIT SYMBOL	SOIL TAXONOMIC CLASSIFICATION	SOIL PHASE	LANDFORM	ACRES
36	Pachic Argiustolls	Gravelly clay loam	Linear and concave valley plains	0.73
172	Lithic Ustochrepts	Gravelly fine sandy loam	linear and concave elevated and lowland plains	1.18
599	Typic Argiustolls	Gravelly clay loam	nearly level to strongly sloping simple linear and convex elevated and lowland plains	0.29
Total				2.20

Table 3.4 Soils located in the project area and their associated characteristics and acreages.

Pachic Argiustolls are productive soils that formed in mixed alluvium from basalt and are characterized as having high organic matter content in the upper part of soil profiles. These soils have excellent organic carbon sequestration potential. This is primarily due to high fine root turnover rates that contribute to organic matter accumulations.

Lithic Ustochrepts are generally low productivity soils. These soils formed from the Moenkopi Formation and wherever these soils are found there is a noticeable lack of vegetative ground cover suggesting there is inherent low fertility and high pH, which restricts vegetative productivity and therefore ground cover.

Typic Argiustolls are moderately productive soils that formed in residuum from basalt and cinders. These soils also have high organic matter accumulations in the upper part of soil provides, but less than Pachic Argiustolls.

In general, soils within the project areas are functioning properly with regard to hydrologic condition, stability, and nutrient cycling. Areas where soils exhibit impaired conditions are generally near water sources. This is due to livestock and wildlife ungulates (elk) that concentrate in these areas. As a result, vegetative ground cover is reduced and soils are compacted by hoof action.

Relevant Laws, Regulations, and Policy

The proposed project will be in line with all applicable laws, regulations, and policy affecting soils and watershed management on the KNF (MacDonald, 2017).

The Federal Water Pollution Control Act of 1972:

Public Law 92-500, as amended in 1977 (Public Law 95-217) and 1987 (Public Law 100-4) (also known as the Federal Clean Water Act (CWA)): This Act provides the structure for regulating pollutant discharges to waters of the United States. The Act's objective is "...to restore and maintain the chemical, physical, and biological integrity of the Nation's waters," and is aimed at controlling both point and non-point sources of pollution. The U.S. EPA administers the Act, but many permitting, administrative, and enforcement functions are delegated to State governments. In Arizona, the designated agency for enforcement of the Clean Water Act is the Arizona Department of Environmental Quality (ADEQ).

Environmental Effects

Alternative 1-No action

Under the No Action Alternative, the grazing permittee would continue to haul water as necessary for livestock watering. Water hauling is currently resulting in resource damage to the road that is used for transporting water (FSR 87). Rutting, compaction, puddling and soil displacement are the primary effects of water hauling. These effects increase the frequency of needed repairs, as well as the cost to maintain a serviceable traveled way.

Alternative 2-The Proposed Action

Soil erosion rates resulting from pipeline installation were modeled for each TES map unit in the project area. Table 3.5 provides a summary of modeled erosion rates based on a pipeline corridor width of 12 feet and total pipeline length of 1.5 miles. For the purposes of this analysis, the following assumptions are made:

- The entire 12-foot-wide corridor would exhibit soil disturbance;
- There would be no vegetative ground cover for the first year following installation of the pipeline;
- A 0.10 chance (10-year), 2-hour design storm was used for precipitation-induced erosion and sediment delivery; and
- Modeled slopes were the maximum slope for each TES map unit.

These criteria result in a very conservative estimate of soil erosion and sediment delivery values from disturbed soils within the project area.

MAP UNIT	PREDICTED EROSION RATE (TONS/AC/YR)	PREDICTED SEDIMENT YIELD (TONS/AC/YR)	SLOPE (MAX)	ACRES	TOTAL PREDICTED SOIL EROSION (TONS/YR)	TOTAL PREDICTED SEDIMENT YIELD (TONS/YR)
36	0.0001	0.0001	10	0.73	0.000136	0.000136
172	0.01	0.0077	15	1.18	0.0224	0.017248
599	0.01	0.0141	15	0.29	0.005	0.00705
Total				2.20	0.027536	0.02443

Table 3.5 Predicted soil erosion rates and sediment yield for Terrestrial Ecosystem Units in the Miller Pasture Water Pipeline project area.

Predicted soil erosion and sediment delivery rates are very low. This is primarily due to the generally flat terrain, minimal area of disturbance, and high water infiltration rates. The total potential soil erosion is approximately 55 lbs. of soil during the first year following pipeline installation, with approximately 49 lbs. of sediment delivery to connected drainages. However, since the proposed pipeline would cross only one ephemeral drainage near its terminus at Fix Tank, it is very unlikely that the total potential sediment production would be delivered to this one drainage. Since this ephemeral channel flows directly into Fix Tank, any accelerated erosion that results from ground disturbing activities would be delivered to Fix Tank, which would serve as an effective sediment trap.

Cumulative Effects

The geographic setting for the cumulative effects analysis will include the Miller Wash Headwaters subwatershed (31,331 ac.) and the Rio Tank subwatershed (22,571 ac.) for a total cumulative effects analysis area of 53,902 acres. Cumulative effects analyzed for this project area included vegetation management projects, Travel Management, and grazing. Each of the projects listed previously would improve livestock distribution in the Ebert Allotment portion of the cumulative effects analysis area. As a result, the cumulative effect of the proposed action when combined with vegetation treatments would be beneficial to soils and watershed conditions. Since this project will improve livestock distribution in the Miller Pasture portion of the Ebert Allotment, the combined effects of the proposed action will benefit soils and watershed conditions by improving overall vegetative ground cover since livestock will not be as concentrated as they currently are. Water hauling has been causing resource damage to FSR 87. Reducing or eliminating the need to haul livestock water on this minimum standard road will reduce resource damage to road infrastructure. The cumulative effect of the proposed action would therefore be beneficial to soils and watershed resources in the cumulative effects analysis area.

Cultural Resources

On November 16, 2016, Kaibab archeology did an extensive survey of the proposed project area with findings of no cultural resources other than two isolated occurrences that have been fully recorded and are considered not significant. Therefore the project meets the criteria of No Effect pursuant to the 2004 Amended Programmatic Agreement between Forest Service Southwestern Region (R3) and the Arizona, New Mexico, Oklahoma and Texas State Historic Preservation Offices and the Advisory Council on Historic Preservation (R2017030700015).

Range

The project area is located entirely within the Miller Pasture (1,628 acres) of the Ebert Allotment (5,410 acres) on the Williams Ranger District of the KNF. Livestock grazing has occurred on the Williams Ranger District since the 1800s. Grazing occurred concurrently with sheep and cattle until the National Forests were created in the early 1900s. Grazing of livestock on the Ebert Allotment is permitted through a Term Grazing Permit (TGP). Currently a TGP is issued to McNelly Ranches, Inc. for 100 cattle and 4 horses from November 1st through April 30th.

Relevant Laws, Regulations, and Policy

This report was written with all relevant laws, regulations, and policy. The full report can be found in the project record (Owens, 2017).

Affected Environment

The main ecosystem located in the project area based on the Forest Potential Natural Vegetation layer and the Existing Vegetation layer is pinyon-juniper woodlands with grassland component. Plant species would include pinyon pine, juniper species as the dominant vegetation and the grassland component would be blue grama, squirreltail, galleta, and spike muhly. There is 0-10% (33 acres) slope in majority of the project area and a small area of 11-20% (.50 acres) slope near Fix Tank. Elevation across the Ebert Allotment varies from 6,150 feet to 6,450 feet.

Environmental Effects

Limited reliable water sources on the Ebert Allotment lead to reduced livestock management flexibility and distribution. With the installation of the water pipeline extension improved livestock distribution would be more consistent and there would be greater flexibility for livestock management on the allotment. The Miller Pasture Water Pipeline Extension would have direct and indirect effects to vegetation cover (ground cover and canopy cover) and plant height, but these would recover with favorable climatic conditions.

Alternative 1-No Action

Under the No Action Alternative no livestock water pipeline extension would be constructed, FSR 87 would continue to be the only route to access the current pipeline system. This would result in a continual use of the road through various types of inclement weather conditions that would damage the overall road structure and lead to a continued deterioration of soil, vegetation, and hydrology conditions in the immediate area. At times, when the permittee cannot deliver water to the pipeline, cattle grazing throughout the Miller Pasture would be more centralized due to Fix tank being the only water source in the pasture, resulting in an uneven livestock distribution in this pasture. Additionally, livestock would be unable to graze Fix and White Hills Pastures when water is unavailable, limiting the adaptive management actions that could be used on this allotment. Uneven livestock distribution may lead to high utilization levels (over 50%) in localized portions of the pastures resulting in a temporary reduction in canopy cover and plant biomass in areas frequented by livestock. Uneven livestock distribution will reduce the allotment's management options for future grazing years. Over the course of many years repeated high utilization in the same locations may lead to a reduction in vegetation ground cover,

increasing soil erosion, and compaction. Heavier utilization levels may lower annual production of forage plants available to livestock, reducing capable range acres on the Kaibab NF.

Alternative 2-The Proposed Action

The proposed action would allow for the construction of a 1.5 mile HDPE Polyethylene water pipeline extension. To ensure room for alignment to reduce resource impacts a 200 foot buffer is allowed. Under this alternative, ground disturbing activities would take place within a 12 foot swath for the entirety of the length of the proposed pipeline. Direct effects to vegetation include a reduction in plant height, ground cover, and canopy cover due to crushing and removal of biomass within the 12 foot swath from use of heavy machinery and digging. These effects are only temporary because plant height, ground cover, and canopy cover will recover under favorable climatic conditions (within 5–10 years).

Indirect effects to vegetation would include the potential increase in vegetation quality and quantity, ground cover and, canopy cover due to more consistent livestock distribution in Miller Pasture and increased adaptive management opportunities since Fix and White Hills Pastures would have more reliable water sources. Under the Proposed Action water would be more readily available for livestock to access and would allow for improved and consistent distribution in individual pastures.

Under the proposed action, livestock would not be grazing the allotment during the construction of the pipeline allowing for revegetation of the project area prior to permitted season of use. The allotment is used for winter grazing and may have a season of rest for recovery along the disturbed area.

Cumulative Effects

Under the proposed action, livestock would not be grazing the allotment during the construction of the pipeline allowing for revegetation of the project area prior to permitted season of use. The allotment is used for winter grazing and may have a season of rest for recovery along the disturbed area. The installation of the livestock water pipeline extension would cause disturbance within the Miller pasture, reducing the canopy cover, ground cover, and plant height for a temporary time period, but it will recover with favorable climatic conditions. Projects involving artificial water sources promote healthy wildlife interaction and movement (LRMP 70).

Conclusion

The installation of the livestock water pipeline extension would cause disturbance within the Miller pasture, reducing the canopy cover, ground cover, and plant height for a temporary time period, but it will recover with favorable climatic conditions. Projects involving artificial water sources promote healthy wildlife interaction and movement (LRMP 70).

Rare Plants

Using the project boundary, the potential for Endangered, Threatened, Candidate, Conservation Agreement, Critical Habitat, Proposed, Forest Service Sensitive, rare or narrow endemic plant occurrences was determined using habitat, elevation, and geographic distribution of each species as well as the US Fish and Wildlife Service's Information for Planning and Conservation (IPAC) online system. No federally listed Threatened, Endangered, Candidate, Conservation Agreement, Proposed plant species or Critical Habitat were listed for the project area when queried on February 1, 2017, as indicated by IPAC.

Relevant Laws, Regulations, and Policy

This EA incorporates all of the relevant laws, regulations, and policy regarding rare plants, for a full list please see the rare plants report located in the project record (Olsen, 2017). This report was written with standards and guidelines from The LRMP (2014) and Threatened, Endangered, Sensitive, Rare, and Narrow Endemic plant species. Their standards and guidelines helped with the determination of potential species of concern Table 3.6 shows the species of concern.

Forest Service Sensitive Species			
Plant Species' Scientific Name	Common Name	Elevation Range (ft)	Habitat Types
<i>Eremogone aberrans</i> (<i>Arenaria aberrans</i>)	Mt. Dellenbaugh Sandwort	4,900-9,186	chaparral, oak woodland, sagebrush, grasslands, ponderosa pine forests
<i>Chrysothamnus molestus</i>	disturbed rabbitbrush	5,900-7,900	rocky soils mostly on limestone in pinyon-juniper woodlands
<i>Penstemon nudiflorus</i>	Flagstaff breadtongue	3,800-7,500	open ponderosa pine, chaparral, pinyon-juniper woodland
<i>Phlox amabilis</i>	Arizona phlox	3,500-7,800	open sites, coniferous forest, pinyon-juniper woodland and sagebrush
Rare or Narrow Endemic Species			
<i>Astragalus subcinereus</i>	silver Milkvetch	4,500-8,875	pinyon-juniper woodland, sagebrush, shrubland, Great Basin grassland
<i>Draba asprella</i> var. <i>asprella</i>	rough Whitlowgrass	5,000-8,500	rocky soils and riparian areas in pine-oak woodlands
<i>Draba asprella</i> var. <i>kaibabensis</i>	rough Whitlowgrass	4,250-8,400	limestone on open knolls and under pines, ponderosa pine, pinyon-juniper woodland
<i>Draba asprella</i> var. <i>stelligera</i>	rough Whitlowgrass	4,300-8,000	moist banks, canyon walls, sandy bluffs, or openings in ponderosa pine or pinyon-juniper woodland
<i>Penstemon caespitosus</i> var. <i>desertipicti</i>	mat penstemon	4,900-9,840	sagebrush, oak, ponderosa pine, pinyon-juniper woodland
<i>PheMERANTHUS validulus</i>	Tusayan flame-flower	5,550-7,870	gravelly flats within pinyon-juniper woodland or ponderosa pine
<i>Shepherdia rotundifolia</i>	roundleaf buffaloberry	3,280-8,545	dry open rock areas within pinyon-juniper woodland

<i>Stachys Rothrockii</i>	rothrock's hedge-nettle	4,900-8,210	pinyon-juniper woodland, ponderosa pine, grasslands
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Table 3.6: Species of concern for further impact analysis and discussion of alternatives and cumulative effects.

Affected Environment:

It was determined that the following four Forest Service Sensitive plant species could potentially be found within the project boundary: Mt. Dellenbaugh sandwort (*Eremogone aberrans*), disturbed rabbitbrush (*Chrysothamnus molestus*), Flagstaff beardtongue (*Penstemon nudiflorus*), and Arizona phlox (*Phlox amabilis*). It was, also, determined that the following eight rare or narrow endemic plant species could potentially be found within the project boundary: silver milkvetch (*Astragalus subcinereus*), rough Whitlow-grass (*Draba asprella* var. *kaibabensis*), rough Whitlow-grass (*Draba asprella* var. *stelligera*), Jones' wild buckwheat (*Eriogonum jonesii*), mat penstemon (*Penstemon caespitosus* var. *desertipicti*), Tusayan flame-flower (*Pemmeranthus validulus*), roundleaf buffaloberry (*Shepherdia rotundifolia*), and Rothrock's hedge-nettle (*Stachys rothrockii*).

Environmental Effects

Alternative 1-No action

The no action alternative will have minimal adverse effects to Forest Service Sensitive, rare, and narrow endemic plant species. If target plants are located directly adjacent to FSR 87, direct effects to those plants could include crushing from tires if the water hauler cannot pass through the road easement and must navigate to the shoulder. Indirect effects for rooting substrate adjacent to the road can be found in the Water and Soils Specialist Report.

Alternative 2-The Proposed Action

With the design criteria in place, there would be no direct effects to any Forest Service Sensitive, rare, or narrow endemic plant species. The required buffer of 10 feet will be a protective measure to prevent any damage to above or below ground plant parts in the event sensitive, rare, or narrow endemic plants are found. There would be minimal indirect effects to any Forest Service Sensitive, rare, or narrow endemic plant species that are located within the project area. The buffer area of 10 feet would protect the area directly surrounding the plants including the soil in which the plants are rooted. Suitable habitat loss may occur from the ground disturbance caused from heavy equipment. Any indirect effects caused from soil damage can be found in the Watershed and Soils section of the EA. Another potential indirect effect is an increased risk of noxious or invasive weeds entering the area due to disturbance. Noxious and invasive weed mitigation measures are addressed in the Invasive Species Specialist Report.

Cumulative Effects

Cumulative effects are those that could affect plants across the Miller Pipeline project area in the foreseeable future and those that have affected the current landscape condition in the past. These effects include the Grassland Restoration EA, livestock grazing, and the Travel Management rule. The Grassland Restoration project lists mitigation measures for Forest Service Sensitive species, Threatened and Endangered species, and rare and narrow endemic species within the project boundary. Surveys for the Miller Pasture Water Pipeline project design criteria will allow for protection and no effects from implementation of the Grassland Restoration project. Livestock grazing in the area of the proposed project can lead to a decline in plant species due to being browsed. Travel on road corridors can lead to dust on the plants limiting the chance of population spread, pollination, and photosynthetic capability will decrease.

Conclusion

With the design criteria in place, it is my determination that the Miller Pasture Water Pipeline project would not adversely affect the above mentioned species and the project actions are unlikely to result in a trend toward Federal listing or loss of viability for any Forest Service Sensitive, rare, or narrow endemic plant species. With the completed effects analysis, is my determination that the Miller Pasture Pipeline Extension project actions

would not have an adverse effect any Forest Service Sensitive, rare, or narrow endemic plant species, and the project actions are unlikely to result in a trend toward Federal listing or loss of viability for any plant species.

Nonnative Invasive Species

Nonnative invasive species analyzed within the bounds of this project included only those listed in the Land and Resource Management Plan for the Kaibab National Forest (USDA 2014). These species are those with the highest treatment priority and are the following: bull thistle (*Cirsium vulgare*), cheatgrass (*Bromus tectorum*), Dalmatian toadflax (*Linaria dalmatica*), tamarisk (*Tamarix* sp.), Russian knapweed (*Centaurea repens*), diffuse knapweed (*Centaurea diffusa*), spotted knapweed (*Centaurea maculosa*), leafy spurge (*Euphorbia esula*), and yellow starthistle (*Centaurea solstitialis*). It was determined few populations of cheat grass were found to be in the immediate area of the proposed action. Three individual populations were found along FSR 87 and within an immediate area of the Miller Wash Storage Tank.

Land and Resource Management Plan for the Kaibab National Forest (USDA 2014). Provides standards and guidelines for Nonnative Invasive Species. Some nonnative species have invasive tendencies and threaten native species, ecosystem function, and the quantity and quality of forest goods and services (e.g. noxious weeds).

Relevant Laws, Regulations, and Policy that Apply

Land and Resource Management Plan for the Kaibab National Forest (USDA 2014). Provides standards and guidelines for Nonnative Invasive Species. Some nonnative species have invasive tendencies and threaten native species, ecosystem function, and the quantity and quality of forest goods and services (e.g. noxious weeds). This project is in compliance with the relevant laws, regulations and policy. The Final Environmental Impact Statement for Integrated Treatment of Noxious or Invasive Weeds (FEIS) (USDA 2005) provides for additional clarification and treatment measures used in the management of nonnative, noxious and/or invasive species. The Best Management Practices along with a complete list of the laws, regulations, and policy can be found in the Nonnative Invasive Species analysis report (Hite, 2017).

Affected Environment

Currently, there are three known locations in the project area of cheat grass totaling about 1/4th acre in size. Invasive weeds have been documented to alter soil temperature, soil salinity, water availability, nutrient cycles and availability, native seed germination, infiltration and runoff of precipitation, and fire severity and frequency. These alterations of the physical conditions and disturbance regimes can allow for invasive species to spread further than their original introduction site. No specific habitat requirements are listed for nonnative invasive species. Generally, populations are found within areas that have been degraded or disturbed in some fashion allowing for a potential establishment of invasive species. Cheat grass populations have been found in observation records within the proposed area and along the roadway FSR 87.

Environmental Effects

Alternative 1-No action

The No Action Alternative will have minimal adverse effects to current populations of nonnative invasive species found within the project area. Current nearby nonnative invasive species populations along FSR 87 may be spread further into the Forest from continued use of the nearby roadway to haul water to tanks in the area. Risk factors for spread of nonnative invasive species into further areas would likely remain the same.

Alternative 2-The Proposed Action

The Miller Pasture Water Pipeline Extension Project may impact current nonnative invasive species populations by equipment being brought to the site along highways and Forest Service Roads. However, due to the use of BMPs, the proposed action will not cause further wide-scale spread or infestation. Impacts to these populations would lead to an increase in the potential of the current population to spread further into the surrounding areas or

along the project path of the pipeline extension. Indirectly, the operator or owner of any equipment used within the project area could potentially spread cheat grass seeds into further areas outside of Forest Service lands that do not currently have cheat grass present. Soil disturbance along the new extension of the pipeline will be highly susceptible to introduction and establishment of cheat grass due to the nature of the project.

Indicators used for monitoring, assessing population spread, and success of applied treatment nonnative invasive species have been identified within the Final Environmental Impact Statement for Integrated Treatment of Noxious or Invasive Weeds. These include tracking yearly treatment summaries to assess population spread, comparing inventories at five year intervals to compare effectiveness of treatments, and utilizing adaptive management to adjust treatments when or where needed to ensure achievement of a species' objective. Adequate monitoring plans established at time of implementation allows managers to determine the effectiveness of management actions in meeting prescribed objectives.

Cumulative Effects

Cumulative effects are those that could affect the spread of nonnative invasive species across the Miller Pipeline project area in the foreseeable future and those that have affected the current landscape condition in the past. These effects include the Grassland Restoration EA, grazing, and the Travel Management rule. The Grassland Restoration project lists mitigation measures for nonnative invasive species in an effort to prevent spread. Grazing can lead to increased spread of nonnative invasive species by the livestock walking through a population, having the seed from the population attach to their legs and feet and release themselves wherever the cattle travel. Bare ground created where livestock tend to concentrate can lead to weed invasions. With this, having road corridors in the area can increase the amount of spread by having vehicles come from different locations.

Conclusion

With the design criteria listed within this report in place, including any additional Best Management Practices and Mitigation Measures as listed in the Final Environmental Impact Statement for Integrated Treatment of Noxious or Invasive Weeds, it is my determination that the Miller Pasture Water Pipeline Extension Project may impact current nonnative invasive species populations, however these impacts would not result wide-scale spread or infestations.

Lands and Minerals

Arizona Public Service (APS) is the owner and operator of a high-voltage transmission powerline located in the area of the project. APS has been consulted on the project; there will be no effects to the powerline from the project.

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