Reauthorization of Permits, Maintenance, and Vegetation Management on Western Area Power Administration Transmission Lines on Forest Service Lands, Colorado, Nebraska, and Utah

DOE/EIS-0442

Final Environmental Impact Statement




Western Area Power Administration

FOREST SERVICE U S DEPARTMENT OF AGRICULTURE

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REAUTHORIZATION OF PERMITS, MAINTENANCE, AND VEGETATION MANAGEMENT ON WESTERN AREA POWER ADMINISTRATION TRANSMISSION LINES ON FOREST SERVICE LANDS, COLORADO, NEBRASKA, AND UTAH

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Responsible Agencies

- U.S. Department of Energy, Western Area Power Administration (WAPA)
- USDA Forest Service (Forest Service)

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Abstract
Western Area Power Administration (WAPA) owns, operates, and maintains approximately 273 miles of electrical transmission lines on National Forest System (NFS) lands in Colorado, Nebraska, and Utah under the terms of existing agreements with the Forest Service. The proposed project involves changing the vegetation management and maintenance practices in some of these right-of-way (ROW) areas using an integrated vegetation management (IVM) approach based on the American National Standard Institute Tree, Shrub and Other Woody Plant Maintenance-Standard Practices (Integrated Vegetation Management, A. Utility Rights-of-Way (ANSI A300 (Part 7)-2018 IVM). The purpose of this project is to ensure the reliability and safety of the transmission lines, ensure compliance with mandatory transmission line reliability standards, ensure adequate access for maintenance, protect the public and ensure worker safety, and manage risk from fire, all while ensuring the protection of environmental resources.

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https://www.wapa.gov/transmission/EnvironmentalReviewNEPA/Pages/vegetation-management.aspx

MEDICINE BOW-ROUTT NATIONAL FORESTS

NEBRASKA NATIONAL FOREST

PIKE AND SAN ISABEL NATIONAL FORESTS

SAN JUAN NATIONAL FOREST

WHITE RIVER NATIONAL FOREST

ACRONYMS AND ABBREVIATIONS

$\mu g/m^3$	Micrograms per cubic meter
^{o}F	Degrees Fahrenheit
ANF	Ashley National Forest
ANSI	American National Standards Institute
AQS	Air Quality Subsystem
ARNF	Arapaho-Roosevelt National Forests
ATV	All-terrain vehicle
BA	Biological Assessment
BE	Biological Evaluation
BMP	Best management practice
BTUs/ft/s	British thermal units per foot per second
CAA	Clean Air Act
CASTNet	Clean Air STatus and Trends Network
CD	Compact disc
CDNST	Continental Divide National Scenic Trail
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CH_4	Methane
CO	Carbon monoxide
CO_2	Carbon dioxide
CPW	Colorado Parks and Wildlife
DOE	U.S. Department of Energy
EDRR	Early detection rapid response
EIS	Environmental Impact Statement
EO	Executive Order
EPA	U.S. Environmental Protection Agency
ERO	Electric Reliability Organization
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FIRMs	Federal Insurance Rate Maps
FLPMA	Federal Land Policy and Management Act
FR	Federal Register
FSM	Forest Service Manual
GHGs	Greenhouse gases
GIS	Geographic Information System
GMUG	Grand Mesa, Uncompahgre, and Gunnison National Forests
H_2SO_4	Sulfuric acid
HAPs	Hazardous air pollutants
HNO_3	Nitric acid
IMPROVE	Monitoring of Protected Visual Environments
ISAC	Invasive Species Advisory Committee
IVM	Integrated vegetation management
LAU	Lynx Analysis Unit
LOC	Levels of concern
MBRNF	Medicine Bow-Routt National Forests
MBTA	Migratory Bird Treaty Act
MIS	Management indicator species
MOU	Memorandum of Understanding
MVUMs	Motor Vehicle Use Maps
N_2O	Nitrous oxide
NAAQS	National Ambient Air Quality Standards
NADP	National Acid Deposition Program
NAGPRA	Native American Graves Protection and Repatriation Act
NAIP	National Agriculture Imagery Program
NEPA	National Environmental Policy Act
NERC	North American Electric Reliability Corporation
NFMA	National Forest Management Act
NFS	National Forest System
NH_4+	Ammonium
NHPA	National Historic Preservation Act
NISC	National Invasive Species Council
NNF	Nebraska National Forest
NO_2	Nitrogen dioxide
NO_3-	Nitrates
NO_x	Oxides of nitrogen
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRA	National Recreation Area
O&M	Operations and Maintenance
OAHP	Office of Archaeology and Historic Preservation
OHV	Off-highway vehicle
ORV	Off-road vehicle
PA	Programmatic Agreement
PEM	Palustrine emergent
PFO	Palustrine forested
PL	Public Law
PM_{10}	Particulate matter with a diameter equal to or less than 10 microns
$PM_{2.5}$	Particulate matter with a diameter equal to or less than 2.5 microns
ppb	Parts per billion
PSD	Prevention of significant deterioration

PSINF	Pike and San Isabel National Forests
PSS	Palustrine scrub-shrub
PTRCI	Places of Traditional Religious and Cultural Importance
R2	Region 2
RHR	Regional haze rule
RM	Roaded Modified
RMO	Road management objective
RN	Roaded Natural
ROS	Recreation Opportunity Spectrum
ROW	Right-of-way
SHPO	State Historic Preservation Office
SIOs	Scenic Integrity Objectives
SIP	State Implementation Plan
SJNF	San Juan National Forest
SLAMS	State and Local Air Monitoring Sites
SMS	Scenery Management System
SO_2	Sulfur dioxide
SO_4-	Sulfate ion
SOLC	Species of Local Concern
SPM	Semi-primitive motorized
SPNM	Semi-primitive non-motorized
SSURGO	Soil Survey Geographic database
SUA	Special Use Authority
SUP	Special Use Permit
SVR	Standard visual range
TCP	Traditional Cultural Property
TMDLs	Total maximum daily loads
U.S.C.	United States Code
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service
VOC	Volatile Organic Compound
VQOs	Visual Quality Objectives
Western	Western Area Power Administration
WIZ	Weather influence zone
WRNF	White River National Forest

EXECUTIVE SUMMARY

Background

Western Area Power Administration (WAPA), a power marketing administration within the U.S. Department of Energy, proposes to improve the way it manages vegetation along approximately 273 miles of its transmission line rights-of-way (ROWs) on National Forest System (NFS) lands in Colorado, Nebraska, and Utah, along with updating or, where a current authorization is not in place, requesting new authorizations from the United States Forest Service for the operation and maintenance of its transmission lines as they cross National Forest System (NFS) lands. This Environmental Impact Statement (EIS) analyzes the potential impacts of implementing the No Action Alternative or the Proposed Action and identifies measures to address environmental consequences.

WAPA and the U.S. Forest Service are joint lead agencies for this EIS, and prepared it according to requirements of the National Environmental Policy Act (NEPA) of 1969 (42 United States Code [U.S.C.] 4321 et seq.), as amended, and Council on Environmental Quality (CEQ) implementing regulations (40 Code of Federal Regulations [CFR] 1500–1508), and each agency's NEPA implementing regulations, policy, and guidance.

On August 10, 1996, during a period of high temperatures and high electricity demand, a transmission line sagged into filbert trees near Portland, Oregon, leading to a cascade of power outages as far away as southern California. Executive Order (EO) 13212, *Actions To Expedite Energy-Related Projects* (May 18, 2001), declared the increased production and transmission of energy in a safe and environmentally sound matter to be essential to the well-being of the American people, and called for the improvement and streamlining of cooperation among federal agencies to ensure the supply and availability of energy. However, in August 2003, high temperatures resulting in high electricity demand caused a widespread power outage in the Northeast and Midwest, affecting approximately 45 million people in the United States and 10 million people in Ontario, Canada. The U.S.-Canada Power System Outage Task Force found that, again, transmission line sag into overgrown trees in rural Ohio caused the outage.

In response to these widespread outages, Congress enacted the Energy Policy Act of 2005 (Public Law 109-58), which authorized the Federal Energy Regulatory Commission (FERC) to certify an "Electric Reliability Organization" (ERO) to create mandatory and enforceable reliability standards, subject to FERC review and approval. FERC certified the North American Electric Reliability Corporation (NERC) as the ERO. The Energy Policy Act of 2005 also requires federal agencies to expedite approvals to allow owners or operators of transmission facilities access to the facilities to comply with applicable standards, including vegetation management standards.

NERC's Reliability Standard, FAC-003-1, "Transmission Vegetation Management Program" (NERC Standard) was enforced beginning on June 18, 2007 followed by subsequent revisions to the current FAC-003-4 version "Transmission Vegetation Management" in force as of October 1, 2016. NERC enforceable standards are available at: www.nerc.net/standardsreports/standardssummary.aspx. To enhance WAPA's compliance with NERC's Transmission Vegetation Management Reliability Standard, industry standards, and WAPA's policy and guidance, WAPA proposes to improve the way it manages vegetation along its ROWs on NFS lands in Colorado, Nebraska, and Utah. WAPA services an area of approximately 1.3 million square miles and operates and maintains more than 17,000 miles of transmission lines from its four regional offices, including approximately 273 miles of transmission line ROWs on NFS lands in Colorado, Nebraska, and Utah as follows:

- Colorado
    - Arapaho-Roosevelt National Forests
    - Grand Mesa, Uncompahgre, and Gunnison National Forests
    - Medicine Bow-Routt National Forests
    - Pike and San Isabel National Forests
    - San Juan National Forest
    - White River National Forest
- Nebraska
    - Nebraska National Forest
- Utah
    - Ashley National Forest

Forest Service Rocky Mountain Region, Region 2, manages NFS lands in Colorado and Nebraska, and the Intermountain Region, Region 4, manages NFS lands in Utah.

Purpose and Need for Action

WAPA needs to improve the way it manages vegetation along its 273 miles of transmission line ROWs on NFS lands in Colorado, Nebraska, and Utah with the following purposes and objectives:

1. To ensure that WAPA can safely and reliably operate and maintain its existing electrical transmission facilities to deliver electrical power
2. To further WAPA's compliance with NERC's Transmission Vegetation Management Reliability Standards, industry standards, and WAPA's policy and guidance
3. To ensure that WAPA's transmission facilities remain operational for the useful life of the facilities
4. To protect public and worker safety
5. To reduce the risk of wildfires caused by transmission lines and the risk to the facilities from fire
6. To control the spread of noxious weeds
7. To maintain sound relationships with landowners and land managers
8. To ensure that WAPA has access to its transmission facilities for maintenance and emergency response
9. To ensure that the costs associated with maintaining the transmission system can be controlled following sound business principles, including achieving technical and economic efficiencies to minimize impacts on transmission line tariff costs and electrical power rates
10. To allow flexibility to accommodate changes in transmission system operation and maintenance requirements
11. To minimize impacts to environmental resources

The Forest Service needs to issue new and/or updated Special Use Permits for each transmission line in order to be in compliance with the Federal Land Policy and Management Act and to authorize WAPA to change the way it manages vegetation along its ROWs on NFS lands.

Public Involvement

The Notice of Intent (NOI), published in the *Federal Register* (FR) on April 8, 2010 (75 FR 17847), was the first formal step in preparing an EIS and began the scoping process, which ended on May 26, 2010. The NOI invited public participation in the EIS scoping process and solicited public comments on the scope and content of the EIS. WAPA and the Forest Service solicited comments from federal, state, and local agencies; tribal governments; and other organizations and announced opportunities to comment in various local news media. In April 2010, WAPA and the Forest Service hosted three public scoping meetings in Denver and Grand Junction, Colorado, and Vernal, Utah, which provided the public an opportunity to comment and ask questions about the project and EIS development. Before each public meeting, WAPA and the Forest Service held interagency scoping meetings.

Substantive issues raised during the public comment process related to resources and resource uses, such as water resources and recreation, and concerns related to the NEPA process. The comments helped to define the scope of the analysis in this EIS, were used to develop the alternatives, or are addressed in other parts of the EIS. The following is a summary of the main issues raised during the scoping process, organized by topic:

Access and Transportation

- Ensure designated routes are used and maintain access routes according to Forest Service management specifications.
- Determine which routes are available for public use according to an approved Travel Management Plan.

Alternatives

- Minimize the width of vegetation treatment corridors consistent with safety and reliability of the transmission lines.
- Specify the circumstances and areas for treatments implemented under each alternative.

Climate Change

- Minimize the effects of global warming.

Floodplains, Wetlands, and Water Resources

- Design treatment activities near wetland and riparian areas to avoid or mitigate damage to soils, water quality, and non-target vegetation.

Health and Safety

- Concern for the effects of herbicides on human health.

Recreation

- Manage off-highway vehicle (OHV) use responsibly and uniformly across jurisdictional boundaries.

Roadless Areas

- Protect roadless area characteristics and minimize new road construction.

Social and Economic Values

- Promote opportunities for harvesting merchantable forest products following the National Healthy Forest Initiative (Public Law 108-148).

Soils

- Design, install, and maintain erosion control structures and culverts on access routes.
- Apply effective practices to maintain vegetation cover and prevent soil erosion.

Special Status and Sensitive Species

- Limit the removal of mature trees and other vegetation to avoid adversely altering the habitat of sensitive species that rely on a continuous forest canopy.

Vegetation

- Prioritize treatment areas and discuss the treatments proposed in each area.

Visual Resources

- Minimize the width of vegetation treatment corridors and transition cutting intensity to limit visual impacts by "feathering" the edges where trees are cleared.

Wildlife and Wildlife Habitat

- Concern for effects of herbicide on wildlife and general impacts of vegetation treatments on wildlife habitat.

Public Review of the Draft Environmental Impact Statement

The Notice of Availability (NOA) for the Draft EIS was published in the Federal Register on September 27, 2013. The NOA established a 46-day public comment period that ended on November 12, 2013. Due to the Federal government shutdown from October 1 to October 16, 2013, the Environmental Protection Agency and the U.S. Department of the Interior requested an extension to the comment period, which WAPA and the Forest Service granted them, extending their comment period to November 25, 2013. One public meeting was held in Denver, Colorado on October 23, 2013, which consisted of an open house and informal public hearing from 4:00 p.m. to 8:00 p.m. The meeting included exhibits displaying project information and a court reporter was available for taking oral comments. Notice of the meeting was provided through direct mailing and advertisements in the following newspapers: Denver Post and Vernal Express. The mailing notice was sent to approximately 930 individuals and agencies with an interest in the project, including tribal representatives and individuals and agencies that provided scoping comments.

No one attended the public meeting on October 23, 2013. WAPA and the Forest Service received four comment letters; two of the letters (from Uintah County, Utah and Bureau of Reclamation) expressed support for the project. The U.S. Department of the Interior letter indicated they had no comments on the project, and the Environmental Protection Agency letter indicated a rating of Lack of Objections (LO) for the project. No letters were received from the general public or tribes.

Changes to the Draft Environmental Impact Statement

Updates have been made to: wildlife, cultural resources, and cumulative impacts among other technical edits.

Comments received on the Draft EIS were carefully considered. Following coordination meetings between WAPA, the Forest Service, and the USFWS in January and February 2014, a new design feature was created to manage lynx habitat connectivity. The goal of this design feature is to facilitate lynx use of suitable habitat separated by the transmission line ROWs where vegetation management practices reduce the amount of horizontal cover on the ROW.

In the Air Quality section, additional details were added to describe the guidelines developed by federal land managers, including the Forest Service and National Park Service, for Levels of Concern (LOC) for total deposition of nitrogen and sulfur compounds in Class I Wilderness Areas. Because the amount and timing of specific activities that might be needed to maintain ROW will vary considerably by location and over time, the amount of emissions cannot be specifically predicted. Details were also added describing that because the proposed vegetation management activity takes place along already established ROW corridors, there would be no additional indirect impacts from the Proposed Action.

The Forest Health and Vegetation section was updated to include information on the management of felled trees if they are determined to have no economic value. The list of Forest Service sensitive plant species was updated to include information on five new species – the Aztec milkvetch, cushion bladderpod, English sundew, Missouri milkvetch, and Pagosa bladderpod – including their habitat/guild and their potential occurrence in forests in the Project Area.

Information on documented occurrences, and potential habitat of the Ute ladies'-tresses orchid in the Ashley National Forest were added to the Rare Plants section and the Threatened and Endangered Plant Species Section. The determinations for this species under the No Action Alternative and Proposed Action is "no effect." Based on known occurrences and surveys in 2014 species and critical habitat are not present.

Changes in species ESA listing status and changes to the Forest Service sensitive species list were updated, as described in the Affected Environment – Wildlife section. Based on the change in the ESA listing status of two species from candidate to threatened, the Gunnison sage-grouse and yellow-billed cuckoo discussions in this EIS were moved from the Forest Service Sensitive Species section to the Threatened and Endangered Wildlife Species section. In addition, the lesser prairie chicken and New Mexico meadow jumping mouse were also moved from the Forest Service Sensitive Species section to the Threatened and Endangered Wildlife Species section. The potential impacts to these species remain the same. Additional details were added to some Forest Service Wildlife Management Indicator Species and Species of Local Concern regarding the exclusion and reasons for the exclusion of these species. No additional species were added to this section, nor were there any changes for occurrence or potential habitat in the Project Area.

The descriptions for impacts to wildlife were updated to detail that similar impacts would occur to Threatened and Endangered species, MIS, and SOLC where they are present in the ROW; however, none of these impacts would be significant under the Proposed Action and No Action Alternative. Under the No Action Alternative, the determination for the Canada lynx was changed to "may affect, likely to adversely affect" in the Grand Mesa, Uncompahgre, and Gunnison National Forest based on consultation with the USFWS and existing habitat conditions. Under the Proposed Action, the determination for the Canada lynx was changed to "may affect, likely to adversely affect" in the Grand Mesa, Uncompahgre, and Gunnison National Forest, Arapaho-Roosevelt National Forest, Medicine Bow-Routt National Forest, and White River National Forest based on consultation with the USFWS and existing habitat conditions.

The descriptions for impacts to fisheries were updated to describe that no direct impacts are anticipated to greenback cutthroat trout and minor indirect impacts from fine sediment could occur. These potential impacts are "may affect, not likely to adversely affect" the greenback trout under the Proposed Action and the No Action Alternative. In addition, the bluehead sucker and Colorado River cutthroat trout could be affected by the No Action Alternative, but the effects would not cause a trend toward federal listing.

In December 2014, just prior to the Final EIS and ROD being issued, the Gunnison Sage-Grouse was listed as a threatened species by the U.S. Fish and Wildlife Service (USFWS). WAPA officially finalized its first Gunnison Sage-Grouse consultation with the USFWS on February 1, 2017. In September 2018, WAPA completed a re-initiation of that consultation to address possible impacts to Gunnison Sage-Grouse and its designated critical habitat from clearing habitat 50 feet around structures necessary to meet human safety protocols of Occupational Safety and Health Administration (OSHA) requirements for maintenance work on energized power lines. On September 6, 2018, the USFWS concurred with WAPA's mitigation measures and determination of "may affect, not likely to adversely affect."

Additionally, the Cultural Resources section was updated based on a review of current information on recorded resources in the History Colorado and WAPA archives to capture data collected by field work in the project area since the Draft EIS was published.

Other changes to the Draft EIS included updates to Section 1.5 to describe the public review period for the Draft EIS, and other minor technical edits to the text and maps for clarity. The Interdisciplinary Team Members and List of Preparers section was updated to include any changes for persons who reviewed and contributed to the preparation of this document.

Unresolved Issues

No unresolved issues have been identified.

Alternatives

WAPA and the Forest Service developed the No Action Alternative and the Proposed Action alternative to compare the environmental impacts and address issues raised during the public scoping process. Both the No Action Alternative and Proposed Action address maintenance of transmission lines and associated infrastructure, including access routes and managing vegetation. The major difference between the No Action Alternative and the Proposed Action is the proposal to change from a need-driven, reactive vegetation management approach (current practice, or the No Action Alternative) to a proactive maintenance strategy (the Proposed Action) that does not let vegetation become an immediate threat.

No Action Alternative

Under the No Action Alternative, WAPA would continue to maintain its infrastructure, ROW, and access roads as it currently does, as defined under existing authorizations and other agreements. The management approach to controlling vegetation, ensuring access, and maintaining equipment is largely need driven and reactive.

Under existing authorizations WAPA manages trees that are already or nearly a risk to the transmission lines. Because WAPA addresses primarily danger trees, as defined in its policy, it must review the ROWs at least once a year to look for and remove new danger trees. This focus requires annual reentries, and in some areas more frequent reentries, into a ROW to address danger trees that were identified during periodic line patrols or when maintenance crews were in the ROW for other activities. Under a need-driven management approach, WAPA currently manages vegetation along ROW segments as control needs are identified through periodic line patrols. WAPA uses a mix of manual, mechanical, and chemical (herbicides) methods to control vegetation in transmission line and access route ROWs. The No Action Alternative also includes the practice of spot application of Forest Service-approved herbicides. WAPA would continue to repair access routes as needed. Transmission system maintenance activities would consist of regular aerial and ground patrols to find problems, scheduling and performing repairs to correct problems, and preventive maintenance.

Proposed Action

WAPA proposes to change the way it manages vegetation in the ROWs for the transmission lines it owns, operates, or maintains. The Proposed Action is for the Forest Service to issue new Special Use Permits for each transmission line and authorize WAPA to manage vegetation along WAPA ROWs on NFS lands using an integrated vegetation management (IVM) approach, for which WAPA and the Forest Service will jointly develop new operation and maintenance plans which will be an appendix to the Special Use Permits. This approach is based on the American National Standard Institute Tree, Shrub and Other Woody Plant Maintenance – Standard Practices (Integrated Vegetation Management, a. Electric Utility ROW (ANSI A300 (Part 7)-2006 IVM). WAPA would control vegetation growth and fuel conditions that threaten transmission lines. The Proposed Action would balance the purpose of and need for agency action with the need to comply with environmental regulations and Forest Service requirements, address potential impacts to environmental resources, and incorporate public and agency comments. It incorporates the design features developed to protect environmental resources.

The vegetation management proposal would include an initial treatment plan for areas that have been identified for treatment. The initial treatment would affect approximately 1,610 acres of the approximately 4,055 acres of transmission line ROWs on NFS lands.

WAPA identified six broad categories of existing conditions in the ROWs. The condition of the vegetation in the ROW determines whether the ROW would need to be treated soon, needs treatment over the longer term, or is unlikely to need treatment for some time. WAPA routinely monitors ROWs to determine vegetation conditions. The Proposed Action includes vegetation management options based on the conditions in the ROWs. Table ES-1 summarizes the six categories of ROW conditions and vegetation management.

These areas are proposed for mechanical treatment to remove incompatible tall-growth species, while addressing a buildup of fuels from several decades of previous vegetation management activities. Treatments could include logging, chipping, and grinding of trees and existing debris using mechanized equipment and other activities developed in coordination with the Forest Service. After the initial treatment is completed in an area, the proposal is to maintain the area in a desired condition that is generally defined by a lack of incompatible vegetation species. The desired condition depends on the ROW conditions and incorporates design features that protect sensitive resources. As a co-lead agency, the Forest Service proposes to authorize and permit the identified ROWs, access routes, and associated maintenance activities.

Table ES-1. Categories of Right-of-Way Conditions and Vegetation Treatment Methods

Category	Vegetation	Examples	Frequency of Treatment	Treatment Methods
1	Compatible with the transmission line.	The lines span canyons and there will likely always be adequate clearance between vegetation and the transmission line conductors – even with larger mature trees; a vegetation community that is already a stable, low-growth one (e.g., grasses, forbs, bushes, and shrubs) so that vegetation at mature height is not a threat to the transmission line.	None expected for the duration of the authorization, but ROW monitoring will be needed to ensure conditions have not changed.	None expected.
2	Fast-growing incompatible species that are presently not acceptable, and over the long term, the vegetation is likely to include incompatible vegetation types that would require monitoring and treatment.	Mature lodgepole pine, mature aspen, and other species on high-quality growth sites.	• Initial treatment expected within 1 to 5 years. • Maintenance treatments are expected to be relatively frequent (expected 2- to 6-year return intervals).	• Accessible sites would favor use of mechanized equipment and removal of salvageable material. • Inaccessible sites would favor use of hand felling.
3	Fast-growing incompatible species of trees that are in an acceptable condition, but over the long term, incompatible vegetation treatments would be needed.	Immature lodgepole pine and aspen. Other species on high-quality growth sites.	• Maintenance treatments are expected to be relatively frequent (expected 2- to 6-year year return intervals, but this will vary depending on site conditions).	• Accessible sites would favor mechanized equipment, with removal of salvageable material. • Inaccessible sites would favor use of hand felling.
4	Slow-growing incompatible species of mature vegetation that is not acceptable, and over the long term, treatments for incompatible vegetation would be needed to control re-growth.	Mature spruce and fir. Other species on harsh sites.	• Initial treatment is expected within 2 to 5 years, depending on site conditions and vegetation growth. • Maintenance treatments are expected to be relatively infrequent on sites with incompatible species with slow growth rates, perhaps 5 or more years, depending on site conditions.	• On sites with good access, mechanized equipment would be favored and salvageable material would be removed. • On sites with poor access, hand felling and other manual methods would typically be used.

Table ES-1. Categories of Right-of-Way Conditions and Vegetation Treatment Methods

Category	Vegetation	Examples	Frequency of Treatment	Treatment Methods
5	These sites have slow-growing incompatible species, and the ROW is in an acceptable condition; but over the long term, the incompatible species would need to be monitored and treated.	Immature spruce and fir. Other incompatible species on harsh sites.	• Maintenance treatments are expected to be relatively infrequent, perhaps 5 years or longer, depending on site conditions.	• On sites with good access, mechanized equipment would be favored and salvageable material would be removed. • On sites with poor access, hand felling and other manual methods would typically be used.
6	Treatments in these areas of ROW are driven largely by the conditions of the fuel load. Typically, they include areas with low-growing vegetation types characterized by having high fuel loads. Sites are characterized by dense, woody vegetation capable of high-intensity fire, with transmission lines having relatively low conductor-to-ground clearances.	Sagebrush, Gambel oak, dense lodgepole regeneration, and pinyon and juniper pine.	• Initial treatments are expected. This could include mechanical removal of vegetation near structures and from areas of the ROW. • Maintenance treatments as needed. Need is determined from ROW monitoring.	• In areas with good access, mechanized treatment such as mowing would be favored. • In areas with poor access, manual treatments would typically be used. • Gambel oak could be treated with herbicides.

Environmental Consequences

Table ES-2 summarizes the impacts of the No Action Alternative and the Proposed Action. Potential effects would be similar across the affected NFS lands, unless otherwise indicated. Chapter 3, Affected Environment and Environmental Consequences, describes the affected environment and potential effects in detail.

Table ES-2. Summary of Environmental Consequences by Alternative

Resource	No Action Alternative	Proposed Action
Air Quality	Except for slash-pile burning, which is expected to be done very infrequently if at all, direct and indirect impacts on air pollutant concentrations, atmospheric deposition, visibility, and climate change in the project area from ROW maintenance activity emissions are expected to be very minor or negligible. Potential cumulative effects would be localized along the various ROWs throughout the project area and insignificant compared to emissions from other regional sources.	Implementing integrated vegetation management would improve efficiencies in scheduling of maintenance activities. Following this approach and ensuring that engines and other equipment are properly tuned and turned on only when in active use (which minimizes emissions from idling), direct, indirect, and cumulative impacts on air quality are also expected to be negligible and comparable to or less than under the No Action Alternative.
Surface Water	There would be some potential for short-term adverse effects from vegetation maintenance that causes erosion and sedimentation from reentry into the same site or adjoining sites in the ROWs. These effects would be very localized because of the small footprint required to remove danger trees. There could be long-term, but likely minor, impacts to water quality from recurring vegetation treatments, including increased levels of erosion, sedimentation, habitat degradation, and degradation of beneficial uses of the receiving waters. No cumulative effects have been identified, but there would likely be at least a minor degree of impact from recurring maintenance activities.	There would be a potential for more short-term direct adverse effects on water resources in areas where treatments are required. After the initial treatments, long-term effects would be greatly reduced because of less-frequent reentry for vegetation maintenance. WAPA's ROWs cross four waterbodies listed as impaired that serve as source waters for public drinking water systems – two in Grand Mesa, Uncompahgre, and Gunnison National Forests and two in Medicine Bow-Routt National Forests. Water quality issues near these impaired waterbodies should not be exacerbated, even during the initial maintenance effort to reset vegetation conditions, because of design features and standard maintentenance procedures. There would be limited potential for cumulative effects.

Table ES-2. Summary of Environmental Consequences by Alternative

Resource	No Action Alternative	Proposed Action
Soils	Danger-tree removal, fuels reduction, and other ROW maintenance activities would continue to disturb soil and could subject soils to accelerated runoff and erosion rates. Management practices would continue to adversely affect soil compaction, soil quality, organic matter content, nutrient cycling, and soil productivity. These impacts would be short term and localized. Vegetation management activities in ROWs would continue to meet Forest Service Soil Quality Standards. No substantial cumulative effects were identified.	Potential short-term direct adverse effects include increased soil erosion, compaction, and rutting from mechanical and biological treatments, and decreased soil nitrogen levels in areas where large amounts of wood chips are broadcast. Formation of hydrophobic soil from slash-pile burning would be localized and not extend over large areas, so there would be no substantial increase in erosion. There would be potential long-term beneficial effects from decreased fuel loads, which would reduce the potential for high-intensity, long-duration wildfires. There could be short-term indirect cumulative effects on receiving waters from sedimentation caused by accelerated erosion along ROWs.
Wetlands/Riparian Areas/Floodplains	There would be potential direct adverse effects from danger-tree removal, access road maintenance, and accumulation of woody debris. These effects would include soil disturbance or compaction, and altering floodplains from removal of danger trees, access road maintenance, and tower repair. There would be potential beneficial effects from debris accumulation adding to the complexity of both the terrestrial and aquatic habitats. There would be potential indirect adverse effects associated with erosion (including streambed and bank instability), sedimentation, and inadvertent diversion of surface water. The potential for impacts increases with the number of wetland features present, and forests with the most wetland (especially PFO wetlands), riparian, and floodplain resources will have the highest potential for impacts. Design features would minimize these effects. There would be potential cumulative effects from changes in stream flow from the conversion of forested wetlands/riparian areas to non-forested, and the accumulation of downed danger trees. If stream flows were altered over time, it could cause increased sediment loading and decreased bank stability.	Same as the No Action Alternative.
Forest Health and Vegetation	No appreciable direct or indirect effects on forest health.	There would be potential beneficial effects on forest health from vegetation treatments in areas currently affected by pests (151 acres) within 6 years of authorization. However, potential effects on overall forest health would be negligible compared to more than 1 million acres in Colorado with active pest outbreaks. There would be potential beneficial effects from treating debris and eliminating bark beetle breeding habitat in the debris and returning fuel loads to pre-treatment levels. There would be potential beneficial cumulative effects on forest health from accelerating ROW treatments compared to the No Action Alternative.

Table ES-2. Summary of Environmental Consequences by Alternative

Resource	No Action Alternative	Proposed Action
Invasive Species	There would be no substantial adverse or beneficial effects on invasive species or effects on other vegetation populations from introduction or spread of invasive species. There could be indirect effects from the gradual, steady encroachment of newly established invasive plant populations over the long term. There would be more potential for increased spread of invasive species due to the aggressive, successional nature of the invasive species present in Grand Mesa, Uncompahgre, and Gunnison National Forests and San Juan National Forest. There could be minor cumulative effects on plant diversity, reduction or expansion of colonization of noxious weeds on disturbed sites, and potential herbicide damage to non-targeted plants.	There would be no substantial direct effects on invasive species. There could be gradual indirect effects on other vegetation populations from increased potential for introduction and spread of invasive species due to the greater area of surface disturbance and exposed soil. There would be more opportunity for spread of invasive species in San Juan National Forest and Grand Mesa, Uncompahgre, and Gunnison National Forest because of the diverse volume and number of existing invasive species in ROWs. There would be a potential for increased plant diversity because of more aggressive treatment and larger treatment areas, allowing for the establishment of compatible plant species and communities. Cumulative effects would be similar to those under the No Action Alternative.
Rare Plants	There would be no substantial adverse or beneficial effects on threatened, endangered, or proposed plant species, or their habitat. No impacts are anticipated to Ute ladies'-tresses based on lack of presence in 2014 surveys and critical habitat not present. Therefore, the No Action Alternative is "no effect" to Ute ladies'-tresses. Except for Ashley National Forest and Nebraska National Forest, the Forest Service has documented the presence of Forest Service sensitive species and associated habitats throughout the study area. The potential for direct and indirect effects on sensitive plant species would be from surface disturbance and potential habitat impacts from existing transmission line maintenance actions and associated vegetation management in the ROWs. There could be minor cumulative effects on plant diversity, the spread of noxious weeds on disturbed sites, and herbicide damage to non-targeted plants.	Similar to the No Action Alternative, Forest Service sensitive species or habitat may be affected. There would be more potential for direct and indirect adverse effects because there would be more vegetation treatments over larger areas in ROWs where vegetation would be treated. There would be a potential for increased plant diversity due to more aggressive and larger treatment areas, though with less re-entry and frequency allowing for the establishment of compatible plant species and communities. Although design features are intended to minimize direct impacts from proposed activities, there could still be unavoidable indirect impacts. Similar to the No Action Alternative, no impacts are anticipated to Ute ladies'-tresses based on lack of presence in 2014 surveys and critical habitat not present. Therefore, the Proposed Action is "no effect" to Ute ladies'-tresses. There would be minor potential for direct and indirect effects on rare plant habitat in alpine ecosystems in Grand Mesa, Uncompahgre, and Gunnison National Forests. Cumulative effects would be similar to those under the No Action Alternative.

Table ES-2. Summary of Environmental Consequences by Alternative

Resource	No Action Alternative	Proposed Action
Wildlife	There is a potential for minor direct and indirect impacts to wildlife resources from vegetation management, other maintenance activities, and ROW inspections. Danger tree management would allow for early and mid-seral habitat conditions to persist within forested landscapes, benefiting wildlife that favor these conditions. Few habitat effects would be evident within non-forested landscapes. Danger tree removal conducted during the spring and early summer nesting season could result in the destruction of bird nests with eggs or chicks present. Wildlife mortality or injury could also occur from collisions with vehicles and helicopters, and when vehicles leave roads and track across the ROWs; however, these would be rare. Noise and disturbances associated with maintenance operations could result in temporary short-term impacts as wildlife flee the disturbance or seek cover. Increased erosion from soil disturbing activities, accidental spills of hazardous materials (e.g. solvents, gasoline, diesel fuel, etc.), and herbicides used for vegetation management could pose a hazard to some wildlife species, particularly amphibians if these contaminants wash into wetlands and other aquatic habitats. Cumulative impacts to wildlife would be relatively minor when considered together with other actions in the region. Similar impacts would occur to federally-protected Threatened and Endangered species, MIS, and SOLC where they are present in the ROW; however, none of these impacts would be significant. In the Grand Mesa, Uncompahgre, and Gunnison National Forest, the No Action Alternative is “may affect, likely to adversely affect” the Canada lynx.	Direct and indirect effects would be similar to the No Action Alternative, except that the magnitude of the effects would be greater during initial treatment due to more intensive vegetation management. Removal and long-term management of incompatible vegetation, including regenerating forest stands and dense shrub stands that pose a high fire risk, would keep ROWs much more open than under the No Action Alternative. These conditions would primarily benefit those species that favor open herbaceous communities, low-density shrub communities, and forest-edge habitat. Reduced security cover in the more open ROWs could impede movements by some small mammals, amphibians, and reptiles, reducing habitat connectivity for those species. Risk to nesting birds, mortality from vehicle collisions and equipment operating within ROWs, and risk from contaminants (including fine sediments, hazardous materials, and herbicides) would be greater. Although design features are intended to minimize effects from the Proposed Action, some unavoidable impacts would remain. Noise and human disturbances associated with the proactive vegetation management would exceed the No Action Alternative, especially in the first five years. Cumulative effects would be similar to those under the No Action Alternative. Similar impacts would occur to federally-protected Threatened and Endangered species, MIS, and SOLC where they are present in the ROW; however, none of these impacts would be significant. In the Arapaho-Roosevelt National Forest, Grand Mesa, Uncompahgre, and Gunnison National Forests, Medicine Bow-Routt National Forest, and White River National Forest, the Proposed Action is “may affect, likely to adversely affect” the Canada lynx.

Table ES-2. Summary of Environmental Consequences by Alternative

Resource	No Action Alternative	Proposed Action
Fisheries	There would be minor potential for direct and indirect impacts to fisheries resources from vegetation management activities in ROWs compared to the overall lengths of streams in the surrounding National Forest System lands that have fisheries habitat. There would be no effects on fish survival or population numbers in the forests. Cumulative effects would be minor. No direct impacts are anticipated to the greenback cutthroat trout and minor indirect impacts from fine sediment delivery could occur. These potential impacts are "may affect, not likely to adversely affect" the greenback cutthroat trout. The bluehead sucker and Colorado River cutthroat trout could be affected by the No Action Alternative, but the effects would not cause a trend toward federal listing. No impacts are anticipated to the flannelmouth sucker, mountain sucker, or roundtail chub.	Direct and indirect effects would be similar to those under the No Action Alternative, except there would be more effects from increased vegetation management, application of herbicides, slash-pile burning, and erosion. There would be potential short-term adverse effects from vegetation treatment causing soil compaction and disruption, and the localized degradation of habitat through loss of shade and increased sunlight from canopy openings. There would be negligible effects from slash-pile burning and application of herbicides. Cumulative effects would be similar to those under the No Action Alternative. Similar to the No Action Alternative, no direct impacts are anticipated to the greenback cutthroat trout and minor indirect impacts from fine sediment delivery could occur. These potential impacts are "may affect, not likely to adversely affect" the greenback cutthroat trout. The bluehead sucker and Colorado River cutthroat trout could be affected by the No Action Alternative, but the effects would not cause a trend toward federal listing. No impacts are anticipated to the flannelmouth sucker, mountain sucker, or roundtail chub.
Fire and Fuels Management	There would be increased potential for wildfire damage on 1,153 acres that do not meet desired fuel conditions. Debris would continue to accumulate and add to the existing fuel loads, which would increase the risks from wildfire in the project area. Only dead or tall trees would be removed from the ROWs. Conditions and risks would vary by forest, depending on existing fuel loads and vegetation types in the ROWs. There would be no potential for adverse cumulative effects in the eight forests. There would be minor potential for beneficial cumulative effects in the Arapaho-Roosevelt, Ashley, and Grand Mesa, Uncompahgre, and Gunnison National Forests.	There would be decreased potential for wildlfire damage and threat to adjacent NFS lands from reducing the amounts of fuel on the ground, thinning the trees to a wider spacing, controlling re-growth, and pruning the lower branches of the trees to create a gap between surface and ladder and canopy fuels. There would be potential indirect effects on fire behavior from lower heat produced and shorter flame lengths. There would be slight changes in the rate of fire spread because thinning trees opens the canopy to allow more sunlight to reach the surface, which reduces moisture in fine fuels that respond rapidly to changes in temperature. Beneficial cumulative effects would be similar to those under the No Action Alternative; however, they would be slightly greater given the reductions in risk of wildfire under the Proposed Action.

Table ES-2. Summary of Environmental Consequences by Alternative

Resource	No Action Alternative	Proposed Action
Cultural Resources	Continuation of the present maintenance practices will have little or no likelihood of affecting, either directly or indirectly, NRHP listed or eligible cultural resources (historic properties) for those exempt activities listed in WAPA's existing Programmatic Agreement (Appendix F) for maintenance and minor construction activities at existing WAPA facilities (2015). Non-exempt activities listed in the Programmatic Agreement have a greater likelihood of directly or indirectly affecting historic properties. Any adverse effects to historic properties as a result of non-exempt activities will be resolved under the Sec. 106 process. WAPA expects there would be no or minimal cumulative impacts to cultural resources under the No Action Alternative.	The likelihood of affecting, either directly or indirectly, historic properties under the Proposed Action would the same as under the No Action Alternative. There is little or no likelihood of directly or indirectly affecting historic properties for those exempt activities listed in WAPA's existing Programmatic Agreement (Appendix F). Non-exempt activities listed in the Programmatic Agreement have a greater likelihood of directly or indirectly affecting historic properties. Any adverse effects to historic properties as a result of non-exempt activities will be resolved under the Sec. 106 process. WAPA expects there would be no or minimal cumulative impacts to cultural resources under the No Action Alternative.
Transportation	There could be temporary and short-term traffic delays and road closures on access routes open to public travel (580 miles) where immediate risks to transmission lines are found or when access routes need maintenance. There could be beneficial effects from access route maintenance improving travel conditions on NFS roads. Indirect effects include temporary increases in public traffic on other NFS roads, or use of unauthorized routes. There could be cumulative effects from traffic delays or road closures on access routes open to public travel if the reasonably foreseeable projects affect traffic patterns or travel on the same NFS routes and occur at the same time as project activities. However, these cumulative effects would be temporary and of short duration, lasting only as long as project activities in the immediate vicinity.	Project activities that affect transportation are the same as those described for the No Action Alternative, and effects would be similar. The potential for direct and indirect effects on transportation are primarily related to the frequency and location of initial vegetation treatments, and maintenance treatments needed thereafter. WAPA would use the same access routes under the Proposed Action as under the No Action Alternative. There could be increases in the frequency of traffic delays and road closures on access routes open to public travel (580 miles) in vegetation treatment areas, or as access routes need maintenance. There would be increased potential for road damage from using or hauling heavy equipment. Over the long-term, maintenance activities could also be identified and addresssed more proactively, benefiting public travel on NFS routes. Cumulative effects on transportation would be similar to effects under the No Action Alternative because both alternatives use the same NFS access routes, except that project effects would occur more frequently and larger areas would be treated under the Proposed Action. For this reason, the potential for cumulative effects would increase under this alternative, but would be temporary and last only as long as project activities in the immediate vicinity.

Table ES-2. Summary of Environmental Consequences by Alternative

Resource	No Action Alternative	Proposed Action
Visual Resources	WAPA transmission line infrastructure, ROWs, and access routes, and current vegetation management activities are part of the existing visual landscape in the project area and would not substantially degrade the character or change scenic quality. There would be no impacts to existing VQOs or SIOs. Air pollutant emissions would be consistent with ongoing management activities and would not increase. There are currently no unresolved conflicts with visual standards identified by a federal land management agency. Because current management activities are a part of the existing visual landscape, continuing them would not permanently reduce visually important features on NFS lands. They are short-duration activities that would help maintain a visual landscape that is consistent within ROWs, and would not result in long-term adverse visual changes or contrasts to the existing landscape as viewed from areas with high visual sensitivity. There could be indirect and cumulative impacts on the project area's scenic character because management under the No Action Alternative would increase the chance for catastrophic fire where dense vegetation under the transmission line would aid in the spread of forest fires.	Proposed Action activities that affect recreation are the same as those described for the No Action Alternative. Direct and indirect effects on recreation would be similar to those described for the No Action Alternative, but could occur more often in areas where ROWs need initial vegetation treatments, and maintenance treatments at intervals thereafter. Management of vegetation in Category 1 and 5 (Table 2-3) areas would affect recreation the least because these areas do not require initial treatments, but effects could occur more often in the Category 2, 3, 4 and 6 areas. Following design features and standard maintenance procedures would minimize effects. There would be increased potential for indirect visual effects because larger areas in one location might need treatment and would be more noticeable. Cumulative effects would be similar to those under the No Action Alternative, because both alternatives would affect the same recreation activities and facilities. The potential for cumulative effects would be greater under the Proposed Action because of the initial increased frequency of project activities over a larger area. These effects would be temporary and of similar duration as under the No Action Alternative

Table ES-2. Summary of Environmental Consequences by Alternative

Resource	No Action Alternative	Proposed Action
Recreation	There could be temporary and short-term trail closures from vegetation treatment or maintenance activities. There could be beneficial effects from trail maintenance and removing obstacles or repair work. Recreationists could experience temporary road closures that prevent or delay travel to recreation sites, trails, and trailheads for short periods. There could be indirect effects from localized noise or views of workers, equipment, vehicles, or debris, and treated areas; these conditions could temporarily affect the experience of dispersed recreationists on trails or in areas near treatment or maintenance activities. Recreationists in SPM or SPNM settings would be more sensitive to indirect effects, but the expected experience or character of the area would not be permanently altered to the degree that it would change these recreation opportunity settings. If the present and reasonably foreseeable projects occur at the same time and overlap with the same transmission line ROWs, there could be cumulative effects on recreation activities and facilities from temporary closures, delays, or detours, or displacement of recreation activities. These temporary effects would be limited to the transmission line ROWs or immediate area near the ROWs being treated. However, the potential cumulative effects would be temporary and of short duration, lasting only as long as vegetation treatment activities are underway in the immediate vicinity.	Proposed Action activities that affect recreation are the same as those described for the No Action Alternative. Direct and indirect effects on recreation would be similar to those described for the No Action Alternative, but could occur more often in areas where ROWs need initial vegetation treatments, and maintenance treatments at intervals thereafter. Management of vegetation in Category 1 and 5 (Table ES-1) areas would affect recreation the least because these areas do not require initial treatments, but effects could occur more often in the Category 2, 3, 4 and 6 areas. Following design features and standard maintenance procedures would minimize effects. There would be increased potential for indirect visual effects because larger areas in one location might need treatment and would be more noticeable. Cumulative effects would be similar to those under the No Action Alternative, because both alternatives would affect the same recreation activities and facilities. The potential for cumulative effects would be greater under the Proposed Action because of the initial increased frequency of project activities over a larger area. These effects would be temporary and of similar duration as under the No Action Alternative.
Public Health and Safety	Activities under the No Action Alternative are designed to maintain the transmission lines to minimize hardware failure and reduce risks from potentially dangerous interactions with vegetation that could cause a fire. For hazardous materials (e.g., solvents, gasoline, diesel fuel, etc.) spills, impacts are expected to be minor and short term. WAPA does not expect public-safety problems during maintenance activities. Impacts to public use of NFS lands are expected to be short term and minor. No direct or indirect effects related to electromagnetic fields are expected. No cumulative effects were identified.	Same as the No Action Alternative.

MIS	Management Indicator Species	SIO	Scenic Integrity Objective
MVUM	motor vehicle use map	SOLC	Species of Local Concern
NFS	National Forest System	SPM	semi-primitive motorized
PFO	palustrine forested	SPNM	semi-primitive non-motorized
ROW	right-of-way	VQO	Visual Quality Objective

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CHAPTER 1 – PURPOSE AND NEED FOR ACTION

1.1 Background

On August 10, 1996, during a period of high temperatures and high electricity demand, a transmission line sagged into filbert trees near Portland, Oregon, leading to a cascade of power outages as far away as southern California. Executive Order (EO) 13212, *Actions To Expedite Energy-Related Projects* (May 18, 2001), declared the increased production and transmission of energy in a safe and environmentally sound manner to be essential to the well-being of the American people, and called for the improvement and streamlining of cooperation among federal agencies to expedite projects that will increase the production, transmission, or conservation of energy. In August 2003, high temperatures resulting in high electricity demand caused a widespread power outage in the Northeast and Midwest, affecting approximately 45 million people in the United States and 10 million people in Ontario, Canada. The U.S.-Canada Power System Outage Task Force found that, again, transmission line sag into overgrown trees in rural Ohio caused the outage.

In response to these widespread outages, Congress enacted the Energy Policy Act of 2005 (Public Law 109-58), which authorized the Federal Energy Regulatory Commission (FERC) to certify an "Electric Reliability Organization" (ERO) to create mandatory and enforceable reliability standards, subject to FERC review and approval. FERC certified the North American Electric Reliability Corporation (NERC) as the ERO. The Energy Policy Act of 2005 also requires federal agencies to expedite approvals to allow owners or operators of transmission facilities access to the facilities to comply with applicable standards, including vegetation management standards.

NERC's original Reliability Standard, FAC-003-1, "Transmission Vegetation Management Program" (NERC Standard) was enforced beginning on June 18, 2007. The most recent version of the NERC Standard has been revised as FAC-003-4, "Transmission Vegetation Management" approved on February 11, 2016 and became enforceable on October 1, 2016. A copy of the NERC standard is available on the web at https://www.nerc.com/pa/stand/Pages/ReliabilityStandardsUnitedStates.aspx?jurisdiction=United%20States. To enhance Western Area Power Administration's (WAPA) compliance with NERC's Transmission Vegetation Management Reliability Standard, industry standards, and WAPA's policy and guidance, WAPA proposes to improve the way it manages vegetation along its rights-of-way (ROWs) on National Forest System (NFS) lands in Colorado, Nebraska, and Utah (the project area; see Figure 1-1). WAPA serves an area of approximately 1.3 million square miles and operates and maintains approximately 17,000 miles of transmission lines from its four regional offices, including approximately 273 miles of transmission line ROWs on NFS lands in Colorado, Nebraska, and Utah, WAPA's Rocky Mountain Customer Service Region.

When the Forest Service approves the construction of an electric transmission line on NFS lands, it is a long-term commitment of the area in the permitted ROW. This includes a commitment to allow continuous access for maintenance and emergencies. Although the Forest Service authorizations are not exclusive, subsequent uses within the ROW must be compatible with the permitted ROW. The electrical transmission facility must routinely be maintained and be able to operate unimpeded for its intended purpose through its full range of anticipated and designed conditions. In the permitted ROW, vegetation management objectives focus on reducing the risk associated with transmission lines contacting trees and starting wildfires, ensuring the transmission lines are managed to maximize the opportunity to survive wildfires, ensuring public health and safety, ensuring the safety of electrical workers, ensuring access, and protecting environmental resources.

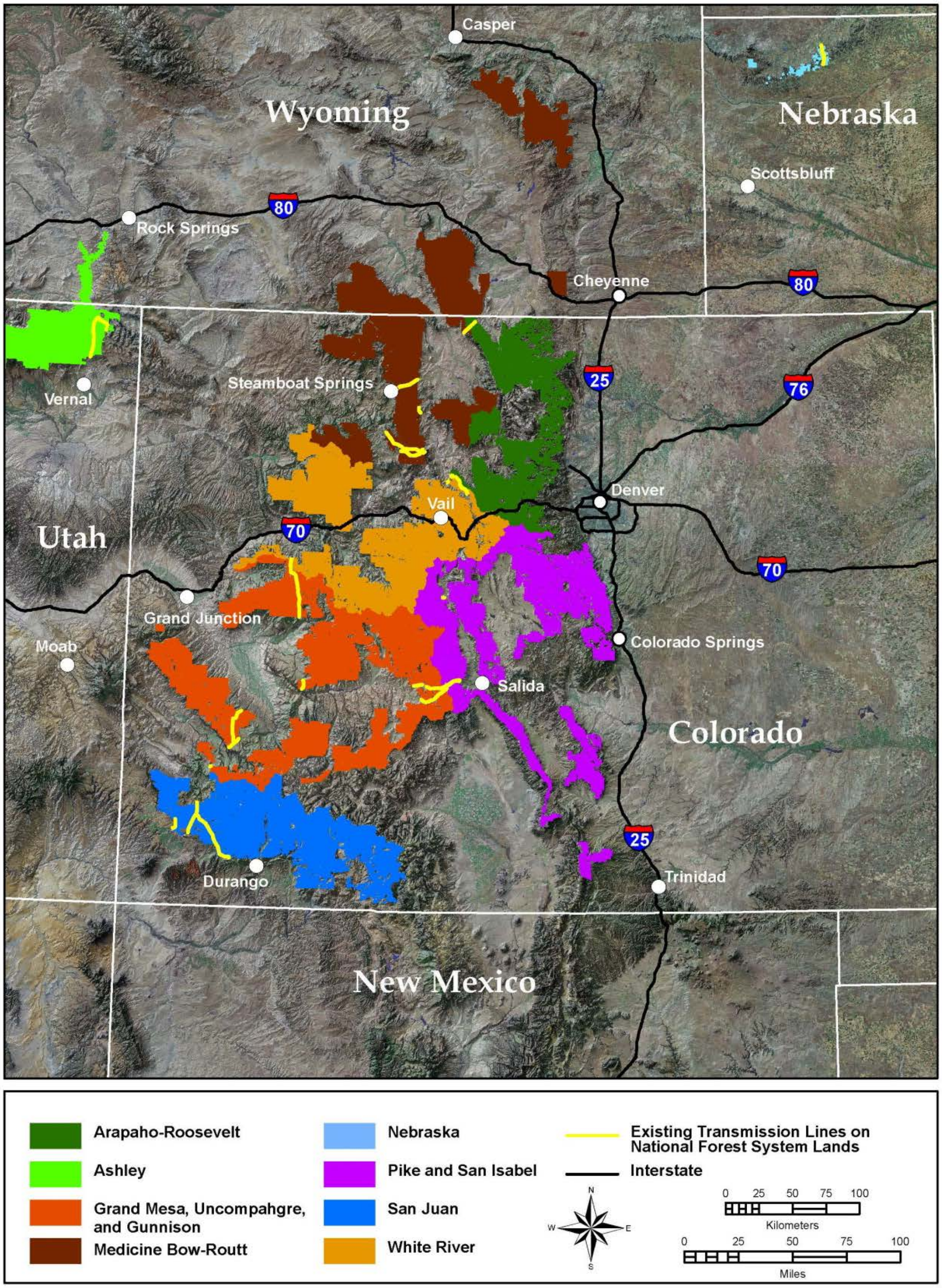
The vegetation management requirements are an example of the issues WAPA and the Forest Service encounter with having different types of authorizations for the transmission lines. In many cases, ROW maintenance has been guided by operation and maintenance (O&M) plans that limit removal of trees to those identified as hazardous. In these cases, maintenance practices typically do not address the encroaching vegetation until it becomes a threat that requires immediate attention to ensure no adverse effect to the transmission line or to avoid a threat of fire. This reactive approach to hazardous-vegetation maintenance is not conducive to ensuring the level of operating reliability that is required by today's NERC standards, nor is it efficient or cost effective. Today's stricter maintenance standards require a more aggressive, proactive approach to vegetation management, with the goal of ensuring that there will be no tree-caused transmission line outages or fires. Surveys of the WAPA transmission-line ROWs in the Colorado, Nebraska, and Utah forests reveal a broad spectrum of vegetation threat conditions. While some ROWs are reasonably clean and secure, many others contain dense slash, heavy live and dead fuel loads, and encroaching trees.

This Environmental Impact Statement (EIS) analyzes the impacts of revising WAPA's vegetation management practices in the project area (the Proposed Action) and the reauthorization of the permits to occupy NFS lands or continuing current vegetation management practices (the No Action Alternative). WAPA and the U.S. Forest Service are joint lead agencies for preparing this EIS, as defined in 40 Code of Federal Regulations (CFR) 1501.5. Tri-State Generation and Transmission, Inc. is a project participant.

1.1.1 Legal Mandates

WAPA must meet NERC Standards, industry standards, and WAPA, Orders, policy, and guidance. FERC oversees efforts of utilities throughout the country to maintain reliability through effective vegetation management. FERC has designated NERC as the ERO responsible for enforcing the NERC Standard, which requires WAPA to prepare and keep current a formal transmission vegetation management program.

Figure 1-1. Project Area for the Western Area Power Administration Transmission Line Reauthorization Project



1.1.2 Agency Guidance and Industry Standards

In the Utility Vegetation Management Final Report (FERC 2004), researchers concluded that current industry requirements and standards are not adequate to achieve the level of utility vegetation management necessary to improve reliability by reducing tree-caused transmission outages. The report emphasizes the need for new standards and best management practices (BMPs) for utility ROW vegetation management. In addition to the NERC Standard, transmission owners must adhere to industry standards to comply with the 2005 Energy Policy Act. The NERC Standard was developed in part to ensure that utilities maintain a reliable electric transmission system by using the described strategy to manage vegetation in transmission line ROWs. WAPA developed the Proposed Action in this EIS to meet the purpose and need described in Section 1.2 for WAPA's ROWs, including the need to comply with applicable industry standards and requirements. Standard FAC-003-4 requires that each utility develop a transmission vegetation management program. A commonly used industry standard for vegetation management in utility ROWs is American National Standards Institute (ANSI) Standard A300, Part 7. The vegetation management proposal described in this EIS is based on that ANSI standard. The following WAPA Orders provide additional guidance on WAPA's proposal: WAPA O 430.1C, Right-Of-Way Management Guidance for Vegetation, Encroachments, and Access Routes; and WAPA O 450.3C, Transmission Vegetation Management Program. Subsequent major revisions to these requirements are not likely to require major changes to the activities included in the Proposed Action described in this EIS. However, WAPA will evaluate revised requirements as they occur to decide if additional environmental review would be required.

1.1.3 National Environmental Policy Act

As federal agencies, WAPA and the Forest Service are responsible for preparing this EIS according to the requirements of the National Environmental Policy Act (NEPA) of 1969 (42 United States Code [U.S.C.] 4321 et seq.), as amended, Council on Environmental Quality (CEQ) implementing regulations (40 CFR 1500–1508), U.S. Department of Energy (DOE) NEPA implementing regulations, and Forest Service-specific NEPA guidance. WAPA and the Forest Service prepared this EIS to assess the environmental, social, and economic impacts associated with the proposed action on NFS lands and to evaluate two alternatives – the No Action Alternative and the Proposed Action.

The EIS preparation process consists of a series of procedural steps to ensure an adequate and open analysis of the environmental issues associated with a Proposed Action and its alternatives. The analysis should measure the direct, indirect, and cumulative impacts of each alternative, impacts to long-term productivity, and irreversible or irretrievable commitments of resources that would be involved in the proposal if it were implemented. Impacts of all alternatives must be compared to provide adequate information to select a preferred alternative. The process provides and encourages opportunities for interagency coordination and public involvement. This EIS provides an analysis of impacts from implementing the alternatives and identifies measures to address adverse impacts to the natural and human environment.

At the end of the public comment period for the Draft EIS, WAPA and the Forest Service reviewed and developed responses to substantive comments from the public and other agencies. WAPA incorporated the responses to substantive comments and other information identified during this review in the Final EIS, as appropriate.

The Final EIS will provide WAPA and the Forest Service with information the agencies can use as the basis for a final decision that considers factors relevant to the proposed project. The Final EIS will not be a decision document; rather it will document the potential environmental consequences of implementing the No Action Alternative or the Proposed Action. WAPA will document the decision in a separate Record of Decision. The Forest Service will issue its own decisions.

1.2 Purpose and Need for Action

WAPA needs to improve the way it manages vegetation along its 273 miles of ROWs on NFS lands in Colorado, Nebraska, and Utah, with the following purposes and objectives:

1. To ensure that WAPA can safely and reliably operate and maintain its existing electrical transmission facilities to deliver electrical power
2. To further WAPA's compliance with NERC's Transmission Vegetation Management Reliability Standards, industry standards, and WAPA's Orders, policy, and guidance
3. To ensure that WAPA's transmission facilities remain operational for the useful life of the facilities
4. To protect public and worker safety
5. To reduce the risk of wildfires caused by transmission lines and the risk to the facilities from fire
6. To control the spread of noxious weeds
7. To maintain sound relationships with landowners and land managers
8. To ensure that WAPA has continuous access to its transmission facilities for maintenance and emergency response
9. To ensure that the costs associated with maintaining the transmission system can be controlled following sound business principles, including achieving technical and economic efficiencies to minimize impacts on transmission line tariff costs and electrical power rates
10. To allow flexibility to accommodate changes in transmission system operation and maintenance requirements
11. To minimize impacts to environmental resources.

WAPA holds a variety of authorizations for its transmission lines on NFS lands. Several transmission lines were authorized by Memoranda of Understanding between the Bureau of Reclamation and the Forest Service, others were authorized to WAPA's customers with WAPA designated as responsible for maintaining the line under an agreement with the customer, and some were authorized under Special Use Permits. The Forest Service needs to reauthorize and issue Special Use Permits for each transmission line and authorize WAPA to change the way it manages vegetation along its ROWs on NFS lands.

The various types of authorizations differ in their terms and conditions, which leads to confusion about which maintenance activities are authorized. Table 1-1 identifies the transmission lines and authorizations. The Table identifies the name of the transmission line as used in the EIS analyses and the current 2020 naming convention.

Table 1-1. Existing Agreements for the Transmission Line Rights-of-Way

Transmission Line [Historical Naming Convention]	2020 Naming Convention	Memorandums of Understanding, Special Use Permits, Other Permits, Dates, Signatory
Archer-Hayden 230-kV	Terry Ranch Road-North Park North Park-Hayden 230-kV	SUP 8/31/1995, Regional Forester Same document for Ault-Craig transmission line
Ault-Craig 345-kV	Ault-Craig 345-kV	SUP 8/31/1995, Regional Forester Same document for Archer-Hayden transmission line
Blue River-Gore Pass 230-kV	Blue River-Gore Pass 230-kV	Construction authorized 10/22/1986, Application pending since 02/04/1998.
Box Butte-Chadron [Alliance-Chadron] 115-kV	Box Butte Switch Station-Chadron 115-kV	Original MOU between SCS and BOR; BLM ROW grant NEBLMA 026189 issued 6/03/1955, Transferred to Forest Service 8/22/1994
Curecanti-Lost Canyon [Cortez-Curecanti] 230-kV	Curecanti-Lost Canyon 230-kV	MOU 6/13/1962, Regional Forester
Curecanti-Poncha [Curecanti-Midway] 230-kV	Curecanti-Poncha 230-kV	MOU 8/24/1962
Curecanti-Rifle [Curecanti-Hayden] 230-kV	Curecanti-North Fork North Fork Rifle 230-kV	GMUG - MOU 6/13/1962, Regional Forester White River National Forest - MOU 6/13/1962, Regional Forester
Flaming Gorge-Vernal #1 138-kV	Flaming Gorge-Vernal #1 138-kV	MOU 10/19/1960, Acting Regional Forester
Flaming Gorge-Vernal #3 138-kV	Flaming Gorge-Vernal #3 138-kV	MOU 7/12/1966, Acting Regional Forester
Gore Pass-Hayden [Green Mountain-Oak Creek] 138-kV	Gore Pass-Hayden 138-kV	Letter permit issued to BOR 4/26/1950
Gore Pass-Muddy Pass 69-kV	Line is scheduled to be decommissioned	1951 permit; information taken from Transfer Book; application pending since 5/1998
Great Cut-McPhee 12.5-kV	Great Cut-McPhee 12.5-kV	BOR/Forest Service MOA; land use agreement to transfer ROW to WAPA dated 11/19/1987
Great Cut Switchyard-Great Cut Tap 115-kV	Great Cut Tap-Great Cut 115-kV	BOR/Forest Service MOA; land use agreement to transfer ROW to WAPA dated 11/19/1987[1]
Green Mountain-Blue Ridge Repeater 2.4-kV [Green Mountain-Blue River]	Green Mountain-Blue Ridge Repeater 2.4-kV	Letter permit issued to BOR 7/17/1950 by Regional Forester
Green Mountain-Kremmling 69-kV	Green Mountain-Kremmling 69-kV	Transferred from BLM 2/28/1988
Hayden-Gore Pass 230-kV	Hayden-Gore Pass 230-kV	Easement issued to Tri-State 11/9/1982; maintenance by WAPA
Hesperus-Montrose 345-kV	Montrose-Hesperus 345-kV	SUP 6/13/1994, Regional Forester Application for roads permit pending since 9/22/1998
Malta-Mount Elbert 230-kV	Mount Elbert-Malta 230-kV	BLM ROW grant COC102703 shows BLM jurisdiction for T11S, R80W, S9; possible transfer from BLM to Forest Service

Table 1-1. Existing Agreements for the Transmission Line Rights-of-Way

Transmission Line [Historical Naming Convention]	2020 Naming Convention	Memorandums of Understanding, Special Use Permits, Other Permits, Dates, Signatory
North Gunnison-Salida 115-kV	Salida-North Gunnison 115-kV	Letter permit issued to BOR 2/5/1951, Regional Forester

[1]The Bureau of Reclamation 'owned' the lands initially as fee, easement, or withdrawn lands and the Bureau of Reclamation's project still has primacy.

BLM Bureau of Land Management
BOR Bureau of Reclamation
GMUG Grand Mesa, Uncompahgre, and Gunnison National Forests
kV kilovolt
MOA Memorandum of Agreement
MOU Memorandum of Understanding
R Range
ROW Right-of-Way
S Section
SCS Soil Conservation Service
SUP Special Use Permit
T Township

1.3 Proposed Action

WAPA proposes to change the way it manages vegetation in the ROWs for the transmission lines it owns, operates, or maintains. The Proposed Action for the Forest Service is to reauthorize and issue Special Use Permits for each transmission line and authorize WAPA to proactively manage vegetation along WAPA ROWs on NFS lands using an integrated vegetation management (IVM) approach, for which WAPA would develop new operation and maintenance plans. This approach is based on the ANSI Tree, Shrub, and Other Woody Plant Maintenance-Standard Practices (Integrated Vegetation Management, A. Utility Rights-of-Way (ANSI A300 (Part 7)-2018 IVM). WAPA would control vegetation growth and fuel conditions that threaten transmission lines. The Proposed Action would balance the purpose of and need for agency action with the need to comply with environmental regulations and Forest Service requirements, address potential impacts to environmental resources, and incorporate public and agency comments. The Proposed Action incorporates the design features developed to protect environmental resources.

The vegetation management proposal would include an initial treatment plan for areas that have been identified for treatment. The initial treatment would affect approximately 1,610 acres of the approximately 4,055 acres of transmission line ROWs on NFS lands. These areas are proposed for mechanical treatment to remove incompatible tall-growth species, while addressing a buildup of fuels from several decades of previous vegetation management activities. Treatments could include logging, chipping, and grinding of trees and existing debris using mechanized equipment, and other activities developed in coordination with the Forest Service. As a co-lead agency, the Forest Service proposes to authorize and permit the identified ROWs and associated access routes and maintenance activities.

1.4 Decision Framework

The Administrator for WAPA is the responsible DOE official for approving the EIS and signing the record of decision. The Regional Director for Region 2 is the counterpart responsible official for the Forest Service. The Forest Supervisors in Arapaho-Roosevelt National Forests; Ashley National Forest; Grand Mesa, Uncompahgre, and Gunnison National Forests; Medicine Bow-Routt National Forests; Nebraska National Forest; Pike and San Isabel National Forests; San Juan National Forest; and White River National

Forest are the responsible officials for their respective Forests and will make their decisions based on the EIS. WAPA and the Forest Service will make the following decisions: whether to (1) reauthorize the transmission line permits to include WAPA's Proposed Action; (2) implement the Proposed Action; (3) implement a modified Proposed Action; or (4) select the No Action Alternative. The decisions include incorporation of design features and standard maintenance practices.

1.5 Public Involvement

Public involvement is an important part of the decision-making process for an EIS. WAPA developed a Public Participation Plan for collaborative and community-based public involvement programs.

1.5.1 Scoping

The Notice of Intent (NOI), published in the *Federal Register* (FR) on April 8, 2010 (75 FR 17847), was the first formal step in preparing an EIS and began the scoping process, which ended on May 26, 2010. The NOI invited public participation in the EIS scoping process and solicited public comments on the scope and content of the EIS. Also, WAPA solicited comments and issues from federal, state, and local agencies, tribal governments, and other organizations, and announced opportunities to comment in various local news media. WAPA's project website address is provided in Section 1.1; the website provides the public project-related information, including the dates, times, and locations of the public scoping meetings.

WAPA and the Forest Service held three public scoping meetings in April 2010. Table 1-2 lists scoping meeting dates, facilities, and locations. The scoping meetings were in an open-house format from 3:00 p.m. to 7:00 p.m. to facilitate public attendance at each location. WAPA and the Forest Service also held agency scoping meetings at each location on the same dates from 1:30 p.m. to 2:30 p.m.

Table 1-2. Scoping Meeting Locations

Date of Meeting	Facility	Location
Thursday, April 22, 2010	Ramada Plaza Denver North	10 East 120th Avenue, Denver, Colorado
Friday, April 23, 2010	Museum of Western Colorado, Whitman Education Center	248 South 4th, Grand Junction, Colorado
Monday, April 26, 2010	Uintah Basin Applied Technology College	450 North 2000 West, Vernal, Utah

WAPA received written scoping comments by mail and email, and at the public meetings. For a detailed description of issues identified during scoping, see the Western Area Power Administration Transmission Line Management Reauthorization Project Scoping Summary Report (Western 2010). The scoping summary report details the public involvement process and the issues the public identified and is available on the project website.

1.5.2 Public Review of the Draft Environmental Impact Statement

The Notice of Availability (NOA) for the Draft EIS was published in the Federal Register on September 27, 2013. The NOA established a 46-day public comment period that ended on November 12, 2013. Due to the Federal government shutdown from October 1 to October 16, 2013, the Environmental Protection Agency and the U.S. Department of the Interior requested an extension to the comment period, which WAPA and the Forest Service granted, extending their comment period to November 25, 2013. One public meeting was held in Denver, Colorado on October 23, 2013, which consisted of an open house and informal public hearing from 4:00 p.m. to 8:00 p.m. The meeting included exhibits displaying project information and a court reporter was available for taking oral comments. Notice of the meeting was provided through direct mailing and advertisements in local newspapers. The mailing notice was sent to approximately 930 individuals and agencies with an interest in the project, including tribal representatives and individuals and agencies that provided scoping comments.

No one attended the public meeting on October 23, 2013. WAPA and the Forest Service received four comment letters; two of the letters (from Uintah County, Utah and Bureau of Reclamation) expressed support for the project. The U.S. Department of the Interior letter indicated they had no comments on the project, and the Environmental Protection Agency letter indicated a rating of Lack of Objections (LO) for the project. No letters were received from the general public or tribes.

1.5.3 Changes to the Draft Environmental Impact Statement

Comments received on the Draft EIS were carefully considered. Following coordination meetings between WAPA, the Forest Service, and the USFWS in January and February 2014, a new design feature was created to manage lynx habitat connectivity. The goal of this design feature is to facilitate lynx use of suitable habitat separated by the transmission line ROWs where vegetation management practices reduce the amount of horizontal cover on the ROW.

In the Air Quality section, additional details were added to describe the guidelines developed by federal land managers, including the Forest Service and National Park Service, for Levels of Concern (LOC) for total deposition of nitrogen and sulfur compounds in Class I Wilderness Areas. Because the amount and timing of specific activities that might be needed to maintain ROW will vary considerably by location and over time, the amount of emissions cannot be specifically predicted. Details were also added describing that because the proposed vegetation management activity takes place along already established ROW corridors, there would be no additional indirect impacts from the Proposed Action.

The Forest Health and Vegetation section was updated to include information on the management of felled trees if they are determined to have no economic value. The list of Forest Service sensitive plant species was updated to include information on five new species – the Aztec milkvetch, cushion bladderpod, English sundew, Missouri milkvetch, and Pagosa bladderpod – including their habitat/guild and their potential occurrence in forests in the Project Area.

Information on proposed conservation measures, documented occurrences, and potential habitat of the Ute ladies'-tresses orchid in the Ashley National Forest were added to the Rare Plants section and the Threatened and Endangered Plant Species Section. The determinations for this species under the No Action Alternative and Proposed Action were changed to "may affect, not likely to adversely affect (NLAA)." Discountable and insignificant impacts to the Ute ladies'-tresses are anticipated under the Proposed Action and the No Action Alternative, because WAPA would implement conservation measures to avoid and minimize impacts.

Changes in species ESA listing status and changes to the Forest Service sensitive species list were updated, as described in the Affected Environment – Wildlife section. Based on the change in the ESA listing status of two species from candidate to threatened, the Gunnison sage-grouse and yellow-billed cuckoo discussions in this EIS were moved from the Forest Service Sensitive Species section to the

Threatened and Endangered Wildlife Species section. In addition, the lesser prairie chicken and New Mexico meadow jumping mouse were also moved from the Forest Service Sensitive Species section to the Threatened and Endangered Wildlife Species section. The potential impacts to these species remain the same. Additional details were added to some Forest Service Wildlife Management Indicator Species and Species of Local Concern regarding the exclusion and reasons for the exclusion of these species. No additional species were added to this section, nor were there any changes for occurrence or potential habitat in the Project Area.

The descriptions for impacts to wildlife were updated to detail that similar impacts would occur to Threatened and Endangered species, MIS, and SOLC where they are present in the ROW; however, none of these impacts would be significant under the Proposed Action and No Action Alternative. Under the No Action Alternative, the determination for the Canada lynx was changed to “may affect, likely to adversely affect” in the Grand Mesa, Uncompahgre, and Gunnison National Forest based on consultation with the USFWS and existing habitat conditions. Under the Proposed Action, the determination for the Canada lynx was changed to “may affect, likely to adversely affect” in the Grand Mesa, Uncompahgre, and Gunnison National Forest, Arapaho-Roosevelt National Forest, Medicine Bow-Routt National Forest, and White River National Forest based on consultation with the USFWS and existing habitat conditions.

The descriptions for impacts to fisheries were updated to describe that no direct impacts are anticipated to greenback cutthroat trout and minor indirect impacts from fine sediment could occur. These potential impacts are “may affect, not likely to adversely affect” the greenback trout under the Proposed Action and the No Action Alternative. In addition, the bluehead sucker and Colorado River cutthroat trout could be affected by the No Action Alternative, but the effects would not cause a trend toward federal listing.

In December 2014, as WAPA was finalizing the Final EIS, the Gunnison Sage-Grouse was listed as a threatened species by the U.S. Fish and Wildlife Service (USFWS). WAPA officially finalized its first Gunnison Sage-Grouse consultation with the USFWS on February 1, 2017. In September 2018, WAPA completed a re-initiation of that consultation to address possible impacts to Gunnison Sage-Grouse and its designated critical habitat from clearing habitat 50 feet around structures necessary to meet human safety protocols of Occupational Safety and Health Administration (OSHA) requirements for maintenance work on energized power lines. On September 6, 2018, the USFWS concurred with WAPA’s mitigation measures and determination of “may affect, not likely to adversely affect.”

Additionally, the Cultural Resources section was updated based on a review of current information on recorded resources in the History Colorado and WAPA archives to capture data collected by field work in the project area since the Draft EIS was published.

Other changes to the Draft EIS included updates to Section 1.5 to describe the public review period for the Draft EIS, and other minor technical edits to the text and maps for clarity. The Interdisciplinary Team Members and List of Preparers section was updated to include any changes for persons who reviewed and contributed to the preparation of this document.

1.6 Cooperating Agencies and Project Partners

Cooperating agencies can be federal, tribal, state, or local government agencies that have jurisdiction by law or special expertise related to reasonable alternatives or significant environmental, social, or economic impacts associated with a proposed action. To facilitate interagency participation in the preparation of the EIS, WAPA invited agencies to be Cooperating Agencies, but none of the invited agencies accepted Cooperating Agency status. WAPA will continue to update the agencies on the status and schedule of the project, receive agency comments, and discuss issues regarding the proposed action and area resources.

The Forest Service is a federal land management agency that manages the eight national forests that would be affected by this proposed action. Because the Forest Service must ensure that actions proposed in the eight national forests are consistent with the applicable forest plans and the requirements of NEPA before reauthorizing a special use authorization, the Forest Service is a co-lead agency in preparing this EIS.

Tri-State Generation and Transmission (Tri-State) is a project partner in this EIS. The authorization for the Hayden-Gore Pass transmission line in Medicine Bow-Routt National Forests is under Tri-State's name; however, WAPA operates and maintains this transmission line.

1.7 Native American Consultation

WAPA is the lead agency for tribal consultation and for compliance with the National Historic Preservation Act, as amended (NHPA; 16 U.S.C. 470 et seq.) and other cultural resource protection regulations. WAPA sent a letter on March 26, 2010, to 44 Native American tribes to initiate government-to-government consultation pursuant to EO 13175, *Consultation and Coordination With Indian Tribal Governments* (November 6, 2000). The letter invited tribes to participate in project review and consultation under NHPA and NEPA. WAPA requested that tribes provide information about special ethnographic or archaeological resources in the project area.

Tribes received notices of the availability of the Draft EIS for their review and comment. Tribes that requested a copy of the Draft EIS were provided with one.

1.8 Issues Identified for Detailed Analysis

This section summarizes the substantive issues and concerns that WAPA and the Forest Service identified for analysis in the EIS. These were identified from comments submitted during scoping by the public, state and local governments, other federal agencies, tribes, and the Interdisciplinary Team. These issues establish a framework for the analysis in Chapter 3 of the EIS. Substantive comments were addressed because (1) they are potential factors in deciding which alternative will be selected or how to modify an alternative to reduce impacts, (2) they are topics of public interest, or (3) they are required to be analyzed by a law, regulation, or policy. Comments not specifically addressed are those that are (1) outside the scope of the proposed action or alternative, (2) already decided by law, regulation, land management plan, or other higher-level decision, (3) unrelated to the decisions to be made, or (4) conjectural and not supported by scientific or factual evidence.

Substantive issues raised during the public comment process were about resources and resource uses, such as water resources and recreation, and concerns related to the NEPA process, including when public meetings are held. The issues helped to define the scope of the analysis in this EIS or were used to develop the alternatives. Table 1-3 summarizes comments under each topic identified during the scoping process.

Table 1-3. Issues Identified During Public Scoping

Topic	Summary of Comments
Access and Transportation	• Minimize unauthorized use of maintenance and ROW access routes. • Reclaim abandoned or unused access routes in transmission line ROWs. • Ensure designated routes are used and maintain access routes according to Forest Service management specifications. • Maintain access to all water-related facilities. • Determine which routes are available for public use according to an approved Travel Management Plan.
Alternatives	• Minimize the width of vegetation treatment corridors consistent with the safety and reliability of the transmission lines. • Specify the circumstances and areas for treatments implemented under each alternative. • Design and discuss methods for slash disposal to minimize impacts and threats to resources while sufficiently reducing slash at a reasonable cost.

Table 1-3. Issues Identified During Public Scoping

Topic	Summary of Comments
Climate Change	• Minimize the effects of global warming.
Floodplains, Wetlands, and Water Resources	• Design treatment activities near wetland and riparian areas to avoid or mitigate damage to soils, water quality, and non-target vegetation. • Prohibit the use of heavy equipment in riparian, wetland, and floodplain areas. Use hand-felling and other techniques to minimize damage.
Health and Safety	• Concern for the effects of herbicides on human health.
Land Use	• Comply with the requirements of the General Management Plans for each national forest in the project area.
Process and Public Involvement	• Concern that public meetings are when the public is at work and therefore the public has little opportunity for involvement. • Disclose if the proposed action relates to or overlaps the Emergency Powerline Clearing Project in Arapaho-Roosevelt, White River, and Medicine Bow-Routt National Forests.
Recreation	• Remove cut trees in the transmission line ROW in the Hightower Area of Grand Mesa to prevent blocking existing OHV routes and creation of unauthorized OHV routes. • Manage OHV use responsibly and uniformly across jurisdictional boundaries.
Roadless Areas	• Protect roadless area characteristics and minimize new road construction.
Social and Economic Values	• Promote opportunities for harvesting merchantable forest products following the National Healthy Forest Initiative (Public Law 108-148).
Soils	• Design, install, and maintain erosion control structures and culverts on access routes. • Apply effective practices to maintain vegetation cover and prevent soil erosion. • Recognize the Natural Resources Conservation Service soil survey as the authority in soil conservation matters.
Special Status and Sensitive Species	• Limit the removal of mature trees and other vegetation to avoid adversely altering the habitat of sensitive species that rely on a continuous forest canopy. • Work with Forest Service biologists to minimize adverse impacts to Canada lynx habitat. • Perform botany surveys in all proposed treatment areas to identify plants listed as threatened, endangered, or candidates for Endangered Species Act listing. Mark plant populations to be avoided and provide buffer areas to allow plants to propagate.
Vegetation	• Concern for overuse of prescribed burning and herbicides. • Prioritize treatment areas and discuss the treatments proposed in each area. • Perform surveys and eradicate, to the extent practicable, noxious weeds before treatment and for two full growing seasons after treatment. Require vehicle washing before entering national forest lands.
Visual Resources	• Minimize the width of vegetation treatment corridors and transition cutting intensity to limit visual impacts by "feathering" the edges where trees are cleared.
Wildlife and Wildlife Habitat	• To maintain and facilitate wildlife habitat connectivity across transmission line ROWs by leaving areas with cover vegetation to provide migration corridors for forest-dwelling species. • Concern for effects of herbicides on wildlife and general impacts of vegetation treatments on wildlife habitat.

OHV off-highway vehicle
ROW right-of-way

1.9 Relationship to Policies, Plans, and Programs

Numerous federal and state laws and applicable regulations, policies, and actions affect the Proposed Action, the No Action Alternative, and development of the EIS. The National Forest Management Act of 1976 (NFMA; 16 U.S.C. 1600), as amended, is the primary authority for Forest Service management of public lands. This law provides the overarching policy by which the Forest Service manages NFS lands. NFMA mandates that the Forest Service manage public lands to provide for multiple use and sustained yield (16 U.S.C. 1604 [e] [1]). WAPA and the Forest Service prepared this EIS following NEPA, and in compliance with CEQ NEPA implementing regulations (40 CFR Parts 1500–1508) and DOE NEPA implementing procedures (10 CFR Part 1022). Table 1-4 lists other laws, statutes, regulations, and EOs relevant to WAPA's proposed action. Portions of the proposed action could affect floodplains and wetlands, so proposed floodplain or wetland actions must proceed following DOE floodplain and wetland environmental review requirements.

Table 1-4. Federal Laws, Statutes, Regulations, Executive Orders, and Other Regulatory and Guidance Documents

Federal Laws and Statutes
American Indian Religious Freedom Act of 1978 (P.L. 95-341; 42 U.S.C. 1996)
Archaeological and Historic Data Preservation Act of 1974 (P.L. 86-253, as amended by P.L. 93291; 16 U.S.C. 469)
Archaeological Resources Protection Act of 1979 (P.L. 96-95; 16 U.S.C. 470aa-mm)
Bald and Golden Eagle Protection Act of 1940 (16 U.S.C. 668-668d, 54 Stat. 250) as amended (P.L. 95-616 (92 Stat. 3114)) November 8, 1978
Clean Air Act of 1990 (as amended by P.L. 92-574; 42 U.S.C. 4901)
Clean Water Act of 1972 (33 U.S.C. 1251 et seq.)
Colorado River Basin Salinity Control Act of 1974 (P.L. 93-320)
Department of Transportation Act of 1966 (P.L. 89-670; 49 U.S.C. Section 303)
Endangered Species Act of 1973 (P.L. 85-624; 16 U.S.C. 661, 664 1008)
Energy Policy Act of 2005 (P.L. 109-59)
Farmland Protection Policy Act (P.L. 97-98 and 7 CFR Part 658)
Federal Land Policy and Management Act of 1976 (P.L. 94-579, 90 Stat 2743, 43 USC 1701; P.L 115-141, 43 USC 1772)
Federal Water Pollution Control Act of 1972, Section 404 (P.L. 92-500; 33 U.S.C.1344, as amended)
Forest and Rangeland Renewable Resources Planning Act of 1974, as amended
Healthy Forests Restoration Act of 2003
Historic Sites Act of 1935 (P.L. 292-74; 16 USC 461-467)
Land and Water Conservation Fund Act of 1965 (P.L. 88-578)
Migratory Bird Treaty Act of 1918 (16 U.S.C. 703-712, as amended)
National Environmental Policy Act of 1969 (P.L. 91-190; 42 U.S.C. 4321)
National Forest Management Act of 1976, as amended (P.L. 94-58816, U.S.C. 1600(note))
National Historic Preservation Act of 1966, Section 106, (P.L. 89-665; 16 U.S.C. 407(f)
Native American Graves Protection and Repatriation Act of 1990 (P.L. 101-601)
Wilderness Act of 1964 (P.L. 88-577; 16 U.S.C. 1131-1133, as amended)

Table 1-4. Federal Laws, Statutes, Regulations, Executive Orders, and Other Regulatory and Guidance Documents

Federal Laws and Statutes
Executive Orders
Executive Order 11296 Flood Hazard Evaluation Guidelines
Executive Order 11514 Protection and Enhancement of Environmental Quality
Executive Order 11593 Protection and Enhancement of the Cultural Environment
Executive Order 11988 Floodplain Management (43 CFR 6030)
Executive Order 11990 Protection of Wetlands
Executive Order 12372 Intergovernmental Review of Federal Programs
Executive Order 12898 Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations
Executive Order 13007 Indian Sacred Sites
Executive Order 13175 Consultation and Coordination with Indian Tribal Governments
Executive Order 13112 Invasive Species
Executive Order 13186 Responsibilities of Federal Agencies to Protect Migratory Birds
Executive Order 13212 Actions to Expedite Energy-related Projects
Executive Order 13287 Preserve America
Executive Order 13690 Establishing a Federal Flood Risk Management Standard
Federal Regulations
7 CFR Part 658, as amended, Prime and Unique Farmlands
10 CFR 1021, U.S. Department of Energy National Environmental Policy Act Implementing Procedures
10 CFR 1022, U.S. Department of Energy Compliance with Floodplain/Wetlands Environmental Review Requirements
33 CFR 320-331 and 40 CFR Part 230, Section 404 of the Clean Water Act and its Implementing Regulations
36 CFR 219, National Forest System Land Management Planning; Final Rule
36 CFR 220, National Environmental Policy Act Procedures
36 CFR 251, Subpart B – Special Uses
36 CFR Part 800, as amended, Protection of Historic Properties
40 CFR Part 93, Subpart B, General [Clean Air Act] Conformity Regulations
40 CFR Parts 1500-1508 CEQ implementation of NEPA
43 CFR Part 2800, as amended, ROWs Principles and Procedures
50 CFR Part 402, Interagency Cooperation, Endangered Species Act of 1973, as Amended
Forest Service Handbook 2509.25 Watershed Conservation Practices
Forest Service Handbook 2509.22 (R1/R4 Amendment) Soil and Water Conservation Practices Handbook

In addition to federal laws, statutes, regulations, and EOs, WAPA and the Forest Service incorporated the following agency guidelines to produce this EIS in compliance with NEPA:

- CEQ "Forty Most Asked Questions" (46 FR 18026, March 23, 1981) and supplemental guidance (48 FR 18026, July 23, 1983)
- CEQ's Cumulative Effects Guidance, January 1997
- CEQ's Environmental Justice Guidance, December 1997
- DOE, Office of Environment, Safety and Health, NEPA Compliance Guide, Volume II, August 1998
- DOE Environmental lmpact Statement Checklist, November 1997
- DOE, Effective Public Participation under the National Environmental Policy Act, August 1998

- U.S. Department of Agriculture (USDA) Handbook #701, Environmental Policy and Procedures
- USDA Regulations - Departmental Regulation 9500-3, Land Use Policy
- Forest Service Handbook 1909.15, Environmental Policy and Procedures
- Forest Service Handbook 2400, Timber Management
- Forest Service Handbook 2709.11, Special Uses
- Landscape Aesthetics, a Handbook for Scenery Management
- Western Area Power Administration, Integrated Vegetation Management Manual 2011
- Western Area Power Administration Order 430.1C, Right-of-Way Management Guidance for Vegetation, Encroachments, and Access Routes, February 16, 2017
- Western Area Power Administration Order 450.3C, Transmission Vegetation Management Program, February 6, 2017

1.9.1 Compliance with Land and Resource Management Plans

Each national forest and grassland is governed by a management plan as required by NFMA. These plans outline management direction, including desired future conditions, suitable uses, monitoring requirements, goals and objectives, and standards and guidelines. Monitoring of conditions in a national forest or national grassland ensures projects follow plan direction and determines effects that might require a change in management direction. WAPA will comply with NFMA and the following land and resource management plans specific to various NFS lands in the project area:

- Arapaho-Roosevelt National Forests – 1997 Revision of the Land and Resource Management Plan
- Ashley National Forest – 1986 Land and Resource Management Plan
- Grand Mesa, Uncompahgre, and Gunnison National Forests – 1983 Land and Resource Management Plan
- Medicine Bow-Routt National Forests – 1998 Revised Land and Resource Management Plan
- Nebraska National Forest – Nebraska National Forest and Associated Units Land and Resource Management Plan 2001 Revision
- Pike and San Isabel National Forests – 1984 Land and Resource Management Plan
- San Juan National Forest –2013 Land and Resource Management Plan
- White River National Forest – 2002 Revised Land and Resource Management Plan

1.9.2 Permits and Required Compliance

In addition to compliance with various laws and regulations and conformance with land use plans, WAPA is required to comply with the existing transmission line special use authorization/permit (SUA/SUP) and O&M plans issued by the Forest Service. As a federal agency, WAPA is not required to comply with state or local land use regulations, but intends to comply with the substantive requirements of these regulations when practicable.

1.10 Document Structure

This EIS is structured as follows:

- *Chapter 1. Purpose and Need for Action:* This chapter includes information about the history of the project proposal, the purpose and need for the project, and the proposal for achieving that purpose and need. This chapter also describes how WAPA informed the public of the proposal and how the public responded.
- *Chapter 2. Alternatives:* This chapter provides a detailed description of the No Action Alternative and the Proposed Action. This discussion includes standard maintenance procedures and design features. Chapter 2 summarizes and compares the environmental consequences associated with the No Action Alternative and the Proposed Action.
- *Chapter 3. Affected Environment and Environmental Consequences*: This chapter summarizes the physical, biological, social, and economic environments of the project area and the effects of implementing the No Action Alternative and the Proposed Action, including potential cumulative effects. It also presents the scientific and analytical basis for the comparison of alternatives provided in Chapter 2.
- *Chapter 4. Consultation and Coordination:* This chapter lists preparers and agencies consulted during the development of the EIS.
- *Chapter 5. References:* This chapter provides bibliographical information for cited sources.
- *Appendices:* The appendices provide more detailed information to support the analyses presented in the EIS.

Maps: Maps showing the ROWs and associated vegetation conditions in the subject forests are included on the project website: https://www.wapa.gov/transmission/EnvironmentalReviewNEPA/Pages/vegetation-management.aspx.

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CHAPTER 2– ALTERNATIVES

2.1 Introduction

This chapter describes the No Action Alternative (no changes in vegetation management and maintenance practices) and the Proposed Action (proposed changes in vegetation management and maintenance practices) on National Forest System lands. Section 2.2.1 describes vegetation management and maintenance practices WAPA now uses. Section 2.2.2 provides a general description of Proposed Action activities on National Forest System lands and follows with specific examples of how WAPA would implement the Proposed Action in each forest (Section 2.2.2.6).

2.2 Alternatives Considered in Detail

WAPA and the Forest Service developed the No Action and Proposed Action alternatives to compare environmental impacts and address issues raised during the public scoping process.

WAPA's O&M practices ensure the safety and reliability of the electric transmission system and ensure compliance with mandatory reliability standards. These include the lines listed in Table 2-1 that are located on NFS lands. WAPA owns, operates, and maintains most of the lines in Table 2-1. As noted in the table, some lines are owned by another utility or ownership is split between WAPA and other utilities. WAPA has agreements to maintain the split-ownership lines. WAPA's No Action Alternative and Proposed Action include maintaining transmission lines and associated infrastructure, including access routes to transmission lines and communications facilities, and managing vegetation. The major difference between the No Action Alternative and the Proposed Action is the proposal to change vegetation management practices. Section 2.2.2 describes those proposed changes. Additionally, under the Proposed Action WAPA would operate under new permits with O&M plans rather than under current outdated authorizations.

Transmission line maintenance activities are categorized as follows:

- Vegetation management (transmission lines, associated facilities, and access route ROWs). Effective vegetation maintenance ensures that vegetation does not interfere with transmission line conductors, towers, other hardware, or communications paths; impede access to the transmission line or interfere with work on the transmission lines and related facilities; or create unsafe conditions for either the public or maintenance crews. Maintenance is performed using a variety of methods including mechanical (such as hand clearing with chain saws, and self-propelled grinders, mowers, or mulchers) and herbicide applications (used either to selectively or non-selectively kill target vegetation or retard growth).
- Access route maintenance. Access route maintenance includes activities that ensure access routes are in appropriate condition for maintenance crews to efficiently drive to transmission lines and associated work sites. These activities can include vegetation maintenance, including mowing, spraying weeds, or reseeding, grading, surfacing, and erosion control (such as maintaining water diversions like culverts, ditches, and water bars). Overland travel along the transmission line ROW with managed low vegetation growth can often serve as acceptable maintenance access.
- Maintenance of transmission lines, including associated structures, hardware, and equipment. This category of activities includes routine aerial and ground patrols of transmission lines and

access route ROWs, and repairs to or replacement of structures, conductors, static wires, insulators, guy wires, foundations, and other hardware.

2.2.1 No Action Alternative (Continue Past Practices)

Under CEQ NEPA implementing regulations, an EIS must include an evaluation of a No Action Alternative (40 CFR 1502.14). Under NEPA, the Lead Agency has the discretion to describe the No Action Alternative as the future conditions without project implementation, which can also include predictable actions by persons or entities other than the federal agency involved in a project, acting under existing management direction or level of management intensity. When the Proposed Action involves updating an adopted management plan or program, the No Action Alternative includes the continuation of the existing management plan or program.

Under the No Action Alternative, WAPA would continue to maintain its infrastructure, ROW, and access roads as it currently does, as defined under existing authorizations and other agreements. The management approach to controlling vegetation, ensuring access, and maintaining equipment is largely need-driven and reactive. Under the No Action Alternative, the Forest Service would re-authorize the ROWs with no change from current vegetation management.

Under existing authorizations WAPA manages trees that already or nearly pose a risk to the transmission lines. Because WAPA addresses primarily danger trees, as defined in its policy[1], it must review the ROWs at least once a year to look for new danger trees and remove them. This focus requires annual reentries, and in some areas more frequent reentries, into the ROW to address danger trees that were identified during periodic line patrols or when maintenance forces were in the ROW for other activities. Under a need-driven management approach, WAPA currently manages vegetation along ROW segments as control needs are identified through periodic line patrols. WAPA manages vegetation using the mix of manual, mechanical, and chemical methods (herbicides) to control vegetation in transmission line and access route ROWs. The No Action Alternative also includes the practice of spot application of Forest Service-approved herbicides. WAPA would perform access route repairs as needed. Transmission system maintenance activities would consist of regular aerial and ground patrols to find problems, scheduling and performing repairs to correct problems, and preventative maintenance.

[1] *Danger trees are trees located within or adjacent to the easement or permit area that present a hazard to employees, the public, or power system facilities. Characteristics used in identifying a danger tree include but are not limited to the following: encroachment within the safe distance to the conductor as a result of the tree bending, growing, swinging, or falling toward the conductor; deterioration or physical damage to the root system, trunk, stem or limbs and/or the direction and lean of the tree; vertical or horizontal conductor movement and increased sag as a result of thermal, wind and ice loading; exceeding facility design specifications; fire risk; and other threats to the electric power system facilities or worker/public safety (WAPA O 430.1C, dated 02-17-2017).*

2.2.1.1 Maintenance Activities

Inspection and Transmission System Management

WAPA conducts aerial (usually by helicopter), ground, and climbing inspections of its transmission infrastructure in compliance with its internal policies and guidance. The requirements are updated as needed. WAPA accomplishes the following inspections:

Aerial Inspections

At a minimum, WAPA conducts aerial inspections every 6 months, usually by helicopter, over the entire transmission system to check for danger trees or encroaching vegetation, and to find damaged or malfunctioning equipment. WAPA conducts aerial patrols between 50 and 300 feet above the transmission line, depending on land use, topography, weather, and the objective of the patrol. The helicopter generally passes quickly (less than 1 minute) over a span (the area between two structures), but can circle back or hover if issues are found or more documentation is needed.

Ground Inspections

Annual ground-based inspections check access to the structures, tree clearances, fences, gates, locks, and structure hardware, and ensure that each structure would be readily accessible in an emergency. Ground inspections allow for the inspection of hardware that is more difficult to inspect by air, and identify access road issues such as erosion, washed out culverts, and vegetation encroachment. Ground inspections are typically done using pickup trucks, all-terrain vehicles (ATVs), or sometimes snow cats or snow machines. Access is via designated routes and along the transmission line ROW.

Climbing Inspections

WAPA uses climbing inspections on transmission line structures if aerial or ground inspections find problems. Typically these inspections involve accessing the structures via existing access routes, or travel along the ROW in pickup trucks or ATVs, and could require bucket trucks.

2.2.1.2 Vegetation Management

Manual

Manual vegetation control includes using powered and unpowered tools; installing static barriers (such as weed control mats); and spot, or localized, application of approved herbicides. The primary benefit of manual methods is selectivity – only unwanted vegetation is removed. The primary disadvantages of manual methods are that they are labor intensive and are more effective and efficient in relatively low-density vegetation in relatively small areas. Manual treatments typically are not efficient for addressing the need to dispose of accumulated biomass, managing fuels, and preventing fire in the ROW.

WAPA uses the following manual techniques: cutting, trimming, hand-pulling and hoeing, and applying herbicides, as described in the following sections.

Cutting

The most common manual method is cutting with power saws. WAPA uses this technique on species that do not resprout, when access is limited, or when only a few trees need to be cut, or in sensitive areas where cutting is selective. Cutting would be used as appropriate based on species and site. For species that do re-sprout, which includes most deciduous trees such as aspen, sprouts can rapidly resurge to original height within a growing season in some cases, to several years and at much greater density in other cases. Access for subsequent manual treatments is thereby hindered, and concerns regarding fire survivability increase in the ROW.

WAPA sometimes follows its manual cutting operations with some slash disposal techniques designed to hasten natural decomposition and improve aesthetic appeal. The slash is typically lopped and scattered uniformly across the treated area. Small trees are limbed on one side so they lie flat on the ground. Alternatively, branches and small trees might be mechanically chipped and the chips spread over the ROW or deposited in piles. Stems too large for chipping are lopped and scattered in the ROW, as the situation requires. However, the typically arid environment of the Rocky Mountain Region is not conducive to rapid decomposition of woody biomass and leads to the accumulation of fuels in the ROW. After only a few cycles of vegetation treatments, the accumulation of this debris might need to be addressed to control the accumulation of fuel in the ROW and reduce the potential impact of fire on the transmission line.

Trimming

Trimming or pruning is the removal of selected branches from tree trunks to prevent them from growing into transmission lines. WAPA uses this labor-intensive technique in special situations where it is desirable to leave trees in place as visual screens, or where easement contracts and land and resource management plans dictate trimming criteria. To protect the transmission line, trimmed trees must be cut to the applicable standards. Because of the extreme hazards associated with trimming trees near energized power lines, and WAPA's experience from several accidents and fatalities, this technique has limited applicability. Selective thinning or removal of excessively tall trees to achieve or retain vegetation screening is often another acceptable approach in sensitive areas.

Hand-Pulling and Hoeing

Noxious weed control along ROWs theoretically can be accomplished by hand-pulling and hoeing. These manual treatments are not practical for large areas. Hand-pulling and hoeing do not control weeds that re-sprout from rootstocks or root fragments in the soil. WAPA rarely practices hand-pulling and hoeing, but these techniques could be appropriate in some cases.

Chemical (Herbicides)

Spot application of Forest Service-approved herbicides is a typical technique to control noxious weeds and other undesirable, mostly herbaceous, vegetation. WAPA applies herbicides on a limited basis to control vegetation in areas around structures. The herbicide is applied directly to the vegetation using a hand or powered sprayer. There would be no aerial application of herbicides.

WAPA uses herbicides that are approved for use in ROW maintenance and by the Forest Service. WAPA uses Environmental Protection Agency- and state-registered herbicides, and appropriately licensed or certified applicators apply the herbicides following the label requirements.

Mechanical

Mechanical vegetation control typically uses self-propelled machine platforms with various interchangeable treatment-head attachments to remove or control target vegetation along transmission line and access route ROWs. Depending on the particular equipment attachment and skill of the operator, these methods are selective or nonselective (all plants in the path of the machine are affected). Rubber-tired mechanical equipment platforms are generally limited to operating on slopes less than 30 to 35 percent. Specialized tracked equipment platforms, with articulating control cabins, are typically used on slopes up to 60 percent. Both types of specialized equipment platforms can operate with very low ground pressures. However, site-specific obstacles such as rocks or other extreme terrain can reduce their efficiency and there are areas that cannot be accessed by machine for mechanical treatments. WAPA uses the following mechanical techniques: mowing/grinding, chipping, and grinding, as described in the following sections.

Mowing/Grinding

WAPA uses mechanized heavy equipment with high-speed rotary blades to cut, chop, or shred woody vegetation in ROWs. Target vegetation is typically cut off at ground level, encouraging the selection and recovery of low-growing plant communities consisting of grasses, forbs, and other herbaceous plants. Examples of this type of mowing equipment are Fecon, brush-hog, Track-Mack, and Hydro-Ax. WAPA rarely uses mowing, but the technique has been used where appropriate.

Chipping

Chipping is the process of feeding limbs and other woody debris through a mechanical chipper. The chipper can be used to spread the material back onto the ROW. When strategically placed in the ROW, chipped material keeps nutrients in the ecosystem, helps retain soil moisture, can help control erosion, and can help retard the re-growth of undesirable plant species. This method can be used effectively to control vegetation, improve the aesthetics of the treated area, reduce undesirable fuel loads, and protect soil and water resources.

2.2.1.3 Access Route Maintenance

WAPA relies on access routes for safe and reliable access to transmission lines and supporting infrastructure. WAPA typically notifies the Forest Service before work begins on access routes, and complies with applicable specifications, guidelines, and design features. Maintenance activities include grading; blading; surfacing; reseeding; and constructing, repairing, or replacing water diversions such as culverts, ditches, and water bars. Typically, such activities would involve graders, backhoes, and support vehicles such as pickup trucks.

Inspection and Maintenance of Culverts, Fords and Ditches

With Forest Service approval and in coordination with the Forest Service, WAPA may maintain installed runoff and small stream controls that protect access roads, such as culverts, ditches, and fords. Ideally, installed culverts and ditches are kept free of debris and obstructions. WAPA's goal is to ensure that culverts work properly so that access to the line is not impeded.

Typical access road work can involve the use of backhoes, dump trucks, graders, and pickup trucks. The work is typically confined to the roadbed. Extraordinary work, such as replacing washed-out culverts, could require work outside the ROW and would require additional discussions with and approvals from the Forest Service. WAPA completes environmental reviews before the work if the work is outside previously studied areas. Work in some drainages could require coordination with and permitting from the Army Corps of Engineers or other regulatory agencies.

Water Bars

A water bar is a ridge, typically formed from the road surface material that directs water off of the road. Water bars are constructed across roads at about a 30-degree angle to the direction of travel, where water erosion is a problem, and where water tends to accumulate and soften the surfaces. Adjacent area capacity for receiving surface flows off the road is important in water-bar location, design, and construction. WAPA maintains existing water bars or can install new water bars where needed. This work typically involves backhoes, graders, and pickup trucks. WAPA may use blading to maintain water bars.

Grading

WAPA maintains the surfaces of established dirt access roads using a bulldozer or road grader, and grades areas with excessive potholes and erosion as needed to maintain access. This work typically involves pickup trucks and a road grader hauled in on a lowboy trailer.

Two-Track Access Maintenance

Two-track access is often present in the transmission line ROW itself or as a spur that leads from a maintained access road to a transmission structure or the transmission line ROW. These are overland routes that are not maintained to the same degree as established, graded access. WAPA does maintenance work when the access becomes almost impassable or when a special job requires access for multiple vehicles or special equipment. Maintenance activities can include filling washouts, removing downed trees, removing large rocks, or cutting dense vegetation that has grown into the access surface and prevents access to the work area.

Overland Access

WAPA uses primarily overland access inside the transmission line ROWs. Overland access typically is not routinely maintained. Vegetation might need to be cut if it makes the ROW impassable for maintenance vehicles and emergency access. Overland access is typically by ATVs, four-wheel drive pickup trucks, snow mobiles, snow cats, and similar vehicles.

2.2.1.4 Transmission Line Maintenance

The need for repairs and preventive maintenance is based on the results of inspections, reliability-centered maintenance requirements, and in some cases, routinely scheduled service or actions (e.g., wood pole inspections and treatments). Activities used to maintain transmission lines and associated facilities include periodic aerial and ground patrols; installing, maintaining, and replacing hardware, ground wire, guy wires, and bird guards; replacing wood poles; placing fill or rocks around existing culverts or existing structures; and repairing or replacing conductors, insulators, cross arms, x-braces, and metal supports. WAPA would do aerial patrols up to three times a year using a helicopter at approximately 60 feet above the conductors for visual inspection. WAPA would do ground patrols annually, typically using pickup trucks, ATVs, snow cats, or snowmobiles to drive along transmission lines. Either type of patrol could find problems that would require immediate repair or replacement of transmission line hardware. Equipment and activities needed for repairs would vary greatly. For example, technicians could tighten tower hardware on the spot with hand tools, but repairing a tower footing might require the use of a backhoe. Bulldozers, bucket trucks, or other heavy vehicles could also be used for transmission system maintenance activities.

2.2.1.5 Emergency Actions

In cases of actual system failure or imminent threats to system reliability, public safety, or the environment (e.g., hardware failure, structure failure during ice storms, and trees falling on conductors or structures), WAPA would take the steps necessary to remedy the situation. These steps include removing problem vegetation from the ROW or nearby areas (trees outside the ROW that could fall on transmission lines) or clearing and repairing access routes to allow repair equipment to access transmission lines or structures. WAPA would address emergency actions as necessary.

2.2.1.6 Summary of Activities Included in Maintenance

Transmission Line Maintenance

- Ground and aerial patrols
- Ground wire maintenance
- Aircraft warning devices maintenance, including repair and replacement
- Insulator maintenance, including replacements, repairs, or cleaning
- Bird-guard maintenance, including installation, repair, and replacement of bird-guard devices (e.g., anti-perching, alternative perches and anti-fouling devices)
- Installation, repair, or replacement of bird diverter devices
- Bird nesting structure , repair, and replacement
- Cross-arms maintenance on wood-pole structures, including replacement, repair, and addition
- Steel members of steel lattice transmission line structures, including repair, replacement, and addition
- Hardware on wood and steel transmission line structures, including installation, repair, and replacement
- Installation, repair, and replacement of guy anchors and guy lines on wood structures
- Cross-brace and knee-brace maintenance, including repair, replacement, and addition
- Damper maintenance, including repair, replacement, and addition
- Ground-spike maintenance on wood-pole structures, including repair, replacement, and addition
- Ground-rod maintenance, including repair, replacement, and addition
- Armor rod maintenance and clipping-in structures
- Conductor maintenance, including upgrading, repair, and replacement
- Static wire maintenance, including installation, repair, and replacement
- Fiber optic cable installation, repair, and replacement
- Wood preservative maintenance on wood-pole structures, including inspections and retreatment
- Placement of rocks, mats, and other materials at bases of poles or structures to stabilize erosion
- Remediation of small spills of oil and hazardous materials that occurred incidental to maintenance work (e.g., hydraulic hose failures and overfills)
- Structure mile markers and structure identification number maintenance, including repair, replacement, and addition
- Repair of vandalism such as gunshots to insulators and other structural damage

- Removing soil deposited around tower legs
- Ground-anchors maintenance, including installation, repair, and replacement
- Wood-pole maintenance, including butting, reinforcement, and replacement and in-kind replacement of damaged or rotted poles
- Placing fill or rocks around existing towers or structures
- Maintaining identified vehicle and equipment staging areas for work associated with routine maintenance

Access Maintenance

- Installing and repairing fences and gates to control access
- Placing fill or rocks around existing culverts to control erosion
- Repairing erosion on access roads to maintain the existing roadbed
- Repair of road embankments
- Grading, scraping and resurfacing existing access roads
- Installing rip-rap along creeks and rivers in localized, restricted areas to control erosion, prevent bank degradation, and protect structures and access roads
- Maintenance and repair, including replacement, of existing culverts
- Installation of culverts as needed to maintain existing access routes
- Vegetation management, including mowing, weed spraying, reseeding, and similar activities
- Manual and mechanical removal or pruning of danger trees or vegetation
- Placing rocks, mats, and other materials at bases of poles or structures to control vegetation growth
- Manual and mechanical removal or pruning of danger trees or vegetation
- Localized applications of herbicides to control weeds and vegetation

2.2.2 Proposed Action

WAPA proposes to change the way it manages vegetation in the ROWs for the transmission lines and related facilities it owns, operates, or maintains. As described in Chapter 1, WAPA manages its transmission line ROWs to ensure the reliability and safety of the transmission lines, ensure compliance with mandatory reliability standards, ensure adequate access for maintenance, protect the public and ensure worker safety, and manage risk from fire, all while ensuring the protection of environmental resources. The Proposed Action is to issue new authorizations along with the development of new operation and maintenance plans to include proactive management of vegetation along WAPA ROWs on NFS lands using an IVM approach. This approach is based on the American National Standard Institute Tree, Shrub and Other Woody Plant Maintenance-Standard Practices (Integrated Vegetation Management, a. Electric Utility ROW (ANSI A300 (Part 7)-2006 IVM). WAPA would control vegetation growth and fuel conditions that threaten transmission lines. As under the No Action Alternative, the Proposed Action addresses vegetation management along approximately 273 miles of ROWs, covering a total of approximately 4,055 acres. The Proposed Action would balance the purpose of and need for agency action discussed in Chapter 1 with the need to comply with environmental regulations and Forest Service requirements, protect environmental resources, and respond to public and agency comments. WAPA developed design features to protect environmental resources and will incorporate them into the Proposed Action.

2.2.2.1 Location of the Proposed Action

See Figure 1-1 for the locations of WAPA transmission line ROWs on NFS lands in Colorado, Nebraska, and Utah. U.S. Forest Service Region 2 manages NFS lands in Colorado and Nebraska, and Region 4 manages NFS lands in Utah. More detailed maps showing the ROWs for the subject forests are included on the project website at: https://www.wapa.gov/transmission/EnvironmentalReviewNEPA/Pages/vegetation-management.aspx.

2.2.2.2 Transmission Line Rights-of-Way

Table 2-1 lists the transmission lines, their ROW widths, and their locations by forest. ROW widths for transmission lines vary by voltage. Each ROW width is designed to ensure that the transmission line is kept a safe distance from other objects and structures, such as trees and buildings. Widths are typically determined by National Electric Safety Codes and engineering and maintenance requirements.

Table 2-1. Transmission Line Rights-of-Way

Transmission Line	National Forest(s) (length)	Approximate ROW width (feet)	Length on NFS Lands (miles)	Approximate Acres on NFS Lands[1]
Archer-Hayden 230-kV	Arapaho-Roosevelt (5 miles) Medicine Bow-Routt (13.7 miles)	125	18.7	283.5
Ault-Craig 345-kV	Arapaho-Roosevelt (5.1 miles) Medicine Bow-Routt (13.6 miles)	175	18.7	379
Blue River-Gore Pass 230-kV	Arapaho-Roosevelt (6.9 miles) White River (7 miles)	200	13.9	210.4
Box Butte-Chadron [Alliance-Chadron] 115-kV	Nebraska (9.2 miles)	75	9.2	83.4
Curecanti-Lost Canyon [Cortez-Curecanti] 230-kV	Grand Mesa, Uncompahgre, and Gunnison (6 miles) San Juan (14.5 miles)	125	20.5	308.1
Curecanti-Poncha [Curecanti-Midway] 230-kV	Grand Mesa, Uncompahgre, and Gunnison (10.2 miles) Pike and San Isabel (8.4 miles)	125	18.6	281.8
Curecanti-Rifle [Curecanti-Hayden] 230-kV	Grand Mesa, Uncompahgre, and Gunnison (29.7 miles) White River (3.4 miles)	125	33.1	502.5
Flaming Gorge-Vernal #1 138-kV	Ashley (6.6 miles)	80	6.6	62.9
Flaming Gorge-Vernal #3 138-kV	Ashley (19.6 miles)	80	19.6	189.7
Gore-Hayden [Green Mountain-Oak Creek] 138-kV	Medicine Bow-Routt (11.1 miles)	75	11.1	102
Gore Pass-Muddy Pass 69-kV	Medicine Bow-Routt (1.7 miles)	100	1.7	19.7
Great Cut-McPhee 12.5-kV	San Juan (4.9 miles)	30	4.9	17.9
Great Cut Switchyard-Great Cut Tap 115-kV	San Juan (0.2 mile)	30	0.2	0.9
Green Mountain-Blue River 2.4-kV	Arapaho-Roosevelt (1 mile) White River (0.4 mile)	50	1.4	4.4
Green Mountain-Kremmling 69-kV	Arapaho-Roosevelt (2 miles)	100	2.0	24.3

Table 2-1. Transmission Line Rights-of-Way

Transmission Line	National Forest(s) (length)	Approximate ROW width (feet)	Length on NFS Lands (miles)	Approximate Acres on NFS Lands[1]
Hayden-Gore Pass (partially owned by Tri-State) 230/345-kV	Medicine Bow-Routt (21.9 miles)	175	21.9	332.5
Hesperus-Montrose 345-kV	Grand Mesa, Uncompahgre, and Gunnison (18.9 miles) San Juan (31.2 miles)	175	50.1	1,061.8
Malta-Mount Elbert 230-kV	Pike and San Isabel (0.9 mile)	115	0.9	12.5
North Gunnison-Salida 115-kV	Pike and San Isabel (8 miles) Grand Mesa, Uncompahgre, and Gunnison (11.5 miles)	75	19.5	177.6
TOTAL		**-**	**272.7**	**4,054.9**

[1]Approximate acres on NFS lands calculated using geographic information system (GIS) data (WAPA 2011).

kV kilovolt
NFS National Forest System
ROW Right-of-way

2.2.2.3 Access

WAPA needs authorized access routes (see Table 2-2) to maintain transmission lines, including access for vegetation management and routine maintenance, and to ensure worker safety. WAPA uses a variety of routes to access its transmission line ROWs, including public roads, designated forest roads, trails, and spurs (see Map Access-1 through Map Access-8). Overland access is generally in the transmission line ROW and provides access to specific structures. WAPA does not propose new access roads under the Proposed Action; however, the Proposed Action does include access roads and routes as areas that require vegetation management and maintenance. This would include re-establishment of existing roads and routes. WAPA would incorporate design features for access use and maintenance. Under the Proposed Action, WAPA would maintain access routes using the same methods described under the No Action Alternative.

Table 2-2. Access Road Mileage

National Forest	On Forest Service Motor Vehicle Use Map[1]	Needs Permitting[2]
Arapaho-Roosevelt National Forests	30	10.5
Ashley National Forest	29.4	16.7
Grand Mesa, Uncompahgre, and Gunnison National Forests	171.7	51
Medicine Bow-Routt National Forests	137.1	19.2
Nebraska National Forest	13	4.6
Pike and San Isabel National Forests	16.7	11.7
San Juan National Forest	169.5	51.1
White River National Forest	12.5	10.6
TOTAL	**579.9**	**175.3**

[1]The MVUM displays National Forest System routes (roads and trails) or areas designated open to motorized travel.
[2]Routes WAPA uses outside of the ROW that are not on an MVUM would need to be permitted.

<u>Roadless Areas</u>

Of the 273 miles of transmission line ROW analyzed for this project a total of approximately 1 mile is located in Forest Service roadless areas.

In the Arapaho Roosevelt National Forest, two portions of the Blue River-Gore Pass transmission line cross the Copper Mountain Roadless Area. The southern portion of the line, approximately 3.1 miles, was excluded from the Roadless area (e.g, the ROW is located within a 100’ “cherry stem”). WAPA would be permitted to treat 125 feet of the ROW, totaling approximately 47 acres along this ROW including approximately 9.4 acres within the Roadless Area. The northern portion of the line, approximately one mile, was not excluded from the Roadless Area (i.e., no “cherry stem” exists here). Approximately 14.6 acres of the right of way would be treated in the Roadless Area.

Under the Proposed Action, vegetation treatments would continue along four miles of ROW, some in the Copper Mountain Roadless Area. These activities were previously approved through a Decision Memo by the Arapaho Roosevelt National Forest in 2019. The decision was affirmed by the Rocky Mountain Regional Forester as consistent with the Colorado Roadless Rule, which permits tree cutting “for the construction, reconstruction, or maintenance of existing or future authorized electrical power lines (36 CFR 294.44(c)(3).” The activities are authorized on 24 acres of the ROW within the Roadless Area. They include utilizing vegetation management crews to assess the ROW condition, identifying incompatible vegetation, and trimming and removing incompatible vegetation, including cutting “danger trees” as defined in WAPA Order 430.1C, using the appropriate means for the terrain and vegetation type. In general, only hand treatment is permitted on slopes over 35% while other types of treatment are used on lesser slopes where access permits. The transmission line is accessed via existing access routes; no new road construction is authorized, and only rubber-treaded vehicles are used.

In the Ashley National Forest, WAPA’s Flaming Gorge-Vernal #1 transmission line, approximately 4.2 miles of transmission line ROW is surrounded by several Roadless Areas (e.g., 0401002, 0401003, 0401006, and 040132 Roadless Areas on Flaming Gorge Ranger District). This ROW is located within an 80-foot-wide “cherry stem” excluded from the Roadless area. Under the Proposed Action, vegetation treatments would continue along WAPA’s ROW in the “cherry stem” described above. The transmission line is accessed via existing access routes or helicopter; no new road construction is authorized, and only rubber-treaded vehicles are used.

The transmission line ROW’s are accessed from approximately four miles of existing access routes which crosses the 0401002, 0401003, 0401006, and 040132 Roadless Areas, predominately on unmaintained spurs from NFS Road 610 on Flaming Gorge Ranger District. Less than one mile of existing access route crosses the 0401006 Roadless Area, off various unmaintained spurs along the U.S. Highway 191 corridor on the Vernal Ranger District to access WAPA’s Flaming Gorge-Vernal #3 transmission line. In sum, the approximately five miles of access routes in the roadless area would equate to six acres of ongoing vegetation clearance. The transmission line would continue to be accessed via existing access routes or helicopter; no new road construction would be authorized, and only rubber-treaded vehicles would be used.

2.2.2.4 Vegetation Management Proposed Practices

WAPA ROWs are in various conditions with regard to vegetation management and fuel loading. For example, there are areas that need relatively little treatment, areas that need significant treatment to bring them to a desirable condition that could then be managed efficiently, and other areas with mixed conditions. This is the result of a variety of past actions, including the extent of vegetation clearing along the ROWs when transmission lines were constructed and how these areas were subsequently managed over the years; maintenance practices over many years in a variety of vegetation types that could have contributed to excessive fuel loading in the ROWs; past danger-tree cutting; site conditions (e.g., slope, soil types, rainfall, pine beetle and other beetle attacks, and diseases); tree species distribution; topography; and other variables such as drought.

To facilitate the environmental impact analysis for this EIS, WAPA identified six categories of existing conditions in the ROWs and how it would manage each category to meet the objectives of the Proposed Action. The Proposed Action includes vegetation management options based on the conditions in the ROWs. Table 2-3 summarizes the six categories of existing conditions. The following definitions help readers understand the Proposed Action and the six categories of existing conditions.

- **Threshold**. Synonyms: action threshold, trigger. The condition of vegetation or fuel load in the ROW that would initiate the need to control it. Factors include maximum desired levels of plant density or height of undesirable vegetation (also called incompatible vegetation), fuel loads, public and worker safety, and the availability of funding and crews.
- **Maintenance treatments**. Vegetation or fuel management methods and activities selected to keep vegetation or fuel in a desirable condition or to restore a desirable condition.
- **Re-entry interval**. The estimated length of time to the next vegetation or fuel management treatment. Several variables affect the length of the interval, such as growth rates of undesirable

species, availability of human resources to do the treatments, budget constraints, and project priorities.

- **Initial treatment**. The first round of vegetation management activities used to establish a desired condition in the ROW. The initial treatment is typically more equipment- and resource-intensive than maintenance treatments.
- **Fast-growing undesirable vegetation**. A relatively fast-growing species that at mature height typically threatens the transmission line. The species and the site conditions determine growth rate. For example, aspen and lodgepole pine are often fast-growing undesirable species. In less-than-ideal site conditions they might grow more slowly. Conversely, normally slow growing species can be faster growing on high-quality sites.
- **Slow-growing undesirable vegetation**. A species that at mature height typically threatens the transmission line, but it is typically slow growing. Examples are spruce and fir. The growth rate might be a characteristic of the species, or it might be due to a typically faster-growing species on a marginal site, where its growth is much slower.
- **Fuel load**. The amount of fuel, whether dead or alive (green), in the ROW. Undesirable fuel loads could contribute to unacceptable risks to the transmission line from fires. Characteristics that make fuel load undesirable include how easily ignited it is, how hot it burns, how well it sustains fire, how rapidly it burns, how long it will burn, flame lengths, and how much smoke the burn will generate.
- **Desired vegetation condition**. The acceptable or optimal condition of native vegetation in the ROW, which is generally defined by a lack of undesirable species. The species makeup of a desired vegetation condition varies depending on ROW conditions. For example, if a transmission line spans deep ravines high above trees, the desired condition might include tall-growing tree species. In other areas with less power-line-to-ground clearance, the desired vegetation condition would include lower-growth plant species.
- **Undesirable vegetation**. Synonyms: target vegetation, incompatible vegetation, unacceptable vegetation. Vegetation species that present a safety hazard and are unsuitable for the intended use of the ROW, or that at mature height would typically threaten transmission line reliability, operations, or maintenance.
- **Desirable vegetation**. Synonyms: compatible vegetation, acceptable vegetation. Vegetation species that do not present a safety hazard, and are suitable for the intended use of the ROW.

2.2.2.5 Categories of Right-of-Way Conditions and Vegetation Treatment Methods

WAPA identified six broad categories of ROW conditions on NFS lands. The condition of the vegetation in the ROW determines whether the ROW would need to be treated soon; needs treatment over the longer term, or is unlikely to need treatment for some time. WAPA routinely monitors ROWs to determine vegetation conditions. Managing fuel loads is also an objective of the Proposed Action covered specifically under Category 6, and WAPA would manage fuel loads as needed when it treats vegetation in the ROWs. Table 2-3 lists the six categories of ROW conditions and their treatment methods.

Table 2-3. Categories of Right-of-Way Conditions and Vegetation Treatment Methods

Category	Vegetation	Examples	Frequency of Treatment	Treatment Methods
1	Compatible with the transmission line.	The lines span canyons and there will likely always be adequate clearance between vegetation and the transmission line conductors – even with larger mature trees; a vegetation community that is already a stable, low-growth one (e.g., grasses, forbs, bushes, and shrubs) so that vegetation at mature height is not a threat to the transmission line.	None expected for the duration of the authorization, but ROW monitoring will be needed to ensure conditions have not changed.	None expected.
2	Fast-growing incompatible species that are presently not acceptable, and over the long term, the vegetation is likely to include incompatible vegetation types that would require monitoring and treatment.	Mature lodgepole pine, mature aspen, and other species on high-quality growth sites.	• Initial treatment expected within 1 to 5 years. • Maintenance treatments are expected to be relatively frequent (expected 2- to 6-year return intervals).	• Accessible sites would favor use of mechanized equipment and removal of salvageable material. • Inaccessible sites would favor use of hand felling.
3	Fast-growing incompatible species of trees that are in an acceptable condition, but over the long term, incompatible vegetation treatments would be needed.	Immature lodgepole pine and aspen. Other species on high-quality growth sites.	• Maintenance treatments are expected to be relatively frequent (expected 2- to 6-year year return intervals, but this will vary depending on site conditions).	• Accessible sites would favor mechanized equipment, with removal of salvageable material. • Inaccessible sites would favor use of hand felling.
4	Slow-growing incompatible species of mature vegetation that is not acceptable, and over the long term, treatments for incompatible vegetation would be needed to control re-growth.	Mature spruce and fir. Other species on harsh sites.	• Initial treatment is expected within 2 to 5 years, depending on site conditions and vegetation growth. • Maintenance treatments are expected to be relatively infrequent on sites with incompatible species with slow growth rates, perhaps 5 or more years, depending on site conditions.	• On sites with good access, mechanized equipment would be favored and salvageable material would be removed. • On sites with poor access, hand felling and other manual methods would typically be used.

Table 2-3. Categories of Right-of-Way Conditions and Vegetation Treatment Methods

Category	Vegetation	Examples	Frequency of Treatment	Treatment Methods
5	These sites have slow-growing incompatible species, and the ROW is in an acceptable condition; but over the long term, the incompatible species would need to be monitored and treated.	Immature spruce and fir. Other incompatible species on harsh sites.	• Maintenance treatments are expected to be relatively infrequent, perhaps 5 years or longer, depending on site conditions.	• On sites with good access, mechanized equipment would be favored and salvageable material would be removed. • On sites with poor access, hand felling and other manual methods would typically be used.
6	Treatments in these areas of ROW are driven largely by the conditions of the fuel load. Typically, they include areas with low-growing vegetation types characterized by having high fuel loads. Sites are characterized by dense, woody vegetation capable of high-intensity fire, with transmission lines having relatively low conductor-to-ground clearances.	Sagebrush, Gambel oak, dense lodgepole regeneration, and pinyon and juniper pine.	• Initial treatments are expected. This could include mechanical removal of vegetation near structures and from areas of the ROW. • Maintenance treatments as needed. Need is determined from ROW monitoring.	• In areas with good access, mechanized treatment such as mowing would be favored. • In areas with poor access, manual treatments would typically be used. • Gambel oak could be treated with herbicides.

As listed in Table 2-3, actions WAPA proposes for treating vegetation depend on the species present in the ROW, their growth characteristics, and risks to the transmission line. WAPA also would consider other factors when determining when and where to implement the treatments, including, but not limited to, the relative risk of the current situation in the ROW to reliability, the need to comply with mandatory reliability standards, fire threat, public and worker safety, and availability of funding and crews. The Proposed Action does not impose a single action threshold for all scenarios, nor does it use numerical thresholds (e.g., height of trees).

Table 2-4 summarizes the total acres of ROW conditions in the subject forests.

Table 2-4. Acres of Rights-of-Way in each Vegetation Management Category by Forest

National Forest	Category 1	Category 2	Category 3	Category 4	Category 5	Category 6	Total
ANF	19.6	2.8	31.1	25.3	59.3	114.5	252.6
ARNF	23.18	47.1	164.3	19.9	17.1	16.6	288.2
GMUG	102.1	111.9	357.7	33.0	123.7	473.3	1,201.7
MBRNF	311.4	113.2	366.9	53.1	69.5	21.4	935.5
NNF	79.7	0	0	3.8	0	0	83.5
PSINF	31.4	10.5	55.9	18.3	47.0	48.6	211.7
SJNF	103.4	46.5	68.7	40.7	356.6	282.4	898.3
WRNF	54.1	35.4	1.9	23.5	0	68.5	183.4
TOTAL	**724.8**	**367.4**	**1,046.5**	**217.6**	**673.2**	**1,025.3**	**4,054.9**

ANF Ashley National Forest
ARNF Arapaho-Roosevelt National Forests
GMUG Grand Mesa, Uncompahgre, and Gunnison National Forests
MBRNF Medicine Bow-Routt National Forests
NNF Nebraska National Forest
PSINF Pike and San Isabel National Forests
SJNF San Juan National Forest
WRNF White River National Forest

Photos 2-1 through 2-17 show areas of ROWs corresponding to the six categories described in Table 2-3. These photos illustrate the types of ROW conditions associated with each category, and represent typical ROW conditions.

CATEGORY 1 CONDITIONS - PHOTO SERIES 2-1 THROUGH 2-3

ROW vegetation is compatible with the transmission line based on topography and presence of natural, stable, low-growing vegetation communities.

Photo 2-1. ROW with natural, low-growing vegetation outside the aspen stands that is compatible with the transmission line.

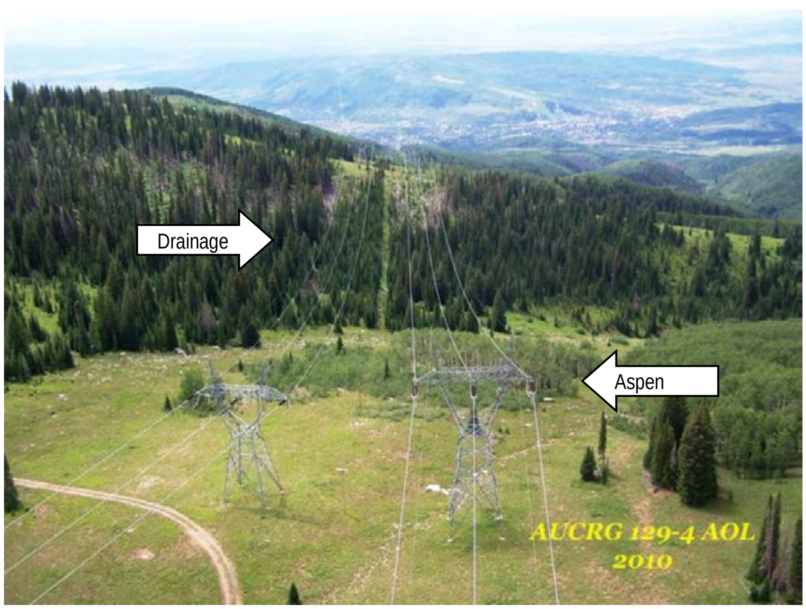

Photo 2-2. The transmission line spans vegetation in a drainage that is unlikely to present a risk to the transmission line, and would not require intensive treatment. Aspen patch immediately behind the foreground towers would require intermittent treatment. Conifers near and in the bottom of the drainage area would not.

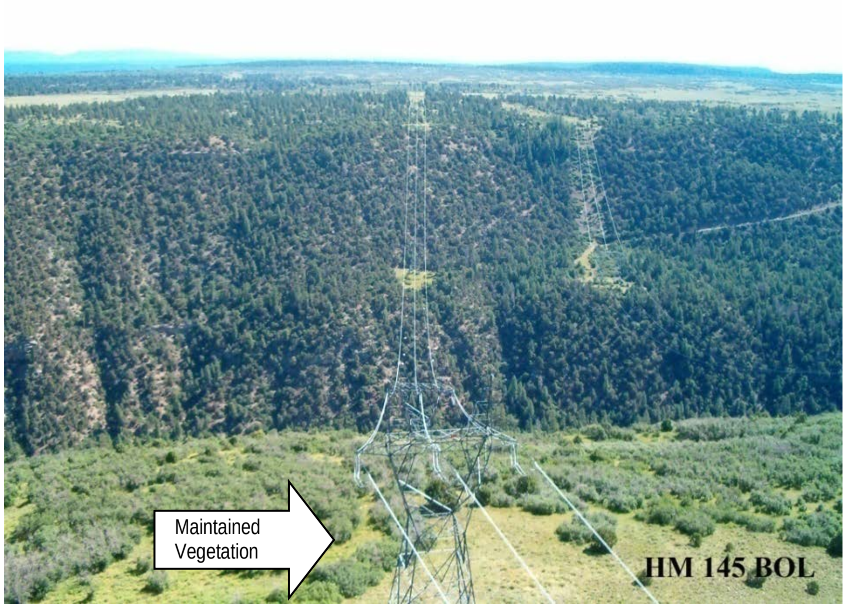

Photo 2-3. Transmission line spans vegetation that would not require treatment. However, note that at the structure locations, vegetation is maintained so it would not present problems with access, fuel load, or safety of the structure.

CATEGORY 2 CONDITIONS - PHOTO SERIES 2-4 THROUGH 2-6

Fast-growing incompatible species that are not acceptable; over the long term, the vegetation is likely to include incompatible vegetation types that would require monitoring and treatment.

Photo 2-4. Incompatible conifer and aspen vegetation that would require initial treatment to establish a low-growth condition, which WAPA would then maintain. In the middle of the photo, note how the aspen in the ROW have vigorously re-grown after numerous treatments.

Photo 2-5. Stands of aspen, a typically fast-growing species, that would need to be cut, after which WAPA would periodically monitor the site and re-treat it as necessary.

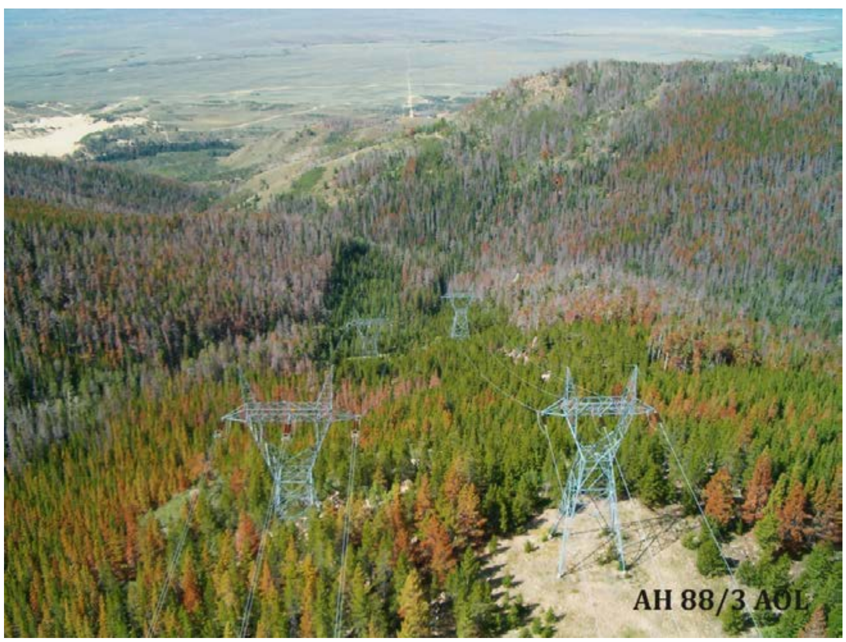

Photo 2-6. The lodgepole pine in the ROW is rapidly re-growing and would need to be treated and maintained.

CATEGORY 3 CONDITIONS - PHOTO SERIES 2-7 THROUGH 2-9

Fast growing incompatible species of trees that are in an acceptable condition, but over the long term, WAPA would need to treat incompatible vegetation.

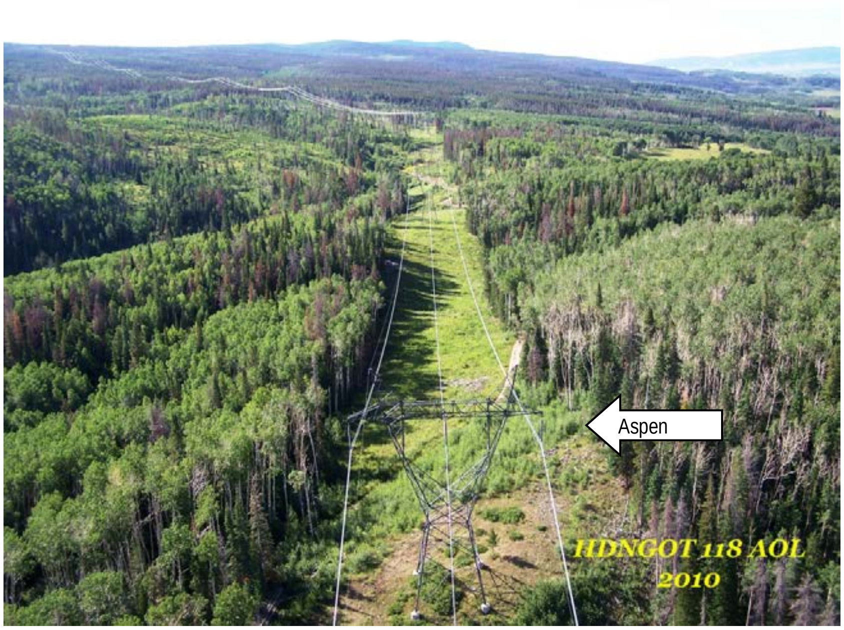

Photo 2-7. The ROW was cut when the line was constructed and has been maintained in a desirable condition. Note that aspen and lodgepole pine are the predominant species, with rapid aspen regeneration occurring immediately behind the first transmission line structure. WAPA would monitor the ROW and treat it as needed to maintain this condition.

Photo 2-8. These parallel ROWs have been maintained in a desirable condition through a stand of predominantly aspen.

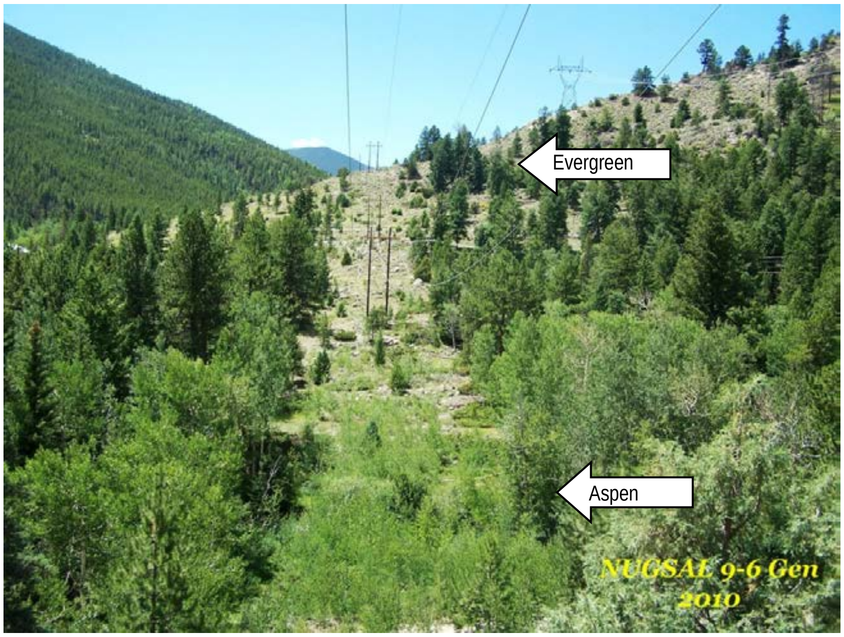

Photo 2-9. In the foreground, aspen, a fast-growing incompatible species, would need to be treated and then maintained in a low-growth condition. In the background, slower-growing evergreen species have not become a problem since the line was constructed; this is typical of Category 5 conditions. The photo also illustrates that there can be different types of vegetation conditions in a small section, and underscores the need for routine monitoring of ROWs.

CATEGORY 4 CONDITIONS - PHOTO SERIES 2-10 THROUGH 2-12

Slow-growing incompatible species of mature vegetation that is not acceptable, and in the long-term incompatible; vegetation treatments would be needed to control re-growth.

Photo 2-10. The trees on this site are slower growing, but at maturity would interfere with the transmission line. WAPA would need to treat the area to establish a lower growth condition, which WAPA would monitor and maintain as needed.

Photo 2-11. This ROW condition is not acceptable because of the risk the trees pose to the transmission line conductors, and poor access for maintenance.

Photo 2-12. These two parallel lines have different authorizations for vegetation maintenance. The line on the left is in a desirable condition, but WAPA will monitor it and treat as needed. The line on the right is not in a desirable condition; WAPA would schedule it for initial treatment and then maintain it in a condition similar to the line on the left.

CATEGORY 5 CONDITIONS - PHOTO SERIES 2-13 THROUGH 2-15

These sites have slow-growing incompatible species, and the ROW condition is acceptable. However, over the long term, WAPA would need to monitor and treat the incompatible species.

Photo 2-13. Harsher growing site with slower-growing incompatible species that are acceptable, but would require monitoring and longer-term treatment.

Photo 2-14. The condition of this ROW is generally acceptable and relatively stable, but will require monitoring to ensure that the need for treatment can be identified and implemented. Note the low level of aspen re-growth in the lower right corner, which has emerged and must be closely monitored.

Photo 2-15. Although this ROW is generally acceptable, the two larger trees under the transmission line are due for treatment to ensure they do not present a hazard to the line.

CATEGORY 6 CONDITIONS - PHOTO SERIES 2-16 THROUGH 2-17

Treatments in these areas of ROW are driven largely by the conditions of the fuel load. Typically, they include areas with low-growing vegetation characterized by having high fuel loads. Sites are characterized by dense, woody vegetation capable of high-intensity fire, where transmission lines have relatively low conductor-to-ground clearances.

Photo 2-16. WAPA would monitor potential fuel loading under the lines and near the structures, and schedule treatment as needed.

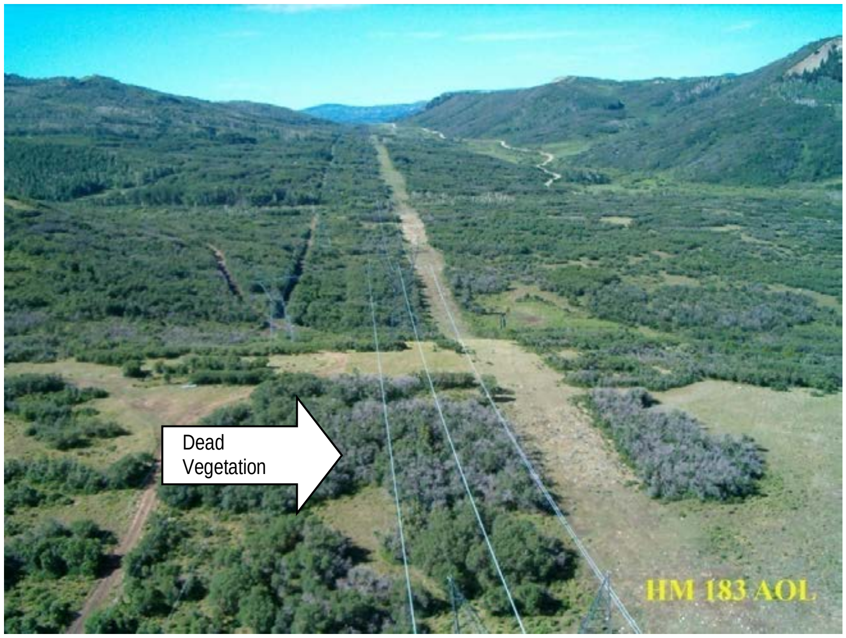

Photo 2-17. There are two parallel transmission lines and a pipeline in this utility corridor. This dense vegetation around structures and under the conductors could present a fuel problem. Note the dead vegetation under the transmission line in the foreground.

If the ROW is not in an acceptable condition, the Proposed Action includes an initial treatment to establish a desired ROW condition. If the ROW is in an acceptable condition, WAPA would maintain it at that state as discussed under the heading Maintain Desired ROW Conditions. During both activities, WAPA would implement design features to protect resources.

Establish Desired ROW Vegetation Condition

If the vegetation in the ROW does not meet WAPA's requirements, WAPA would treat it to reach a desired condition. WAPA considers the following when developing a proposed desired condition:

- How the existing condition meets or does not meet the purpose of and need for agency action described in Chapter 1
- Environmental protection requirements and the need to protect resources and incorporate design features
- The presence, abundance, height, and distribution of woody vegetation that, at mature height, would threaten the transmission line
- The degree of fuel loading in the ROW and the need to decrease the amount of fuel loading
- Adequate access to the ROW and structures for vegetation management activities (e.g., presence of woody vegetation, slope, topography, terrain, and soils)

WAPA would assess current conditions in the ROW to identify areas that need initial treatments based on the categories described above. There are approximately 1,610 acres identified that would need the initial treatment. Treatment of this many acres spread over 273 miles of ROWs requires planning and prioritization to effectively and efficiently accomplish this part of the Proposed Action. WAPA would prioritize areas that need treatment based on several considerations, including availability of resources, both human and financial; competing priorities; relative risk of the condition to the transmission line; and sensitive or protected species or other sensitive resources.

This proposal includes options for treating the ROW. The initial treatment of ROW vegetation would emphasize the following activities:

- Cut danger trees if any are present
- Manage slash that has built up in the ROW to reduce fuels density
- Grind or crush regeneration that has grown in the ROW to reduce the density of live, green fuels
- Cut tree species that at mature height would threaten safe, reliable transmission-line operation

If there are no environmental or other issues to be mitigated, WAPA proposes to remove incompatible vegetation that at mature height would interfere with transmission line safety and reliability. These are typically trees. The desired condition would be a ROW dominated by grasses, forbs, shrubs, and lower-growth tree species that, at maturity, would not interfere with the transmission line.

Maintain Desired ROW Condition

Once the vegetation is in a condition that meets WAPA's requirements, WAPA would monitor and retreat ROW areas at appropriate intervals based on the results of reviews of ROW conditions during line patrols (see Categories 3, 5, and 6 and the discussions under the heading Categories of ROW Condition and Treatment Methods). In ROW areas with relatively low conductor-to-ground clearances, WAPA would typically retain lower-growth native plant species to maintain the desired vegetation condition. WAPA would do this through active management to remove tall-growth species. Depending on the specific site conditions, desirable native species could include grasses, forbs, and shrubs, through appropriately-sized small or lower-growing tree species. Generally, more selective control methods can be used to maintain this condition along the ROW. ROW maintenance activities and treatment intervals would vary in the ROW depending on the success of previous treatments, vegetation type, rates of vegetation re-growth, environmental protection requirements, and risks to the transmission line.

An important component of ROW maintenance is fuels management to mitigate the risk of outages and wildfires. WAPA would evaluate the risk to transmission line operations and security from wildfire and manage fuels in the ROWs. ROW fuel loads associated with vegetation re-growth or control treatments must be evaluated and controlled as needed. All vegetation (dead or live) can be considered fuel because it can contribute to fire intensity and duration. In addition to reducing the risk of incompatible vegetation in a ROW, WAPA's proposed ROW reclamation and long-term maintenance strategies would address areas where accumulated fuel poses an unacceptable risk.

WAPA would reduce fuel density in ROWs using mechanical and manual treatment approaches, as described in this section (see Mechanical Fuel Reduction Methods section below).

WAPA would monitor all ROWs. There could be areas that need no or minimal vegetation management – for example, some areas in canyons and drainages or other steep topography in which trees might not grow to heights or densities that would threaten the transmission line that crosses high above (see Category 1). In some of these areas few if any control methods would be needed for years. In other vegetation communities, occasional mowing of vegetation around structures could be needed to ensure access to the structures and to reduce the risk of fire to the transmission line. Regardless, WAPA would need to monitor all ROWs to continuously evaluate vegetation conditions and ensure they meet the management requirements, and to ensure that changed conditions have not resulted in unacceptable threats.

Proposed Vegetation Control Methods

WAPA proposes several general control methods, individually or in combination, to manage vegetation. These methods include a variety of control methods utilities typically use to manage their ROWs. Section 2.2.1 briefly describes these techniques because WAPA has been using them in its ROWs as part of routine maintenance. This section provides more information about these techniques. Under the Proposed Action, WAPA would use the same techniques, but in some areas of its ROWs, WAPA would use the techniques more efficiently and effectively to control and maintain vegetation . The following paragraphs describe the general vegetation-control methods.

Manual Control Methods

Manual vegetation control includes the use of hand-operated powered tools and non-powered hand tools. Manual techniques – mainly using chainsaws – can be used where equipment access is limited by terrain, soil conditions, or other environmental conditions. One or two trucks carrying equipment and workers drive along the access road to the appropriate site. Crews of two or more with chainsaws then hike along the ROW and cut target vegetation. Crews using manual control methods often use ATVs instead of trucks. Crew sizes for this type of activity usually range from two to four.

Using Geotextile Barriers

Geotextile “weed barriers” or landscape fabrics made of synthetic material (actually a physical barrier rather than manual method) can be placed on the ground around plantings in local areas or under gravel yards or surfaces. This is typically done in urban areas where landowners might request it around ornamental plantings. WAPA may use geotextile barriers under structures with noxious weed problems or where it may control sprouting of incompatible species.

Mechanical Control Methods

Mechanical vegetation control uses machine platforms with various interchangeable treatment-head attachments to remove or control target vegetation along transmission line and authorized access route ROWs. Rubber-tired mechanical equipment platforms are generally limited to operating on slopes less than 30 to 35 percent. Specialized tracked equipment platforms, with articulating control cabins, are typically used on slopes up to 60 percent. Both types of specialized equipment platforms can operate with very low ground pressures. However, site-specific obstacles such as rocks or other extreme terrain conditions can reduce their efficiency and even prevent the use of mechanized control methods. Mechanical operations usually involve a crew of two to three.

- **Feller bunchers**. These machines grab trees, cut them at the base, pick them up, and move them to a windrow or onto the back of a truck. The tree is under the machine’s control.
- **Skidders and forwarders**. Skidders are tracked or four-wheel drive tractors with winches. They have articulated steering and usually a small, adjustable, push-blade on the front. They are one of the few logging machines capable of thinning or selective logging in larger timber. Forwarders can also haul smaller log lengths than a skidder, but this sometimes limits their range of operation. However, forwarders cause relatively little ground disturbance because material is carried on the back of the forwarder instead of being dragged behind, as with a skidder. Site conditions (e.g., soil moisture and terrain), presence of sensitive environmental resources, and forest conditions dictate the appropriate combination and use of this type of equipment.
- **Roller-choppers**. This technique uses rotating drums towed by a variety of vehicles that roll and chop vegetation and forest debris. A series of blades, steel chains, or other devices attached to the drum chop the vegetation.

- **Walking brush controllers**. These machines have booms, dippers, and other means to manipulate cutting equipment and control vegetation with minimal soil disturbance.
- **Mowing/grinding**. Mechanized heavy equipment with high-speed rotary blades can be used to cut, chop, or shred woody vegetation in ROWs. Target vegetation is typically cut off at ground level, encouraging the selection and recovery of low-growing plant communities consisting of grasses, forbs, and other herbaceous plants. Examples of this type of mowing equipment are Fecon, brush-hog, Track-Mack, and Hydro-Ax.

Herbicides and Growth Regulators

WAPA would use spot application of herbicides approved for use on NFS lands to treat undesirable, mostly herbaceous vegetation. WAPA applies herbicides to invasive species. Herbicides are applied directly to the vegetation using a hand or powered sprayer. Herbicides are used on incompatible vegetation that sprouts after initial treatment by cutting or mowing. Herbicide applications typically involve a crew of one to two.

WAPA uses herbicides that are approved for use in ROW maintenance and by the Forest Service. WAPA uses Environmental Protection Agency- and state-registered herbicides, and appropriately licensed or certified applicators apply the herbicides following the label requirements.

Herbicides can be applied in different ways, depending on the targeted plants, vegetation density, and site circumstances. WAPA proposes herbicide treatment either by spot application or localized (site-specific) application.

When making decisions about the use of these methods, WAPA considers the area being treated, the presence of sensitive plants and other environmental resources, the herbicide label requirements, and whether the method is cost effective and efficient.

SITE-SPECIFIC HERBICIDE APPLICATION

Site-specific or localized herbicide application is the treatment of individual or small groupings of plants. WAPA typically uses this application method only in areas of low to medium target-plant density. The application techniques include, but are not limited to, the following:

- **Basal treatment.** Appropriately licensed or certified applicators apply the herbicides using hand sprayers or by backpack sprayers. They apply herbicides at the base of the plant (the bark or stem) from the ground up to knee height. The herbicide is usually mixed with an oil carrier to enhance penetration through the bark, and applied to a point short of run-off. These treatments can be done during the dormant season or growing season, depending on species.
- **Low-volume foliar treatment.** Applicators apply herbicides using a backpack sprayer, or ATVs or tractors with a spray gun. They apply herbicides to the foliage of individual or clumps of plants during the growing season, just enough to wet them lightly. They use a relatively high percentage of herbicide mixed with water. They add thickening agents where necessary to control drift, and might add dyes to see easily what areas have been treated.
- **Cut stump treatments.** Applicators apply herbicide to freshly cut stumps of incompatible vegetation to prevent re-growth by sprouting.

Prescribed Burning

Prescribed fire is a fire intentionally ignited to meet specific land management objectives, such as reducing flammable fuels or prepare an area for new trees or vegetation. Prescribed fire is a management tool that will help manage fuel loads when used under controlled conditions. Prescribed burning is a technique the Forest Service can use for routine maintenance.

Energized transmission lines can arc to the ground when smoke is present, which would present potential hazards to persons involved in the burn, and concern for the transmission line and overall electrical system reliability. Use of fire for vegetation treatment would be conducted by Forest Service or inter-agency fire personnel, and would require a separate site-specific NEPA decision by them. Forest Service fire managers develop detailed fire prescriptions based on weather, moisture content of the fuels, management objectives, public safety, air quality requirements, and other factors before burning is allowed. Although it is a useful tool for vegetation and fuel-loading management in ROWs, many places are not appropriate for prescribed fire.

Burning slash piles could be conducted as part of the maintenance of the ROWs; however, any type of burning would be coordinated through and conducted by the local Forest Service or interagency fire personnel from the local unit. WAPA would not expect to conduct any prescribed burns of its own, but would coordinate with Forest Service or interagency fire personnel planning prescribed fire activities. In some cases an outage of the transmission line may need to be scheduled to allow safe prescribed fires.

Livestock Grazing

WAPA could use targeted grazing to control vegetation in ROWs when appropriate and in coordination with the local Forest Service or managing agency Range Management Specialist and State Wildlife Agency, where applicable.

DEBRIS DISPOSAL

Managing vegetation includes cleanup – the treatment of slash and debris disposal. There are five basic methods of disposing of the vegetation debris generated when vegetation is cut, as follows:

- **Logging.** Marketable timber might be processed and piled for future removal from the ROW.
- **Chipping.** With chipping, a mechanical brush chipping unit cuts brush into chips 10 centimeters (4 inches) or less in diameter. The chips can be spread over the ROW, piled in the ROW, or trucked off the site. Trunks too large to be handled by the chipper are limbed and the limbs chipped. Trunks are placed in rows along the edge of the ROW or scattered, as the situation requires. Spreading chips in the ROW can be an effective ROW management tool to control erosion, reduce soil drying, improve aesthetics in the treated area, control noxious weeds, and control rapid re-growth of incompatible species by sprouting of seeds already in the soil.
- **Lopping and scattering.** With lopping and scattering, some of the branches of a fallen tree are cut off (lopped) by ax or chainsaw, so the tree trunk lies flat on the ground. The trunks are usually cut in 1- to 2-meter (4- to 8-foot) lengths. The cut branches and trunks are then scattered on the ground.
- **Mulching.** Mulching is a debris treatment that falls between chipping and lop and scatter. The debris is cut, shredded, or otherwise broken into 30- to 60-centimeter (1- to 2-foot) lengths and scattered in the ROW.

- **Pile burning.** With pile burning, vegetation debris is piled outside the ROW and burned in small piles. High-intensity burning is a hazard in the ROW and near electric facilities because the smoke can induce flashovers from electrified facilities. Burning also contributes to air pollution and can damage the soil below the burn piles. The fire can escape to other areas if not properly managed. Pile burning in an area outside the ROW would reduce the safety and fire risk issues associated with in-ROW burning. WAPA would only use pile burning techniques as requested by the Forest Service or interagency fire and fuels personnel. WAPA would make piles in preparation for burning and any burning would be conducted by the Forest Service.

MECHANICAL FUEL REDUCTION METHODS

Under the Proposed Action, WAPA would reduce existing fuel loads through mechanical thinning, mowing, chipping, and debris removal. WAPA would use site-specific treatments to reduce potential impacts from wildfire on the transmission line by reducing the likely intensity and duration of fires in ROWs. WAPA would use a range of mechanical and manual methods, depending on site conditions. These include tree removals, mechanical and hand thinning of small-diameter trees to reduce ladder fuels, mechanical mastication (e.g., grinding and chipping), and hand and mechanical piling. The target fuels of these treatments include downed trees, slash, debris from past treatments, green fuels such as regenerated aspen and lodgepole pine, and brush such as Gambel oak and sagebrush.

Prescribed burning and slash pile burning could be conducted to reduce fuel loads as described in the *Prescribed Fire* section above. Prescribed fire treatments would include mechanical piling and burning to reduce surface fuels over larger areas. Large pockets of dead and down woody material and slash generated from mechanical treatments could be piled and burned to further reduce fuel loadings. However, any type of burning would be coordinated through and conducted by the local Forest Service or interagency fire personnel from the local unit. WAPA would not conduct any burning operations of its own.

2.2.2.6 Proposed Action by Forest

This section identifies the ROW conditions in each of the six treatment categories for each of the eight affected forests. The text and table for each forest identifies the acres of vegetation the Proposed Action would affect by type and category.

WAPA gathered information about existing conditions along its ROWs and maintained the information in a geographic information system (GIS) database to document baseline conditions. The vegetation data is a modified version of the official Forest Service Region 2 (R2) Vegetation dataset. R2 Vegetation is an infrequently updated broad classification of existing vegetation conditions with minimum mapping units that are too coarse to accurately analyze ROW conditions. Because of this, some areas do not accurately reflect current vegetation conditions. WAPA modified the R2 Vegetation dataset for its ROWs to update vegetation polygons and respective species types. WAPA did this by drawing more detailed vegetation polygons using aerial imagery from the 2009 National Agriculture Imagery Program (NAIP). For the Ashley National Forest, WAPA used the Ashley National Forest Vegetation dataset and modified it as was done for the R2 Vegetation dataset. WAPA identified vegetation species using aerial interpretation, field observations and reviewing other vegetation data sources including the Colorado Vegetation Classification Project for national forests in Colorado, and the Southwest Regional Gap analysis data. WAPA then used the GIS database to record baseline vegetation conditions along the ROWs. Baseline conditions also reflect WAPA's vegetation management activities through April 2010, including danger-tree removal and other vegetation management to maintain safe and reliable operation of the transmission lines.

Arapaho-Roosevelt National Forests

Methods for Determining Existing Vegetation Conditions

WAPA identified 12 vegetation types in Arapaho-Roosevelt National Forests. Table 3-25 lists baseline vegetation conditions in Arapaho-Roosevelt National Forests.

WAPA used the information in Table 3-25 and the GIS dataset to identify ROW conditions in each of the six treatment categories (see Section 2.2.2.5). Table 2-5 lists the acres of vegetation the Proposed Action would affect by type and category. Maps ARNF-1 through ARNF-6 shows the detail associated with each transmission line by project area. Category 1 should require no vegetation treatment, but WAPA would monitor this category. Categories 2 and 4 will require initial vegetation treatment over the short term. Categories 3 and 5 are areas WAPA has already treated; however, incompatible species will require continued maintenance. Category 6 identifies areas that might require treatment for fuels reduction.

Table 2-5. Proposed Action in Arapaho-Roosevelt National Forests by Transmission Line, Vegetation Type, and Category (acres)

Transmission Line	Species Type	Category 1	Category 2	Category 3	Category 4	Category 5	Category 6	Total
ARCHER-NORTH PARK								
ARH-NOP / 230kV	Forb	0.5	0.0	0.0	0.0	0.0	0.0	0.5
Maps ARNF-4 – ARNF-6	Cleared	0.0	0.0	51.7	0.0	0.3	0.3	52.3
	Big sagebrush	0.0	0.0	0.0	0.0	0.0	7.8	7.8
	Aspen	0.0	1.8	0.0	0.0	0.0	0.0	1.8
	Lodgepole pine	1.8	9.6	0	0.0	0.0	0.0	11.5
	Limber pine	0.0	0.0	0.0	0.9	0.0	0.0	0.9
	Spruce/fir	0.0	0.0	0.0	1.7	0.0	0.0	1.7
	Subtotal	**2.3**	**11.4**	**51.7**	**2.6**	**0.3**	**8.1**	**76.4**
AULT-CRAIG								
AU-CRG / 345kV	Forb	0.2	0.0	0.0	0.0	0.0	0.0	0.2
Maps ARNF-4 – ARNF-6	Grass	0.4	0.0	0.0	0.0	0.0	0.0	0.4
	Cleared	4.4	0.0	62.2	0.0	8.2	0.3	75.1
	Big sagebrush	0.0	0.0	0.0	0.0	0.0	8.2	8.2
	Aspen	0.0	1.6	0.0	0.0	0.0	0.0	1.6
	Lodgepole pine	2.4	13.8	0.0	0.0	0.0	0.0	16.2
	Spruce/fir	0.1	0.0	0.0	2.9	0.0	0.0	3.0
	Subtotal	**7.5**	**15.3**	**62.2**	**2.9**	**8.2**	**8.5**	**104.6**
BLUE RIVER-GORE PASS								
BRU-GOT / 230kV	Bare	0.3	0.0	0.0	0.0	0.0	0.0	0.3
Maps ARNF-1 – ARNF-30	Forb	4.7	0.0	0.0	0.0	0.0	0.0	4.7
	Cleared	0.0	0.0	16.7	0.0	2.2	0.0	18.9
	Rock soil	0.0	0.0	0.0	0.0	1.6	0.0	1.6
	Aspen	0.0	5.7	2.1	0.0	0.0	0.0	7.7
	Douglas fir	0.0	0.0	0.0	6.9	0.0	0.0	6.9
	Lodgepole pine	5.8	13.4	30.7	0.0	0.0	0.0	49.9
	Spruce/fir	1.6	0.0	0.0	7.5	4.9	0.0	14.1
	Subtotal	**12.4**	**19**	**49.5**	**14.4**	**8.7**	**0.0**	**104.1**

Table 2-5. Proposed Action in Arapaho-Roosevelt National Forests by Transmission Line, Vegetation Type, and Category (acres)

Transmission Line	Species Type	Category 1	Category 2	Category 3	Category 4	Category 5	Category 6	Total
GREEN MOUNTAIN-BLUE RIDGE REPEATER								
GM-BLR / 2.4kV	Aspen	0.0	0.6	0.0	0.0	0.0	0.0	0.6
Map ARNF-3	Forb	0.9	0.0	0.0	0.0	0.0	0.0	0.9
	Cleared	0.0	0.0	0.8	0.0	0.0	0.0	0.8
	Lodgepole pine	0.0	0.7	0.0	0.0	0.0	0.0	0.7
	Subtotal	**0.9**	**1.3**	**0.8**	**0.0**	**0.0**	**0.0**	**3.0**
ALL LINES								
	Bare	0.3	0.0	0.0	0.0	0.0	0.0	0.3
	Forb	6.2	0.0	0.0	0.0	0.0	0.0	6.2
	Cleared	4.5	0.0	131.5	0.0	10.7	0.6	147.2
	Grass	0.4	0.0	0.0	0.0	0.0	0.0	0.4
	Rock soil	0.0	0.0	0.0	0.0	1.6	0.0	1.6
	Big sagebrush	0.0	0.0	0.0	0.0	0.0	16	16
	Aspen	0.0	9.6	2.1	0.0	0.0	0.0	11.6
	Douglas fir	0.0	0.0	0.0	6.9	0.0	0.0	6.9
	Limber pine	0.0	0.0	0.0	0.9	0.0	0.0	0.9
	Lodgepole pine	10	37.5	30.7	0.0	0.0	0.0	78.3
	Spruce/fir	1.7	0.0	0.0	12.2	4.9	0.0	18.8
	TOTAL	**23.2**	**47.1**	**164.3**	**19.9**	**17.1**	**16.6**	**288.2**
Summary (percent)		**8**	**16**	**57**	**7**	**6**	**6**	**100**

NOTE: Due to rounding and other GIS-related issues, some numbers may not sum correctly.

<u>*Proposed Action in Arapaho-Roosevelt National Forests*</u>

This section describes how WAPA would implement the Proposed Action in Arapaho-Roosevelt National Forests. There are four different transmission lines totaling 18 miles that cross Arapaho-Roosevelt National Forests-managed NFS lands. The ROWs have variable widths and cover approximately 288.2 acres.

The 23.2 acres (8 percent) in Category 1 include a variety of vegetation types that will require no treatment because the vegetation is compatible, and it is expected to remain so through the duration of the authorization. WAPA would monitor the ROWs and document conditions.

WAPA would treat approximately 47.1 acres (16 percent) of lodgepole pine and aspen (Category 2) within the first year of authorization because those species are in an unacceptable condition and grow fast. WAPA would treat approximately 164.3 acres (57 percent) of immature lodgepole pine and aspen (Category 3) within 2 to 6 years; these trees are in an acceptable condition due to previous vegetation-management activities. They will require treatment over the short term (within 2 to 6 years). Both of these categories are associated with relatively frequent maintenance treatments, with a return interval of 2 to 6 years.

There are approximately 19.9 acres (7 percent) of Douglas fir and mixed conifer (spruce/fir) (Category 4) not in an acceptable condition. WAPA anticipates initial treatment within 2 to 5 years of the authorization. Because Category 4 includes slow-growing, mature vegetation, WAPA expects maintenance treatments to be relatively infrequent, with a return interval of 5 or more years.

Approximately 17.1 acres (6 percent) of immature spruce and fir (Category 5) will require treatment in 5 or more years after authorization. These are slow-growing species that are in acceptable condition, but they will eventually require treatment to maintain the desired condition. WAPA expects Category 5 maintenance treatments to be relatively infrequent, with a return interval of 5 or more years.

Category 6 identifies areas that might require vegetation management for fuels reduction. WAPA might treat approximately 16.6 acres (6 percent) of big sagebrush as funding becomes available.

Ashley National Forest

<u>*Methods for Determining Existing Vegetation Conditions*</u>

WAPA identified 16 vegetation types in Ashley National Forest. Baseline conditions also reflect WAPA's vegetation management activities through April 2010, including danger-tree removal and other vegetation management to maintain safe and reliable operation of the transmission lines. Table 3-26 lists baseline vegetation conditions in Ashley National Forest.

WAPA used the information in Table 3-26 and the GIS dataset to identify ROW conditions in each of the six treatment categories (see Section 2.2.2.5). Table 2-6 lists the acres of vegetation the Proposed Action would affect by type and category. Maps ANF-1 through ANF-10 show the detail associated with each transmission line by project area. Category 1 should require no vegetation treatment, but WAPA would monitor this category. Categories 2 and 4 would require initial vegetation treatment over the short term. Categories 3 and 5 are areas that WAPA has already treated; however, incompatible species would require continued maintenance. Category 6 identifies areas that might require treatment for fuels reduction.

Table 2-6. Proposed Action in Ashley National Forest by Transmission Line, Vegetation Type, and Category (acres)

Transmission Line	Species Type	Category 1	Category 2	Category 3	Category 4	Category 5	Category 6	Total
FLAMING GORGE-VERNAL #1								
FGE-VNL 1 / 138kV	Grass	0.7	0.0	0.0	0.0	0.0	0.0	0.7
Maps ANF-7 – ANF-10	Douglas fir	0.0	0.0	0.0	1.4	1.2	0.0	2.6
	Mixed coniferous forest	0.2	0.0	0.0	1.3	0.0	0.0	1.5
	Mountain big sagebrush	0.0	0.0	0.0	0.0	0.0	10.7	10.7
	Ponderosa pine	0.0	0.0	0.0	15.8	19.3	0.0	35.1
	Seral aspen/mixed conifer	0.2	0.0	0.0	1.9	9.8	0.0	12.0
	Seral aspen/ponderosa pine	0.0	0.0	0.0	0.4	0.0	0.0	0.4
	Subtotal	**1.1**	**0.0**	**0.0**	**20.8**	**30.4**	**10.7**	**62.9**
FLAMING GORGE-VERNAL #3								
FGE-VNL 3 / 138kV	Alder-leaf mountain mahogany	0.0	0.0	0.0	0.0	0.0	1.6	1.6
Maps ANF-1 – ANF-7	Bare	0.9	0.0	0.0	0.0	0.0	0.0	0.9
	Black sagebrush	3.4	0.0	0.0	0.0	0.0	0.0	3.4
	Grass	12.0	0.0	0.0	0.0	0.0	0.0	12.0
	Shrub	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Water	0.7	0.0	0.0	0.0	0.0	0.0	0.7
	Aspen	0.0	1.4	20.2	0.0	0.0	0.0	21.7
	Douglas fir	0.7	0.0	0.0	0.3	2.9	0.0	4.0
	Lodgepole pine	0.0	1.4	10.9	0.0	0.0	0.0	12.3
	Mixed coniferous forest	0.0	0.0	0.0	0.5	12.3	0.0	12.8
	Mountain big sagebrush	0.0	0.0	0.0	0.0	0.0	71.6	71.6
	Pinyon/juniper	0.0	0.0	0.0	0.0	0.0	6.1	6.1
	Ponderosa Pine	0.8	0.0	0.0	3.6	12.0	0.0	16.4
	Seral aspen/lodgepole pine	0.0	0.0	0.0	0.1	1.7	0.0	1.8
	Subtotal	**18.5**	**2.8**	**31.1**	**4.5**	**29.0**	**79.3**	**165.2**

Table 2-6. Proposed Action in Ashley National Forest by Transmission Line, Vegetation Type, and Category (acres)

Transmission Line	Species Type	Category 1	Category 2	Category 3	Category 4	Category 5	Category 6	Total
ALL LINES								
	Alder-leaf mountain mahogany	0.0	0.0	0.0	0.0	0.0	1.6	1.6
	Bare	0.9	0.0	0.0	0.0	0.0	0.0	0.9
	Black sagebrush	3.4	0.0	0.0	0.0	0.0	0.0	3.4
	Grass	12.7	0.0	0.0	0.0	0.0	0.0	12.7
	Shrub	0.0	0.0	0.0	0.0	0.0	24.5	24.5
	Water	0.7	0.0	0.0	0.0	0.0	0.0	0.7
	Aspen	0.0	1.4	20.2	0.0	0.0	0.0	21.7
	Douglas fir	0.7	0.0	0.0	1.7	4.1	0.0	6.6
	Lodgepole pine	0.0	1.4	10.9	0.0	0.0	0.0	12.3
	Mixed coniferous forest	0.2	0.0	0.0	1.8	12.3	0.0	14.3
	Mountain big sagebrush	0.0	0.0	0.0	0.0	0.0	82.3	82.3
	Pinyon/juniper	0.0	0.0	0.0	0.0	0.0	6.1	6.1
	Ponderosa pine	0.8	0.0	0.0	19.3	31.4	0.0	51.5
	Seral aspen/mixed conifer	0.2	0.0	0.0	1.9	9.8	0.0	12.0
	Seral aspen/lodgepole pine	0.0	0.0	0.0	0.1	1.7	0.0	1.8
	Seral aspen/ponderosa pine	0.0	0.0	0.0	0.4	0.0	0.0	0.4
	TOTAL	**19.6**	**2.8**	**31.1**	**25.3**	**59.3**	**114.5**	**252.6**
Summary (percent)		**8**	**1**	**12**	**10**	**24**	**45**	**100**

NOTE: Due to rounding and other GIS-related issues, some numbers may not sum correctly.

Proposed Action in Ashley National Forest

This section describes how WAPA would implement the Proposed Action in Ashley National Forest. There are two different transmission lines that cross Ashley National Forest-managed NFS lands, crossing 26.1 miles. The ROWs have variable widths and cover approximately 252.6 acres.

The 19.6 acres (8 percent) in Category 1 include a variety of vegetation types (primarily grasses and sagebrush) that would require no treatment because the vegetation is compatible, and it is expected to remain so through the duration of the authorization. This total includes approximately 1.9 acres of various conifers not identified for treatment due to adequate conductor-to-canopy clearance. WAPA would monitor the ROWs and document conditions.

WAPA would treat approximately 2.8 acres (1 percent) of lodgepole pine and aspen in Ashley National Forest within the first year of authorization because they are in an unacceptable condition and are fast-growing species (Category 2). WAPA would treat approximately 31.1 acres (12 percent) of immature lodgepole pine and aspen within 2 to 6 years; these trees are in an acceptable condition due to previous vegetation management activities (Category 3). They would require treatment over the short term (within 2 to 6 years). Both of these categories are on the Flaming Gorge – Vernal #3 line and are associated with relatively frequent maintenance treatments, with a return interval of 2 to 6 years.

There are approximately 25.3 acres (10 percent) comprised primarily of ponderosa pine not currently in an acceptable condition (Category 4). A majority of Category 1 exists on the Flaming Gorge – Vernal #1 line. The initial treatment is anticipated within 2 to 5 years of the authorization. Because Category 4 includes slow-growing, mature vegetation, maintenance treatments are expected to be relatively infrequent, with a return interval of 5 or more years.

There are approximately 59.3 acres (24 percent) of immature mixed coniferous forest and ponderosa pine in Ashley National Forest that would require treatment within 5 or more years after authorization. These are slow-growing species that are acceptable, but they will eventually require treatment to maintain the desired condition (Category 5). Category 5 maintenance treatments are expected to be relatively infrequent, with a return interval of 5 or more years.

Category 6 identifies areas that could require vegetation management for fuels reduction. WAPA might treat approximately 114.5 acres (45 percent) of shrubs and mountain big sagebrush as funding becomes available.

Grand Mesa, Uncompahgre, and Gunnison National Forests

Methods for Determining Existing Vegetation Conditions

WAPA identified 16 vegetation types in Grand Mesa, Uncompahgre, and Gunnison National Forests. Table 3-27 lists baseline vegetation conditions in Grand Mesa, Uncompahgre, and Gunnison National Forests.

WAPA used the information in Table 3-27 and the GIS dataset to identify ROW conditions in each of the six treatment categories (see Section 2.2.2.5). Table 2-7 lists the acres of vegetation the Proposed Action would affect by type and category. Maps GMUG-1 through GMUG-34 show the detail associated with each transmission line by project area. Category 1 should require no vegetation treatment, but WAPA would monitor this category. Categories 2 and 4 would require initial vegetation treatment over the short term. Categories 3 and 5 are areas WAPA has already treated; however, incompatible species would require continued maintenance. Category 6 identifies areas that could require treatment for fuels reduction.

Table 2-7. Proposed Action in Grand Mesa, Uncompahgre, and Gunnison National Forests by Transmission Line, Vegetation Type, and Category (acres)

Transmission Line	Species Type	Category 1	Category 2	Category 3	Category 4	Category 5	Category 6	Total
CURECANTI-LOST CANYON								
CCI-LCN / 230kV	Aspen	0.0	1.3	2.2	0.0	0.0	0.0	3.5
Maps GMUG-1 – GMUG-3	Big sagebrush	0.0	0.0	0.0	0.0	0.0	17.5	17.5
	Gambel oak	0.0	0.0	0.0	0.0	0.0	53.4	53.4
	Pinyon juniper	0.0	0.0	0.0	0.0	0.0	0.1	0.1
	Ponderosa pine	0.0	0.0	0.0	1.1	14.5	0.0	15.6
	Subtotal	**0.0**	**1.3**	**2.2**	**1.1**	**14.5**	**71.0**	**90.2**
CURECANTI-NORTH FORK								
CCI-NFK / 230kV	Grass	10.2	0.0	0.0	0.0	0.0	0.0	10.2
Maps GMUG-9 – GMUG-10	Aspen	1.0	8.0	18.3	0.0	0.0	0.0	27.3
	Gambel oak	0.8	0.0	0.0	0.0	0.0	20.6	21.4
	Spruce/fir	0.0	0.0	0.0	1.7	3.9	0.0	5.6
	Subtotal	**11.9**	**8.0**	**18.3**	**1.7**	**3.9**	**20.6**	**64.5**
CURECANTI-PONCHA								
CCI-PON / 230kV	Forb	4.7	0.0	0.0	0.0	0.0	0.0	4.7
Maps GMUG-26 – GMUG-34	Grass	22.0	0.0	0.0	0.0	0.0	0.0	22.0
	Other sagebrush	0.0	0.0	0.0	0.0	0.0	53.5	53.5
	Willow	0.7	0.0	0.0	0.0	0.0	0.0	0.7
	Aspen	0.0	1.6	8.5	0.0	0.0	0.0	10.1
	Douglas fir	0.0	0.0	0.0	0.0	1.2	0.0	1.2
	Lodgepole pine	4.1	18.4	40.3	0.0	0.0	0.0	62.7
	Subtotal	**31.5**	**20.0**	**48.8**	**0.0**	**1.2**	**53.5**	**155.1**

Table 2-7. Proposed Action in Grand Mesa, Uncompahgre, and Gunnison National Forests by Transmission Line, Vegetation Type, and Category (acres)

Transmission Line	Species Type	Category 1	Category 2	Category 3	Category 4	Category 5	Category 6	Total
HESPERUS-MONTROSE								
HS-MTR / 345kV	Forb	2.4	0.0	0.0	0.0	0.0	0.0	2.4
Maps GMUG-1 – GMUG-2	Grass	15.0	0.0	0.0	0.0	0.0	0.0	15.0
Maps GMUG-4 – GMUG-8	Shrub	0.0	0.0	0.0	0.0	0.0	1.8	1.8
	Aspen	0.0	29.5	52.4	0.0	0.0	0.0	81.9
	Big sagebrush	0.0	0.0	0.0	0.0	0.0	53.4	53.4
	Cottonwood	1.1	0.0	0.0	0.0	0.0	0.0	1.1
	Gambel oak	0.9	0.0	0.0	0.0	0.0	117.6	118.5
	Ponderosa pine	3.5	0.0	0.0	25.0	70.7	0.0	99.2
	Spruce/fir	2.2	0.0	0.0	4.3	20.5	0.0	27.0
	Subtotal	**25.0**	**29.5**	**52.4**	**29.2**	**91.3**	**172.8**	**400.2**
NORTH FORK-RIFLE								
NFK-RFL / 230kV	Bare	0.1	0.0	0.0	0.0	0.0	0.0	0.1
Maps GMUG-11 – GMUG-19	Forb	13.8	0.0	0.0	0.0	0.0	0.0	13.8
	Grass	8.6	0.0	0.0	0.0	0.0	0.0	8.6
	Shrub	0.0	0.0	0.0	0.0	0.0	6.6	6.6
	Snowberry	0.0	0.0	0.0	0.0	0.0	21.6	21.6
	Willow	3.5	0.0	0.0	0.0	0.0	0.0	3.5
	Aspen	1.8	47.9	186.0	0.0	0.0	0.0	235.7
	Big sagebrush	0.0	0.0	0.0	0.0	0.0	39.5	39.5
	Gambel oak	1.1	0.0	0.0	0.0	0.0	43.4	44.4
	Spruce/fir	0.0	0.0	0.0	0.8	12.0	0.0	12.8
	Subtotal	**28.9**	**47.9**	**186.0**	**0.8**	**12.0**	**111.1**	**386.6**

Table 2-7. Proposed Action in Grand Mesa, Uncompahgre, and Gunnison National Forests by Transmission Line, Vegetation Type, and Category (acres)

Transmission Line	Species Type	Category 1	Category 2	Category 3	Category 4	Category 5	Category 6	Total
NORTH GUNNISON-SALIDA								
NGU-SLA / 115kV	Grass	0.8	0.0	0.0	0.0	0.0	0.0	0.8
Maps GMUG-20 – GMUG-27	Other sagebrush	1.5	0.0	0.0	0.0	0.0	36.5	38.0
	Willow	1.6	0.0	0.0	0.0	0.0	0.0	1.6
	Aspen	0.0	0.5	7.0	0.0	0.0	0.0	7.4
	Big sagebrush	0.4	0.0	0.0	0.0	0.0	7.8	8.1
	Douglas fir	0.4	0.0	0.0	0.0	0.9	0.0	1.3
	Lodgepole pine	0.0	4.7	43.2	0.0	0.0	0.0	47.8
	Subtotal	**4.7**	**5.1**	**50.1**	**0.0**	**0.9**	**44.3**	**105.1**
ALL LINES								
	Bare	0.1	0.0	0.0	0.0	0.0	0.0	0.1
	Forb	20.9	0.0	0.0	0.0	0.0	0.0	20.9
	Grass	56.5	0.0	0.0	0.0	0.0	0.0	56.5
	Other sagebrush	1.5	0.0	0.0	0.0	0.0	90.1	91.6
	Shrub	0.0	0.0	0.0	0.0	0.0	8.4	8.4
	Snowberry	0.0	0.0	0.0	0.0	0.0	21.6	21.6
	Willow	5.9	0.0	0.0	0.0	0.0	0.0	5.9
	Aspen	2.8	88.8	274.3	0.0	0.0	0.0	365.9
	Big sagebrush	0.4	0.0	0.0	0.0	0.0	118.2	118.6
	Cottonwood	1.1	0.0	0.0	0.0	0.0	0.0	1.1
	Douglas fir	0.4	0.0	0.0	0.1	2.1	0.0	2.6
	Gambel oak	2.7	0.0	0.0	0.0	0.0	235.0	237.7
	Lodgepole pine	4.1	23.1	83.4	0.0	0.0	0.0	110.6
	Pinyon/juniper	0.0	0.0	0.0	0.0	0.0	0.1	0.1
	Ponderosa pine	3.5	0.0	0.0	26.1	85.2	0.0	114.8
	Spruce/fir	2.2	0.0	0.0	6.8	36.4	0.0	45.4
	TOTAL	**102.1**	**111.9**	**357.7**	**33.0**	**123.7**	**473.3**	**1,201.7**
Summary (percent)		**9**	**9**	**30**	**3**	**10**	**39**	**100**

NOTE: Due to rounding and other GIS-related issues, some numbers may not sum correctly.

<u>*Proposed Action in Grand Mesa, Uncompahgre, and Gunnison National Forests*</u>

This section describes how WAPA would implement the Proposed Action in Grand Mesa, Uncompahgre, and Gunnison National Forests. There are six different transmission lines that cross Grand Mesa, Uncompahgre, and Gunnison National Forests-managed NFS lands, crossing 76.4 miles. The ROWs have variable widths and cover approximately 1,201.7 acres.

The 102.1 acres (9 percent) in Category 1 include a variety of vegetation types (primarily grasses and forbs) that would require no treatment because the vegetation is compatible, and WAPA expects it to remain so through the duration of the authorization. This total includes approximately 10.2 acres of lodgepole pine and mixed conifer not identified for treatment due to adequate conductor-to-canopy clearance. WAPA would monitor the ROWs and document conditions.

WAPA would treat approximately 111.9 acres (9 percent) of lodgepole pine and aspen in Grand Mesa, Uncompahgre, and Gunnison National Forests within the first year of authorization because they are in an unacceptable condition and are fast-growing species (Category 2). WAPA would treat approximately 357.7 acres (30 percent) of immature lodgepole pine and aspen, more than half of which is on the North Fork-Rifle line, within 2 to 6 years; these trees are in an acceptable condition due to previous vegetation management activities (Category 3). They would require treatment over the short term (within 2 to 6 years). Both of these categories are associated with relatively frequent maintenance treatments, with a return interval of 2 to 6 years.

There are approximately 33 acres (3 percent) of ponderosa pine and spruce/fir not in an acceptable condition; most of this vegetation type is on the Hesperus-Montrose line (Category 4). WAPA anticipates initial treatment within 2 to 5 years of the authorization. Because Category 4 includes slow-growing, mature vegetation, WAPA expects maintenance treatments would be relatively infrequent, with a return interval of 5 or more years.

There are approximately 123.7 acres (10 percent) of immature ponderosa pine, spruce, and fir in Grand Mesa, Uncompahgre, and Gunnison National Forests that would require treatment within 5 or more years after authorization. These are slow-growing species that acceptable, but they will eventually require treatment to maintain the desired condition (Category 5). Most of this vegetation is on the Hesperus-Montrose line. WAPA expects Category 5 maintenance treatments to be relatively infrequent, with a return interval of 5 or more years.

Category 6 identifies areas that could require vegetation management for fuels reduction. WAPA might treat approximately 473.4 acres (39 percent) of miscellaneous shrub and Gambel oak vegetation communities along the Hesperus-Montrose, North Fork-Rifle, and Curecanti lines as funding becomes available.

Medicine Bow-Routt National Forests

Methods for Determining Existing Vegetation Conditions

WAPA identified 10 vegetation types in Medicine Bow-Routt National Forests. Table 3-28 lists baseline vegetation conditions in Medicine Bow-Routt National Forests.

WAPA used the information in Table 3-28 and the GIS dataset to identify ROW conditions in each of the six treatment categories (see Section 2.2.2.5). Table 2-8 lists the acres of vegetation the Proposed Action would affect by type and category. Maps MBRNF-1 through MBRNF-22 show the detail associated with each transmission line by project area. Category 1 should require no vegetation treatment, but WAPA would monitor this category. Categories 2 and 4 would require initial vegetation treatment over the short term. Categories 3 and 5 are areas WAPA has already treated; however, incompatible species would require continued maintenance. Category 6 identifies areas that could require treatment for fuels reduction.

Table 2-8. Proposed Action in Medicine Bow-Routt National Forests by Transmission Line, Vegetation Type, and Category (acres)

Transmission Line	Species Type	Category 1	Category 2	Category 3	Category 4	Category 5	Category 6	Total
ARCHER-NORTH PARK								
ARH-NOP / 230kV	Forb	0.8	0.0	0.0	0.0	0.0	0.0	0.8
Maps MBRNF-21 – MBRNF-22	Aspen	0.0	0.1	5.2	0.0	0.0	0.0	5.4
	Douglas fir	0.0	0.0	0.0	0.0	0.7	0.0	0.7
	Lodgepole pine	0.0	3.6	19.0	0.0	0.0	0.0	22.6
	Spruce/fir	1.5	0.0	0.0	6.8	1.8	0.0	10.1
	Subtotal	**2.3**	**3.7**	**24.2**	**6.8**	**2.5**	**0.0**	**39.5**
AULT-CRAIG								
AU-CRG / 345kV	Forb	43.2	0.0	0.0	0.0	0.0	0.0	43.2
Maps MBRNF-14 – MBRNF-20	Grass	22.4	0.0	0.0	0.0	0.0	0.0	22.4
Maps MBRNF-21 – MBRNF-22	Rock soil	0.2	0.0	0.0	0.0	0.0	0.0	0.2
	Shrub	0.0	0.0	0.0	0.0	0.0	4.0	4.0
	Tufted hairgrass - sedge	3.0	0.0	0.0	0.0	0.0	0.0	3.0
	Willow	5.2	0.0	0.0	0.0	0.0	0.0	5.2
	Aspen	0.0	3.8	42.4	0.0	0.0	0.0	46.2
	Douglas fir	0.0	0.0	0.0	0.0	1.5	0.0	1.5
	Lodgepole pine	0.0	20.3	59.3	0.0	0.0	0.0	79.6
	Spruce/fir	2.0	0.0	0.0	26.0	40.9	0.0	68.9
	Subtotal	**76.0**	**24.1**	**101.7**	**26.0**	**42.4**	**4.0**	**274.3**
GORE PASS-HAYDEN								
GOT-HD / 138kV	Forb	56.1	0.0	0.0	0.0	0.0	0.0	56.1
Maps MBRNF-1 – MBRNF-7	Grass	17.8	0.0	0.0	0.0	0.0	0.0	17.8
	Tufted hairgrass - sedge	5.5	0.0	0.0	0.0	0.0	0.0	5.5
	Willow	2.7	0.0	0.0	0.0	0.0	0.0	2.7
	Aspen	0.0	4.1	0.3	0.0	0.0	0.0	4.3
	Lodgepole pine	0.0	10.6	4.1	0.0	0.0	0.0	14.7
	Spruce/fir	0.0	0.0	0.0	0.8	0.0	0.0	0.8
	Subtotal	**82.2**	**14.6**	**4.4**	**0.8**	**0.0**	**0.0**	**102.0**

Table 2-8. Proposed Action in Medicine Bow-Routt National Forests by Transmission Line, Vegetation Type, and Category (acres)

Transmission Line	Species Type	Category 1	Category 2	Category 3	Category 4	Category 5	Category 6	Total
GORE PASS-MUDDY PASS								
GOT-MPS / 69kV	Grass	19.2	0.0	0.0	0.0	0.0	0.0	19.2
Map MBRNF-13	Aspen	0.0	0.5	0.0	0.0	0.0	0.0	0.5
	Subtotal	**19.2**	**0.5**	**0.0**	**0.0**	**0.0**	**0.0**	**19.7**
HAYDEN-GORE PASS								
HDN-GOT / 230kV	Forb	32.7	0.0	0.0	0.0	0.0	0.0	32.7
Maps MBRNF-1 – MBRNF-12	Grass	5.7	0.0	0.0	0.0	0.0	0.0	5.7
	Tufted hairgrass - sedge	10.1	0.0	0.0	0.0	0.0	0.0	10.1
	Willow	9.2	0.0	0.0	0.0	0.0	0.0	9.2
	Aspen	0.0	6.2	16.8	0.0	0.0	0.0	23.1
	Lodgepole pine	11.5	46.8	172.1	0.0	0.0	0.0	230.4
	Spruce/fir	0.0	0.0	0.0	10.6	10.8	0.0	21.4
	Subtotal	**69.2**	**53.0**	**188.9**	**10.6**	**10.8**	**0.0**	**332.5**
HAYDEN-NORTH PARK								
HDN-NOP / 230kV	Forb	42.5	0.0	0.0	0.0	0.0	0.0	42.5
Maps MBRNF-14 – MBRNF-20	Grass	16.4	0.0	0.0	0.0	0.0	0.0	16.4
	Shrub	0.0	0.0	0.0	0.0	0.0	17.4	17.4
	Willow	3.7	0.0	0.0	0.0	0.0	0.0	3.7
	Aspen	0.0	7.9	27.7	0.0	0.0	0.0	35.6
	Lodgepole pine	0.0	9.4	19.9	0.0	0.0	0.0	29.3
	Spruce/fir	0.0	0.0	0.0	8.9	13.7	0.0	22.6
	Subtotal	**62.6**	**17.3**	**47.6**	**8.9**	**13.7**	**17.4**	**167.5**

Table 2-8. Proposed Action in Medicine Bow-Routt National Forests by Transmission Line, Vegetation Type, and Category (acres)

Transmission Line	Species Type	Category 1	Category 2	Category 3	Category 4	Category 5	Category 6	Total
ALL LINES								
	Forb	175.4	0.0	0.0	0.0	0.0	0.0	175.4
	Grass	81.4	0.0	0.0	0.0	0.0	0.0	81.4
	Rock Soil	0.2	0.0	0.0	0.0	0.0	0.0	0.2
	Shrub	0.0	0.0	0.0	0.0	0.0	21.4	21.4
	Tufted hairgrass - sedge	18.6	0.0	0.0	0.0	0.0	0.0	18.6
	Willow	20.8	0.0	0.0	0.0	0.0	0.0	20.8
	Aspen	0.0	22.6	92.4	0.0	0.0	0.0	115.1
	Douglas fir	0.0	0.0	0.0	0.0	2.2	0.0	2.2
	Lodgepole pine	11.5	90.6	274.4	0.0	0.0	0.0	376.6
	Spruce/fir	3.5	0.0	0.0	53.1	67.2	0.0	123.8
	TOTAL	**311.4**	**113.2**	**366.9**	**53.1**	**69.4**	**21.4**	**935.5**
Summary (percent)		**33**	**12**	**39**	**6**	**7**	**2**	**100**

NOTE: Due to rounding and other GIS-related issues, some numbers may not sum correctly.

Proposed Action in Medicine Bow-Routt National Forests

This section describes how WAPA would implement the Proposed Action in Medicine Bow-Routt National Forests. There are six different transmission lines that cross Medicine Bow-Routt National Forests-managed NFS lands, crossing 59 miles. The ROWs have variable widths and cover approximately 935.5 acres.

The 311.4 acres (33 percent) in Category 1 include a variety of vegetation types (primarily grasses and forbs) that would require no treatment because the vegetation is compatible, and WAPA expects it to remain so through the duration of the authorization. This total includes approximately 15 acres of lodgepole pine and mixed conifer not identified for treatment due to adequate conductor-to-canopy clearance. WAPA would monitor the ROWs and document conditions.

WAPA would treat approximately 113.2 acres (12 percent) of lodgepole pine and aspen in Medicine Bow-Routt National Forests within the first year of authorization because they are currently in an unacceptable condition and are fast-growing species (Category 2). WAPA would treat approximately 366.9 acres (39 percent) of immature lodgepole pine and aspen, almost half of which is on the Hayden-Gore Pass line, within 2 to 6 years; these trees are in an acceptable condition due to previous vegetation management activities (Category 3). They would require treatment over the short term (within 2 to 6 years). Both of these categories are associated with relatively frequent maintenance treatments, with a return interval of 2 to 6 years.

There are approximately 53.1 acres (6 percent) of spruce/fir not in an acceptable condition; about half of this vegetation type is on the Ault-Craig line (Category 4). WAPA anticipates initial treatment within 2 to 5 years of the authorization. Because Category 4 includes slow-growing, mature vegetation, WAPA expects maintenance treatments to be relatively infrequent, with a return interval of 5 or more years.

There are approximately 69.4 acres (7 percent) of immature spruce and fir in Medicine Bow-Routt National Forests that would require treatment within 5 or more years after authorization. These are slow-growing species that are acceptable, but they will eventually require treatment to maintain the desired condition (Category 5). Most of this vegetation is on the Ault-Craig line. WAPA expects Category 5 maintenance treatments to be relatively infrequent, with a return interval of 5 or more years.

Category 6 identifies areas that could require vegetation management for fuels reduction. WAPA might treat approximately 21.4 acres (2 percent) of shrubs along the Hayden-North Park and Ault-Craig lines as funding becomes available.

Nebraska National Forest

Methods for Determining Existing Vegetation Conditions

WAPA identified two vegetation types in Nebraska National Forest. Table 3-29 of this EIS lists baseline vegetation conditions in Nebraska National Forest.

WAPA used the information in Table 3-29 and the GIS dataset to identify ROW conditions in each of the six treatment categories (see Section 2.2.2.5). Table 2-9 lists the acres of vegetation the Proposed Action would affect by type and category. Maps NNF-1 through NNF-3 show the detail associated with each transmission line by project area. Category 1 should require no vegetation treatment, but WAPA would monitor this category. Categories 2 and 4 would require initial vegetation treatment over the short term. Categories 3 and 5 are areas WAPA has already treated; however, incompatible species would require continued maintenance. Category 6 identifies areas that could require treatment for fuels reduction.

Table 2-9. Proposed Action in Nebraska National Forest by Transmission Line, Vegetation Type, and Category (acres)

Transmission Line	Species Type	Category 1	Category 2	Category 3	Category 4	Category 5	Category 6	Total
BOX BUTTE-CHADRON								
BBR-CHD / 115kV	Grass	79.6	0.0	0.0	0.0	0.0	0.0	79.6
Maps NNF-1 – NNF-3	Ponderosa pine	0.0	0.0	0.0	3.8	0.0	0.0	3.8
	Subtotal	**79.6**	**0.0**	**0.0**	**3.8**	**0.0**	**0.0**	**83.4**
Summary (percent)		**95**	**0**	**0**	**5**	**0**	**0**	**100**

NOTE: Due to rounding and other GIS-related issues, some numbers may not sum correctly.

Proposed Action in Nebraska National Forest

This section describes how WAPA would implement the Proposed Action in Nebraska National Forest. There is one transmission line that crosses Nebraska National Forest-management NFS lands, crossing 9.2 miles. The ROWs have variable widths and cover approximately 83.5 acres.

The 79.6 acres (95 percent) in Category 1 are comprised of grasses that would require no treatment because the vegetation is compatible, and WAPA expects it to remain so through the duration of the authorization. WAPA would monitor the ROW and document conditions.

There are approximately 3.8 acres (5 percent) of immature ponderosa pine not in an acceptable condition (Category 4). WAPA anticipates initial treatment within 2 to 5 years of the authorization. Because Category 4 includes slow-growing, mature vegetation, WAPA expects maintenance treatments to be relatively infrequent, with a return interval of 5 or more years.

Pike and San Isabel National Forests

Methods for Determining Existing Vegetation Conditions

WAPA identified 12 vegetation types in Pike and San Isabel National Forests. Table 3-30 lists baseline vegetation conditions in Pike and San Isabel National Forests.

WAPA used the information in Table 3-30 and the GIS dataset to identify ROW conditions in each of the six treatment categories (see Section 2.2.2.5). Table 2-10 lists the acres of vegetation the Proposed Action would affect by type and category. Maps PSINF-1 through PSINF-7 show the detail associated with each transmission line by project area. Category 1 should require no vegetation treatment, but WAPA would monitor this category. Categories 2 and 4 would require initial vegetation treatment over the short term. Categories 3 and 5 are areas WAPA has already treated; however, incompatible species would require continued maintenance. Category 6 identifies areas that could require treatment for fuels reduction.

Table 2-10. Proposed Action in Pike and San Isabel National Forests by Transmission Line, Vegetation Type, and Category (acres)

Transmission Line	Species Type	Category 1	Category 2	Category 3	Category 4	Category 5	Category 6	Total
CURECANTI-PONCHA								
CCI-PON / 230kV	Forb	2.6	0.0	0.0	0.0	0.0	0.0	2.6
Maps PSINF-2 – PSINF-7	Grass	15.1		0.0	0.0	0.0	0.0	15.1
	True mountain mahogany	0.0	0.0	0.0	0.0	0.0	21.7	21.7
	Aspen	2.2	1.5	2.1	0.0	0.0	0.0	5.8
	Bristlecone pine	0.0	0.0	0.0	1.4	2.1	0.0	3.5
	Douglas fir	0.0	0.0	0.0	5.7	4.2	0.0	9.9
	Limber pine	0.0	0.0	0.0	0.0	10.5	0.0	10.5
	Lodgepole pine	1.2	5.4	19.9	0.0	0.0	0.0	26.4
	Pinyon/juniper	0.0	0.0	0.0	0.0	0.0	7.6	7.6
	Ponderosa pine	0.4	0.0	0.0	1.9	2.8	0.0	5.0
	Spruce/fir	3.4	0.0	0.0	8.0	7.1	0.0	18.5
	Subtotal	**24.9**	**6.9**	**22**	**16.9**	**26.7**	**29.3**	**126.8**
MALTA-MOUNT ELBERT								
MAL-MTE / 230kV	Bare	0.3	0.0	0.0	0.0	0.0	0.0	0.3
Map PSINF-1	Lodgepole pine	0.0	1.1	11.1	0.0	0.0	0.0	12.2
	Subtotal	**0.3**	**1.1**	**11.1**	**0.0**	**0.0**	**0.0**	**12.5**
NORTH GUNNISON-SALIDA								
NGU-SL / 115kV	Grass	5.7	0.0	0.0	0.0	0.0	0.0	5.7
Maps PSINF-3 – PSINF-7	True mountain mahogany	0.0	0.0	0.0	0.0	0.0	19.0	19.0
	Aspen	0.4	0.4	6.4	0.0	0.0	0.0	7.3
	Douglas fir	0.0	0.0	0.0	0.3	4.4	0.0	4.7
	Lodgepole pine	0.0	2.0	16.5	0.0	0.0	0.0	18.5
	Pinyon/juniper	0.0	0.0	0.0	0.0	0.0	0.3	0.3
	Ponderosa pine	0.0	0.0	0.0	0.4	1.6	0.0	2.0
	Spruce/fir	0.0	0.0	0.0	0.7	14.3	0.0	15.0
	Subtotal	**6.1**	**2.4**	**22.9**	**1.4**	**20.3**	**19.3**	**72.4**

Table 2-10. Proposed Action in Pike and San Isabel National Forests by Transmission Line, Vegetation Type, and Category (acres)

Transmission Line	Species Type	Category 1	Category 2	Category 3	Category 4	Category 5	Category 6	Total
ALL LINES								
	Bare	0.3	0.0	0.0	0.0	0.0	0.0	0.3
	Forb	2.6	0.0	0.0	0.0	0.0	0.0	2.6
	Grass	20.8	0.0	0.0	0.0	0.0	0.0	20.8
	True mountain mahogany	0.0	0.0	0.0	0.0	0.0	40.7	40.7
	Aspen	2.6	2.0	8.5	0.0	0.0	0.0	13.0
	Bristlecone pine	0.0	0.0	0.0	1.4	2.1	0.0	3.5
	Douglas fir	0.0	0.0	0.0	6.0	8.6	0.0	14.6
	Limber pine	0.0	0.0	0.0	0.0	10.5	0.0	10.5
	Lodgepole pine	1.2	8.5	47.5	0.0	0.0	0.0	57.2
	Pinyon/juniper	0.0	0.0	0.0	0.0	0.0	7.9	7.9
	Ponderosa pine	0.4	0.0	0.0	2.3	4.4	0.0	7.1
	Spruce/fir	3.4	0.0	0.0	8.7	21.4	0.0	33.5
	TOTAL	**31.4**	**10.5**	**56**	**18.3**	**47.0**	**48.6**	**211.7**
Summary (percent)		**15**	**5**	**26**	**9**	**22**	**23**	**100**

NOTE: Due to rounding and other GIS-related issues, some numbers may not sum correctly.

Proposed Action in Pike and San Isabel National Forests

This section describes how WAPA would implement the Proposed Action in Pike and San Isabel National Forests. There are three different transmission lines that cross Pike and San Isabel National Forests-managed NFS lands, crossing 17.2 miles. The ROWs have variable widths and cover approximately 211.7 acres.

The 31.4 acres (15 percent) in Category 1 include a variety of vegetation types (primarily grasses and forbs) that would require no treatment because the vegetation is compatible, and WAPA expects it to remain so through the duration of the authorization. This total includes approximately 6 acres of aspen and spruce fir not identified for treatment due to adequate conductor-to-canopy clearance. WAPA would monitor the ROWs and document conditions.

WAPA would treat approximately 10.5 acres (5 percent) of lodgepole pine and aspen in Pike and San Isabel National Forests within the first year of authorization because they are currently in an unacceptable condition and are fast-growing species (Category 2). WAPA would treat approximately 56 acres (26 percent) of immature lodgepole pine and aspen within 2 to 6 years; these trees are in an acceptable condition due to previous vegetation management activities (Category 3). They would require treatment over the short term (within 2 to 6 years). Both of these categories are associated with relatively frequent maintenance treatments, with a return interval of 2 to 6 years.

There are approximately 18.3 acres (9 percent) of immature spruce/fir, Douglas fir, ponderosa pine, and bristlecone pine not currently in an acceptable condition (Category 4). WAPA anticipates initial treatment within 2 to 5 years of the authorization. Because Category 4 includes slow-growing, mature vegetation, WAPA expects maintenance treatments to be relatively infrequent, with a return interval of 5 or more years.

There are approximately 47 acres (22 percent) of immature conifers in Pike and San Isabel National Forests that would require treatment within 5 or more years after authorization. These are slow-growing species that are acceptable, but they will eventually require treatment to maintain the desired condition (Category 5). WAPA expects Category 5 maintenance treatments to be relatively infrequent, with a return interval of 5 or more five years.

Category 6 identifies areas that could require vegetation management for fuels reduction. WAPA might treat approximately 48.6 acres (23 percent) of true mountain mahogany and pinyon/juniper as funding becomes available.

San Juan National Forest

Methods for Determining Existing Vegetation Conditions

WAPA identified 16 vegetation types in San Juan National Forest. Table 3-31 lists baseline vegetation conditions in the San Juan National Forest.

WAPA used the information in Table 3-31 and the GIS dataset to identify ROW conditions in each of the six treatment categories (see Section 2.2.2.5). Table 2-11 lists the acres of vegetation the Proposed Action would affect by type and category. Maps SJNF-1 through SJNF-18 show the detail associated with each transmission line by project area. Category 1 should require no vegetation treatment, but WAPA would monitor this category. Categories 2 and 4 would require initial vegetation treatment over the short term. Categories 3 and 5 are areas WAPA has already been treated; however, incompatible species would require continued maintenance. Category 6 identifies areas that could require treatment for fuels reduction.

Table 2-11. Proposed Action in San Juan National Forest by Transmission Line, Vegetation Type, and Category (acres)

Transmission Line	Species Type	Category 1	Category 2	Category 3	Category 4	Category 5	Category 6	Total
CURECANTI-LOST CANYON								
CCI-LCN / 230kV	Big sagebrush	0.0	0.0	0.0	0.0	0.0	23.5	23.5
Maps SJNF-3 – SJNF-7	Grass	20.9	0.0	0.0	0.0	0.0	0.0	20.9
	Rushes	0.1	0.0	0.0	0.0	0.0	0.0	0.1
	Tufted hairgrass - sedge	1.1	0.0	0.0	0.0	0.0	0.0	1.1
	Aspen	0.0	1.1	0.0	0.0	0.0	0.0	1.1
	Gambel oak	0.0	0.0	0.0	0.0	0.0	19.4	19.4
	Ponderosa pine	3.6	0.0	0.0	10.2	137.9	0.0	151.7
	Subtotal	**25.8**	**1.1**	**0.0**	**10.2**	**137.9**	**42.9**	**217.9**
GREAT CUT-McPHEE								
GCT-MPE / 12.47kV	Bare	0.6	0.0	0.0	0.0	0.0	0.0	0.6
Maps SJNF-1 – SJNF-2	Big sagebrush	0.0	0.0	0.0	0.0	0.0	1.6	1.6
	Grass	4.6	0.0	0.0	0.0	0.0	0.0	4.6
	Rock	0.2	0.0	0.0	0.0	0.0	0.0	0.2
	Shrub	0.0	0.0	0.0	0.0	0.0	0.2	0.2
	True mountain mahogany	0.0	0.0	0.0	0.0	0.0	0.9	0.9
	Water	0.2	0.0	0.0	0.0	0.0	0.0	0.2
	Douglas fir	0.0	0.0	0.0	0.1	0.0	0.0	0.1
	Gambel oak	0.0	0.0	0.0	0.0	0.0	7.0	7.0
	Pinyon/juniper	0.0	0.0	0.0	0.0	0.0	2.6	2.6
	Subtotal	**5.6**	**0.0**	**0.0**	**0.1**	**0.0**	**12.2**	**17.9**

Table 2-11. Proposed Action in San Juan National Forest by Transmission Line, Vegetation Type, and Category (acres)

Transmission Line	Species Type	Category 1	Category 2	Category 3	Category 4	Category 5	Category 6	Total
GREAT CUT SWYD-GREAT CUT TAP								
GCT-TAP / 115kV	Bare	0.3	0.0	0.0	0.0	0.0	0.0	0.3
Map SJNF-1	Gambel oak	0.0	0.0	0.0	0.0	0.0	0.1	0.1
	Pinyon/juniper	0.0	0.0	0.0	0.0	0.0	0.4	0.4
	Subtotal	**0.3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.5**	**0.9**
HESPERUS-MONTROSE								
HS-MTR / 345kV	Bare	6.6	0.0	0.0	0.0	0.0	0.0	6.6
Maps SJNF-6 – SJNF-18	Big sagebrush	0.0	0.0	0.0	0.0	0.0	32.4	32.4
	Forb	2.4	0.0	0.0	0.0	0.0	0.0	2.4
	Grass	35.0	0.0	0.0	0.0	0.0	0.0	35.0
	Tufted hairgrass - sedge	4.2	0.0	0.0	0.0	0.0	0.0	4.2
	Water	0.3	0.0	0.0	0.0	0.0	0.0	0.3
	Aspen	10.6	45.4	68.7	0.0	0.0	0.0	124.7
	Cottonwood	1.3	0.0	0.0	0.6	0.0	0.0	1.9
	Douglas fir	6.6	0.0	0.0	3.2	0.0	0.0	9.7
	Gambel oak	0.0	0.0	0.0	0.0	0.0	192.0	192.0
	Pinyon/juniper	0.0	0.0	0.0	0.0	0.0	2.3	2.3
	Ponderosa pine	4.6	0.0	0.0	26.7	218.7	0.0	250.0
	Subtotal	**71.6**	**45.4**	**68.7**	**30.5**	**218.7**	**226.7**	**661.6**

Table 2-11. Proposed Action in San Juan National Forest by Transmission Line, Vegetation Type, and Category (acres)

Transmission Line	Species Type	Category 1	Category 2	Category 3	Category 4	Category 5	Category 6	Total
ALL LINES								
	Bare	7.5	0.0	0.0	0.0	0.0	0.0	7.5
	Big sagebrush	0.0	0.0	0.0	0.0	0.0	57.5	57.5
	Forb	2.4	0.0	0.0	0.0	0.0	0.0	2.4
	Grass	60.5	0.0	0.0	0.0	0.0	0.0	60.5
	Rock	0.2	0.0	0.0	0.0	0.0	0.0	0.2
	Rushes	0.1	0.0	0.0	0.0	0.0	0.0	0.1
	Shrub	0.0	0.0	0.0	0.0	0.0	0.2	0.2
	True mountain mahogany	0.0	0.0	0.0	0.0	0.0	0.9	0.9
	Tufted hairgrass - sedge	5.3	0.0	0.0	0.0	0.0	0.0	5.3
	Water	0.5	0.0	0.0	0.0	0.0	0.0	0.5
	Aspen	10.6	46.5	68.7	0.0	0.0	0.0	125.8
	Cottonwood	1.3	0.0	0.0	0.6	0.0	0.0	1.9
	Douglas fir	6.6	0.0	0.0	3.3	0.0	0.0	9.8
	Gambel oak	0.0	0.0	0.0	0.0	0.0	218.6	218.6
	Pinyon/juniper	0.0	0.0	0.0	0.0	0.0	5.3	5.3
	Ponderosa pine	8.2	0.0	0.0	36.9	356.6	0.0	401.7
	TOTAL	**103.3**	**46.5**	**68.7**	**40.7**	**356.6**	**282.4**	**898.3**
Summary (percent)		**12**	**5**	**8**	**5**	**40**	**31**	**100**

NOTE: Due to rounding and other GIS-related issues, some numbers may not sum correctly.

Proposed Action in San Juan National Forest

This section describes how WAPA would implement the Proposed Action in San Juan National Forest. There are four different transmission lines that cross San Juan National Forest-managed NFS lands, crossing 50.8 miles. The ROWs have variable widths and cover approximately 898.3 acres.

The 103.3 acres (12 percent) in Category 1 include a variety of vegetation types (primarily grasses and forbs) that would require no treatment because the vegetation is compatible, and WAPA expects it to remain so through the duration of the authorization. This total includes approximately 10.6 acres of aspen not identified for treatment due to adequate conductor-to-canopy clearance. WAPA would monitor the ROWs and document conditions.

WAPA would treat approximately 46.5 acres (5 percent) of aspen in San Juan National Forest within the first year of authorization because they are in an unacceptable condition and are fast-growing species (Category 2). WAPA would treat approximately 68.7 acres (8 percent) of immature aspen, all of which is on the Hesperus-Montrose line, within 2 to 6 years; these trees are in an acceptable condition due to previous vegetation management activities (Category 3). They would require treatment over the short term (within 2 to 6 years). Both of these categories are associated with relatively frequent maintenance treatments, with a return interval of two to six years.

There are approximately 40.7 acres (5 percent) of ponderosa pine not in an acceptable condition; Most of this vegetation type is on the Hesperus-Montrose and the Curecanti-Lost Canyon lines (Category 4). WAPA anticipates initial treatment in 2 to 5 years of the authorization. Because Category 4 includes slow-growing, mature vegetation, WAPA expects maintenance treatments to be relatively infrequent, with a return interval of 5 or more years.

There are approximately 356.6 acres (40 percent) of immature ponderosa pine in San Juan National Forest that would require treatment within 5 or more years after authorization. These are slow-growing species that are acceptable, but they will eventually require treatment to maintain the desired condition (Category 5). Most of this vegetation is on the Hesperus-Montrose and Curecanti-Lost Canyon lines. WAPA expects Category 5 maintenance treatments to be relatively infrequent, with a return interval of 5 or more years.

Category 6 identifies areas that could require vegetation management for fuels reduction. WAPA might treat approximately 282.4 acres (31 percent) of Gambel oak, most of which is along the Hesperus-Montrose line as funding becomes available.

White River National Forest

Methods for Determining Existing Vegetation Conditions

WAPA identified 13 vegetation types in White River National Forest. Table 3-32 lists baseline vegetation conditions in White River National Forest.

WAPA used the information in Table 3-32 and the GIS dataset to identify ROW conditions in each of the six treatment categories (see Section 2.2.2.5). Table 2-12 lists the acres of vegetation the Proposed Action would affect by type and category. Maps WRNF-1 through WRNF-7 show the detail associated with each transmission line by project area. Category 1 should require no vegetation treatment, but WAPA would monitor this category. Categories 2 and 4 would require initial vegetation treatment over the short term. Categories 3 and 5 are areas WAPA has already treated; however, incompatible species would require continued maintenance. Category 6 identifies areas that could require treatment for fuels reduction.

Table 2-12. Proposed Action in White River National Forest by Transmission Line, Vegetation Type, and Category (acres)

Transmission Line	Species Type	Category 1	Category 2	Category 3	Category 4	Category 5	Category 6	Total
BLUE RIVER-GORE PASS								
BRU-GOT / 230kV	Forb	46.1	0.0	0.0	0.0	0.0	0.0	46.1
Maps WRNF-5 – WRNF-7	Cleared	0.0	0.0	1.9	0.0	0.0	0.0	1.9
	Grass	1.6	0.0	0.0	0.0	0.0	0.0	1.6
	Other sagebrush	0.0	0.0	0.0	0.0	0.0	0.2	0.2
	Aspen	1.0	8.2	0.0	0.0	0.0	0.0	9.2
	Douglas fir	0.3	0.0	0.0	8.7	0.0	0.0	9.0
	Lodgepole pine	0.2	23.4	0.0	0.0	0.0	0.0	23.6
	Ponderosa pine	0.0	0.0	0.0	4.1	0.0	0.0	4.1
	Spruce/Fir	0.0	0.0	0.0	10.6	0.0	0.0	10.6
	Subtotal	**49.3**	**31.6**	**1.9**	**23.4**	**0.0**	**0.2**	**106.3**
GREEN MOUNTAIN-BLUE RIDGE REPEATER								
GM-BLR / 2.4Kv	Big sagebrush	0.0	0.0	0.0	0.0	0.0	1.4	1.4
Map WRNF-4	**Subtotal**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**1.4**	**1.4**
GREEN MOUNTAIN-KREMMLING								
GM-KRM / 69kV	Big sagebrush	1.4	0.0	0.0	0.0	0.0	20.8	22.2
Map WRNF-3	True mountain mahogany	0.0	0.0	0.0	0.0	0.0	1.5	1.5
	Douglas fir	0.0	0.0	0.0	0.1	0.0	0.0	0.1
	Gambel oak	0.0	0.0	0.0	0.0		0.4	0.4
	Subtotal	**1.5**	**0.0**	**0.0**	**0.1**	**0.0**	**22.8**	**24.3**
NORTH FORK-RIFLE								
NFK-RFL / 230kV	Big sagebrush	0.0	0.0	0.0	0.0	0.0	3.8	3.8
Maps WRNF-1 – WRNF-2	Grass	1.2	0.0	0.0	0.0	0.0	0.0	1.2
	Other sagebrush	0.0	0.0	0.0	0.0	0.0	4.3	4.3
	Aspen	0.0	3.9	0.0	0.0	0.0	0.0	3.9
	Gambel oak	0.7	0.0	0.0	0.0	0.0	27.7	28.4
	Pinyon/juniper	1.4	0.0	0.0	0.0	0.0	8.4	9.8
	Subtotal	**3.3**	**3.9**	**0.0**	**0.0**	**0.0**	**44.1**	**51.3**

Table 2-12. Proposed Action in White River National Forest by Transmission Line, Vegetation Type, and Category (acres)

Transmission Line	Species Type	Category 1	Category 2	Category 3	Category 4	Category 5	Category 6	Total
ALL LINES								
	Big sagebrush	1.4	0.0	0.0	0.0	0.0	25.9	27.3
	Cleared	0.0	0.0	1.9	0.0	0.0	0.0	1.9
	Forb	46.1	0.0	0.0	0.0	0.0	0.0	46.1
	Grass	2.8	0.0	0.0	0.0	0.0	0.0	2.8
	Other sagebrush	0.0	0.0	0.0	0.0	0.0	4.5	4.5
	True mountain mahogany	0.0	0.0	0.0	0.0	0.0	1.5	1.5
	Aspen	1.0	12.0	0.0	0.0	0.0	0.0	13.0
	Douglas fir	0.3	0.0	0.0	8.8	0.0	0.0	9.1
	Gambel oak	0.7	0.0	0.0	0.0	0.0	28.1	28.9
	Lodgepole pine	0.2	23.4	0.0	0.0	0.0	0.0	23.6
	Pinyon/juniper	1.4	0.0	0.0	0.0	0.0	8.4	9.8
	Ponderosa pine	0.0	0.0	0.0	4.1	0.0	0.0	4.1
	Spruce/fir	0.0	0.0	0.0	10.6	0.0	0.0	10.6
	TOTAL	**54.1**	**35.4**	**1.9**	**23.5**	**0.0**	**68.5**	**183.4**
Summary (percent)		**30**	**19**	**1**	**13**	**0**	**37**	**100**

NOTE: Due to rounding and other GIS-related issues, some numbers may not sum correctly.

Proposed Action in White River National Forest

This section describes how WAPA would implement the Proposed Action in White River National Forest. There are four different transmission lines that cross White River National Forest-managed NFS lands, crossing 12.9 miles. The ROWs have variable widths and cover approximately 183.4 acres.

The 54.1 acres (30 percent) in Category 1 include a variety of vegetation types (primarily grasses and forbs) that would require no treatment because the vegetation is compatible, and WAPA expects it to remain so through the duration of the authorization. WAPA would monitor the ROWs and document conditions.

WAPA would treat approximately 35.4 acres (19 percent) of lodgepole pine and aspen in White River National Forest within the first year of authorization because they are in an unacceptable condition and are fast-growing species (Category 2). WAPA would treat approximately 1.9 acres (1 percent) of immature lodgepole pine and aspen on the Blue River Gore-Pass line within 2 to 6 years; these trees are in an acceptable condition due to previous vegetation management activities (Category 3). They would require treatment over the short term (within 2 to 6 years). Both of these categories are associated with relatively frequent maintenance treatments, with a return interval of 2 to 6 years.

There are approximately 23.5 acres (13 percent) of Douglas fir and mixed conifer (spruce/fir) in White River National Forest on the Blue River-Gore Pass line that are not in an acceptable condition (Category 4). WAPA anticipates initial treatment within 2 to 5 years of the authorization. Because Category 4 includes slow-growing, mature vegetation, WAPA expects maintenance treatments to be relatively infrequent, with a return interval of 5 or more.

There is no Category 5 vegetation (immature spruce and fir) along the ROWs in White River National Forest. Therefore, WAPA does not propose Category 5 treatment in White River National Forest within 5 or more years after authorization.

Category 6 identifies areas that could require vegetation management for fuels reduction. WAPA might treat approximately 68.5 acres (37 percent) of big sagebrush and Gambel oak in White River National Forest as funding becomes available.

2.2.2.7 Design Features

Table 2-13 lists the Proposed Action design features. WAPA developed the design features to protect environmental resources, and will incorporate them into the Proposed Action. The Standard Maintenance Procedures in Table 2-15 are also a part of the Proposed Action if they are at least as stringent at protecting environmental resources and do not conflict with the design features.

Table 2-13. Design Features for the Western Area Power Administration Proposed Action

Record Number	Design Features
	Air Quality
1	WAPA shall use practical methods and devices that are reasonably available to minimize emissions of air contaminants. This includes particulates from soil disturbance, excessive exhaust from internal combustion engines, etc.
2	Equipment and vehicles that show excessive emissions of exhaust gases due to poor engine adjustments, or other inefficient operating conditions, shall not be operated until corrective repairs or adjustments are made.
3	Use reasonably available methods to prevent or control emissions of dust and fumes to the air. Dust shall be controlled in areas where nuisance dust could disturb nearby residences, public activities, or other sensitive resources, or where local or state air quality regulations require it. Vehicles and other equipment with internal-combustion engines must be maintained and tuned to limit emissions of fumes and particulates.
	Soils
4	Activities shall be conducted to minimize scarring or defacing of the natural surroundings in the vicinity of the work.
5	Operate heavy equipment only when soil moisture is below the plastic limit or protected by at least 1 foot of packed snow or 2 inches of frozen soil. Soil moisture exceeds the plastic limit if the soil can be rolled into a 3-millimeter (0.12-inch) thread without breaking or crumbling.
6	Organic ground cover shall be maintained so that pedestals, rills, and surface runoff are not increased. Maintain a ground cover of 70 percent or more in the activity areas.
7	Chipped material depth could be limited based on further coordination with the Forest Service. Areas exceeding depth and cover limits should be respread.

Table 2-13. Design Features for the Western Area Power Administration Proposed Action

Record Number	Design Features
8	If landings, roads, or skid trails are constructed by removing topsoil: a) Topsoil will be stockpiled for respreading. b) Inclusion of stumps and woody debris with topsoil will be minimized. c) Handling topsoil during wet conditions will be avoided. d) Topsoil piles will be protected from traffic and water erosion, and will not be buried by slash. e) The consistency of the surface of the respread topsoil will be suitable for the subsequent seeding (if seeding is to be done). f) Slash will be scattered on the soil surface to provide some erosion control until vegetation is established. g) Where rehabilitation treatments will include both tillage and topsoil respreading, the sequence of operations will be planned to avoid recompacting tilled areas. Tilling can take place after topsoil is respread with a minimum of mixing.
9	All scarification and other site preparation work should be laid out with the terrain contour.
10	Restrict roads, landings, skid trails, concentrated-use sites and similar soil disturbances to permitted areas.
11	Where soils are susceptible to the formation of a significant hydrophobic layer (i.e., those with a surface layer of sandy loam or coarser), conduct prescribed burns so as to avoid high-temperature, long-duration burns. Slash and other woody material to be burned shall be sited on planar or convex slopes to avoid concentrated runoff flowing through the burned area.
12	Water turnoff bars or small terraces shall be constructed across ROW trails on hillsides to prevent water erosion and to help establish natural revegetation on the trails.
13	When work is finished, all work areas except access trails shall be left in a condition that will help with natural revegetation (unless reseeding, mulching, or other specific requirements apply), provide for proper drainage, and prevent erosion. Seed mix will be approved by the Forest Service. All seed, mulch, and hay approved for use will be properly certified as weed-free.
	Riparian Areas, Aquatic Resources, and Water Quality
14	Equipment staging areas and refueling locations will be at least 250 feet away from streams and wetlands. Spill prevention and containment measures will be used at all staging areas and refueling locations. A Spill Prevention, Control, and Containment Plan will be prepared prior to work initiation.
15	Vehicles, including heavy equipment, trucks, and ATVs, will be allowed to cross perennial and intermittent streams with defined beds and banks at open channel crossings (without bridges or culverts) only at locations designated by the Forest Service. If the Forest Service determines that it is needed, open channel crossing locations will be repaired following use to restore the channel to appropriate dimensions, stabilize stream banks, prevent erosion, and allow vegetation to recover.
16	Equipment will not be permitted within 100 feet of the edge of streams or the edge of riparian or wetlands/fens vegetation, except as noted below and authorized by the Forest Service. Hand felling of hazard trees is permitted within this 100-foot buffer.

Table 2-13. Design Features for the Western Area Power Administration Proposed Action

Record Number	Design Features
17	For trees felled within riparian buffers: a) Trees should be directionally felled away from streams and wetlands in areas immediately next to culverts (within 50 feet) or when trees are too small to be sufficiently anchored and would create problems during high flows by being transported downstream and potentially blocking culverts. b) Trees large enough to be anchored and that would provide instream aquatic habitat should be felled directly across the stream. This simulates natural conditions and provides a large woody component to the stream for aquatic organisms and fisheries habitat. In perennial streams, the Forest Service will decide which trees will be felled across the stream and used for habitat, and which will be felled away from the stream. c) Trees should be removed using at least one-end (partial) suspension. d) Trees should not be skidded across perennial or intermittent stream courses.
18	For isolated wetlands in transmission line ROWs, trees within the wetland and wetland buffer should be left standing if the trees will not violate applicable electrical safety standards.
19	For some streams, terrain might limit the extent of riparian vegetation and upland vegetation within the water influence zone. For these streams, conventional logging equipment may be used within the water influence zone with Forest Service approval. Larger trees and woody debris should be kept in the riparian zone and be used for instream aquatic habitat when feasible and consistent with protection of other resources.
20	Burn piles will be located away from perennial streams, lakes, ponds, wetlands, and riparian areas. The minimum distances are 50 feet for handmade piles and at least 200 feet for machine-made piles. For intermittent or ephemeral streams, handmade burn piles would be located 50 feet from or outside of the inner gorge, whichever is less.
21	Isolated wetlands in the ROW that might occur under tree canopy, or seasonally, might not have been mapped and might not be visible on aerial photos. To avoid or minimize impacts to these areas, ROWs will be surveyed to identify and delineate wetlands and riparian areas before using mechanical equipment so that the appropriate design features are planned and implemented.
22	Waste waters from construction-type operations shall not enter streams, water courses, or other surface waters without use of turbidity-control methods, such as settling ponds, gravel-filter entrapment dikes, filter fences, approved flocculating processes that are not harmful to fish, recirculation systems for washing of aggregates, or other approved methods. Waste waters discharged into surface waters shall be essentially free of suspended material. These actions shall comply with applicable Clean Water Act requirements.
23	Minimize activities in riparian areas or span riparian areas. Avoid disturbance to riparian vegetation whenever practical.
24	Minimize the crossing of riparian areas with equipment and vehicles during maintenance activities. Use existing bridges or fords to access the ROW from either side of riparian areas.

Table 2-13. Design Features for the Western Area Power Administration Proposed Action

Record Number	Design Features
	Winter Logging
25	In areas with soils with high susceptibility for compaction, activities will be limited when soils are "too wet" (as described under Soils). If harvesting during conditions when soil wetness cannot be determined (i.e., when soil is covered with snow), either a soil scientist will be consulted or the following guidelines will be used: a) Frozen soil is 4 inches deep OR b) Compactable snow or a combination of compactable snow and frozen soil is 12 inches in thickness. Snow quality should compact and form a running surface for equipment by being moist and non-granular. c) Designated skidtrails are NOT REQUIRED except for other resource concerns. d) Conditions that would be monitored closely during operations are soil being "too wet" (as described under Soils); bare soil in trails; and day-time temperatures exceeding 35 °F for an extended period.
26	For soils rated low or moderate for susceptibility to compaction, harvesting will not be done when soils are "too wet" (as described under Soils). These soil types may be harvested on year-round as long they are not wet. Snow or frozen soil is not required to protect soils.
	Noxious Weeds and Invasive Species
27	Noxious weeds will be controlled and managed pursuant to Forest Service Manual 2900 - Invasive Species Management.
28	Off-road equipment shall not be moved into the project area without having first taken reasonable measures to ensure it is free of soil, seeds, vegetation matter, or other debris that could contain noxious weed seeds. Equipment may also be inspected before moving it from areas infested with invasive species of concern to areas free of invasive species. Reasonable measures include pressure washing or steam cleaning in an off-site location where containment of oil, grease, soil, and plant debris provides optimal protection of project areas. All equipment surfaces should be cleaned, especially drive systems, tracks, and "pinch points" to ensure removal of potentially invasive species.
29	Revegetation might be required in areas where ground cover is disturbed (e.g., landings and skid trails). If required, areas will be revegetated using approved certified weed-free seed mixes to prevent soil erosion or noxious weeds.
30	Herbicides selected for use will be registered, approved for ROW application, and applied following the label requirements by appropriately licensed or certified applicators. Herbicides approved by the Forest Service for use on NFS lands will be used. Herbicide use on NFS lands will comply with Forest Service requirements.
31	Staging areas should be located in areas not infested with invasive species.
32	Work in un-infested areas first and then move to infested areas as practical.
33	Designate travel pathways that are free of invasive plants when possible. If an infested pathway is the only choice, pre-treat that travel corridor with the appropriate herbicide before work activities as feasible.

Table 2-13. Design Features for the Western Area Power Administration Proposed Action

Record Number	Design Features
34	Project materials such as gravel, sand, and fill would be obtained from weed-free sources to the extent practicable and will be maintained weed-free during transport to the project site and while in storage there.
35	Green woody conifer debris under 4-inch diameter can be lopped and scattered to minimize insect populations. Green pine or fir tree debris over 4-inch diameter needs to be removed, burned, chipped or bucked to 4 feet lengths to minimize species in pines or western balsam bark beetles in subalpine fir. Spruce and Douglas-fir tree boles over 8-inch diameter need to be removed, debarked, or bucked to 2 feet lengths to minimize risks of spruce beetle or Douglas-fir beetle build-up.
	Rare Plants
36	Before implementing new vegetation treatments and ground-disturbing maintenance activities, the project area will be reviewed using existing data or, if appropriate, surveyed using established protocols, where available, for listed and proposed threatened, endangered, sensitive plant species, and plant species of local concern.
37	The Forest Service will identify activity restrictions and requirements in areas of known declining plant species (e.g., timing and measures to provide connectivity/linkage of habitats) so that the activity would not increase the trend toward federal listing or loss of population viability.
38	Activities potentially occurring in habitats needed by sensitive species would be modified in coordination with the Forest Service.
	Wildlife (General, including Management Indicator Species)
39	Activities that could occur in areas with sensitive species, sensitive life-cycle needs (e.g., lambing areas, crucial winter ranges, and sensitive nesting areas) would be modified to minimize or avoid adverse impacts based on additional coordination with the Forest Service.
40	During nesting season, surveys would be conducted before activities commence with the goal of avoiding disturbance or take of an active nest or migratory bird protected under the MBTA.
41	When treatments occur on or near known amphibian breeding sites, a decontamination protocol could be required to prevent the spread of chytrid fungus. This would be predicated on whether the equipment has been exposed to sites that are known to harbor or are highly suspected of harboring chytrid fungus.
42	The Forest Service will identify activity restrictions (e.g., activity timing and vegetation management prescriptions) so the activity will not result in adverse effects, a trend toward federal listing, or loss of viability in the project area.
43	Clean maintenance vehicles and machinery and treat as needed before beginning work or next to waterways in the effort to reduce potential spread of Whirling Disease.

Table 2-13. Design Features for the Western Area Power Administration Proposed Action

Record Number	Design Features
	Slash Disposal/Fuels Treatments
44	Material, including tops, limbs, boles, non-salvageable trees, and other woody material, resulting from tree felling or removal operations should be treated to a fuels profile that promotes surface fire behavior of less than 4-foot flame lengths (maximum fireline intensity of 100 BTU/ft/s) under the average severe fire weather conditions.[1] To achieve the desired surface fire behavior, the resulting fuel bed should show one of the following: a) Low fuel loading such as that represented under Fuel Models (FM) such as Timber Litter (TL) 3, TL 5, FM8 or FM9. b) A highly compacted fuel bed generally no more than 18’ (crushed, chipped, masticated[2], or lopped and scattered. For reference to fuel models see (Scott and Burgan 2005) and (Anderson 1982).
45	For fire prevention, internal-combustion engines will be equipped with a spark arrester approved in the USDA Forest Service “Spark Arrester Guide” (Gonzales et al. 2007).
	Cultural Resources
46	A Cultural Resource Inventory and consultation, in accordance with appropriate Programmatic Agreement (Appendix E), will be completed prior to individual project implementation.
47	Activities will comply with appropriate Programmatic Agreement or Section 106 and other applicable requirements.
48	If previously unidentified prehistoric or historic materials are found during the course of the proposed activity, work in that area will cease. Work in the area of the cultural resource will not resume until the site has been evaluated for cultural materials and potential effects, and Section 106 is complied with. The discovery must be protected until notified to proceed by the authorized officer.
49	If the SHPO or a Native American tribe so requests, WAPA will further consult to identify properties of traditional cultural and religious significance to tribes or other interested parties that may lie within WAPA’s areas of potential effect as defined in the consultation for the undertaking.
	Transportation
50	Slash and debris will be kept out of road ditches and drainage channels.
51	Hauling that results in excessive road damage and could contribute to possible sediment discharges into stream channels will be suspended on native surface roads during periods of precipitation. Hauling will be suspended until the road subgrade can adequately carry trucks and there would be no road damage.
52	On haul roads, ruts, holes, and washboards shall be removed by scarifying or cutting the bottom of the defects. Such cut material shall be regraded and compacted at suitable moisture content over the traveled way. Fines accumulated while blading roads or from drainage ditches shall not be wasted over fill shoulders.
53	Water bars, out sloping the prism, and cross drains will be installed as needed to remove surface water and stabilize road surfaces. Stumps, rocks, slash, and logs will be placed on the ripped road surface to a density and depth to mimic the surrounding ground. Specific rehabilitative methods would be determined case by case.

Table 2-13. Design Features for the Western Area Power Administration Proposed Action

Record Number	Design Features
54	Gates or other closures will be installed as needed to prevent unauthorized use of access roads that are not open to public travel, and closure signs will be posted.
55	Access to water-related facilities will be maintained.
56	Reclaim abandoned access routes in transmission-line ROWs.
	Visual
57	Clumps or islands of trees will be left in openings of danger tree removal (where sagging lines and ground clearance are not a concern) to break sight distance and to maintain natural-appearing landscape mosaic pattern.
58	Minimize Visual Effects by: • Limit the use of foliar application of herbicide to reduce creation of large areas of browned vegetation. • At road crossings, highway or visual overlooks, leave sufficient vegetation, where possible to screen views of the right-of-way. • If the area is visually very sensitive consider (1) softening the straight line of corridor edge by cutting some additional trees outside the ROW; or (2) if possible, leaving some low-growing trees within the ROW; or (3) implement a less-aggressive treatment of the ROW and ensuring a higher frequency of monitoring vegetation conditions and scheduling re-treatments when needed. • Treating unnatural-appearing soil disturbances. Smooth piles of soil created by machinery or any other soil disturbance from machine piling within 100 feet of areas requiring Partial Retention VQO/Moderate SIO or higher, scenic byways, hiking or multi-use trails, camping areas, other areas of moderate to high use recreation, or any other areas of visual significance. • Best Management Practices. BMPs shall be implemented, such as for tractor skidding design, erosion control, and protection of meadows, streamcourses, and aquatic resources may apply to biological, soil, or other resource areas and would also apply to visual resources in that they indirectly protect aesthetics and prevent impacts that would dominate the visual landscape during and after project implementation.
	Developed Recreation Sites, Trails, Trailheads, and Administrative Sites
59	WAPA would coordinate closure of trailheads, administrative sites, campgrounds, and travel corridors with the local Ranger District to minimize impacts to the public and other permitted users.
60	WAPA would coordinate closure of motorized or nonmotorized trails with the local Ranger District to minimize impacts to the public. Coordination would include identifying if alternative routes are available for trail closures, unless it would interfere with wildlife travel, interfere with maintenance of the ROW, or impact other resources.
61	WAPA would coordinate closure of NFS roads with the local Ranger District to maintain access to developed recreation sites, trails, or trailheads outside transmission-line ROWs to minimize impacts to the public. Coordination would include identifying if alternative roads providing access are available, unless it would interfere with wildlife travel, interfere with maintenance of the ROW, or impact other resources.

Table 2-13. Design Features for the Western Area Power Administration Proposed Action

Record Number	Design Features
62	WAPA will post advance notice of trail closure at trailheads or nearby developed recreation sites or recreation areas. Notices will include duration of the trail closure and whether an alternative route is available. If an alternative route is available, a map of the route will also be posted.
63	Use of noise-generating equipment next to campgrounds would be limited to daytime hours.
64	Slash and debris will be kept out of motorized and non-motorized trails.
	Scenic Byways, Special Interest Areas, and Research Natural Areas
65	Tree cutting and clearing should be done by hand in power line ROWs that are next to or cross scenic byways, special interest areas, and national recreation areas. Boles will be left in place; slash will be lopped and scattered to a depth of less than 24 inches unless it would result in unacceptable fuel loading, interfere with wildlife travel, interfere with maintenance of the line, or impact other resources.
	Public Safety
66	Maintenance Level 2 roads shall be temporarily closed to general public access during felling, slash treatment, or removal operations. Temporary closures may range from 1 day to 2 weeks.
	Waste Management
67	Sanitary wastes, oils, greases, fuels, refuse, and garbage must be managed and controlled. Oils, fuels, greases, antifreeze, and other liquid chemicals must be controlled to prevent spills. They must not be stored within 250 feet of a drainage, whether wet or dry, or lakes, wetlands, fens, or other surface water. Equipment will not be fueled or serviced within 250 feet of surface water. Spills must be promptly cleaned up and contaminated soils and debris must be properly disposed of in approved landfills or by other approved methods. Solid waste materials must be removed from the area and disposed of appropriately. No chemicals or solid wastes will be buried in the WAPA ROWs or disposed of in areas not approved as disposal facilities.

Table 2-13. Design Features for the Western Area Power Administration Proposed Action

Record Number	Design Features

[1]Average severe weather conditions (High Percentile or 90th Percentile Weather Conditions) were obtained from the Colorado Wildfire Risk Assessment (Weather Influence Zones) or analysis of the applicable fire weather stations in Nebraska and Ashley national forests. Depending on the locations of the transmission lines, WAPA will apply a different set of weather conditions. The following table identifies the weather conditions in each national forest:

National Forest(s)	WIZ/Weather Station	1-hour TL	10-hour TL	100-hour TL	Live herbaceous fuels	Live woody fuels	20 Foot Wind Speed	Maximum probable wind gust
Ashley	Cart Creek (Zone 442)	2	3	5	30	60	8	23
	Diamond Rim (Zone 443)	3	3	5	30	60	17	36
Arapaho-Roosevelt	East-WIZ 3 (Corral Creek)	4	6	10	31	80	12	29
	West-WIZ 2 (Dowd)	4	6	10	24	80	15	33
Grand Mesa, Uncompahgre, and Gunnison	East-WIZ 5 (Taylor Park)	4	5	8	27	76	13	30
	West-WIZ 6 (Morefield)	4	4	7	37	71	12	29
Medicine Bow-Routt	West-WIZ 2 (Dowd)	4	6	10	24	80	15	33
Nebraska	Kings Canyon	3	4	9	31	87	7	21
Pike and San Isabel	WIZ 5 (Taylor Park)	4	5	8	27	76	13	30
San Juan	NW Dolores WIZ 6 (Morefield)	4	4	7	35	71	12	29
	SE Dolores WIZ 7 (Sandoval)	3	4	6	37	68	9	24
White River	WIZ-5 (Taylor Park)	4	5	8	27	76	13	30

[2]If mastication (synonymous with mulching or slash busting) is a selected treatment method, a vertical shaft masticator with sufficient horsepower and hydraulic system performance to perform efficiently is recommended, because the materials would be better distributed (less than 60 percent of surface covered by 4 inches maximum depth of chips) and there is less soil disturbance necessary to achieve the desired fuel profile.

°F degrees Fahrenheit
ATV all-terrain vehicle
BTU/ft/s British thermal unit per feet per second
MBTA Migratory Bird Treaty Act
NFS National Forest System
NPDES National Pollutant Discharge Elimination System
ROW right-of-way
SHPO State Historic Preservation Office
TL timber litter
WIZ Weather Influence Zone

Lynx Habitat Connectivity Design Feature

Between January 13, 2014, and February 12, 2014, a number of coordination meetings with Forest Service and WAPA representatives took place to determine appropriate levels of lynx habitat connectivity design criteria. As a result of this process, an additional design feature has been incorporated into the Proposed Action.

The goal of this design feature is to facilitate lynx use of suitable habitat separated by the transmission line ROWs where vegetation management practices reduce the amount of horizontal cover on the ROW. Gaps in suitable habitat may be avoided by resident lynx (Roberts, pers. comm. 2013). Gaps may be from forest fires, timber harvests, and roads (von Kienast 2003; Koehler et al. 2008; Interagency Lynx Biology Team 2013). Von Kienast (2003) noted that lynx seemed to avoid crossing a burned area over 150 meters wide; Koehler *et al.* (2003) noted that lynx avoided forest openings and burned areas where cover canopy was less than 10 percent. Results of snow tracking studies found that lynx traveled the edges of meadows, but only crossed meadows where openings were less than 100 meters wide (Aubry *et al.* 2000). During snow-free periods, shrub habitats may be used for travel by lynx (Aubry *et al.* 2000).

Based on this information, it is assumed that lynx may be reluctant to cross wide transmission line ROWs typical of those found in the project area. To facilitate lynx use of suitable habitats and to contribute to the goal of maintaining connectivity between habitats, WAPA, the Forest Service, and USFWS coordinated to develop a design feature, which is incorporated into the Proposed Project. Within lynx habitat, the proposed vegetation management and maintenance activities (i.e., removal of "undesirable" vegetation) may pose a barrier to daily lynx movements, where vegetation removal creates wide linear gaps that separate suitable habitat. Natural topography (i.e., drainages, swales) may allow the retention of existing habitat conditions with taller growth forms and dense vegetation that would continue to facilitate lynx movement.

The objectives of the design feature are: (1) ensure that the blocks are located where they are likely to facilitate lynx habitat use when natural connectivity areas are not available; (2) the locations and spacing of the blocks should be determined based on availability of contiguous (across the ROW) and effective lynx habitats that need to stay connected; (3) the blocks must meet requirements of the purpose and need for the proposed action and allow WAPA to meet the regulatory requirements whenever practical (e.g., not present undue risks of fire and fuel loads, improve effectiveness and efficiency of ROW maintenance); and (4) allow for flexibility in areas where lynx habitat has been altered (e.g., beetle kill) to establish blocks in the out years as the vegetation recovers and a need for adding a block is then identified by the Forest Service, WAPA, and USFWS.

Design Feature

Within lynx habitat, where topography does not allow for retention of taller vegetative growth within the ROWs, and in locations where vegetation management in the ROW creates long stretches of ROW without contiguous habitat, blocks of taller or denser vegetation that may include undesirable species will be retained within the ROW. Blocks may cross the width of the ROW, but smaller access roads or natural gaps in vegetation within the blocks will be acceptable. The retained taller or denser vegetation would ensure desired clearance between transmission line and vegetation and allow for extended re-entry intervals for the purpose of successive treatment, as described in the purpose and need for the Proposed Project. Tall older age class incompatible vegetation (typically trees) would be removed, but younger age class incompatible vegetation would be retained on the ROW, along with compatible shrubs and other vegetation. The blocks would typically be about 50 to 100 meters in length, and as wide as the ROW (depending on site conditions [e.g., availability of contiguous effective habitat on both sides of the ROW, availability of natural connections in the area, fire risk proposed by the fuels condition of the vegetation block, present condition of the lynx habitat]). The retention blocks would include trees and other undesirable species which come in naturally (such as lodgepole pine regeneration). The blocks would be spaced about 0.5 to 1 mile apart along the ROWs as needed to maintain connectivity across the ROWs between effective habitats. In some areas, management of the blocks could occur on a rotational basis, depending on the status of the vegetation risks in the block. For example, as one treated area reaches a height and density where it would need retreatment to maintain line safety, a nearby new retention block area would be maintained to provide habitat connectivity in the same area.

In areas where the condition of habitat around the ROW is no longer considered suitable or vegetation conditions present unacceptable risk of fire or other risks to the transmission line (e.g., in areas with extensive beetle kill or unacceptable fuel loads under and adjacent to the ROW), WAPA would initially treat the area to mitigate the risks and monitor vegetation recovery. As the vegetation recovers, WAPA would coordinate with the Forest Service and USFWS to identify options for creating retention blocks across the ROW. The block areas would be identified through WAPA's Annual Operating Plan or other agreed to review process.

2.3 Comparison of Alternatives

Table 2-14 summarizes and compares potential impacts under the No Action Alternative and the Proposed Action. Chapter 3 provides additional information on the specific impacts of each alternative.

Table 2-14. Summary of Environmental Consequences by Alternative

Resource	No Action Alternative	Proposed Action
Air Quality	Except for slash-pile burning, which is expected to be done very infrequently if at all, direct and indirect impacts on air pollutant concentrations, atmospheric deposition, visibility, and climate change in the project area from ROW maintenance activity emissions are expected to be very minor or negligible. Potential cumulative effects would be localized along the various ROWs throughout the project area and insignificant compared to emissions from other regional sources.	Implementing integrated vegetation management would improve efficiencies in scheduling of maintenance activities. Following this approach and ensuring that engines and other equipment are properly tuned and turned on only when in active use (which minimizes emissions from idling), direct, indirect, and cumulative impacts on air quality are also expected to be negligible and comparable to or less than under the No Action Alternative.
Surface Water	There would be some potential for short-term adverse effects from vegetation maintenance that causes erosion and sedimentation from reentry into the same site or adjoining sites in the ROWs. These effects would be very localized because of the small footprint required to remove danger trees. There could be long-term, but likely minor, impacts to water quality from recurring vegetation treatments, including increased levels of erosion, sedimentation, habitat degradation, and degradation of beneficial uses of the receiving waters. No cumulative effects have been identified, but there would likely be at least a minor degree of impact from recurring maintenance activities.	There would be a potential for more short-term direct adverse effects on water resources in areas where treatments are required. After the initial treatments, long-term effects would be greatly reduced because of less-frequent reentry for vegetation maintenance. WAPA's ROWs cross four waterbodies listed as impaired that serve as source waters for public drinking water systems – two in Grand Mesa, Uncompahgre, and Gunnison National Forests and two in Medicine Bow-Routt National Forests. Water quality issues near these impaired waterbodies should not be exacerbated, even during the initial maintenance effort to reset vegetation conditions, because of design features and standard maintenance procedures. There would be limited potential for cumulative effects.
Soils	Danger-tree removal, fuels reduction, and other ROW maintenance activities would continue to disturb soil and could subject soils to accelerated runoff and erosion rates. Management practices would continue to adversely affect soil compaction, soil quality, organic matter content, nutrient cycling, and soil productivity. These impacts would be short term and localized. Vegetation management activities in ROWs would continue to meet Forest Service Soil Quality Standards. No substantial cumulative effects were identified.	Potential short-term direct adverse effects include increased soil erosion, compaction, and rutting from mechanical and biological treatments, and decreased soil nitrogen levels in areas where large amounts of wood chips are broadcast. Formation of hydrophobic soil from slash-pile burning would be localized and not extend over large areas, so there would be no substantial increase in erosion. There would be potential long-term beneficial effects from decreased fuel loads, which would reduce the potential for high-temperature, long-duration wildfires. There could be short-term indirect cumulative effects on receiving waters from sedimentation caused by accelerated erosion along ROWs.

Table 2-14. Summary of Environmental Consequences by Alternative

Resource	No Action Alternative	Proposed Action
Wetlands/Riparian Areas/Floodplains	There would be potential direct adverse effects from hazard tree removal, access road maintenance, and accumulation of woody debris. These effects would include soil disturbance or compaction and altering floodplains from removal of hazard trees, access road maintenance, and tower repair. There would be potential beneficial effects from debris accumulation adding to the complexity of both the terrestrial and aquatic habitats. There would be potential indirect adverse effects associated with erosion (including streambed and bank instability), sedimentation, and inadvertent diversion of surface water. The potential for impacts increases with the number of wetland features present and forests with the most wetland (especially PFO wetlands), riparian, and floodplain resources will have the highest potential for impacts. Design features would minimize these effects. There would be potential cumulative effects from changes in stream flow from the conversion of forested wetlands/riparian areas to non-forested, and the accumulation of downed trees. If stream flows were altered over time, it could cause increased sediment loading and decreased bank stability.	Same as the No Action Alternative.
Forest Health and Vegetation	No appreciable direct or indirect effects on forest health.	There would be potential beneficial effects on forest health from vegetation treatments in areas currently affected by pests (151 acres) within 6 years of authorization. However, potential effects on overall forest health would be negligible compared to more than 1 million acres in Colorado with active pest outbreaks. There would be potential beneficial effects from treating debris and eliminating bark beetle breeding habitat in the debris and returning fuel loads to pre-treatment levels. There would be potential beneficial cumulative effects on forest health from accelerating ROW treatments compared to the No Action Alternative.
Invasive Species	There would be no substantial adverse or beneficial effects on invasive species or effects on other vegetation populations from introduction or spread of invasive species. There could be indirect effects from the gradual, steady encroachment of newly established invasive plant populations over the long term. There would be more potential for increased spread of invasive species due to the aggressive successional nature of the invasive species present in Grand Mesa, Uncompahgre, and Gunnison National Forests and San Juan National Forest. There could be minor cumulative effects on plant diversity, reduction or expansion of colonization of noxious weeds on disturbed sites, and potential incidental herbicide damage to non-target plants.	There would be no substantial direct effects on invasive species. There could be gradual indirect effects on other vegetation populations from increased potential for introduction and spread of invasive species due to the greater area of surface disturbance and exposed soil. There would be more opportunity for spread of invasive species in San Juan National Forest because of the diverse volume and number of existing invasive species in ROWs. There would be a potential for increased plant diversity because of more aggressive treatment and larger treatment areas, allowing for the establishment of compatible plant species and communities. Cumulative effects would be similar to those under the No Action Alternative.

Table 2-14. Summary of Environmental Consequences by Alternative

Resource	No Action Alternative	Proposed Action
Rare Plants	There would be no substantial adverse or beneficial effects on threatened, endangered, or proposed plant species, or their habitat. No impacts are anticipated to Ute ladies'-tresses based on lack of presence in 2014 surveys and critical habitat not present. Therefore, the No Action Alternative is "no effect" to Ute ladies'-tresses. Except for Ashley National Forest and Nebraska National Forest, the Forest Service has documented the presence of Forest Service sensitive species and associated habitats throughout the study area. The potential for direct and indirect effects on sensitive plant species would be from surface disturbance and potential habitat impacts from existing transmission line maintenance actions and associated vegetation management in the ROWs. There could be minor cumulative effects on plant diversity, the spread of noxious weeds on disturbed sites, and herbicide damage to non-targeted plants.	Similar to the No Action Alternative, Forest Service sensitive species or habitat may be affected. There would be more potential for direct and indirect adverse effects because there would be more vegetation treatments over larger areas in ROWs where vegetation would be treated. There would be a potential for increased plant diversity due to more aggressive and larger treatment areas, though with less re-entry and frequency allowing for the establishment of compatible plant species and communities. Although design features are intended to minimize direct impacts from proposed activities, there could still be unavoidable indirect impacts. Similar to the No Action Alternative, no impacts are anticipated to Ute ladies'-tresses based on lack of presence in 2014 surveys and critical habitat not present. Therefore, the Proposed Action is "no effect" to Ute ladies'-tresses. There would be minor potential for direct and indirect effects on rare plant habitat in alpine ecosystems in Grand Mesa, Uncompahgre, and Gunnison National Forests. Cumulative effects would be similar to those under the No Action Alternative.

Table 2-14. Summary of Environmental Consequences by Alternative

Resource	No Action Alternative	Proposed Action
Wildlife	There is a potential for minor direct and indirect impacts to wildlife resources from vegetation management, other maintenance activities and ROW inspections. Danger tree management would allow for early and mid-seral habitat conditions to persist within forested landscapes, benefiting wildlife that favor these conditions. Few habitat effects would be evident within non-forested landscapes. Danger tree removal conducted during the spring and early summer nesting season could result in the destruction of bird nests and eggs or chicks present. Wildlife mortality or injury could also occur from collisions with vehicles and helicopters, and when vehicles leave roads and track across the ROWs; however, this would be rare. Noise and disturbances associated with maintenance operations could result in temporary, short-term impacts as wildlife flee the disturbance or seek cover. Increased erosion from soil disturbing activities, accidental spills of hazardous materials (e.g., solvents, gasoline, diesel fuel, etc.), and herbicides used for vegetation management could pose a hazard to some wildlife species, particularly amphibians if these contaminants wash into wetlands and aquatic habitats. Cumulative impacts to wildlife would be relatively minor when considered together with other actions in the region. Similar impacts would occur to Threatened and Endangered species, MIS, and SOLC where they are present in the ROW; however, none of these impacts would be significant. In the Grand Mesa, Uncompahgre, and Gunnison National Forest, the No Action Alternative is "may affect, likely to adversely affect" the Canada lynx.	Direct and indirect effects would be similar to the No Action Alternative, except that the magnitude of the effects would be greater during initial treatment due to more intensive vegetation management. Removal and long-term management of incompatible vegetation, including regenerating forest stands and dense shrub stands that pose a high fire risk, would keep ROWs much more open than under the No Action Alternative. These conditions would primarily benefit those species that favor open herbaceous communities, low-density shrub communities, and forest-edge habitat. Reduced security cover in the more open ROWs could impede movements by some small mammals, amphibians, and reptiles, reducing habitat connectivity for those species. Risk to nesting birds, mortality from vehicle collisions and equipment operating within ROWs, and risk from contaminants (including fine sediments, hazardous materials, and herbicides) would be greater. Although design features are intended to minimize effects from the Proposed Action, some unavoidable impacts would remain. Noise and human disturbances associated with the proactive vegetation management would exceed the No Action Alternative, especially in the first five years. Cumulative effects would be similar to those under the No Action Alternative. Similar impacts would occur to Threatened and Endangered species, MIS, and SOLC where they are present in the ROW; however, none of these impacts would be significant. In the Arapaho-Roosevelt National Forest; Grand Mesa, Uncompahgre, and Gunnison National Forest; Medicine Bow-Routt National Forest; and White River National Forest, the Proposed Action is "may affect, likely to adversely affect" the Canada lynx.

Table 2-14. Summary of Environmental Consequences by Alternative

Resource	No Action Alternative	Proposed Action
Fisheries	There would be minor potential for direct and indirect impacts to fisheries resources from vegetation management activities in ROWs compared to the overall lengths of streams in the surrounding NFS lands that have fisheries habitat. There would be no effects on fish survival or population numbers in the forests. Cumulative effects would be minor. No direct impacts are anticipated to the greenback cutthroat trout and minor indirect impacts from fine sediment delivery could occur. These potential impacts are "may affect, not likely to adversely affect" the greenback cutthroat trout. The bluehead sucker and Colorado River cutthroat trout could be affected by the No Action Alternative, but the effects would not cause a trend toward federal listing. No impacts are anticipated to the flannelmouth sucker, mountain sucker, or roundtail chub.	Direct and indirect effects would be similar to those under the No Action Alternative, except there would be more effects from increased vegetation management, application of herbicides, slash-pile burning, and erosion. There would be potential short-term adverse effects from vegetation treatment causing soil compaction and disruption, and the localized degradation of habitat through loss of shade and increased sunlight from canopy openings. There would be negligible effects from slash-pile burning and application of herbicides. Cumulative effects would be similar to those under the No Action Alternative. Similar to the No Action Alternative, no direct impacts are anticipated to the greenback cutthroat trout and minor indirect impacts from fine sediment delivery could occur. These potential impacts are "may affect, not likely to adversely affect" the greenback cutthroat trout. The bluehead sucker and Colorado River cutthroat trout could be affected by the No Action Alternative, but the effects would not cause a trend toward federal listing. No impacts are anticipated to the flannelmouth sucker, mountain sucker, or roundtail chub.
Fire and Fuels Management	There would be increased potential for wildfire damage on 1,153 acres that do not meet desired fuel conditions. Debris would continue to accumulate and add to the existing fuel loads, which would increase the risks from wildfire in the project area. Only dead or tall trees would be removed from the ROWs. Conditions and risks would vary by forest, depending on existing fuel loads and vegetation types in the ROWs. There would be no potential for adverse cumulative effects in the eight forests. There would be minor potential for beneficial cumulative effects in the Arapaho-Roosevelt, Ashley, and Grand Mesa, Uncompahgre, and Gunnison National Forests.	There would be decreased potential for wildfire damage and threat to adjacent NFS lands from reducing the amounts of fuel on the ground, thinning the trees to a wider spacing, controlling re-growth, and pruning the lower branches of the trees to create a gap between surface and ladder and canopy fuels. There would be potential indirect effects on fire behavior from lower heat produced and shorter flame lengths. There would be slight changes in the rate of fire spread because thinning trees opens the canopy to allow more sunlight to reach the surface, which reduces moisture in fine fuels that respond rapidly to changes in temperature. Beneficial cumulative effects would be similar to those under the No Action Alternative; however, they would be slightly greater given the reductions in risk of wildfire under the Proposed Action.

Table 2-14. Summary of Environmental Consequences by Alternative

Resource	No Action Alternative	Proposed Action
Cultural Resources	Continuation of the present maintenance practices will have little or no likelihood of affecting, either directly or indirectly, NRHP listed or eligible cultural resources (historic properties) for those exempt activities listed in WAPA's existing Programmatic Agreement (Appendix F) for maintenance and minor construction activities at existing WAPA facilities (2015). Non-exempt activities listed in the Programmatic Agreement have a greater likelihood of directly or indirectly affecting historic properties. Any adverse effects to historic properties as a result of non-exempt activities will be resolved under the Sec. 106 process. WAPA expects there would be no or minimal cumulative impacts to cultural resources under the No Action Alternative.	The likelihood of affecting, either directly or indirectly, historic properties under the Proposed Action would the same as under the No Action Alternative. There is little or no likelihood of directly or indirectly affecting historic properties for those exempt activities listed in WAPA's existing Programmatic Agreement (Appendix F). Non-exempt activities listed in the Programmatic Agreement have a greater likelihood of directly or indirectly affecting historic properties. Any adverse effects to historic properties as a result of non-exempt activities will be resolved under the Sec. 106 process. WAPA expects there would be no or minimal cumulative impacts to cultural resources under the No Action Alternative.
Transportation	There could be temporary and short-term traffic delays and road closures on access routes open to public travel (579.9 miles) where immediate risks to transmission lines are found or when access routes need maintenance. There could be beneficial effects from access route maintenance improving travel conditions on NFS roads. Indirect effects include temporary increases in public traffic on other NFS roads, or use of unauthorized routes. There could be cumulative effects from traffic delays or road closures on access routes open to public travel if the reasonably foreseeable projects affect traffic patterns or travel on the same NFS routes and occur at the same time as project activities. However, these cumulative effects would be temporary and of short duration, lasting only as long as project activities in the immediate vicinity.	Project activities that affect transportation are the same as those described for the No Action Alternative, and effects would be similar. The potential for direct and indirect effects on transportation are primarily related to the frequency and location of initial vegetation treatments, and maintenance treatments needed thereafter. WAPA would use the same access routes under the Proposed Action as under the No Action Alternative. There could be increases in the frequency of traffic delays and road closures on access routes open to public travel (579.9 miles) in vegetation treatment areas, or as access routes need maintenance. There would be increased potential for road damage from using or hauling heavy equipment. Over the long-term, maintenance activities could also be identified and addressed more proactively, benefiting public travel on NFS routes. Cumulative effects on transportation would be similar to effects under the No Action Alternative because both alternatives use the same NFS access routes, except that project effects would occur more frequently and larger areas would be treated under the Proposed Action. For this reason, the potential for cumulative effects would increase under this alternative, but would be temporary and last only as long as project activities in the immediate vicinity.

Table 2-14. Summary of Environmental Consequences by Alternative

Resource	No Action Alternative	Proposed Action
Visual Resources	WAPA transmission line infrastructure, ROWs, and access routes, and current vegetation management activities are part of the existing visual landscape in the project area and would not substantially degrade the character or change scenic quality. There would be no impacts to existing VQOs or SIOs. Air pollutant emissions would be consistent with ongoing management activities and would not increase. There are currently no unresolved conflicts with visual standards identified by a federal land management agency. Because current management activities are a part of the existing visual landscape, continuing them would not permanently reduce visually important features on NFS lands. They are short-duration activities that would help maintain a visual landscape that is consistent within ROWs and would not result in long-term adverse visual changes or contrasts to the existing landscape as viewed from areas with high visual sensitivity. There could be indirect and cumulative impacts on the project area's scenic character because management under the No Action Alternative would increase the chance for catastrophic fire where dense vegetation under the transmission line would aid in the spread of forest fires.	There would be no adverse impacts on visual resources from vegetation management activities in Category 1, 3, and 5 (Table 2-3) areas, because vegetation in these categories is in an acceptable condition and requires no substantial alteration of the existing visual character. There could be long-term adverse changes in visual character from vegetation management activities in Category 2, 4, and 6 areas with partial retention VQO/moderate SIO or higher, because these designations lend themselves to limiting management activities and preserving the existing visual environment. There could be indirect and cumulative benefits from the decreased chance for catastrophic fires where dense vegetation is removed under the transmission lines on NFS lands, which could in turn protect scenic resources on the surrounding forested areas and in nearby local communities.
Recreation	There could be temporary and short-term trail closures from vegetation treatment or maintenance activities. There could be beneficial effects from trail maintenance and removing obstacles or repair work. Recreationists could experience temporary road closures that prevent or delay travel to recreation sites, trails, and trailheads for short periods. There could be indirect effects from localized noise or views of workers, equipment, vehicles or debris and treated areas; these conditions could temporarily affect the experience of dispersed recreationists on trails or in areas near treatment or maintenance activities. Recreationists in SPM or SPNM settings would be more sensitive to indirect effects, but the expected experience or character of the area would not be permanently altered to the degree that it would change these recreation opportunity settings. If the present and reasonably foreseeable projects occur at the same time and overlap with the same transmission line ROWs, there could be cumulative effects on recreation activities and facilities from temporary closures, delays, or detours, or displacement of recreation activities. These temporary effects would be limited to the transmission line ROWs or immediate area near the ROWs being treated. However, the potential cumulative effects would be temporary and of short duration, lasting only as long as vegetation treatment activities are underway in the immediate vicinity.	Proposed Action activities that affect recreation are the same as those described for the No Action Alternative. Direct and indirect effects on recreation would be similar to those described for the No Action Alternative, but could occur more often in areas where ROWs need initial vegetation treatments, and maintenance treatments at intervals thereafter. Management of vegetation in Category 1 and 5 (Table 2-3) areas would affect recreation the least because these areas do not require initial treatments, but effects could occur more often in the Category 2, 3, 4 and 6 areas. Following design features and standard maintenance procedures would minimize effects. There would be increased potential for indirect visual effects because larger areas in one location might need treatment and would be more noticeable. Cumulative effects would be similar to those under the No Action Alternative, because both alternatives would affect the same recreation activities and facilities. The potential for cumulative effects would be greater under the Proposed Action because of the initial increased frequency of project activities over a larger area. These effects would be temporary and of similar duration as under the No Action Alternative.

Table 2-14. Summary of Environmental Consequences by Alternative

Resource	No Action Alternative	Proposed Action
Public Health and Safety	Activities under the No Action Alternative are designed to maintain the transmission lines to minimize hardware failure and reduce risks from potentially dangerous interactions with vegetation that could cause a fire. For hazardous materials (e.g., solvents, gasoline, diesel fuel, etc.) spills, impacts are expected to be minor and short term. WAPA does not expect public-safety problems during maintenance activities. Impacts to public use of NFS lands are expected to be short term and minor. No direct or indirect effects related to electromagnetic fields are expected. No cumulative effects were identified.	Same as the No Action Alternative.

MVUM motor vehicle use map
NFS National Forest System
PFO palustrine forested
ROW right-of-way
SPM semi-primitive motorized
SPNM semi-primitive non-motorized

2.3.1 Standard Maintenance Procedures Common to All Alternatives

Table 2-15 lists the standard maintenance procedures common to the No Action Alternative and the Proposed Action.

Table 2-15. Standard Maintenance Procedures for the Western Area Power Administration Reauthorization Project

Record Number	Procedure
	Air
A-1	Do not use equipment that has excessive exhaust emissions because they are in need of repair.
A-2	Use practical methods and devices to control air emissions. Emissions include dust from soil disturbance and other maintenance activities, and particulates from internal combustion engines. For example, control excessive dust emissions with water, minimizing dust generation on windy days. Use appropriate emissions controls on vehicles. Minimize long idling times on vehicles.
	Soils
S-1	Minimize maintenance in wet periods and on wet soils to prevent excessive rutting, erosion, and compaction.
S-2	Limit disturbance and removal of soils and vegetation during maintenance activities. These actions shall comply with applicable Clean Water Act requirements.
S-3	Construct water turnoff bars or small terraces across ROW trails on hillsides to prevent water erosion and to help establish natural revegetation.
	Water
W-1	Water drainages will not be redirected so that the water would follow a shorter course to natural drainages. Rainwater or groundwater that collects in an excavation (i.e., a hole dug to replace a damaged structure) will not be drained into surface water (i.e., a wetland, stream) without the appropriate permit.
W-2	All spills will be cleaned up immediately. There will be no refueling, chemical storage, or chemical mixing near (e.g., less than 250 feet) surface water.
W-3	Do not stockpile or deposit job materials (e.g., gasoline, chainsaws, and garbage containers) near stream banks, wetlands, lake shorelines, or other surface water. Ensure that project materials are staged away from potential high water areas or storm runoff drainages. These actions shall comply with applicable Clean Water Act requirements.
	Herbicides
H-1	All herbicide applicators shall be trained and licensed/certified in the appropriate categories.
H-2	Ensure that protected plants are avoided when applying herbicides.
H-3	All herbicide labels shall be strictly followed.
H-4	If posting and re-entry intervals are specified in the herbicide label, they will be enforced.
H-5	There will be no aerial application of herbicides.
H-6	Herbicides and application equipment shall be secured and not left unattended in areas with unrestricted access.

Table 2-15. Standard Maintenance Procedures for the Western Area Power Administration Reauthorization Project

Record Number	Procedure
H-7	All storage, equipment cleaning, residue disposal, container rinsing, and rinsate disposal requirements shall be followed.
H-8	Herbicides used near surface water such as wetlands, riparian areas or streams and springs would be approved for use near aquatic environments. These actions shall comply with applicable Clean Water Act requirements.
	Fishes, Wildlife, and Plants
B-1	Culverts needed at waterway crossings will be installed during periods of low flow and will not create a barrier to fish.
B-2	Excavations over 3 feet deep would be fenced, covered, or filled at the end of each working day, or have escape ramps to prevent entrapping wildlife. Trenches and holes will be inspected before filling to ensure wildlife is not entrapped. If discovered, wildlife will be allowed to escape on their own accord.
B-3	Pets must be under active restraint and not allowed to harm wildlife. No firearms are allowed at work sites.
B-4	Report mortalities or injuries of any protected wildlife species that occurs as a result of maintenance activities to WAPA or Forest Service biologist
B-5	Perform maintenance before or after the nesting season, unless logistical or site-specific circumstances do not permit a delay. In those cases, a survey for nesting birds protected under the MBTA will be conducted within one week of the start of activities. .
B-6	WAPA and the Forest Service will continue ongoing coordination prior, during, and following activities.
	Cultural
C-1	Upon discovery of potential cultural materials while digging, cease work in the immediate area (within 50 feet) of the find and notify WAPA's Regional Preservation Officer or Federal Preservation Officer. WAPA complies with the requirements of the Programmatic Agreement to avoid damage to cultural resources.
C-2	Avoid known cultural resources and follow current agreements. Ensure that crews (WAPA and Contractors) are informed of the locations of sensitive resources and that the resources are protected. Collection of cultural materials is forbidden.
C-3	Before beginning project activities, project personnel will be instructed on the protection of cultural and environmental resources. The information will address (a) federal and state laws regarding antiquities and plants and wildlife, including disturbance, collection, and removal, (b) the importance of these resources and the purpose and need to protect them, and (c) avoidance areas and special precautions.
	Recreation Sites
R-1	WAPA will make necessary arrangements to maintain access to developed recreation sites, trails, or trailheads outside transmission line ROWs to minimize impacts to recreation users.
	General
G-1	Limit the movement of crews and equipment to ROWs, including access routes, when practical.
G-2	When weather and ground conditions permit, obliterate project-caused deep ruts on or off roads. As needed loosen compacted soils by scarifying, harrowing, disking, or other approved methods. Repair damage to ditches, drainages, and access. Restore land and facilities as nearly as practical to the original grade condition.

Table 2-15. Standard Maintenance Procedures for the Western Area Power Administration Reauthorization Project

Record Number	Procedure
G-3	Repair fences and gates that may be damaged during maintenance activities. Restore to pre-construction condition.
G-4	When needed, post proper signs or other warnings to minimize impacts to activities by the public.
G-5	Minimize the spread of noxious weeds by cleaning equipment before moving from areas with noxious weeds to those without.
G-6	Equip vehicles with required noise abatement devices.
G-7	Ensure that spark arrestors are installed on chainsaws and other equipment that present a potential for starting fires.
G-8	All spills of hazardous materials (e.g., solvents, gasoline, diesel fuel, etc.) shall be promptly cleaned up and any contaminated soil, rags, absorbents, etc., shall be disposed on in accordance with the state and local waste disposal requirements. Any notifications required by the regulations shall be completed.
G-9	Do not burn or bury waste materials (e.g., garbage or other material brought into the site). Remove all waste materials from the project area and dispose of them properly or recycle them.
G-10	When work is finished, ensure that work areas except access trails are left in a condition that will help with natural revegetation (unless reseeding, mulching, or other specific requirements apply), provide for proper drainage, and prevent erosion. Seeding and mulch requirements will be specified. Seed mix will be approved by the Forest Service. All seed, mulch, and hay approved for use will be properly certified as weed-free.
G-11	Comply with applicable federal, state, and local environmental requirements. Before beginning project activities, instruct supervisory WAPA and contractor personnel on the protection of cultural and environmental resources at the site. Include in work orders and contracts the appropriate precautions related to cultural resources, wildlife, water quality, and other requirements.
G-12	Locate staging areas to preserve trees and vegetation when practical. Remove materials and debris from the site at the end of the job. As needed regrade and revegetate so that surfaces drain naturally, blend with the natural terrain, and are left in a condition that will help with revegetation, provide for proper drainage, and prevent erosion.
	Public Health and Safety
P-1	Use signs, flags, warning cones, and other devices as applicable in areas of public access to indicate that maintenance activities are ongoing. Ensure that any excavations are protected by fencing, covering, etc.
P-2	Ensure that workers are conspicuous by requiring bright clothing and hardhats.
P-3	Ensure that vehicles equipped with catalytic converters are not parked where vegetation could catch on fire.

NPDES National Pollutant Discharge Elimination System
ROW right-of-way
SWPP Stormwater Pollutions Prevention

2.4 Alternatives Considered but Eliminated from Detailed Study

NEPA requires federal agencies to evaluate all reasonable alternatives and to briefly discuss the reasons for dropping alternatives from further analysis. Public comments on the Proposed Action showed possible alternative methods to achieve some of the purpose and need of the Proposed Action. WAPA and the Forest Service considered the alternatives presented below and dropped them from detailed study for the stated reasons.

Remove all tall-growing trees in the transmission line ROWs in the project area

WAPA and the Forest Service considered an alternative to remove all tall-growing trees in the transmission line ROWs, but dropped it from detailed study. Vegetation conditions in the ROWs vary across each forest and transmission line, and not all areas require the same treatment methods. For example, lodgepole pine (a tall-growing tree species) might need to be cut in some areas so it does not interfere with the transmission lines; however, in areas where the transmission lines cross a drainage, the trees might never reach a height that could interfere with transmission lines and therefore would not require cutting. Removing all tall-growing trees along 273 miles of transmission line in the project area would remove wildlife habitat, negatively affect visual resources, needlessly impact other resources, unnecessarily introduce impacts described in Chapter 3 of the EIS, and require more funds and other resources to be used with no benefit to the stated purpose and need for the project, and it would not conform to WAPA's need to decrease environmental impacts.

Do not use herbicides in the project area to control vegetation

WAPA and the Forest Service considered an alternative prohibiting the use of herbicides, but dropped it from detailed study. In some cases, depending on location and vegetation type, the use of herbicides as a technique for vegetation management would be correct. For example, applying herbicides would be a proper technique for treating individual or small groupings of plants. Further, herbicides are a key and, sometimes, necessary tool for the removal of undesirable vegetation including, but not limited to, invasive plant species. Also, herbicide application can be carried out in a variety of ways including, but not limited to, low-volume foliar treatment and cut stump treatments. Prohibiting the use of herbicides would reduce WAPA's ability to efficiently and effectively control incompatible vegetation and noxious weeds. Herbicide use can be done in an environmentally responsible way with minimal impact when used in accordance with the design features, product label instructions, and state and Forest Service requirements. Prohibiting the use of herbicides in some cases would require the use of more environmentally damaging vegetation treatment techniques.

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CHAPTER 3 – AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

Introduction

This chapter describes the affected environment and environmental consequences associated with WAPA's ROWs and access, and the proposals to maintain the lines and change vegetation management activities. The project area is defined as the ROWs of the transmission lines on NFS lands in Colorado, Nebraska, and Utah, and the access needed for the maintenance and vegetation management activities. The ROWs include approximately 4,055 acres along 273 miles. The access includes approximately 753 miles. Table 3-1 lists the transmission line segments in each forest that make up the project area.

Table 3-1. Total Acres and Miles of Transmission Line Segments by National Forest

Transmission Line Segment	Total Acres	Total Miles
Arapaho-Roosevelt National Forest		
Archer-North Park	76.5	5.0
Ault-Craig	104.6	5.1
Blue River-Gore Pass	104.1	6.9
Green Mountain-Blue Ridge Repeater	3.0	1.0
Ashley National Forest		
Flaming Gorge-Vernal #1	62.9	6.6
Flaming Gorge-Vernal #3	189.7	19.6
Grand Mesa, Uncompahgre, and Gunnison National Forest		
Curecanti-Lost Canyon	90.2	6
Curecanti-North Fork	64.5	4.3
Curecanti-Poncha	155.1	10.2
Hesperus-Montrose	400.2	18.9
North Fork-Rifle	386.7	25.5
North Gunnison-Salida	105.1	11.6
Medicine Bow-Routt National Forest		
Archer-North Park	39.5	2.6
Ault-Craig	274.3	13.6
Gore Pass-Hayden	102	11.1
Gore Pass-Muddy Pass	19.7	1.7
Hayden-Gore Pass	332.5	22.0
Hayden-North Park	167.5	11.1
Nebraska National Forest		
Box Butte-Chadron	83.5	9.2
Pike and San Isabel National Forest		
Curecanti-Poncha	126.7	8.4
Malta-Mount Elbert	12.5	0.9
North Gunnison-Salida	72.4	8.0

Table 3-1. Total Acres and Miles of Transmission Line Segments by National Forest

Transmission Line Segment	Total Acres	Total Miles
San Juan National Forest		
Curecanti-Lost Canyon	218	14.5
Great Cut Switchyard-Great Cut Tap	0.9	0.2
Great Cut-McPhee	17.9	4.9
Hesperus-Montrose	661.6	31.2
White River National Forest		
Blue River-Gore Pass	106.3	7.0
Curecanti-Rifle	51.4	3.4
Green Mountain-Blue Ridge Repeater	1.4	0.5
Green Mountain-Kremmling	24.3	2.0
TOTAL	**4,055**	**273**

Source: WAPA Area Power Administration 2011

Each resource section includes an introduction, a description of the regulatory and policy framework, a description of the methods and assumptions for analysis, a description of the baseline (existing) conditions for each of the eight forests with WAPA transmission line segments, and the potential environmental consequences under the No Action Alternative and the Proposed Action, including potential direct, indirect, and cumulative impacts under each alternative. The environmental consequences discussions also address consistency of the alternatives with applicable regulations.

Impacts can be direct, indirect, long term, short term, adverse (negative), or beneficial (positive).

- Direct impacts are caused by the action and occur at the same time and place.
- Indirect impacts are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable. Indirect and direct impacts can be long term, short term, adverse, or beneficial.
- Long-term impacts would generally last beyond five years.
- Short-term impacts result in changes to the environment that are stabilized or mitigated relatively quickly and without long-term effects. Short-term impacts would be resolved within the first five years of the action.
- Beneficial effects improve the quality of a resource.
- Adverse effects diminish the quality of a resource.
- Cumulative impacts are the impact on the environment from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes the other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7).

Impact intensity describes the degree, level, or relative significance of an effect. The descriptors and their definitions are as follows:

- No effect – No discernible effect.
- Negligible – Effect is at the lowest level of detection and causes very little or no disturbance or improvement.
- Minor – Effect is slight but detectable, with some perceptible effects of disturbance or improvement.
- Moderate – Effect is readily apparent and has measureable effects of disturbance or improvement.
- Significant – Effect is readily apparent and has measureable effects of disturbance or improvement that are of local or regional importance, or set a precedent for future project undertakings. The significance of an impact criteria or threshold is determined resource by resource.

Appendix A identifies other present and reasonably foreseeable future actions considered in the cumulative impacts analysis for each resource. This EIS also includes a discussion of irreversible or irretrievable commitments of resources (see Section 3.17). A resource commitment is considered irreversible when impacts from its use would limit future use options and the change cannot be reversed, reclaimed, or repaired. A resource commitment is considered irretrievable when the use or consumption of the resource is neither renewable nor recoverable for use by future generations.

Resources Considered but Not Analyzed in this EIS

WAPA and the Forest Service selected the resources analyzed from the required "early and open scoping process" (40 CFR 1501.7) as part of preparing an EIS. Scoping is a process through which lead agencies solicit input from the public and interested agencies on the nature and extent of the actions, alternatives, and impacts to be addressed in an EIS, and the methods by which they would be analyzed. Chapter 1 describes the scoping process for this EIS. WAPA and the Forest Service considered all resources in the project area and determined that the proposed project would not impact several resources. As a result, this EIS does not discuss the following resources:

- Geology and mineral resources – The No Action Alternative and Proposed Action do not include activities that would reasonably be expected to affect geology or minerals. Geological conditions, such as the potential for landslides, earthquakes, and other unforeseen events, would not be expected to affect the No Action Alternative or Proposed Action.
- Groundwater – The No Action Alternative and the Proposed Action do not include activities that would reasonably be expected to affect groundwater.
- Hazardous materials and solid wastes – The decision from this EIS will not authorize a specific project. The normal use of vehicles and equipment will be addressed in the O&M plan.
- Land use and agricultural practices – WAPA's ROWs on NFS lands are not under active agricultural uses that would be affected by the actions analyzed in the EIS. WAPA could not identify potential impacts to this resource.
- Paleontology – WAPA is not proposing earthmoving, road construction, drilling, or similar activities under the No Action Alternative or Proposed Action. The actions addressed in this EIS are not expected to impact paleontological resources.
- Range – There are range resources such as active allotments, range vegetation resources, and range structural improvements crossing and adjacent to WAPA's ROWs on NFS lands. WAPA's

transmission lines have been in place for many years on NFS lands without conflicts to rangelands or rangeland uses.

- Social and economic values – Social values concern the human communities in the project area, including towns, cities, and rural areas; the customs, culture, and history of the area as it relates to human settlement; and current social values. Economic values are concerned with the production, distribution, and consumption of goods and services. The existing transmission lines are located on uninhabited NFS Lands and have been in place for many years. The No Action Alternative and Proposed Action do not include activities that would reasonably be expected to affect social and economic values.
- Wild and Scenic Rivers – There is one designated wild and scenic river (Cache La Poudre) in the Arapaho-Roosevelt National Forest; however, the designated section of river is approximately 24 miles from WAPA's transmission lines and WAPA's activities would not affect this river. No other designated wild and scenic rivers occur in the project area; therefore, the activities under the No Action Alternative and Proposed Action would not be expected to affect designated wild and scenic rivers.

3.1 Air Quality

3.1.1 Introduction

This section describes the existing air quality and climate in Colorado, Nebraska, and Utah where WAPA transmission line ROWs are present in the eight national forests. Air pollutants addressed in this EIS include criteria air pollutants, and sulfur and nitrogen compounds that could impair visibility or cause atmospheric deposition, including acid rain. Because of the types of equipment to be used in the transmission line maintenance work, emissions of hazardous air pollutants (HAPs) would be negligible. Therefore, this EIS does not discuss the impacts of HAPs.

Section 3.1.2 describes the regulatory and policy framework; Section 3.1.3 describes indicators for the analysis of impacts; Section 3.1.4 describes analysis methods and assumptions; Section 3.1.5 describes how air quality, visibility, and deposition in the region are monitored; Section 3.1.6 describes the affected environment (existing conditions) for air resources; Section 3.1.7 describes the climate in the project area; Section 3.1.8 addresses climate change; and Section 3.1.9 describes potential impacts to air quality in the project area including cumulative impacts on air quality and climate change.

3.1.2 Regulatory and Policy Framework

The Clean Air Act (CAA; 42 U.S.C. 7401 *et seq.*) and its amendments mandate the control of air pollutants throughout the United States. The CAA, promulgated in 1970 and amended in 1977 and 1990, obliges all federal agencies, including WAPA, to comply with state and local air pollution control requirements. The CAA addresses criteria air pollutants, state and National Ambient Air Quality Standards (NAAQS) for criteria air pollutants, and the Prevention of Significant Deterioration (PSD) program.

Further, NEPA (Public Law [PL] 91-190, January, 1 1970) requires WAPA to "… promote efforts which will prevent or eliminate damage to the environment …" and to "… attain the widest range of beneficial uses … without degradation, risk to health and safety, or other undesirable and unintended consequences …"

3.1.3 Indicators

The air pollutants addressed here include criteria air pollutants and sulfur and nitrogen compounds, which could contribute to visibility impairment and atmospheric deposition, including acid rain. The NAAQS set the maximum thresholds for criteria air pollutants. The state PSD programs establish allowable increases of a given pollutant for a particular area from specific sources. These standards and programs typically affect Class I air quality areas[1] or Sensitive Class II Wilderness Areas.[2]

Criteria Air Pollutants

To protect human health and welfare, the U.S. Environmental Protection Agency (EPA) established NAAQS for the following criteria pollutants: ozone, particulate matter (PM_{10} and $PM_{2.5}$), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and lead. Air pollutant concentrations greater than the NAAQS represent a risk to human health. If the air quality in a geographic area meets the NAAQS, the area is called an attainment area; areas that do not meet the NAAQS are called nonattainment areas, and states must develop comprehensive plans to reduce pollutant concentrations to a safe level. Attainment or nonattainment is determined separately for each criteria pollutant.

Visibility

Visibility, also referred to as visual range, is a subjective measure of the distance an observer can clearly see light or an object. Light extinction is used as a measure of visibility and is calculated from the monitored components of fine particle mass (aerosols) and relative humidity. It is expressed in deciviews, a measure for describing perceived changes in visibility. One deciview is defined as a change in visibility that is just perceptible to an average person, which is approximately a 10 percent change in light extinction. To estimate potential visibility impairment, monitored aerosol concentrations are used to reconstruct visibility conditions for each day monitored. The aerosol species include ammonium sulfate, ammonium nitrate, organic matter, elemental carbon, soil elements, and coarse mass. The daily values are then ranked from clearest to haziest and divided into three categories to indicate the mean visibility for all days (average) — the 20 percent of days with the clearest visibility (20 percent clearest), and the 20 percent of days with the worst visibility (20 percent haziest). Visibility can also be defined by standard visual range (SVR) measured in miles, which is the farthest at which an observer can see a black object viewed against the sky above the horizon; the larger the SVR, the cleaner the air. Visibility is important to visitors who come to enjoy the scenic beauty of public lands in the national parks and wilderness areas, often from a long distance. Having clear days for viewing opportunities is especially important for many visitors who are in the area for only a short period.

The EPA regional haze rule (RHR) published in 1999 requires that states establish goals (expressed in deciviews) that provide for reasonable progress toward achieving natural visibility conditions in Class I

………………………………………………

[1] *Class I air quality areas include national parks larger than 6,000 acres and wilderness areas larger than 5,000 acres that existed or were authorized as of August 7, 1977. They receive the highest degree of air quality protection under the CAA (National Park Service 2010a).*

[2] *The CAA designates national parks and wilderness areas larger than 5,000 acres that were in existence before 1997 as Class I areas. All other wilderness areas (and areas such as national monuments and seashores) are designated Class II. For air quality impact analyses as part of EIS development, the Class II wilderness area may be referred to as a sensitive Class II wilderness area because potential air pollutants could impair air quality concentrations, visibility, or lake acidification in these areas.*

areas (national parks and wilderness areas) within each state. Visibility in these areas is measured as part of the Interagency Monitoring of Protected Visual Environments (IMPROVE) network.

Atmospheric Deposition

Atmospheric deposition refers to processes in which air pollutants are removed from the atmosphere and deposited into terrestrial and aquatic ecosystems. Air pollutants can be deposited by precipitation (rain and snow) or the gravitational settling of gaseous pollutants on soil, water, and vegetation. Much of the concern about deposition is due to secondary formation of acids and other compounds from emitted nitrogen and sulfur species, such as oxides of nitrogen (NO_x) and SO_2, which can contribute to acidification of lakes, streams, and soils and affect other ecosystem characteristics, including nutrient cycling and biological diversity.

Substances deposited include:

- Acids such as sulfuric acid (H_2SO_4) and nitric acid (HNO_3), sometimes referred to as acid rain
- Air toxics such as pesticides, herbicides, and volatile organic compounds (VOCs)
- Heavy metals such as mercury
- Nutrients such as nitrates (NO_3^-) and ammonium (NH_4^+)

The accurate measurement of atmospheric deposition is complicated by contributions to deposition from several components — rain, snow, cloud water, particle settling, and gaseous pollutants. Deposition varies with precipitation and other meteorological variables (e.g., temperature, humidity, winds, and atmospheric stability), which in turn, vary with elevation and time.

Federal land managers, including the Forest Service and National Park Service, have established guidelines or Levels of Concern (LOC) for total deposition of nitrogen and sulfur compounds in Class I Wilderness Areas. Total nitrogen deposition of 1.5 kilograms per hectare per year (kg/ha/yr) or less is considered to be unlikely to harm terrestrial or aquatic ecosystems. For total sulfur deposition, the LOC is 3 kg/ha/yr.

3.1.4 Methods and Assumptions for Analysis

To describe the affected environment for air quality in the Colorado, Nebraska, and Utah project areas, WAPA used existing air quality data from air pollution monitors operated by various state and federal agencies, and examined the data to assess current conditions and recent trends. WAPA also examined meteorological data to assess current climate conditions of the area. As mandated by the CAA, the EPA has jurisdiction to evaluate air quality conditions, and classifies areas in relation to the applicable NAAQS for criteria pollutants. Possible classifications include:

- **Attainment** – The area complies with the applicable primary and secondary ambient air quality standard for the particular pollutant.
- **Nonattainment** – The area does not comply with the standard or contains sources that contribute to an adjacent area being not in compliance.
- **Unclassified** – The area does not have enough monitoring data to assess whether it complies with the applicable standard.

Although there are no monitors along the transmission line ROWs, data from nearby monitors are assumed to be representative of regional air quality conditions discussed in this chapter.

The approach to analyzing potential air quality impacts of the planned ROW maintenance activities (in the Environmental Consequences section below) is more qualitative than quantitative, and for the analysis, WAPA developed a list of representative equipment typically used for maintenance activities. The list includes emission factor information for maintenance equipment in terms of mass of emissions per hour of operation, and for vehicles in terms of mass per mile traveled. WAPA examined this information and used it to compare with emissions from other known activities or sources in the area to estimate potential impacts to air quality, including those affecting criteria pollutant concentrations, visibility, and atmospheric deposition. Because the amount and timing of specific activities that might be needed to maintain ROW will vary considerably by location and over time, the amount of emissions cannot be specifically predicted. Because emissions from the ROW maintenance activities are small, localized, and widely scattered along the various ROWs in the national forests throughout the three states, WAPA did not model air quality to assess potential impacts as part of this analysis.

Impact Criteria and Indicators

An impact on air quality can result if any of the following would occur as a direct result of emissions from activities expected to be undertaken during the proposed project:

- Project emissions would result in a significant increase of any criteria pollutant for which the project region is in nonattainment under an applicable local, state, or federal ambient air quality standard.
- Estimated pollutant concentrations would exceed the maximum allowable PSD increments for PM_{10}, NO_2, or SO_2.
- Project emissions that would result in a declaration of nonattainment in a specific area for one or more criteria pollutants, or would cumulatively contribute to a net increase in any criteria pollutant that would result in a designation of nonattainment.
- Project emissions that would exceed Class I or Class II increment values established by the PSD regulations.
- Project emissions that would contribute to a cumulative air quality effect that could lead to violations of air quality standards, even if the individual effect of the project or activity is relatively minor compared to other sources in the region.
- Estimated deposition of sulfates and nitrates would exceed established depositional guidelines in areas classified as sensitive to acidification.

3.1.5 Monitoring of Air Quality, Visibility, and Deposition in the Region

State and federal agencies monitor air pollutant concentrations, visibility, and atmospheric deposition at several locations throughout western Colorado, northwestern Nebraska, and northeastern Utah. Some of the monitoring sites are near or relatively near the transmission lines in the national forests.

For this analysis, WAPA focuses on measurements likely to be representative of the regional air quality in the project area, especially the nearby wilderness and Class I areas. The air quality data used for this analysis include ozone data for selected State and Local Air Monitoring Sites (SLAMS) from the EPA Air Quality System (AQS), and particulate and visibility data from the IMPROVE dataset. As applicable, wet deposition-related concentration data for sulfates, nitrates, and ammonium from the National Atmospheric Deposition Program (NADP) and dry deposition data for sulfates, nitrates, and ammonium from the Clean Air STatus and Trends Network (CASTNet) are included. Table 3-2 summarizes air quality and deposition data monitoring for the selected sites.

Table 3-2. Air Quality Monitoring Sites in the Colorado, Nebraska, and Utah Region

Parameter(s)	County, State	Site	Type of Monitor	Operating Schedule	Location	
					Longitude	Latitude
Ozone	Larimer, CO	Rocky Mountain National Park	SLAMS	Hourly	40.2772	-105.545
	Montezuma, CO	Mesa Verde National Park	SLAMS	Hourly	37.1983	-108.490
PM_{10}, $PM_{2.5}$, Visibility	Routt, CO	Mount Zirkel Wilderness	IMPROVE	1 in 3 days	40.5383	-106.677
	Larimer, CO	Rocky Mountain National Park	IMPROVE	1 in 3 days	40.2783	-105.546
	Plata, CO	Weminuche Wilderness	IMPROVE	1 in 3 days	37.6594	-107.800
	Montezuma, CO	Mesa Verde National Park	IMPROVE	1 in 3 days	37.1984	-108.491
	Garfield, CO	White River National Forest	IMPROVE	1 in 3 days	39.1536	-106.8209
	Garden, NE	Crescent Lake	IMPROVE	1 in 3 days	41.7627	-102.434
Dry Deposition	Larimer, CO	Rocky Mountain National Park	CASTNet	Weekly	40.2770	-105.545
	Gunnison, CO	Gothic	CASTNet	Weekly	38.9573	-106.985
	Montezuma, CO	Mesa Verde National Park	CASTNet	Weekly	37.1980	-108.490
Wet Deposition	Larimer, CO	Rocky Mountain National Park	NADP	Weekly	40.3642	-105.582
	Garfield, CO	Sunlight Peak	NADP	Weekly	39.4272	-107.380

Source: Colorado State University 2011

CASTNet Clean Air Status and Trends Network
CO Colorado
IMPROVE Interagency Monitoring of Protected Visual Environments
NADP National Acid Deposition Program
NE Nebraska
$PM_{2.5}$ particulate matter less than 2.5 microns in diameter
PM_{10} particulate matter less than 10 microns in diameter
SLAMS State and Local Air Monitoring Site

3.1.6 Affected Environment

3.1.6.1 Air Quality

The existing air quality in the project area is typical of undeveloped regions in the western United States. Most of the region is designated as attainment or unclassified for all applicable NAAQS for criteria pollutants.

Ozone

In general, ground-level ozone is a regional issue primarily affecting metropolitan areas in Colorado, Nebraska, Utah, and surrounding states. Ozone is formed in the lower atmosphere by a series of reactions involving sunlight and precursor emissions of NO_x and VOCs. Ozone and its precursors can be transported regionally, and ozone transport can lead to high ozone concentrations outside urban areas.

Based on their locations outside the urban areas, two ozone monitoring sites — one in Rocky Mountain National Park and one in Mesa Verde National Park — are expected to be representative of regional ozone concentrations in western Colorado. There are no ozone monitors in the affected areas of Nebraska and Utah. Compliance with the 8-hour ozone NAAQS is based on the ozone “design value,” which is defined as the 3-year average of the annual fourth highest observed 8-hour average ozone concentration. Based on available data for 2008 through 2010, the estimated ozone design value for Rocky Mountain National Park is 74 parts per billion (ppb) and for Mesa Verde National Park it is 68 ppb. Both are below the current 8-hour ozone NAAQS of 75 ppb.

Particulate Matter

Sources of particulate matter (both PM_{10} and $PM_{2.5}$) in the project area include a variety of human causes, and might also include fugitive dust associated with post-burn conditions from wildfires and from unpaved roads. High winds can contribute to PM concentrations.

PM data are available for several IMPROVE sites in the project area. Table 3-3 summarizes and compares the latest available PM_{10} and $PM_{2.5}$ concentrations from selected sites in these areas with the NAAQS. These sites were selected to represent recent regional concentrations in and near the national forests of interest. As shown in Table 3-2, Crescent Lake is in Nebraska; the other sites are in Colorado.

Table 3-3. Summary of Representative PM Concentrations for 2008–2010 for Interagency Monitoring of Protected Visual Elements Sites Compared with the National Ambient Air Quality Standards

Pollutant	Averaging Time	NAAQS	Mt. Zirkel Wilderness	Rocky Mountain NP	Weminuche Wilderness	Mesa Verde NP	Crescent Lake
		(μg/m³)	(μg/m³)	(μg/m³)	(μg/m³)	(μg/m³)	(μg/m³)
PM_{10}	24-hour	150[1]	51.0	44.9	142.4	186.1	62.5
$PM_{2.5}$	Annual	15[2]	2.2	2.8	2.6	3.0	3.8
	24-hour	35[3]	5.6	7.4	9.3	9.9	9.4

[1]Not to be exceeded more than once per year on average over 3 years. Maximum 24-hour value for 2008 through 2010; all maxima are for 2008.
[2]Three-year average of the weighted annual mean $PM_{2.5}$ concentration in an area must not exceed 15 μg/m³.
[3]Three-year average of the 98th percentile of 24-hour concentrations in an area must not exceed 35 μg/m³.

μg/m³ micrograms per cubic meter
Mt. Mount
NAAQS National Ambient Air Quality Standards
NP National Park
$PM_{2.5}$ particulate matter less than 2.5 microns in diameter
PM_{10} particulate matter less than 10 microns

IMPROVE monitors are not federal reference method monitors and not generally used to demonstrate attainment of the PM standards. The maximum PM_{10} concentration for Mesa Verde National Park exceeds 150 micrograms per cubic meter ($\mu g/m^3$), but this occurs only once during the 3-year period (in 2010). So, all sites are likely to be in compliance with the NAAQS for PM_{10} and $PM_{2.5}$.

Visibility

Visibility data for the nearby Class I areas indicate that all three areas experience at least some visibility impairment, particularly on the haziest days. The EPA RHR issued in 1999 requires states to establish Reasonable Progress Goals for improving visibility, with the overall goal of attaining natural visibility conditions by 2064. Thus, one measure of visibility is a comparison with natural visibility conditions. Table 3-4 compares visibility in deciviews for 2009 (the most recent year for which there are visibility data) for the IMPROVE sites in and near the project area with the natural visibility conditions established for these areas (EPA 2003). As shown in Table 3-2, Crescent Lake is in Nebraska; the other sites are in Colorado.

Table 3-4. Summary of Visibility Conditions for 2009 for Selected Interagency Monitoring of Protected Visual Environments Sites Compared with Natural Visibility Conditions

Grouping	Mt. Zirkel Wilderness		Rocky Mountain National Park		Weminuche Wilderness		Mesa Verde National Park		Crescent Lake	
	2009 IMPROVE (dv)	Natural Visibility (dv)	2009 IMPROVE (dv)	Natural Visibility (dv)	2009 IMPROVE (dv)	Natural Visibility (dv)	2009 IMPROVE (dv)	Natural Visibility (dv)	2009 IMPROVE (dv)	Natural Visibility[1] (dv)
20% Best Days	1.3	2.0	2.6	1.9	2.2	1.9	3.0	2.0	4.9	2.2
20% Worst Days	9.5	7.1	11.9	7.1	10.0	7.1	11.6	7.1	16.3	7.3
All Days	5.0	4.5	6.7	4.5	5.7	4.5	6.7	4.5	10.2	4.7

[1]Natural visibility value for nearby Badlands, South Dakota.

dv deciview
IMPROVE Interagency Monitoring of Protected Visual Environments
Mt. Mount

Acid Deposition

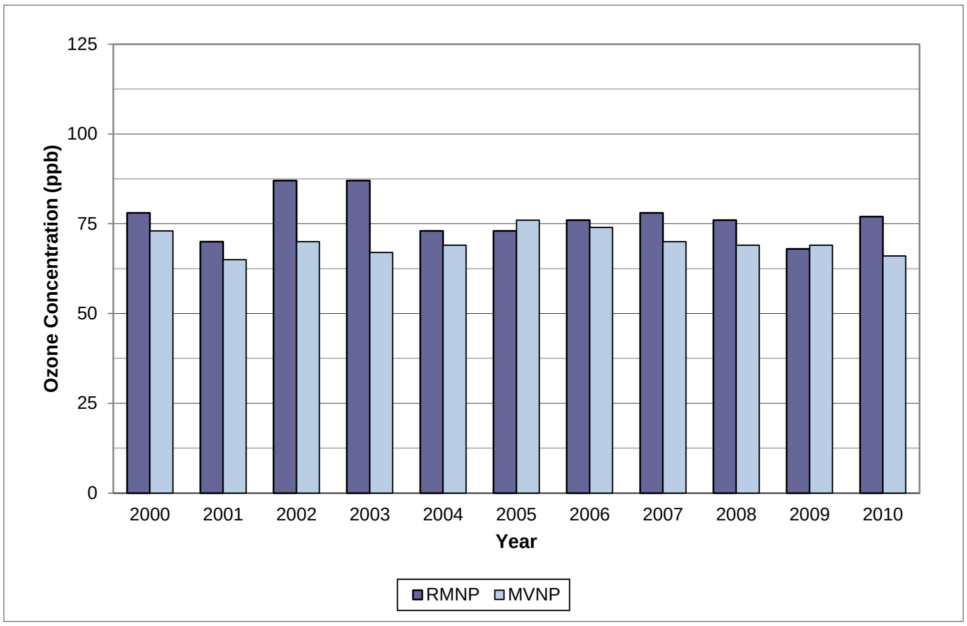
Atmospheric deposition of air pollutants can increase the acidity of soils and water resources. Measurements of atmospheric dry deposition are currently being taken at four locations in the project area, and measurements of wet deposition are taken at two locations. The data are used to monitor levels of deposition that could be detrimental to the area; of most concern are the levels of nitrogen and sulfur deposition. Recently, the National Park Service initiated a program in Rocky Mountain National Park to investigate sources contributing to deposition in the park (National Park Service 2009).

3.1.6.2 Trends

Ozone

Figure 3-1 shows the annual fourth highest 8-hour average ozone concentration for the Rocky Mountain and Mesa Verde National Park monitoring sites for 2000 through 2010. As noted earlier, the fourth highest 8-hour average ozone concentration for each year is used to calculate the design value and assess compliance with the ozone NAAQS. Also note that data for 2010 are incomplete.

Figure 3-1. Fourth Highest 8-Hour Average Ozone Concentration for the Rocky Mountain National Park and Mesa Verde National Park Ozone Monitoring Sites

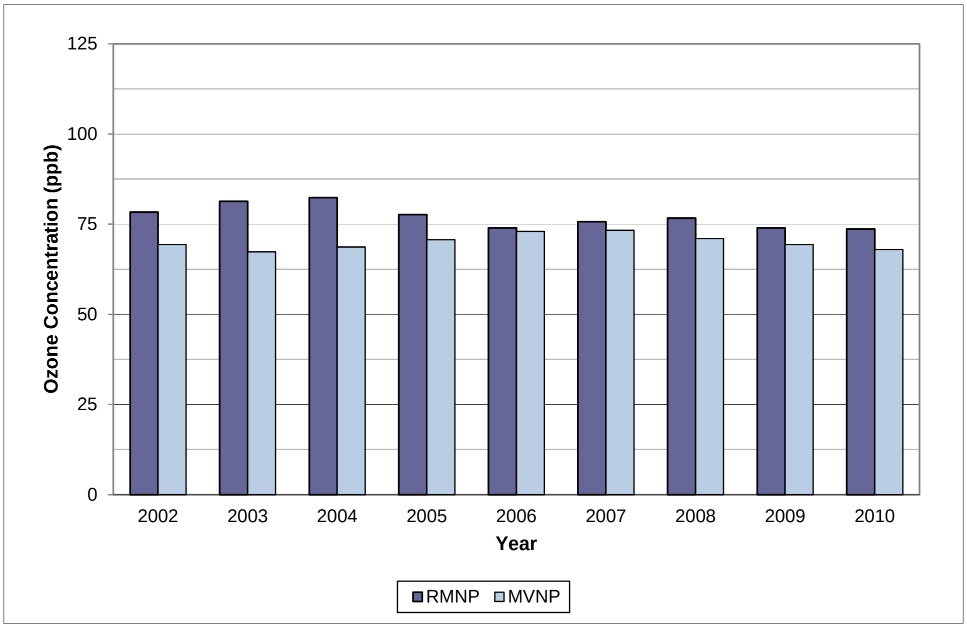


Data source: Colorado State University 2011

MVNP	Mesa Verde National Park
ppb	parts per billion
RMNP	Rocky Mountain National Park

Figure 3-2 shows the 8-hour ozone design values for the same sites for 2002 through 2010. Overall, there is a slight downward (statistically significant) trend in this metric during this period for Rocky Mountain National Park; there is no discernible trend for Mesa Verde National Park.

Figure 3-2. 8-Hour Ozone Design Value for the Rocky Mountain National Park and Mesa Verde National Park Ozone Monitoring Sites



Data source: Colorado State University 2011
NOTE: The NAAQS for 8-hour average ozone concentrations is 75 ppb.

MVNP	Mesa Verde National Park
NAAQS	National Ambient Air Quality Standards
ppb	parts per billion
RMNP	Rocky Mountain National Park

Particulate Matter

Figure 3-3 shows the maximum 24-hour PM_{10} concentration for each year during the period 2000 through 2010 for the IMPROVE sites at Rocky Mount National Park, Mesa Verde National Park, and Crescent Lake. WAPA selected these sites to represent trends in PM and visibility for the project area.

Figure 3-3. Maximum 24-Hour Average PM_{10} Concentration for the IMPROVE Monitoring Sites at Rocky Mountain National Park, Mesa Verde National Park, and Crescent Lake

Data source: Colorado State University 2011

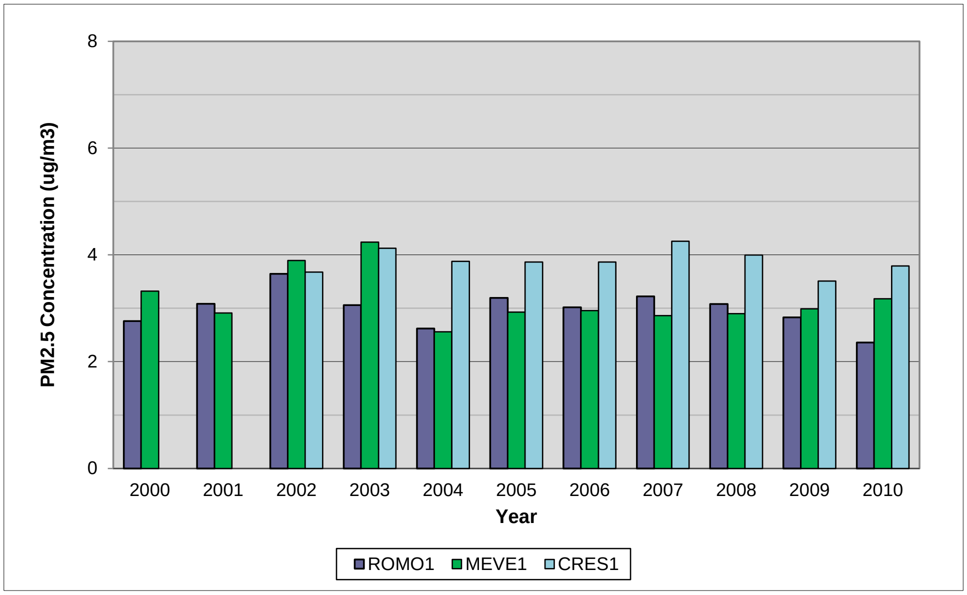
NOTE: The NAAQS for 24-hour average PM_{10} is 150 µg/m³.

µg/m³	micrograms per cubic meter
CRES1	Crescent Lake
MEVE1	Mesa Verde National Park
NAAQS	National Ambient Air Quality Standards
PM_{10}	particulate matter less than 10 microns
ROMO1	Rocky Mountain National Park

The data indicate significant year-to-year variation, and overall, no trend in the 24-hour PM_{10} values for Rocky Mountain National Park, an upward trend for Mesa Verde National Park, and a slight upward trend for Crescent Lake during this period. Only the trend for Crescent Lake is statistically significant.

Figure 3-4 shows the annual average $PM_{2.5}$ concentrations for each year from 2000 through 2010 for the three IMPROVE sites.

Figure 3-4. Annual Average $PM_{2.5}$ Concentration for the IMPROVE Monitoring Sites at Rocky Mountain National Park, Mesa Verde National Park, and Crescent Lake



Data source: Colorado State University 2011

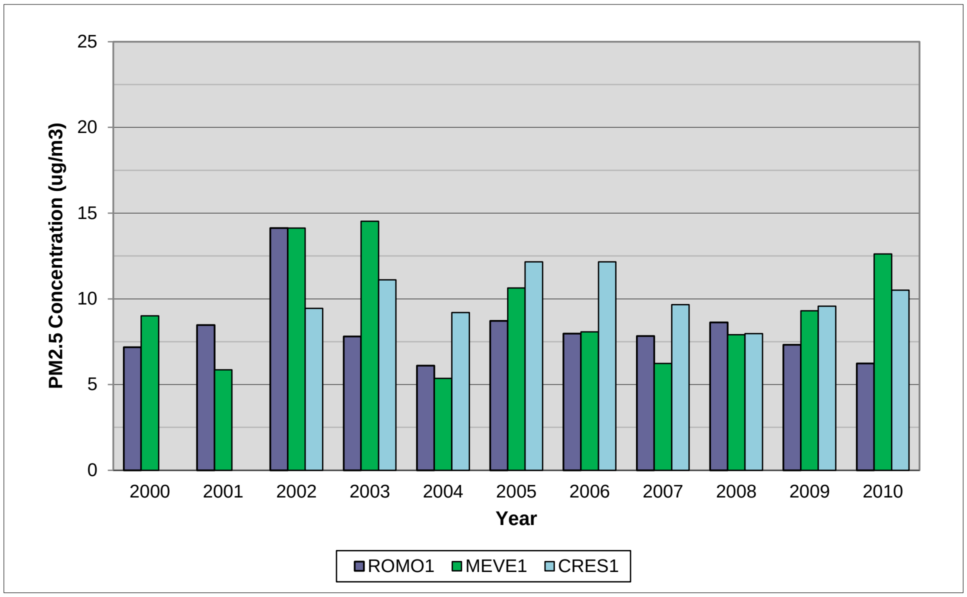
NOTE: The NAAQS for annual average $PM_{2.5}$ is 15 µg/m^3.

µg/m^3	micrograms per cubic meter
CRES1	Crescent Lake
MEVE1	Mesa Verde National Park
NAAQS	National Ambient Air Quality Standards
$PM_{2.5}$	particulate matter less than 10 microns
ROMO1	Rocky Mountain National Park

Overall, the data indicate a downward trend in the annual average $PM_{2.5}$ values for all three sites during this period. None of the trends are statistically significant.

Figure 3-5 shows the 98th percentile $PM_{2.5}$ concentration for each year from 2000 through 2010 for the sites.

Figure 3-5. 98th Percentile 24-Hour $PM_{2.5}$ Concentration for the IMPROVE Monitoring Sites at Rocky Mountain National Park, Mesa Verde National Park, and Crescent Lake



Data source: Colorado State University 2011

NOTE: The NAAQS for 24-hour average $PM_{2.5}$ is 35 µg/m³.

µg/m³	micrograms per cubic meter
CRES1	Crescent Lake
MEVE1	Mesa Verde National Park
NAAQS	National Ambient Air Quality Standards
$PM_{2.5}$	particulate matter less than 10 microns
ROMO1	Rocky Mountain National Park

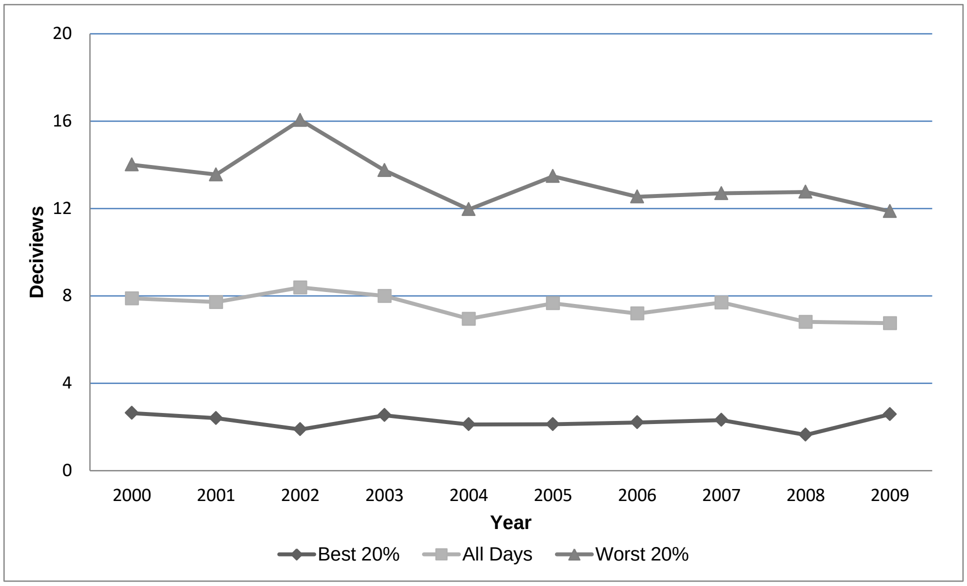
For this metric, there is significant variation from year to year, and overall, the data indicate a downward trend in 24-hour $PM_{2.5}$ concentrations for Rocky Mountain National Park and Crescent Lake, and no trend for Mesa Verde National Park during this period. None of the trends are statistically significant.

Visibility

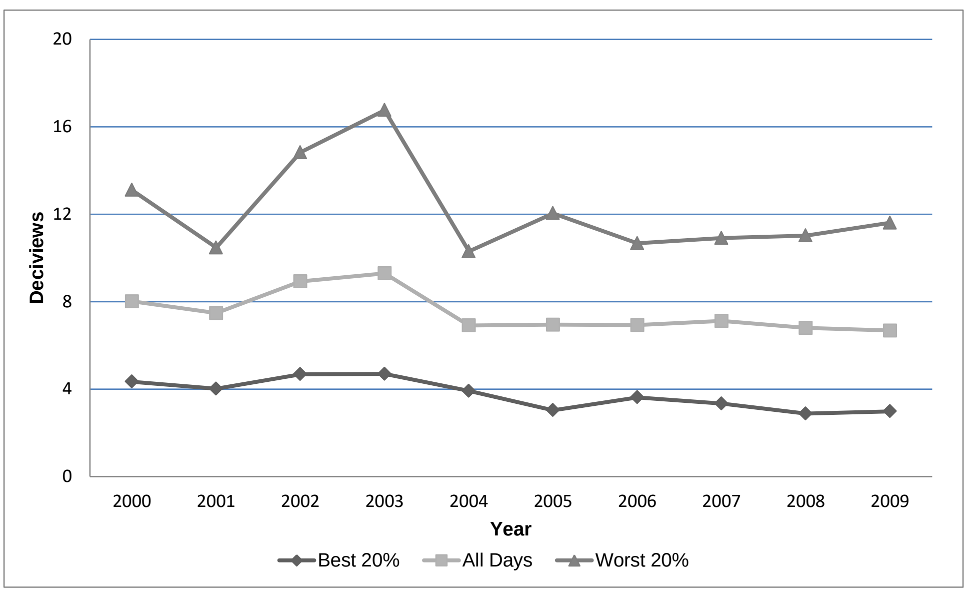
Figure 3-6 (A through C) shows annual average visibility in deciviews for the 20 percent best days, 20 percent worst days, and all days for each year during the period 2000 through 2009 for the IMPROVE sites at Rocky Mountain National Park, Mesa Verde National Park, and Crescent Lake.

Figure 3-6. Annual Average Visibility for the IMPROVE Monitoring Sites

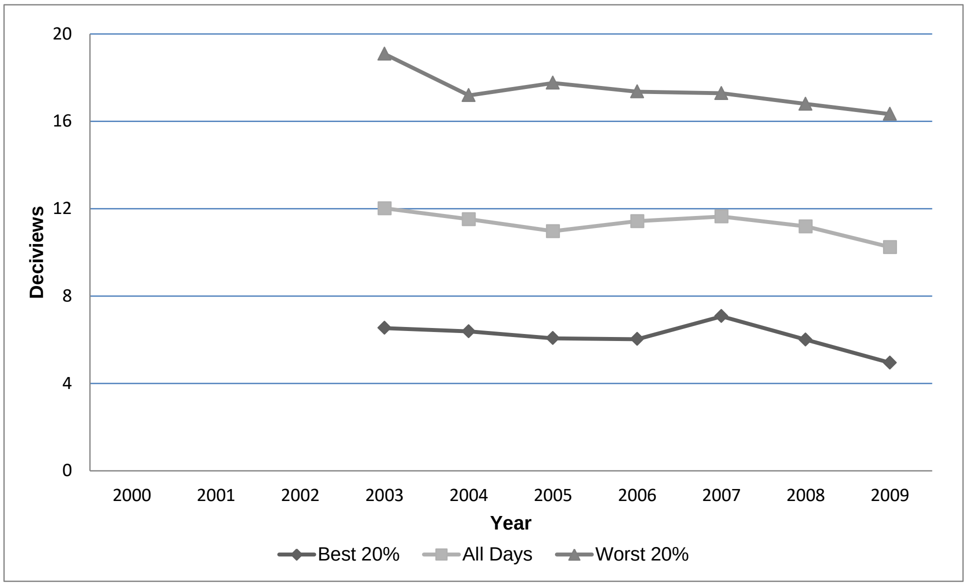
A) Rocky Mountain National Park



B) Mesa Verde National Park



C) Crescent Lake



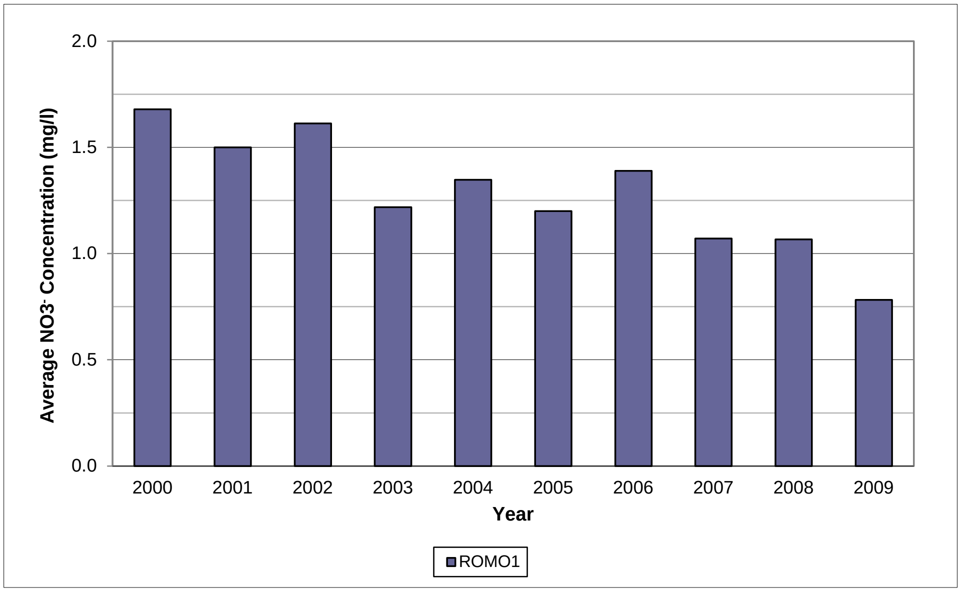
Data for Rocky Mountain National Park indicate a downward trend (improved visibility) for the 20 percent worst days and all-days categories, and no trend for the 20 percent best days category. Data for Mesa Verde National Park and Crescent Lake indicate a downward trend and improved visibility for all categories. The data for the 20 percent worst days vary more from year to year, especially at the national park sites, possibly due the effects of wildfires, which also can vary year to year. Note that data collection for Crescent Lake began in 2002. In all three cases, the trends are statistically significant for one or more of the categories, including the 20 percent worst days and all-days categories for Rocky Mountain National Park, the 20 percent best days and all-days categories for Mesa Verde National Park, and the 20 percent worst days category for Crescent Lake.

Acid Deposition

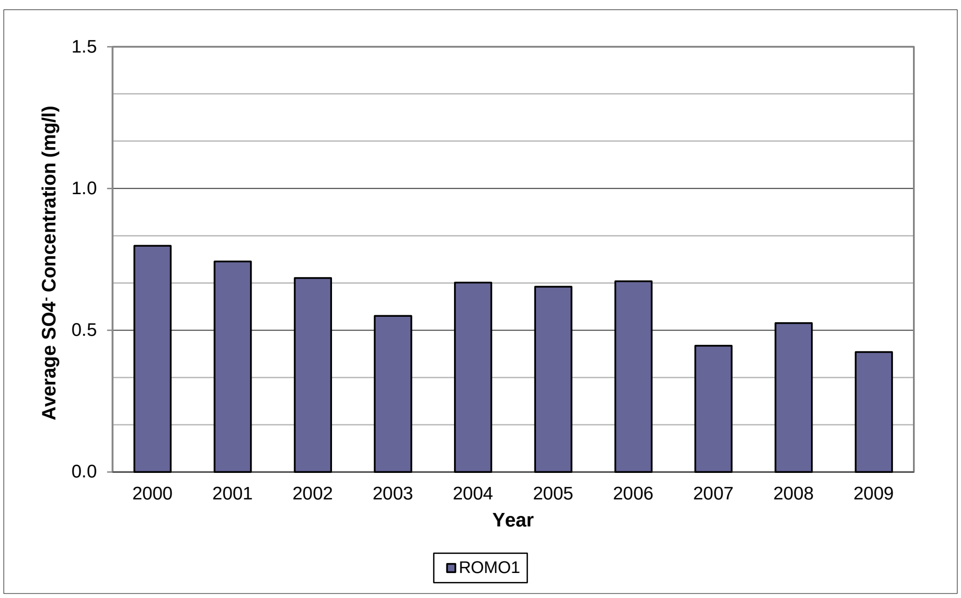
Figure 3-7 shows annual average concentration data for NO_3^-, sulfate ion (SO_4^-), and NH_4^+ from precipitation samples for each year during the period 2000 through 2009 for the NADP site at Rocky Mountain National Park. For each year, the data represent the average concentration based on all sampling periods.

Figure 3-7. Annual Average Concentration for the National Atmospheric Deposition Monitoring Sites at Rocky Mountain National Park

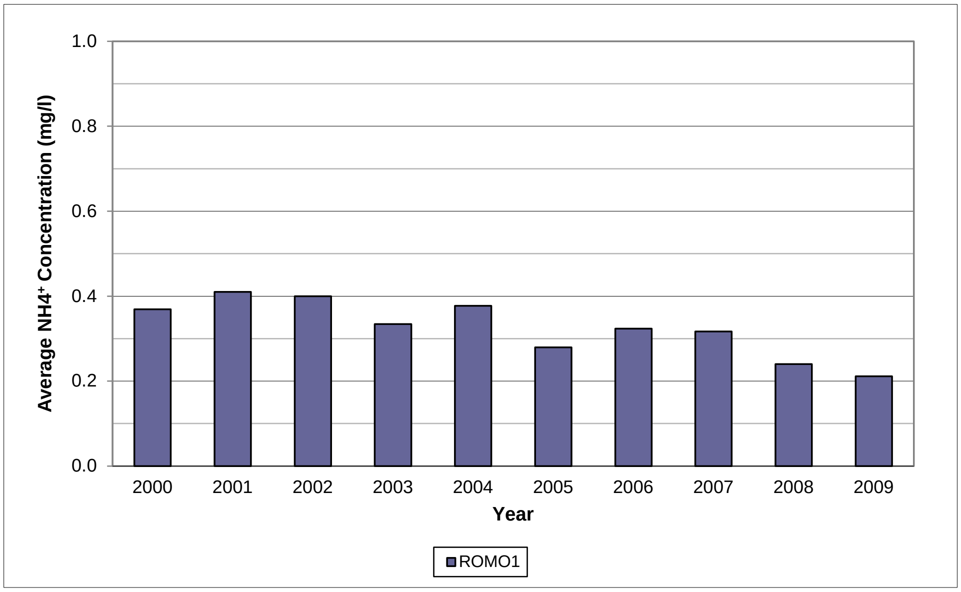
Nitrate Ion Concentration



Sulfate Ion Concentration



Ammonium Ion Concentration



mg/l milligrams per liter
ROMO1 Rock Mountain National Park

The data indicate a decrease over time in nitrate, sulfate, and ammonium concentrations in precipitation samples during this period. In all three cases, the trends are statistically significant.

3.1.7 Climate

The project area includes portions of the western Great Basin and the Rocky Mountains, with high flat plains in eastern Colorado and northwest Nebraska, and mountainous regions of central and western Colorado and northeastern Utah where the national forests are located.

Nebraska National Forest is in the northwestern part of the state and experiences a semi-arid climate with relatively warm summers and cold winters, and seasonal variations in precipitation and temperature. The western panhandle area of Nebraska experiences lower humidity and lower annual precipitation, averaging approximately 13.8 inches. Table 3-5 lists 50-year averages of climatological data for the nearby Hay Springs, Nebraska monitor, with wind information included for the Alliance, Nebraska site. The Hay Springs site experiences higher average precipitation than the region-wide average for this part of Nebraska.

Table 3-5. Climate Information for Hay Springs, Nebraska (1951–2010)

Climate Component	Hay Springs, Nebraska
Mean annual maximum temperature (degrees Fahrenheit)	61.7
Mean summer (June, July, August) maximum temperature (degrees Fahrenheit)	84.7
Mean annual minimum temperature (degrees Fahrenheit)	31.8
Mean winter (December, January February) minimum temperature (degrees Fahrenheit)	11.6
Mean annual temperature (degrees Fahrenheit)	48.1
Mean annual precipitation (inches)	16.2
Mean annual snowfall (inches)	30.7
Mean annual wind speed (miles per hour)	5-10[1]
Prevailing wind direction (indicates direction from which the winds are blowing)	W[1]

Source: High Plains Regional Climate Center 2011

[1]Alliance, Nebraska

The Arapaho-Roosevelt National Forest, Grand Mesa, Uncompahgre and Gunnison National Forest, Medicine Bow-Routt National Forest, Pike and San Isabel National Forest, San Juan National Forest, and White River National Forest are in the Rocky Mountains of Colorado in sub-alpine and alpine climate zones with elevations ranging from 5,000 to more than 13,500 feet. Table 3-6 lists recent average temperature, precipitation, and wind speed data for Grand Junction, Colorado, a representative site in western Colorado near a number of these forests. Located in the sub-alpine zone at an elevation of 4,597 feet, the climate zone is considered semi-arid to arid in the region referred to as the “high desert” country, with an average precipitation of nine inches per year.

Table 3-6. Climate Information for Grand Junction, Colorado (1996–2008)

Climate Component	Grand Junction, Colorado
Mean annual maximum temperature (degrees Fahrenheit)	66.4
Mean summer (June, July, August) maximum temperature (degrees Fahrenheit)	91.3
Mean annual minimum temperature (degrees Fahrenheit)	40.2
Mean winter (December, January February) minimum temperature (degrees Fahrenheit)	22.7
Mean annual temperature (degrees Fahrenheit)	53.3
Mean annual precipitation (inches)	9.0
Mean annual snowfall (inches)	23.6
Mean annual wind speed (miles per hour)	7.0
Prevailing wind direction (indicates direction from which the winds are blowing)	ESE

Source: Western Regional Climate Center 2011

Ashley National Forest in northeastern Utah is situated on the northern edge of the Colorado Plateau in mountainous terrain with elevations ranging from 6,000 to 13,500 feet. The climate of the area is semi-arid to arid, with annual precipitation of less than 10 inches. Table 3-7 lists recent climatological information for nearby Vernal, Utah.

Table 3-7. Climate Information for Vernal, Utah (1998–2008)

Climate Component	Vernal, Utah
Mean annual maximum temperature (degrees Fahrenheit)	61.0
Mean summer (June, July, August) maximum temperature (degrees Fahrenheit)	86.7
Mean annual minimum temperature (degrees Fahrenheit)	32.9
Mean winter (December, January February) minimum temperature (degrees Fahrenheit)	12.2
Mean annual temperature (degrees Fahrenheit)	46.9
Mean annual precipitation (inches)	8.0
Mean annual snowfall (inches)	15.3
Mean annual wind speed (miles per hour)	5.3
Prevailing wind direction (indicates direction from which the winds are blowing)	W

Source: Western Regional Climate Center 2011

3.1.8 Climate Change

Throughout the project area, alterations in future weather and land-use conditions resulting from possible changes in the overall climate of the region could affect a number of resources. Meteorological data collected throughout the world during the last 50 years show strong indications of a warming planet. Other environmental data collected from oceans, wetlands, forests, and polar regions (associated with ice pack extent, thickness, and melting) corroborate the global warming trend. It is well known that certain gases in the atmosphere allow short-wave radiation from sunlight (visible light, ultraviolet, and near infrared) through the atmosphere. These gases include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_20), water vapor, and other trace gases. When the sun's radiation strikes Earth's surface, heat is generated in the form of infrared radiation. These same gases act to absorb longer wave infrared radiation, resulting in a warming of the atmosphere. This phenomenon is known as the "greenhouse effect," because these gases, referred to as greenhouse gases (GHGs), act to trap heat in the atmosphere similar to a greenhouse.

Throughout Earth's history, the proportions of the major constituents of the atmosphere (oxygen and nitrogen), which make up 99 percent of the atmosphere, have changed somewhat over time due to natural and geogenic processes. The concentrations of minor constituents such as CO_2, CH_4, N_2O, and water vapor have also varied somewhat throughout history. Since the advent of the Industrial Revolution in the 1700s, fossil fuels (coal, oil, and natural gas) have been used for heat and power generation throughout the world. This has resulted in increases in the concentrations of GHGs, compared to pre-industrial concentrations, as estimated using long-term historical records of ice-core samples. During the last 50 years, the rate of this increase in GHG concentrations, especially CO_2, has shown a dramatic upward trend, likely due to the increased burning of fossil fuels brought on by larger populations demanding more energy throughout the world, especially in Asia and other newly developing countries. The increases in CO_2 are due to the use of fossil fuels and certain changes in land use, while the major human activities that cause increases in CH_4 and N_2O include animal manure management, agricultural soil management, sewage treatment, and combustion of fossil fuels in stationary and mobile sources (IPCC 2007a).

3.1.8.1 Indicators

In the project area, most GHG emissions, primarily in the form of CO_2, result from the combustion of fossil fuels for energy use and transportation. Energy demand is driven by population growth, economic development, and seasonal weather conditions. Other activities potentially contributing to CO_2 emissions include emissions from prescribed burning and wildfires. CH_4 emissions result from landfills, the development of fossil fuel resources (coal mines, and oil and gas drilling and production operations), and agricultural and livestock activities.

3.1.8.2 Current Conditions

Throughout the project area, numerous activities and actions result in GHG emissions; the largest contributors are the combustion of fossil fuels in power plants, and the use of on-road and off-road vehicles, internal combustion engines, and construction equipment. In addition to direct GHG emissions from these activities, indirect GHG emissions and other factors potentially contributing to climate change include electricity generated outside the region, land use changes (e.g., converting forested areas to agricultural use), and soil erosion. Maintenance activities involving the use of various vehicles and equipment along the transmission line ROWs result in very small amounts of GHG emissions that contribute to the regional, national, and global pool of GHG emissions.

3.1.8.3 Trends

As previously noted, meteorological and other environmental data from the last 50 years show strong indications of global warming and a relatively steep upward trend in observed global temperatures. For example, temperature data collected around the globe during the 50-year period 1956 through 2005 show a warming trend nearly twice that observed during the 100-year period 1906 to 2005 (IPCC 2007b). The observations indicate that temperature increases have been observed over all parts of Earth, with the largest increases occurring in the northern latitudes. In addition to direct temperature measurements, responses to these changes are indicated by other environmental data collected in forests, oceans, reefs, wetlands, ecosystems, glaciers, and icepacks throughout the world. Some researchers have also attributed the increased frequency and intensity of large-scale and mesoscale weather systems (e.g., hurricanes, tropical storms, tornadoes, and severe storms) to the observed increases in global temperatures. The nine warmest years on record (since approximately 1850) have all occurred since 1998, with 2005 and 2010 tying as the two warmest years. Data collected during the last half century in the Mountain West show an approximate 1.5 degrees Fahrenheit (^{o}F) increase in average surface temperature (Global Change Research Program 2009), with the largest increase in average temperature occurring in the winter months. The research also notes that cold days are becoming less frequent and hot days are becoming more frequent throughout the region.

During the last half century, the world's population, energy use, industrial activity, fossil fuel development, deforestation, and conversion of undeveloped land have increased substantially, resulting in direct and indirect GHG emissions or effects on the environment that contribute to global warming.

3.1.9 Environmental Consequences

This section describes impacts on air quality for the No Action Alternative and Proposed Action described in Chapter 2. As noted above, WAPA has taken a more qualitative than quantitative approach to estimating potential air quality impacts of its planned ROW maintenance activities in the eight national forests in the project area. In general, adverse impacts to air quality are those that increase emissions of air pollutants (including criteria air pollutants, and sulfur and nitrogen compounds) that can affect air pollutant concentrations, visibility, atmospheric deposition, and lake chemistry. Impacts on these components are affected by the magnitude and spatial and temporal distribution of the primary and precursor emissions and their interactions with local and regional meteorological conditions and topographic features. Beneficial impacts are those that decrease emissions, from either control measures or a reduction in activities that generate emissions. Direct impacts result from management decisions that increase or reduce emissions from a source or resource use. Indirect impacts result from management actions that affect subsequent activities that could increase or reduce emissions.

Impacts Common to Both Alternatives

The vegetation management and maintenance activities WAPA would undertake along its transmission line ROWs under the No Action Alternative or the Proposed Action that would produce emissions of air pollutants include general ROW inspection and maintenance, vegetation management, access route maintenance, and transmission line maintenance. ROW inspection and maintenance and vegetation management activities include the use of some type of vehicle or fossil-fueled powered equipment, which emit pollutants. Activities associated with access route maintenance require a variety of vehicles and equipment. Finally, transmission line maintenance can involve the use of pickup trucks, ATVs, and snowmobiles, and in some cases, bulldozers, bucket trucks, and other heavy equipment.

The various on-road and off-road vehicles and other power equipment used during these activities emit the following pollutants:

- Dust (consisting of coarse [PM_{10}] and fine [$PM_{2.5}$] particulates) from the movement and exhaust of vehicles and other equipment on roadways and in ROWs
- VOC, NO_x, CO, SO_2, CO_2, and $PM_{2.5}$ emissions from diesel-powered motor vehicles, portable generators, and other equipment (e.g., masticators and chippers/grinders)
- VOC, NO_x, CO, SO_2, and CO_2 emissions from gasoline-powered vehicles, engines, and other vegetation management equipment (e.g., chainsaws, self-propelled grinders, mowers, and mulchers)

In addition to the use of mechanical or other powered devices for ROW maintenance, vegetation and fuel-load management, and soils management (prevention of thick hydrophobic layers), as noted in Chapter 2, WAPA might on rare occasion also burn slash material, resulting in emissions of VOCs, PM_{10}, $PM_{2.5}$, NO_x, CO, SO_2, and CO_2. Depending on the size of the area or number of piles burned and the duration of the burning, emissions from this activity would likely be many orders of magnitude larger than the emissions from the various equipment and vehicles used for vegetation management on a given day in a particular segment of a ROW. However, it is expected that burning would be very limited or would not be utilized as part of WAPA's vegetation management procedures due to the potential for electrical arcing from smoke produced under the transmission lines, the possibility of fire spreading beyond the ROW into the adjacent forest land, and the desire to minimize air pollutant emissions. Also, in scheduling pile burning, forest, weather, and air quality conditions must be accounted for, and these conditions could limit the number of days each year burning might be allowed. Slash burning along the ROWs would employ low-intensity burning techniques, and the Forest Service would authorize and supervise the activity. As noted above, WAPA will not use prescribed burning for ROW maintenance; only the Forest Service would perform prescribed burns.

Emissions from typical daily or annual ROW maintenance operations are expected to be very small in relation to other local and regional sources and could differ along the various national forest transmission line ROWs, depending on the location and ease of access, the complexity of the terrain, the types of vegetation encountered, the length of ROW serviced, and the particular types of maintenance activities that would be required. Emissions would also depend on the types and numbers of equipment used (e.g., horsepower rating, fuel, and age), hours of operation, and duration of use. Table 3-8a and Table 3-8b list a set of criteria pollutant and CO_2 emission factors for various vehicles and other equipment (representative of equipment in use in Colorado in 2008) that can be used in activities similar to WAPA's ROW maintenance activities. These include light-duty gasoline and diesel-powered trucks (pickups), heavy-duty diesel trucks, mowing equipment, chainsaws, and chippers/stump grinders. Although not a complete list and WAPA might not use some of the equipment listed in particular ROW maintenance activities, the table provides representative types of equipment WAPA could use. Table 3-8a lists emission factors for service vehicles in terms of grams per miles traveled; Table 3-8b lists emission factors for maintenance equipment in terms of grams per hour of usage. Emission factors for chippers/grinders and mowers are provided for a number of horse-power categories for both gasoline and diesel-powered models. It should be noted that the emission factors for the gasoline-powered chippers/stump grinders and mowers are a combination of two- and four-stroke engines. The higher the horse-power rating, the larger the emission factor, and the magnitude of the factors for a given horse-power category vary by fuel type for the different pollutants. For example, although there are exceptions, diesel-powered equipment generally emits less NO_x, SO_2, CO, VOCs and CO_2 but more PM_{10} and $PM_{2.5}$ than comparable (same size and horse-power rating) gasoline-powered equipment.

Table 3-8a. Exhaust Emission Factors (grams/mile) for 2008 for Vehicles Used in Right-of-Way Maintenance Activities

Vehicle Type	Capacity (horse power)	Fuel	Emissions (grams/mile)						
			NO_x	PM_{10}	SO_2	CO	VOCs	$PM_{2.5}$	CO_2
Light duty truck	NA	Gasoline	1.13	0.03	0.01	23.97	1.07	0.01	476.9
Light duty truck	NA	Diesel	2.31	0.11	0.01	6.25	2.75	0.09	409.5
Heavy duty truck	NA	Diesel	2.72	0.28	0.01	1.72	0.35	0.23	791.8

Source: EPA 2006

CO	carbon monoxide
CO_2	carbon dioxide
NO_X	nitrogen oxide
PM_{10}	particulate matter less than 10 microns in diameter
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
SO_2	sulfate
VOCs	volatile organic compounds

Table 3-8b. Emission Factors (grams/hour) for Various Equipment Used in Right-of-Way Maintenance Activities

Equipment Type	Capacity (horse power)	Fuel	Emissions (grams/hour)						
			NO_x	PM_{10}	SO_2	CO	VOCs	$PM_{2.5}$	CO_2
Chainsaw	11	Gasoline	14.55	107.23	1.54	3228.89	680.77	98.65	7545.97
Feller/bunch/skidder	100	Diesel	470.30	53.75	12.79	387.97	46.07	52.14	59476.18
Logging equipment	300	Diesel	1,317.04	73.86	34.60	528.39	67.00	71.64	160,846.33
Chippers/stump grinders	6	Gasoline	12.18	1.60	0.66	717.54	61.11	1.47	3200.01
Chippers/stump grinders	11	Gasoline	35.36	1.03	1.64	2,378.72	63.79	0.95	7,949.46
Chippers/stump grinders	16	Gasoline	55.33	1.61	2.56	3,721.99	99.81	1.48	12,438.53
Chippers/stump grinders	25	Gasoline	72.42	1.90	3.36	4,796.90	117.41	1.75	16,326.13
Chippers/stump grinders	40	Gasoline	94.72	1.93	4.00	1,161.88	32.64	1.77	19,389.80

Table 3-8b. Emission Factors (grams/hour) for Various Equipment Used in Right-of-Way Maintenance Activities

Equipment Type	Capacity (horse power)	Fuel	Emissions (grams/hour)						
			NO_x	PM_{10}	SO_2	CO	VOCs	$PM_{2.5}$	CO_2
Chippers/stump grinders	75	Gasoline	354.84	3.28	7.44	4,107.43	128.95	3.02	36,107.82
Chippers/stump grinders	100	Gasoline	467.13	4.32	9.80	5,407.18	169.75	3.97	47,533.75
Chippers/stump grinders	175	Gasoline	694.86	6.42	14.57	8,043.19	252.51	5.91	70,706.46
Chippers/stump grinders	25	Diesel	63.20	5.80	0.04	36.88	10.06	5.62	6,316.00
Chippers/stump grinders	40	Diesel	86.20	7.90	0.06	43.98	12.11	7.67	9,406.85
Chippers/stump grinders	50	Diesel	109.18	10.01	0.08	55.71	15.34	9.71	11,915.35
Chippers/stump grinders	75	Diesel	157.52	15.61	0.10	85.51	19.55	15.14	15,443.93
Chippers/stump grinders	100	Diesel	217.87	21.80	0.14	118.27	27.04	21.14	21,361.53
Chippers/stump grinders	175	Diesel	316.65	19.61	0.19	104.14	28.36	19.02	27,612.76
Chippers/stump grinders	300	Diesel	606.82	35.34	0.37	190.79	52.44	34.28	55,032.98
Chippers/stump grinders	600	Diesel	1,105.60	58.11	0.67	387.05	85.88	56.36	98,934.45
Chippers/stump grinders	750	Diesel	1,782.69	96.92	1.08	685.97	134.70	94.01	160,098.11
Chippers/stump grinders	1000	Diesel	2,882.81	147.09	1.45	912.76	238.26	142.68	215,706.98
Chippers/stump grinders	1200	Diesel	3,330.54	169.94	1.68	1,054.51	275.27	164.84	249,207.74
Front mowers	11	Gasoline	26.96	0.63	1.16	1,903.44	43.26	0.58	5,612.16
Front mowers	16	Gasoline	45.40	1.06	1.95	3,204.92	72.83	0.98	9,449.47
Front mowers	25	Gasoline	59.71	1.43	2.60	4,930.35	115.99	1.32	12,605.76
Front mowers	40	Gasoline	242.82	1.42	3.54	2,600.96	86.54	1.31	17,180.20
Front mowers	6	Diesel	14.05	1.54	0.01	10.25	2.15	1.49	1,262.77
Front mowers	16	Diesel	35.45	3.23	0.02	20.64	5.60	3.13	3,567.52
Front mowers	25	Diesel	52.39	4.77	0.04	30.51	8.28	4.63	5,272.96
Front mowers	40	Diesel	72.17	6.57	0.05	36.43	9.95	6.37	7,910.56
Front mowers	50	Diesel	103.04	9.38	0.08	52.02	14.21	9.10	11,294.29
Front mowers	75	Diesel	141.22	13.86	0.09	76.28	17.40	13.45	13,929.84
Front mowers	100	Diesel	211.85	21.00	0.14	114.43	26.10	20.37	20,897.28
Rear engine riding mowers	6	Gasoline	8.66	0.95	0.47	608.15	45.27	0.88	2,277.94
Rear engine riding mowers	11	Gasoline	16.19	0.41	0.75	1,073.47	25.38	0.38	3,638.39
Rear engine riding mowers	16	Gasoline	22.30	0.56	1.03	1,478.91	34.96	0.52	5,012.58
Rear engine riding mowers	25	Gasoline	32.47	0.81	1.50	2,162.17	50.55	0.74	7,268.97
Backhoe/trencher	80	Diesel	321.53	39.20	7.75	249.02	39.51	38.02	36,030.42
Road grader	100	Diesel	395.76	30.14	9.30	147.96	35.26	29.24	43,225.52
Spider plow	175	Diesel	611.91	40.73	15.26	204.56	50.84	39.51	70,938.10
Bulldozer/loader	305	Diesel	800.36	48.52	17.54	338.60	50.76	47.07	81,536.42
Excavator/dozer	350	Diesel	1,469.52	89.09	32.20	621.70	93.19	86.42	149,706.22
Winch crawler	475	Diesel	1,994.35	120.91	43.70	843.73	126.48	117.28	203,172.72

Source: EPA 2010

CO carbon monoxide
CO_2 carbon dioxide
NO_X nitrogen oxide
PM_{10} particulate matter less than 10 microns in diameter
$PM_{2.5}$ particulate matter less than 2.5 microns in diameter
SO_2 sulfate
VOCs volatile organic compounds

Using the types of equipment listed in Table 3-9 would result in very small amounts of criteria pollutant and GHG emissions in a typical daily operation compared to daily emissions from power plants, industrial sources, on-road mobile, and other sources in the region. For example, Table 3-9 lists annual emissions for a typical power plant and refinery in Colorado along with annual emission estimates for ROW maintenance equipment used for a total of 8 hours per day 20 days per month for 12 months. The table shows that emissions from this type of equipment are very small compared to other sources in the area that affect local and regional air quality.

Table 3-9. Annual Emission Estimates (tons/year) for Various Equipment used in Right-of-Way Maintenance Activities and Selected Industrial Sources (Annual Emission Estimates for Right-of-Way Equipment Use Assume Operations of 8 hours/day, 20 days/month for 12 months)

Equipment Type	Capacity (horse power)	Fuel	Emissions (tons/year)					
			NO_x	PM_{10}	SO_2	CO	VOCs	$PM_{2.5}$
Chainsaw	11	Gasoline	0.03	0.23	0.00	6.82	1.44	0.21
Feller/Bunch/Skidder	100	Diesel	0.99	0.11	0.03	0.82	0.10	0.11
Logging Equipment	300	Diesel	2.78	0.16	0.07	1.12	0.14	0.15
Chippers/Stump Grinders	175	Gasoline	1.47	0.01	0.03	16.99	0.53	0.01
Chippers/Stump Grinders	1,200	Diesel	7.03	0.36	0.00	2.23	0.58	0.35
Front Mowers	100	Diesel	0.45	0.04	0.00	0.24	0.06	0.04
Rear Engine Riding Mowers	25	Gasoline	0.07	0.00	0.00	4.57	0.11	0.00
Backhoe/Trencher	80	Diesel	0.68	0.08	0.02	0.53	0.08	0.08
Road Grader	100	Diesel	0.84	0.06	0.02	0.31	0.07	0.06
Spider Plow	175	Diesel	1.29	0.09	0.03	0.43	0.11	0.08
Bulldozer / Loader	305	Diesel	1.69	0.10	0.04	0.72	0.11	0.10
Excavator /Dozer	350	Diesel	3.10	0.19	0.07	1.31	0.20	0.18
Winch crawler	475	Diesel	4.21	0.26	0.09	1.78	0.27	0.25
Oil Refinery	NA	NA	742.18	312.92	584.38	426.91	283.10	192.48
Power Plant	NA	Natural Gas	109.56	16.25	1.14	14.06	6.74	16.25
Power Plant	NA	Coal	4,595.20	109.70	13,217	562.70	67.3	28.62

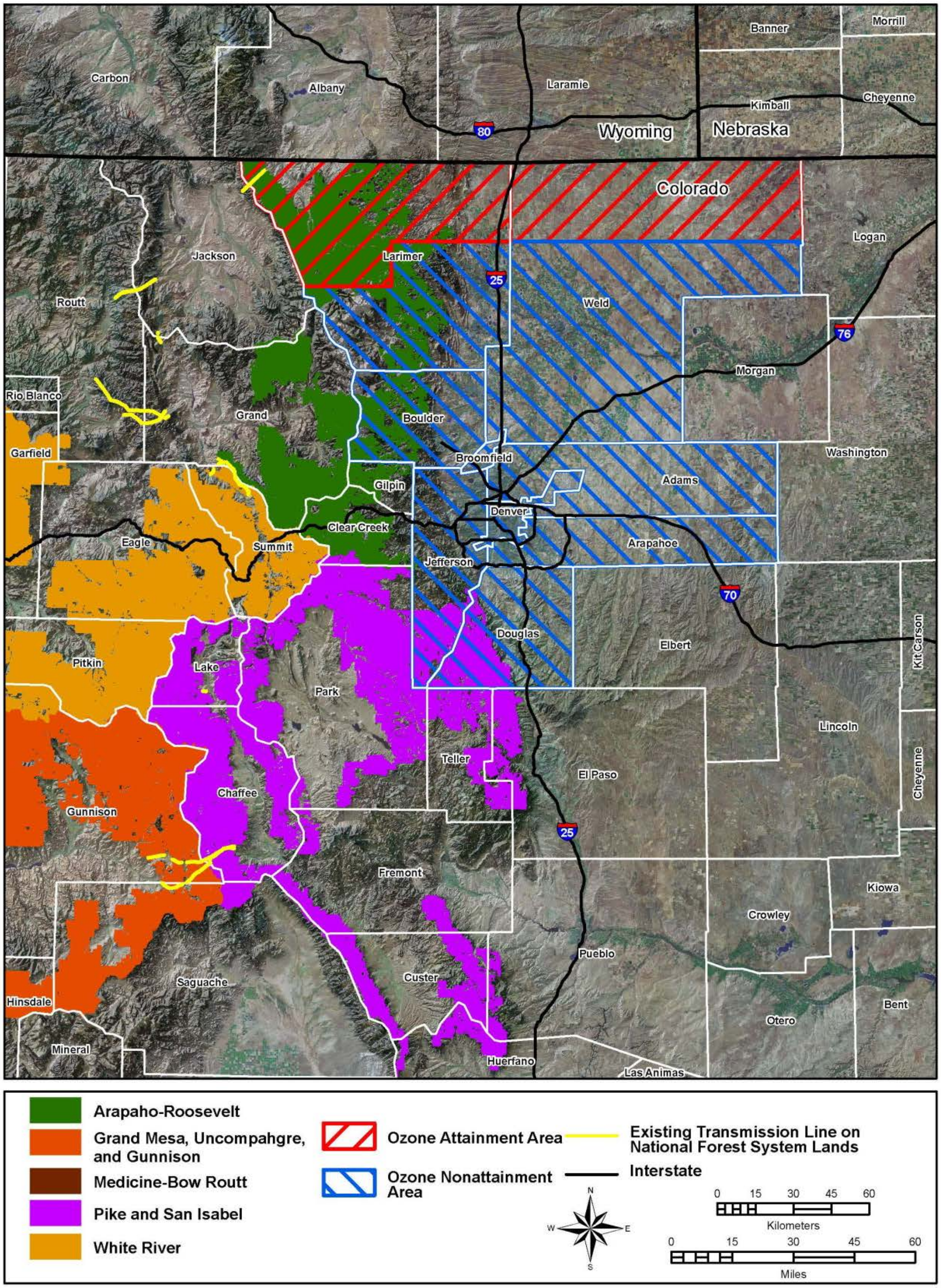
Sources: EPA 2010, EPA 2008

CO carbon monoxide
CO_2 carbon dioxide
NO_X nitrogen oxide
PM_{10} particulate matter less than 10 microns in diameter
$PM_{2.5}$ particulate matter less than 2.5 microns in diameter
SO_2 sulfate
VOCs volatile organic compounds

WAPA would use standard maintenance procedures A-1 and A-2 (see Table 2-15) to minimize potential emissions from project activities, under the No Action Alternative and Proposed Action. In addition, WAPA and the Forest Service developed Design Features 1-3 (see Table 2-13) that would be implemented under the Proposed Action to minimize potential impacts.

Under the No Action Alternative and the Proposed Action, the proximity of the ROW that runs through the northwestern portion of Arapaho-Roosevelt National Forest in Larimer County, Colorado, to the EPA-designated ozone nonattainment area is of most concern for potential air quality impacts from WAPA's ROW maintenance activities. On April 30, 2012, the EPA issued final area designations throughout the United States for counties in violation of the 2008 NAAQS for 8-hour average ozone (EPA 2012). Those designations include the Greater Denver area, which has been designated a "Marginal" nonattainment area and includes the cities of Denver, Boulder, Greeley, Fort Collins, and Loveland. The nonattainment area covers the full counties of Adams, Arapahoe, Boulder, Broomfield, Denver, Douglas, and Jefferson, and parts of Larimer and Weld counties. Figure 3-8 shows the nonattainment area boundaries in relation to the national forests of interest and WAPA's ROWs. As the figure shows, portions of Arapaho-Roosevelt National Forest in Boulder County and southern Larimer County are included in the nonattainment area, but the national forest area in northern Larimer County where WAPA's ROW is located is not part of the nonattainment area. Sources of ozone precursor emissions (NO_x, VOCs, and CO) that could contribute to ozone nonattainment include on-road mobile, non-road equipment, industrial, and power generation sources in the cities and population centers along the Front Range. Given the distance from the Greater Denver nonattainment area, under the No Action Alternative and the Proposed Action, criteria pollutant (ozone precursor) emissions associated with WAPA's ROW maintenance in Arapaho-Roosevelt National Forest would be localized and very small, especially in relation to emissions from the other anthropogenic activities contributing to the production of ozone in the area, and would not contribute to observed ozone concentrations in the nonattainment area. Because emissions from WAPA's ROW maintenance activities in Arapaho-Roosevelt National Forest would be very minimal and would not occur in the nonattainment area, the CAA General Conformity Requirements (DOE 2000) would not apply.

Figure 3-8. Depiction of the Greater Denver "Marginal" Ozone Nonattainment Area Relative to WAPA's Rights-of-Way in Colorado



Other than the Greater Denver ozone nonattainment area, there are no criteria pollutant nonattainment areas in WAPA's project area. However, in northeastern Utah, the counties of Uintah and Daggett, which include portions of Ashley National Forest and two of WAPA's ROWs, have been designated by EPA as "unclassifiable."[3] In recent years, the State of Utah has measured high concentrations in the Uintah Basin in winter months under a unique set of meteorological, topographic, and emissions conditions. These include various ozone precursor sources operating in flat basin or valley-like terrain during the winter months with adequate snow cover (resulting in high albedo and radiation), and a prevailing regional high pressure weather system situated over the area that causes light winds, clear skies, and a strong nighttime radiation inversion, limiting atmospheric mixing and dispersion of pollutants. Under such conditions, ozone precursor emissions (NO_x, VOCs, and CO) from a variety of sources stagnate and build up in the valley and, along with higher than normal solar radiation due to the reflective snow cover, increase the potential for the photochemical production of ozone. Although the State of Utah has measured ozone concentrations in the Uintah Basin in recent winters that exceed the NAAQS for 8-hour ozone, at this time there are not enough years of data for the Uintah Basin for EPA to make a formal designation of the area other than unclassifiable. Similar conditions have occurred in recent years in the Upper Green River Basin area of Wyoming, where emissions from oil and natural gas development sources are likely contributors to the problem, to the point where EPA has designated Sublette County and portions of Lincoln and Sweetwater counties as a Marginal 8-hour ozone nonattainment area. The wintertime ozone phenomenon occurs only during a few of the winter months (mainly February and March) under the unique set of weather conditions noted above, and high ozone concentrations are confined to the valley floors. WAPA's ROW maintenance activities in Ashley Forest are expected to be quite infrequent during these months, and emissions from these activities are expected to be quite small and would not be expected to contribute to future wintertime ozone concentrations in the Uintah Basin.

3.1.9.1 No Action Alternative

Under the No Action Alternative, WAPA would perform ROW maintenance and vegetation management activities using current practices that reflect a more reactive than proactive approach. WAPA would perform the activities under existing agreements with the Forest Service. As noted above, emissions of criteria pollutants and GHGs from the operation of vehicles and other equipment for ROW maintenance would be very small and confined to localized areas. Direct and indirect impacts from the emissions would be negligible. Except for slash pile burning, which is expected to be done very infrequently if at all, the criteria pollutant and GHG emissions from vehicles and equipment for maintenance along the various ROWs in national forests in the project area under the No Action Alternative would not contribute to violations of NAAQS or significantly contribute to atmospheric deposition of nitrogen or sulfur compounds. In addition, these emissions would have negligible impacts on constituents that affect atmospheric visibility or on GHGs that affect climate change. Specifically, the impacts would not exceed the maximum allowable PSD increments for PM_{10}, NO_2, or SO_2; would not exceed Class I or Class II increment values established by the PSD regulations; and would not contribute to deposition of sulfates and nitrates that would exceed established depositional guidelines in areas classified as sensitive to acidification.

[3] *Subsequent to the Draft EIS analysis EPA classified Unitah County as "non-attainment" for ozone.*

3.1.9.2 Proposed Action

The major difference between the No Action Alternative and the Proposed Action is the way WAPA proposes to manage vegetation along the transmission line ROWs. The Proposed Action involves a more proactive approach known as the IVM approach, which is expected to reduce the amount of maintenance visits and use more efficient techniques for vegetation management. Similar to the No Action Alternative, emissions from vehicles and equipment along the various ROWs in the project area under the Proposed Action would be very small and localized. Their direct impacts would not contribute to violations of NAAQS or provide significant contributions to atmospheric deposition of nitrogen or sulfur compounds, and would have negligible impacts on constituents that affect atmospheric visibility, or on GHGs that affect climate change. Because the proposed vegetation management activity takes place along already established ROW corridors, there would be no additional indirect impacts from the Proposed Action. Because implementing IVM under the Proposed Action would provide for efficiencies in short- and long-term planning and scheduling of activities, resulting in fewer maintenance visits (and potentially less use of equipment and fewer emissions), impacts on air quality under the Proposed Action are expected to be comparable to, or might actually be less, than emissions under the No Action Alternative. Specifically, the impacts would not exceed the maximum allowable PSD increments for PM_{10}, NO_2, or SO_2, would not exceed Class I or Class II increment values established by the PSD regulations, and would not contribute to deposition of sulfates and nitrates that would exceed established depositional guidelines in areas classified as sensitive to acidification.

3.1.9.3 Cumulative Effects

A variety of human causes in the Mountain West contribute to observed air pollutant concentrations, atmospheric deposition, and visibility in the project area. These include electricity generation, industrial operations, on- and off-road motor vehicles and other equipment, and other sources (e.g., home heating) in the region that contribute VOC, PM_{10}, $PM_{2.5}$, NO_x, CO, SO_2, and CO_2 emissions as primary pollutants or precursors to secondarily formed ozone and fine particulates ($PM_{2.5}$). Also, sources in nearby large metropolitan areas (e.g., Denver and Salt Lake City) and other states upwind of the area (e.g., California) could contribute to regional air quality by long-range transport of pollutants. In addition to these sources, prescribed burning as part of forest management by the Forest Service and other federal, state, and local agencies in and upwind of the project area, and unplanned wildfires that occur throughout the Mountain West, could also contribute to observed air quality in the project area. As described above, the Greater Denver area is currently an ozone nonattainment area. Therefore, the state of Colorado must prepare a State Implementation Plan (SIP) for EPA approval that outlines steps for reducing primary and ozone precursor emissions in an effort to reduce observed ozone concentrations in the area and bring the area back into attainment. This could include restrictions on the permitting of new industrial sources, efforts to reduce on-road mobile emissions through traffic management or other programs, implementation of emission controls on existing industrial sources, and other programs aimed at reducing local and regional ozone precursor emissions (NO_x, VOCs, and CO).

As described above, emissions from ROW maintenance activities along WAPA's transmission line ROWs are very small and expected to have negligible direct and indirect impacts on air pollutant concentrations, atmospheric deposition, visibility, and climate change in the project area. In terms of cumulative effects, these emissions would be localized along the various ROWs throughout the project area and insignificant compared to emissions from other regional sources that affect air quality in the Denver ozone nonattainment area, the deposition of sulfur and nitrogen compounds to sensitive lakes in the project area, the degradation of regional visibility, and climate change.

3.2 Surface Water

3.2.1 Introduction

WAPA's proposed project could affect surface water resources on NFS lands in Colorado, Nebraska, and Utah. Most of the forest areas with transmission line ROWs are near the headwaters of major drainage basins, where water quality is typically very good and minimally affected by human activities. Many of these areas provide source water for public water systems. In addition to providing sources of drinking water, these forested areas often include healthy populations of aquatic life, and provide many opportunities for recreation in and on the water. Most of the waters draining from national forests, particularly in Colorado, are eventually used for agricultural purposes.

This section identifies specific water resources close to the WAPA transmission line ROWs in the project area. These are high-quality waters that must be protected, and impaired waters that WAPA vegetation management activities should not further degrade. This section also identifies waters that serve as public water supplies and those that have been designated as source waters. Finally, this section highlights waters that have been assigned as priority watersheds under the U.S. Forest Service Watershed Condition Assessment Framework.

Section 3.2.2 describes the regulatory and policy framework, Section 3.2.3 describes analysis methods and assumptions, Section 3.2.4 describes the affected environment (existing conditions) for surface water, and Section 3.2.5 describes potential impacts to surface water in the project area, including cumulative impacts.

3.2.2 Regulatory and Policy Framework

Requirements that apply specifically to activities on NFS lands include best management practices that have been incorporated into Regional Forest Service Conservation Practice Handbooks; Watershed Condition Assessment Framework Documents and identified priority watersheds; and Forest Management Plans (Carlson 2011). There are 29 management measures and design features in the Watershed Conservation Practices Handbook for the Forest Service Rocky Mountain Region (Region 2) (Forest Service 2006a). These address hydrologic function, riparian areas and wetlands, sediment control, soil quality, and water purity. Forest Service Region 4 (the Intermountain Region) has adopted a Soil and Water Conservation Practices Handbook, which sets forth best management practices arranged by activity. This handbook provides examples of proven, site-specific soil and water protection and conservation practices aimed at preventing and controlling nonpoint sources of pollution during land-disturbing activities (Forest Service 1988).

The Forest Service has also developed a National Watershed Condition Framework (Forest Service 2011a) and an accompanying Watershed Condition Classification Technical Guide (Forest Service 2011b). The Watershed Condition Framework establishes a consistent, comparable, and credible process for improving the health of watersheds in national forests and grasslands. The framework involved assessment of hydrologic units on NFS lands at the 6^{th}-level scale to determine whether the condition of watersheds is functioning properly, functioning at risk, or functionally impaired. The determination of watershed condition involves assessment of 12 indicators and attributes that fall into the following four categories: Aquatic-Physical (water quality, quantity, and habitat), Aquatic Biological (aquatic biota and riparian/wetland vegetation), Terrestrial-Physical (roads and trails, and soils), and Terrestrial-Biological (fire regime or wildfire, forest cover, rangeland vegetation, invasive species, and forest health). None of the priority waters identified in Forest Service Watershed Condition Framework 2011 are in the vicinity of WAPA's transmission lines in the project area (Forest Service 2011a).

The Federal Clean Water Act, pertinent state water quality control statutes, and groundwater protection and source water protection programs also apply to water resources on NFS lands. The water quality standards and National Pollutant Discharge Elimination System (NPDES) permitting framework generally provide the site-specific regulatory control system for water quality protection. The general legal requirement governing activities that might impact the availability of quantities of water is that there should be no resulting material injury to existing water rights.

Surface Water Quality Protection

The EPA and states have established criteria for pollutants known to impact designated uses of state waters and set standards for individual water bodies using certain criteria as a baseline. These criteria are expressed both in narrative and numerical terms. The numerical criteria address inorganic chemicals (e.g., major cations, anions, and trace metals), organic chemicals (including commonly applied herbicides), radionuclides, and physical parameters such as pH and temperature. The general regulatory framework for surface water protection involves (1) state adoption of numerical and narrative criteria into a set of basic standards, (2) subsequent consideration (during triennial review hearings) of the basic standards or criteria for actual segment-specific river-basin standards, and (3) implementation of water quality standards in point source permits and nonpoint source management programs.

The water quality standards framework includes an antidegradation policy, which consists of three tiers. Tier 1 is reserved for waters of extremely good quality and those that are outstanding water resources. Once designated, these waters cannot be degraded. Their high quality must be maintained. The waters crossed or near WAPA’s Flaming Gorge-Vernal lines 1 and 3 in Ashley National Forest are Tier 1 or Category 1 waters that cannot be degraded (Utah Department of Administrative Services 2011).

Tier 2 is applied to waters that have a quality better than required to protect their classified beneficial uses. These waters cannot be degraded without first undergoing an antidegradation review. These waters are labeled “reviewable.” Almost all the waters crossed by or near WAPA’s transmission lines are labeled reviewable, but some waters are designated “use protected.” Use-protected waters have no remaining assimilative capacity for one or more pollutants. Segment 12 of Uncompahgre River in Uncompahgre National Forest is an example of a use-protected waterbody.

New NPDES permitting requirements apply to the use of pesticides and herbicides over or near waters of the United States. In Colorado the EPA is the regulatory authority for herbicides applied by agencies using federal monies on federal lands, while the state has permitting authority over the use of herbicides by others. Nebraska and Utah have regulatory authority over pesticide use on NFS lands in those states. There has been an exemption for “routine maintenance” in the NPDES construction permits regulations, as long as certain requirements are met. However, if the situation warrants, some maintenance activities in conjunction with WAPA’s vegetation management program could trigger the need for some type of NPDES permit.

3.2.3 Methods and Assumptions for Analysis

WAPA used the following methods to identify water resources in the project area:

- Identify the national forests where there are WAPA ROWs and use the relevant Forest Plan and Forest Service Watershed Condition Assessment.
- Identify the major drainage basin(s), sub-basin(s), and classified waterbody segment(s) in the immediate vicinity of the transmission line ROWs on NFS lands.
- Determine the classified uses and water quality standards that apply to the potentially affected waters.
- Review the ambient water quality data collected to support the 2010 Integrated Water Quality Monitoring and Assessment (305(b)) Report for Colorado and for the 305(b) reports submitted by Nebraska and Utah that pertain to the potentially affected waters.
- Determine whether there are potentially affected waters listed as impaired under Section 303(d) of the federal Clean Water Act, or assigned as priority watersheds under the Forest Service Watershed Condition Assessment Framework.
- Determine whether the potentially affected waters were classified as source waters for public water systems and if they are subject to a Source Water Protection Plan.

Important assumptions for identifying and analyzing the environment are:

- No new road construction would be required.
- Transmission line ROWs make up a very small portion of the national forest areas and drainage areas they cross.
- Transmission lines typically cross surface waters at point locations or follow utility corridors, which generally are located in upland areas outside riparian zones, wetlands, or drainages.
- Because the project area is mostly forested, there are well-vegetated buffer zones between the locations of most ROW maintenance activities and surface water and groundwater recharge areas.
- Protection of high-quality surface waters and non-degradation of existing impaired waters are major objectives WAPA will address.
- Neither the No Action Alternative nor the Proposed Action should reduce the availability of surface water resources.
- Except for pesticide and herbicide application, which constitutes a point source discharge under Section 402 of the federal Clean Water Act, impacts from vegetation management would be from nonpoint sources of pollution.

Impact Criteria and Indicators

The surface waters in NFS lands potentially affected by the project are of good quality and minimally affected by human activities. WAPA developed impact criteria for surface water; these criteria refer to violations of water quality standards, impairment of classified beneficial uses, and adverse effects to adjacent properties. Vegetation management activities that violate these criteria would constitute an impact.

An impact on surface water could result if the No Action Alternative or Proposed Action caused any of the following:

- Contamination of surface water from erosion or stormwater runoff that would result in a violation of federal or state water quality standards
- Surface water quality degradation that causes a long-term loss of human use or use by aquatic wildlife and plants
- Alteration of the existing drainage pattern of the site or area that would result in off-site erosion or siltation, resulting in adverse effects to adjacent properties
- Surface water impacts that would violate Section 402 or 404 of the Clean Water Act or other applicable surface water regulations, including state-established standards for designated uses

3.2.4 Affected Environment

3.2.4.1 Arapaho-Roosevelt National Forest

The Ault-Craig transmission line sections cross a 2.6-mile section of Medicine Bow-Routt National Forest and then traverse the Medicine Bow Mountains through approximately 5.0 miles of Roosevelt National Forest. The portion of the transmission line ROW in Medicine Bow-Routt National Forest (see Section 3.2.4.6) drains into North Platte River via Government Creek (water quality segment COUCNP7a), a tributary of Canadian River and North Platte River near Cowdrey, Colorado. Waterbody segments in Colorado are referred to by an alphanumeric identification code. The first and second letters (CO) refer to Colorado; the third and fourth letters (UC) refer to the major drainage basin (i.e., Upper Colorado Basin); the fifth and sixth letters (NP) refer to the minor drainage basin, which in this case is the North Platte Basin, and the last character(s) are the actual stream segment number.

The portion of the transmission line ROW in Roosevelt National Forest drains into Laramie River via Pole Creek (segment COSPLA2a, i.e., Colorado, South Platte Basin, Laramie minor basin segment 2a) (Colorado Water Quality Control Division 2011). The Archer-North Park transmission line section parallels the Ault-Craig transmission line.

WAPA's Blue River-Gore Pass and Green Mountain-Blue Ridge Repeater line sections fall partly within the Blue River Watershed of the Upper Colorado River Sub-basin. These transmission line ROWs drain into the same water quality segment (COUCBL19, i.e., Colorado, Upper Colorado, Blue River Segment 19) under Colorado's water quality standards framework. This segment includes all tributaries to the Blue River, including wetlands, from the outlet of Green Mountain Reservoir to the confluence with the Colorado River. Therefore, maintenance activities for the three transmission lines must protect the same classified uses shown in Table 3-10 and are subject to the same water quality standards and antidegradation requirements. Recreation is not a classified use for this segment. The Blue River-Gore Pass transmission line ROW also drains into Blue River segment 18 (COUCBL18). Recreation and other beneficial uses have been classified and are to be protected for this segment. Finally, a portion of the Blue River-Gore Pass transmission line ROW drains into the Williams Fork Watershed, which is segment 8 (COUCUC8) of the Upper Colorado Sub-basin (Colorado Water Quality Control Division 2011).

All but one of the water quality segments intersected by WAPA's transmission lines has very good water quality, which has been classified for all beneficial uses, and a full suite of protective standards have been adopted (Colorado Water Quality Control Division 2010a). Segment 2a of Laramie River is listed as impaired due to exceedances of the pH standard (Colorado Water Quality Control Division 2010b).

Table 3-10. Waterbody Segments Potentially Affected by Transmission Line Maintenance Activities in the Arapaho-Roosevelt National Forest

Transmission Line Section	Total Trans-mission Line Length (miles)	Stream Segment	Stream Miles for Segment	Aquatic Life	Recreation	Water Supply	Agri-culture	Anti-degradation Designation
North Platte and Laramie Sub-basins of the Platte River Basin								
Archer-North Park	5.0	COUCNP7a	5.6	Cold 2	Not Suitable	No	Yes	Reviewable
	5.0	COSPLA2a	359.9	Cold 1	Existing	Yes	Yes	Reviewable
Ault-Craig	5.0	COUCNP7a	5.6	Cold 2	Not Suitable	No	Yes	Reviewable
	5.0	COSPLA2a	359.9	Cold 1	Existing	Yes	Yes	Reviewable
Blue River Sub-basin of the Colorado River Basin								
Blue River-Gore Pass	6.9[1]	COUCBL19	93.4	Cold 1	Existing	Yes	Yes	Reviewable
	6.9[1]	COUCBL18	196.00	Cold 1	Existing	Yes	Yes	Reviewable
	6.9[1]	COUCUC8	319.60	Cold 1	Existing	Yes	Yes	Reviewable
Green Mountain-Blue Ridge Repeater	1.00[1]	COUCBL17	38.6	Cold 1	Existing	Yes	Yes	Reviewable
	1.00[1]	COUCBL19	93.4	Cold 1	Existing	Yes	Yes	Reviewable

Sources: Colorado Water Quality Control Division 2010a, 2010b, 2011.

[1]Total length of transmission line in Arapaho-Roosevelt National Forest, not the specific length allocated to different stream segments.

3.2.4.2 Ashley National Forest

WAPA's transmission line ROWs fall within the upper portion of the Green River Basin in Utah. Because they are completely within Ashley National Forest, they are classified as Category 1 Waters (Table 3-11). These waters have been designated by Utah's Water Quality Board to be of exceptional recreational or ecological significance, or have been determined to be a state or national resource requiring protection. These waters must be maintained at their existing high quality. New point source discharges of wastewater, treated or otherwise, are prohibited in Category 1 segments after the effective date of designation. Other diffuse sources or nonpoint sources of pollution must be controlled to the extent feasible through implementation of best management practices or regulatory programs. These provisions also provide the non-degradation policy framework for performing antidegradation reviews for Category 1 waters (Utah Department of Administrative Services 2011).

Table 3-11. Waterbody Segments Potentially Affected by Transmission Line Maintenance Activities in Ashley National Forest

Transmission Line Section	Transmission Line Length (miles)	Stream Segment	Aquatic Life	Recreation	Water Supply	Agriculture	Anti-degradation Designation
Green River Basin							
Flaming Gorge-Vernal line 3	19.6	Big Brush Creek and Tributaries From Tyzack dam to headwaters	Class 3A[1]	Class 2B[2]	Class 1C[3]	Class 4[4]	Category 1 - non degradation
Flaming Gorge-Vernal line 1	6.6	Davenport Creek and Tributaries	Class 3A[1]	Class 2B[2]	No	No	Category 1 - non degradation
Flaming Gorge-Vernal line 1	6.6	Gorge Creek and Tributaries	Class 3A[1]	Class 2B[2]	No	No	Category 1 - non degradation
Flaming Gorge-Vernal lines 1 and 3	26.1	Tributaries to Flaming Gorge Reservoir	Class 3A[1]	Class 2B[2]	No	No	Category 1 - non degradation

Source: Utah Department of Administrative Services 2011.

[1]Class 3A: Protected for cold-water species of game fish and other cold-water aquatic life, including the necessary aquatic organisms in their food chains.
[2]Class 2B: Protected for infrequent primary contact recreation. Also protected for secondary contact recreation where there is a low likelihood of ingestion of water or a low degree of bodily contact with the water. Examples include, but are not limited to, wading, hunting, and fishing.
[3]Class 1C: Protected for domestic purposes with prior treatment by processes required by the Utah Division of Drinking Water.
[4]Class 4: Protected for agricultural uses, including irrigation of crops and stock watering.

3.2.4.3 Grand Mesa, Uncompahgre, and Gunnison National Forest

Segment 9 (COGUSM9) of the San Miguel River drains the project area of WAPA's Curecanti-Lost Canyon and Hesperus-Montrose transmission lines. This segment includes all tributaries to the San Miguel River below the confluence of the river with Leopard Creek that are within the boundaries of Uncompahgre National Forest. This segment is classified for all beneficial uses and has very good water quality (Table 3-12) (Colorado Water Quality Control Division 2011).

Table 3-12. Waterbody Segments Potentially Affected by Transmission Line Maintenance Activities in Grand Mesa, Uncompahgre, and Gunnison National Forest

Transmission Line Section	Trans-mission Line Length (miles)	Stream Segment	Stream Miles	Aquatic Life	Recreation	Water Supply	Agri-culture	Anti-degradation Designation
Curecanti-Lost Canyon	6.0	COGUSM9	395.5	Cold 1	Existing	Yes	Yes	Reviewable
Curecanti-North Fork	4.3	COGUUG26	870.5	Cold 1	Un-determined	Yes	Yes	Reviewable
Curecanti-Poncha	10.2	COGUUG19	336.3	Cold 1	Un-determined	Yes	Yes	Reviewable
Hesperus-Montrose	18.9[1]	COGUSM9	395.5	Cold 1	Existing	Yes	Yes	Reviewable
	18.9[1]	COGUUN12		Warm 2	Not suitable	No	Yes	Use Protected
North Fork-Rifle	25.5[1]	COGUNF4	472.8	Cold 1	Existing	Yes	Yes	Reviewable
	25.5[1]	COLCLC15	311.1	Cold 1	Existing	Yes	Yes	Reviewable
North Gunnison-Salida	11.6[1]	COGUUG19	336.3	Cold 1	Un-determined	Yes	Yes	Reviewable

Sources: Colorado Water Quality Control Division 2010a, 2011.

[1]Total length of transmission lines in Grand Mesa, Uncompahgre, and Gunnison National Forest, not the specific length allocated to different stream segments.

Segment 12 of the Uncompahgre River (COGUUN12) drains the project area of the Hesperus-Montrose transmission line. This segment includes all tributaries to Uncompahgre River from the South Canal near the Uncompahgre Town-site, which is upstream of the City of Montrose, to the confluence with Gunnison River. Various types of agricultural activities substantially impact the tributaries to the Uncompahgre that are included in this segment. This segment is designated use-protected, which means there is little assimilative capacity for new discharges of pollutants. Unlike the other stream segments in the vicinity of WAPA's transmission lines, this one is classified warm water class 2 for aquatic life. The segment is threatened with becoming impaired, and discharges should not exceed the applicable standards (Colorado Water Quality Control Division 2010a).

Segment 19 of the Upper Gunnison River (COGUUG19) drains the project area of the Curecanti-Poncha and North Gunnison-Salida transmission line in Grand Mesa, Gunnison, and Uncompahgre National Forests. This segment includes all tributaries to Tomichi Creek, one of the main headwater tributaries of Gunnison River. Although it has not been determined whether there is an existing recreation use on this segment, the water quality is generally better than the applicable water quality standards, and would support this use if it were physically possible (Colorado Water Quality Control Division 2010a).

Segment 26 of the Upper Gunnison Sub-basin drains the project area of the Curecanti-North Fork line. This segment includes all tributaries, from the source, to Blue Mesa, Morrow Point, and Crystal reservoirs that are on Gunnison and Uncompahgre National Forests lands or that flow into or are present in Curecanti National Recreation Area (Colorado Water Quality Control Division 2011). These are minimally impacted, high-quality drainages, although it has not yet been determined whether they support an existing recreation use (Colorado Water Quality Control Division 2010a).

Segment 4 of the North Fork of the Gunnison River drains the project area of the southern part of the North Fork-Rifle transmission line in the Grand Mesa, Uncompahgre, and Gunnison National Forest. This segment includes the very good quality source waters of Muddy Creek, which would receive any drainage from the transmission line ROW. Segment 15 (COLCLC15) of the Lower Colorado River drains the project area of the northern part of the transmission line (Colorado Water Quality Control Division 2011). This segment includes all tributaries of Plateau Creek on Colorado's majestic Grand Mesa, which are of very good quality and minimally impacted (Colorado Water Quality Control Division 2010a).

3.2.4.4 Medicine Bow-Routt National Forest

The project area of the Ault-Craig transmission line ROW is drained by segment 11 of the Yampa River in Routt County. This segment does not serve as a drinking water supply (or source water) and is not suitable for recreation uses (Table 3-13). Therefore, it has a somewhat limited set of applicable standards, including all numeric standards designed to protect aquatic life. This line crosses the Park Range on the Continental Divide heading east into Jackson County and North Park. Drainage from the transmission line ROW flows into segment 4a of the North Platte River. This segment consists of all tributaries to the North Platte River unless specifically excepted (Colorado Water Quality Control Division 2011). The Archer-North Park and Hayden-North Park transmission lines parallel the Ault-Craig transmission line.

The Gore Pass-Muddy Creek transmission line also passes into Jackson County and North Park just east of the Continental Divide near the crest of Muddy Pass. The transmission line ROW also drains into segment 4a of the North Platte River. This is a high-quality segment that supports all beneficial uses and is protected by the full suite of water quality standards (Colorado Water Quality Control Division 2010a).

WAPA's Hayden-Gore Pass and Gore Pass-Hayden lines cross the Gore Range near the Summit of Gore Pass in Grand County. Both transmission line ROWs drain into segment 4 (COUCUC4) of the Upper Colorado River Sub-basin. This is a segment that contains all tributaries to the Colorado River from the outlet of Lake Granby to the confluence with Roaring Fork River that are on NFS lands. A common characteristic of these tributaries is that they have very good water quality, potentially due to the land use restrictions within the boundaries of the national forest (Colorado Water Quality Control Division 2010a).

Table 3-13. Waterbody Segments Potentially Affected by Transmission Line Maintenance Activities in Medicine Bow-Routt National Forest

Transmission Line Section	Trans-mission Line Length (miles)	Stream Segment	Stream Miles	Aquatic Life	Recreation	Water Supply	Agriculture	Antidegradation Designation
Archer-North Park	2.6	COUCYA11	28.3	Cold 1	Not suitable	Yes	Yes	Reviewable
	2.6	COUCNP4a	1,563.1	Cold 1	Existing	Yes	Yes	Reviewable
Ault-Craig	13.6[1]	COUCYA11	28.3	Cold 1	Not suitable	No	Yes	Reviewable
	13.6[1]	COUCNP4a	1,563.1	Cold 1	Existing	Yes	Yes	Reviewable
Gore Pass-Hayden	11.1	COUCUC4	920.0	Cold 1	Existing	Yes	Yes	Reviewable
Gore Pass-Muddy Pass	1.7	COUCNP4a	1,563.1	Cold 1	Existing	Yes	Yes	Reviewable
Hayden-Gore Pass	22.0	COUCUC4	920.0	Cold 1	Existing	Yes	Yes	Reviewable
Hayden-North Park	13.6[1]	COUCYA11	28.3	Cold 1	Not suitable	No	Yes	Reviewable
	13.6[1]	COUCNP4a	1,563.1	Cold 1	Existing	Yes	Yes	Reviewable

Source: Colorado Water Quality Control Division 2010a, 2011

[1]Total length of transmission line in Medicine Bow-Routt National Forest, not the specific length allocated to this stream segment.

3.2.4.5 Nebraska National Forest

The Box Butte-Chadron transmission line is within the White River Basin. The drainage system in the vicinity of the transmission line is tributary to Big Bordeaux Creek, water quality segment 11120 (Nebraska DEQ 2009a) (Table 3-14).

Key species in Big Bordeaux Creek include brook trout, brown trout, and rainbow trout. The aquatic life classification for Big Bordeaux Creek is Coldwater, Class B. Class B waters provide, or could provide, a habitat capable of maintaining year-round populations of a variety of coldwater fish and associated vertebrate and invertebrate organisms and plants, or support the seasonal migration of salmonids. These waters do not support natural reproduction of salmonid populations due to limitations of flow, substrate composition, or other habitat conditions, but salmonid populations can be maintained year-round if periodically stocked. Big Bordeaux Creek is not classified for recreation and is not a water supply. Therefore, Big Bordeaux Creek has not been delineated as source water for municipal water supply purposes, and no source water protection plan is in place (Nebraska DEQ 2009b).

According to Nebraska's antidegradation clause, water quality degradation, which would adversely affect existing uses, would not be allowed. All waters in National Forests, including Big Bordeaux Creek, are state resource waters that are subject to antidegradation requirements (Nebraska DEQ 2009c).

Table 3-14. Waterbody Segments Potentially Affected by Transmission Line Maintenance Activities in Nebraska National Forest

Transmission Line Section	Transmission Line Length (miles)	Stream Segment	Aquatic Life	Recreation	Water Supply	Agriculture	Antidegradation Designation
Box Butte-Chadron	9.2	11120	Cold Water Class B	No	No	Yes	Reviewable (i.e., not a "state resource water")

Source: Nebraska DEQ 2009a, 2009b, 2009c

3.2.4.6 Pike and San Isabel National Forest

The Curecanti-Poncha and North Gunnison-Salida transmission lines cross into Pike and San Isabel National Forest in the vicinity of the top of Monarch Pass along U.S. Route 50 on the borderline between Gunnison and Chaffee counties. The project areas for both transmission lines are drained by segment 13 (COARUAL13) of the Upper Arkansas Sub-basin, which includes tributaries such as the South Fork of Arkansas River, the primary receiving stream. The South Fork of Arkansas River has very good water quality; it is classified for all beneficial uses with the associated full suite of water quality standards (Table 3-15) (Colorado Water Quality Control Division 2011).

The land area of the Malta-Elbert transmission line ROW drains into Lake Creek, segment 10 of the Upper Arkansas Sub-basin (COARUA10) at a point very close to its confluence with Arkansas River near Twin Lakes. Lake Creek has very good water quality, is classified for all beneficial uses, and is protected with a full suite of water quality standards (Colorado Water Quality Control Division 2010a).

Table 3-15. Waterbody Segments Potentially Affected by Transmission Line Maintenance Activities in Pike and San Isabel National Forest

Transmission Line Section	Transmission Line Length (miles)	Stream Segment	Stream Miles	Aquatic Life	Recreation	Water Supply	Agriculture	Antidegradation Designation
Curecanti-Poncha	8.4[1]	COARUA13	18.61	Cold 1	Existing	Yes	Yes	Reviewable
Malta-Mt Elbert	0.9	COARUA10		Cold 1	Existing	Yes	Yes	Reviewable
North Gunnison-Salida	8.0[1]	COARUA13	19.54	Cold 1	Existing	Yes	Yes	Reviewable

Source: Colorado Water Quality Control Division 2010a, 2011

[1]Total length of transmission line in the Pike and San Isabel National Forest, not the specific length allocated to different stream segments.

3.2.4.7 San Juan National Forest

The Curecanti-Lost Canyon and Hesperus-Montrose transmission lines cross into San Juan National Forest near the town of Dolores at the southern end of the ROWs. Segment 5 of the Dolores River (COSJDO5) drains project areas for both transmission lines. This stream segment includes all tributaries to the Dolores River and West Dolores River, including all wetlands, lakes and reservoirs, from the source to a point immediately below the confluence with West Dolores River. This is a very good quality segment and is classified for all beneficial uses and protected with a full suite of water quality standards (Table 3-16) (Colorado Water Quality Control Division 2010a).

The Great Cut-McPhee and Great Cut SWYD-Great Cut Tap transmission lines cross into San Juan National Forest on the west side of McPhee Reservoir and just north of Narraguinnep Reservoir. Segment COSJDO11 drains these project areas. This stream segment includes all tributaries to the Dolores River, including all wetlands, lakes, and reservoirs, from a point immediately below the confluence of West Dolores River, to the bridge at Bradfield Ranch (Forest Route 505, near the Montezuma/Dolores county Line). Segment 11 of the Upper Dolores is classified for class 2 cold-water aquatic life, but due to existing fish consumption and water ingestion from this segment, standards for a broad range of organic chemicals are at the stringent fish and water levels. The segment is also classified for existing recreation uses, water supply uses, and agriculture.

Table 3-16. Waterbody Segments Potentially Affected by Transmission Line Maintenance Activities in San Juan National Forest

Transmission Line Section	Transmission Line Length (miles)[1]	Stream Segment	Stream Miles	Aquatic Life	Recreation	Water Supply	Agriculture	Antidegradation Designation
Curecanti-Lost Canyon	14.5	COSJDO5	331.29	Cold 1	Existing	Yes	Yes	Reviewable
Great Cut-McPhee	4.9	COSJDO11	395.5	Cold 2	Existing	Yes	Yes	Reviewable
Great Cut SWYD-Great Cut Tap	0.2	COSJDO11	395.5	Cold 2	Existing	Yes	Yes	Reviewable
Hesperus-Montrose	31.2	COSJDO5	331.29	Cold 1	Existing	Yes	Yes	Reviewable

Source: Colorado Water Quality Control Division 2010a, 2011.

[1]Total length of transmission line on San Juan National Forest lands, not the specific length allocated to different stream segments.

SWYD switchyard

3.2.4.8 White River National Forest

Segment 17 (COUCBL17) of the Blue River Watershed drains the project area in the vicinity of Green Mountain Reservoir in Summit County, Colorado. Segment 17 is fully classified with all beneficial uses protected as existing uses.

Segment 18 (COUCBL18) of the Blue River drains the project are of the portion of the Blue River-Gore Pass transmission line in White River National Forest. This segment has the same full suite of standards and classifications as segment 17 of Blue River (Colorado Water Quality Control Division 2011). Table 3-17 identifies the waterbody segments potentially affected by transmission lines in White River National Forest.

Table 3-17. Waterbody Segments Potentially Affected by Transmission Line Maintenance Activities in White River National Forest

Transmission Line Section	Transmission Line Length (miles)	Stream Segment	Stream Miles	Aquatic Life	Recreation	Water Supply	Agriculture	Antidegradation Designation
Blue River-Gore Pass	7.0[1]	COUCBL18	196.00	Cold 1	Existing	Yes	Yes	Reviewable
Green Mountain-Blue Ridge Repeater	0.5	COUCBL17	38.6	Cold 1	Existing	Yes	Yes	Reviewable
Green Mountain-Kremmling	2.0	COUCBL17	38.6	Cold 1	Existing	Yes	Yes	Reviewable
North Fork-Rifle	3.4[1]	COLCLC5	260.7	Cold 1	Potential	Yes	Yes	Reviewable

Sources: Colorado Water Quality Control Division 2010a, 2011.

[1]Total length of pipeline on White River National Forest lands, not the specific length allocated to different stream segments.

Summary of Potentially Affected Waters Listed as Impaired, Identified as Priority Watersheds, or Delineated as Source Water Supplies

Section 303(d) of the Clean Water Act requires states to identify waters that do not or are not expected to meet applicable water quality standards with technology-based controls alone. This is provided in a document called the 303(d) list, which is updated biennially. The 303(d) list identifies the specific constituent (such as nitrate, copper, sediment, or habitat) causing the specific water-quality impairment for that segment. Total maximum daily loads (TMDLs) are required for all constituents listed for each stream segment on the 303(d) list. WAPA reviewed the 2010-303(d) list compiled by Colorado, Nebraska, and Utah to identify impaired waters intersected by its transmission line ROWs. Table 3-18 lists the results of this review. Only seven of the segments intersected or drained by the transmission line ROWs are listed as impaired as of the 2010 listing cycle for the state Integrated Assessment Reports.

Table 3-18. Summary of Waterbody Segments Potentially Affected by Transmission Line Maintenance Activities

National Forest(s)	Transmission Line Section	Stream Segment	Section 303(d)-listed Waterbodies; Parameter(s) of Concern	Source Waters
Arapaho-Roosevelt	Archer-North Park	COUCNP7a	-	No
		COSPLA2a	303(d); pH	No
	Ault-Craig	COUCNP7a	-	No
		COSPLA2a	303(d); pH	No
	Blue River-Gore Pass	COUCBL19	-	Yes
		COUCBL18	-	Yes
		COUCUC8	-	Yes
	Green Mountain-Blue Ridge Repeater	COUCBL17	-	Yes
		COUCBL19	-	Yes

Table 3-18. Summary of Waterbody Segments Potentially Affected by Transmission Line Maintenance Activities

National Forest(s)	Transmission Line Section	Stream Segment	Section 303(d)-listed Waterbodies; Parameter(s) of Concern	Source Waters
Ashley	Flaming Gorge- Vernal line 3	Big Brush Creek and Tributaries; from Tyzack Dam to headwaters	-	Yes
	Flaming Gorge- Vernal line 1	Davenport Creek and Tributaries	-	No
	Flaming Gorge- Vernal line 1	Gorge Creek and Tributaries	-	No
	Flaming Gorge- Vernal lines 1 and 3	Tributaries to Flaming Gorge Reservoir	-	No
Grand Mesa, Gunnison, and Uncompahgre	Curecanti-Lost Canyon	COGUSM9	-	No
	Curecanti-North Fork	COGUUG26	-	Yes
	Curecanti-Poncha	COGUUG19	-	Yes
	Hesperus-Montrose	COGUSM9	-	No
		COGUUN12	303(d); Se	Yes
	North Fork-Rifle	COGUNF4	-	Yes
		COLCLC15	303(d); Fe (Trec), Se	Yes
	North Gunnison-Salida	COGUUG19	-	Yes
Medicine Bow-Routt	Archer North Park	COUCYA11	-	Yes
		COUCNP4a	-	No
	Ault-Craig	COUCYA11	-	Yes
		COUCNP4a	303(d); Aquatic life use	Yes
	Gore Pass-Hayden	COUCUC4	-	Yes
	Gore Pass-Muddy Pass	COUCNP4a	303(d); Aquatic life use	Yes
	Hayden-Gore Pass	COUCUC4	-	Yes
	Hayden-North Park	COUCYA11	-	No
Nebraska	Box Butte-Chadron	11120	-	Yes
Pike and San Isabel	Curecanti-Poncha	COARUA13	-	Yes
	Malta-Mt Elbert	COARUA10	303(d); pH, D.O., Cu	Yes
	North Gunnison-Salida	COARUA13	-	Yes
San Juan	Curecanti-Lost Canyon	COSJDO5	-	No
	Great Cut-McPhee	COGUSM9	-	No
	Great Cut SWYD-Great Cut Tap	COSJDO11	-	No
	Hesperus-Montrose	COSJDO5	-	No

Table 3-18. Summary of Waterbody Segments Potentially Affected by Transmission Line Maintenance Activities

National Forest(s)	Transmission Line Section	Stream Segment	Section 303(d)-listed Waterbodies; Parameter(s) of Concern	Source Waters
White River	Blue River-Gore Pass	COUCBL18	-	Yes
	Curecanti-Rifle	COLCLC5	-	Yes
	Green Mountain-Blue Ridge Repeater	COUCBL17	-	Yes
	Green Mountain-Kremmling	COUCBL17	-	Yes

Source: Colorado Water Quality Division 2010b.

Cu copper
D.O. dissolved oxygen
Fe (Trec) total recoverable iron
Se selenium

The Water Quality Control Division completed the initial source water assessment reports for more than 1,700 public water systems in November 2004. The Assessment Phase involves a determination of the source of each public water system's water, what contaminant sources potentially threaten the water source(s), and how susceptible each water source is to potential contamination. Many public water systems obtain their water from multiple sources. The susceptibility of an individual water source is analyzed by examining the properties of its physical setting and potential contaminant source threats (Colorado Water Quality Division 2010a). Because many public water systems obtain their source water from streams that originate in the mountains, source water areas are common on NFS lands. Therefore, it is understandable that all but four of WAPA's transmission line segments on NFS lands intersect delineated municipal source water areas (Table 3-18 and Table 3-19).

Table 3-19. Public Water Systems' Delineated Source Water Areas Intersected by WAPA's Transmission Lines

Public Water System Name	Public Water System Identification Number	Public Water System Name	Public Water System Identification Number
City Of Thornton	CO0101150	Clifton Wd	CO0139180
City Of Aurora	CO0103005	Town Of Debeque	CO0139205
Englewood City Of	CO0103045	City Of Grand Junction	CO0139321
City Of Boulder	CO0107152	Ute WCD	CO0139791
City And County Of Broomfield	CO0107155	City Of Craig	CO0141188
City Of Lafayette	CO0107473	City Of Cortez	CO0142200
City Of Longmont	CO0107485	Town Of Dolores	CO0142400
City Of Louisville	CO0107487	Town Of Mancos	CO0142700
City Of Salida	CO0108700	Montezuma WC	CO0142900
Denver Water Board	CO0116001	Town Of Naturita	CO0143533
Town Of Dove Creek	CO0117300	Town Of Nucla	CO0143559
Roxborough Park MD	CO0118055	Project 7 Water Authority	CO0143621
Centennial WSD	CO0118015	City Of Ft Morgan	CO0144005
Colorado Springs Utilities	CO0121150	City Of Rocky Ford	CO0145600
Fountain Valley Authority	CO0121300	Pueblo Board Of Water Works	CO0151500
Canon City	CO0122100	Pueblo West MD	CO0151650
City of Florence	CO0122500	St Charles Mesa Water District	CO0151750
Battlement Mesa Metro District	CO0123133	Town Of Hayden	CO0154333
Town of Parachute	CO0123602	Mt Werner WSD	CO0154524
City of Rifle	CO0123676	Erie Town Of	CO0162255
Town Of Silt	CO0123710	City Of Fort Lupton	CO0162291
Town Of Hot Sulphur Springs	CO0125352	Greeley City Of	CO0162321
Town Of Kremmling	CO0125455	Town Of Hudson	CO0162359
Town Of Berthoud	CO0135138	Town Of Johnstown	CO0162418
Eden Valley Institute	CO0135237	Bowie Mine No2	CO0215202
Town Of Estes Park	CO0135257	Holcim Inc	CO0222700
City Of Ft Collins	CO0135291	Wolford Mountain Recreation Area	CO0225168
Carter Lake Filter Plant	CO0135476	Mountain Coal Co LLC - West Elk Mine	CO0226838
City Of Loveland	CO0135485	Mt Elbert Power Plant	CO0233650
Newell Warnock WA	CO0135538	Platte River Power Authority	CO0235668
Prospect Mountain WC	CO0135621	Riverview Cg	CO0235676
Soldier Canyon Filter Plant	CO0135718	Spruce Lake RV Park	CO0235722
Spring Canyon WSD	CO0135721	Tri State G And T Nucla Station	CO0243185
Sunrise Ranch	CO0135725	Public Service Comanche Plant	CO0251700
Stagecoach State Park	CO0254718	Public Service Co of Colo Hayden Station	CO0254185
Yampa River State Park	CO0254901	-	-

Source: Colorado Water Quality Division 2010a.

3.2.5 Environmental Consequences

There could be direct and indirect impacts on water resources under the No Action Alternative and the Proposed Action. This section describes potential short-term impacts (those that would occur in the first five years after authorization), long-term impacts (those that would occur five or more years after authorization), and cumulative impacts.

Water resources near WAPA's ROWs are highly valued. Most of the forest areas with transmission line ROWs are near the headwaters of major watersheds, where water quality is typically very good and minimally affected by human activities. Many of these areas provide source water for public water systems. Most the waters include healthy populations of aquatic life and provide many opportunities for recreation in and on the water. These waters are eventually used for agricultural purposes. Short- or long-term impacts to the *beneficial uses* of the waters near WAPA's ROWs would be very serious and probably lead to major conflicts with water users. The water resources impact criteria refer to violations of water quality standards, impairment of classified beneficial uses, and interference with groundwater recharge areas.

There are several factors that reduce the likely degree, or potential magnitude, of impacts on water resources for WAPA's maintenance and vegetation management program. Transmission line ROWs make up a very small portion of the watersheds in national forest areas. Transmission lines typically cross surface waters at point locations and often span high over drainages, or follow utility corridors, which generally are in upland areas away from riparian zones, wetlands, and drainages. The project area is mostly forested, and there are buffer zones between the locations of most ROW maintenance activities and sensitive water resources. The transmission lines have been in place for many years and they tend to be in zones with higher precipitation. ROWs that are the subject of this analysis are generally well vegetated, so they can recover quickly from small disturbances.

No new road construction is needed under the No Action Alternative or the Proposed Action. This precludes most of the worst potential for additional impacts on water resources for a project of this nature. Nonetheless, there are important differences in the environmental impacts on water resources between the project alternatives. Sections 3.2.5.1 and 3.2.5.2 describe those impacts.

Minimization of Impacts to Surface Water

At present, WAPA uses the following standard maintenance procedures (see Table 2-15) to ensure water resources are protected:

- Construct water turnoff bars or small terraces across ROW trails on hillsides to prevent water erosion and to help establish natural revegetation.
- When work is finished, ensure that work areas except access trails are left in a condition that will help with natural revegetation (unless reseeding, mulching, or other specific requirements apply), provide for proper drainage, and prevent erosion. Seeding and mulch requirements will be specified. Seed mix will be approved by the Forest Service. All seed, mulch, and hay approved for use will be properly certified as weed-free.
- Do not burn or bury waste materials (e.g., garbage or other material brought into the site). Remove all waste materials from the project area and dispose of them properly or recycle them.

- All spills will be cleaned up immediately. There will be no refueling, chemical storage, chemical mixing near (e.g., less than 250 feet) surface water.
- Do not stockpile or deposit job materials such as gasoline, chainsaws, garbage containers, and so forth near stream banks, wetlands, lake shorelines, or other surface water. Ensure that project materials are staged away from potential high water areas or storm runoff drainages. Comply with applicable NPDES requirements and obtain required permits.

These measures are common to the No Action Alternative and the Proposed Action.

In addition to these standard maintenance procedures, the Proposed Action includes the design features identified in Chapter 2 (Table 2-13) that address protection of water resources. These design features are more detailed and address more types of problems than the standard maintenance procedures, and include required buffer zones and authorized practices in buffer zones to protect water resources. Adherence to these design features would help minimize the short- and long-term impacts of the Proposed Action.

3.2.5.1 No Action Alternative

Under the No Action Alternative, WAPA would continue its past practices for managing vegetation along its ROWs. The primary focus has been on removing danger trees that pose a risk to transmission lines. At a minimum, this requires annual ROW evaluations and reentries by maintenance crews to remove trees that are already, or soon will be, a risk to transmission lines. Danger trees and other vegetation can interrupt reliability and operation of transmission lines and create maintenance problems. At present, WAPA uses manual, mechanical, and chemical (herbicides) methods to remove vegetation after it has become a problem. These measures are common to the No Action Alternative and the Proposed Action, and would continue under the No Action Alternative.

Direct and Indirect Impacts

WAPA's current vegetation management program includes regular deployments of maintenance crews to maintain access routes to each of the transmission line ROWs. Chapter 2 describes current vegetation management methods in detail. These practices define the current level of impacts on water resources from WAPA's vegetation management program.

Maintaining the access routes involves mowing, spraying weeds, or reseeding, and grading, surfacing, and erosion control (such as maintaining water diversions like culverts, ditches, and water bars). Chapter 2 describes these methods.

The focus of vegetation management in the transmission line ROWs is on trees and vegetation that cause dangerous conditions or create maintenance problems. This reactive approach results in recurring needs to enter the same areas along the ROWs. Ground inspections and line patrols are typically performed by driving a pickup truck, ATV, or snow machine along designated access routes into the transmission line ROWs. Maintenance crews then reenter the area to address problems the inspection crews identify.

Driving in ROWs every year can create permanent tracks, which could become a preferential flow path for precipitation runoff. This is a particular problem where access is accomplished by overland travel across routes with managed low vegetation growth. Concentrating runoff in road ruts can lead to accelerated erosion and sedimentation in streams that are high in the watershed and normally have very low concentrations of suspended solids.

WAPA's current approach involves annual reentries to manage problem vegetation along the ROW segments. Maintenance crews use a variety of methods, including hand clearing with chain saws and using self-propelled grinders, mowers, or mulchers. These can be fairly substantial land-disturbing activities. Use of heavy equipment on steeper slopes can lead to severe erosion during runoff conditions. Also, repeated entries into the same areas might not allow time for disturbed areas to fully recover, making them more susceptible to erosion, which can lead to sedimentation problems in nearby waterbodies.

The No Action Alternative includes the current practice of spot application of Forest Service-approved herbicides. WAPA uses herbicides to selectively or non-selectively kill target vegetation or retard its growth. There will be no aerial application of herbicides under the No Action Alternative or the Proposed Action. Nonetheless, frequently recurring use of herbicides is undesirable, particularly when applications are non-selective and can also kill desirable vegetation. Some of the synthetic organic compounds used in herbicides can be strongly sorbed onto soil particles and can last a long time in the environment. If herbicides find their way into waterbodies, they could eliminate sensitive species and damage aquatic ecosystems.

Beneficial, Adverse, Long-term, and Short-term Impacts

One beneficial impact of the No Action Alternative is that WAPA's focus on danger trees and other types of problem vegetation leads to maintenance activities with a small footprint compared to the overall size of the ROWs. Removing specific trees and individual stands of vegetation means that in most cases the land-disturbing activity can be buffered from nearby waterbodies with established vegetation and intact riparian areas. It also means that maintenance efforts have a short duration, which gives post-project site restoration activities a good chance to succeed. Smaller vegetation treatment areas usually result in a relatively small amount of slash for disposal. Slash can be safely scattered uniformly across the treated area without washing into receiving streams. However, because slash degrades slowly in the relatively arid climate, it can accumulate and may eventually become a fuels problem in the ROW.

The short-term effects of specific vegetation maintenance efforts can be acceptable from the standpoint of water resources protection. That should translate into a fairly low potential for conflicts between maintenance activities and the objectives of federal, regional, state, and local land use plans, policies, and controls for the project area.

The tradeoff with this approach is the likely potential need for multiple re-entries into the same site or adjoining sites in the ROWs. As trees and other vegetation that did not present an imminent threat at the time of the first entry continue to grow and become a problem, subsequent interventions would be required. The ongoing need to return to past treatment areas has the long-term effect of creating well-traveled access routes and permanent land disturbances in otherwise fairly unaffected areas. The long-term water quality impacts from recurring vegetation treatments could be from an increased level of erosion. If these problems continue unabated, there could be sedimentation problems and habitat degradation. Other beneficial uses of the receiving waters for recreation and as a drinking water or agricultural water supply could also be degraded to a limited degree.

Cumulative Impacts

WAPA's vegetation maintenance activities have been ongoing in its ROWs for many years. Any cumulative impacts associated with WAPA's activities are reflected in current ambient water quality. Even though there are other activities taking place in the affected watersheds, water quality is generally better than necessary to protect the beneficial uses of receiving streams. There are six impaired waterbody segments of a total of 39 that include WAPA's transmission lines. However, waterbody segments can encompass very large areas with many streams included that are not in the vicinity of WAPA's ROWs. In fact, only one of WAPA's transmission lines (the Ault-Craig ROW) directly intersects and traverses a specific stream (versus an entire segment) that is listed as impaired. In any case, the percentage of runoff from WAPA's ROWs is miniscule compared to the total runoff from the watersheds contributing to the impaired waterbodies WAPA's transmission lines cross or traverse. Also, the impacts to water resources associated with WAPA's maintenance activities will be mitigated to a large degree. The projects listed in Appendix A would likely result in similar potential impacts to water resources as WAPA's current vegetation management program. However, the cumulative impact of these activities combined with WAPA's vegetation maintenance activities would still be minor in the context of the total watershed areas contributing to the impaired stream segments.

3.2.5.2 Proposed Action

The primary difference between the No Action Alternative and the Proposed Action is WAPA's specific proposal to change the way it manages vegetation in ROWs. In areas where treatment is required, the Proposed Action would likely initially result in more short-term direct impacts to surface water in the transmission line ROWs (and potentially impacts on water resources) than the No Action Alternative. But, after the initial treatments, the long-term potential impacts to water quality would be greatly reduced and would range from about 50 percent of the current level to perhaps only 10 to 20 percent of the current level, based on the projected frequency of required reentry into the ROW for vegetation maintenance.

Direct and Indirect Impacts

Perhaps the best indicator of environmental consequences for water resources is the required return interval for vegetation maintenance in each vegetation management category. For every vegetation category, the maintenance requirements and return intervals are considerably less frequent under the Proposed Action than under the No Action Alternative. WAPA would not frequently enter areas with vegetation in Categories 1, 5, and 6 under the Proposed Action; therefore, the maintenance-related impacts to water resources are minimal in these areas.

Areas in Categories 2, 4, and 6 require initial treatments and these equipment- and resource-intensive treatments could lead to erosion during runoff conditions. Initial treatments that occur adjacent to or near surface water could lead to sedimentation problems in nearby waterbodies. The design features identified in Table 2-13 would help to minimize effects to surface water.

The Proposed Action also includes herbicide applications. Herbicides would be used to treat individual or small groups of undesirable plants, including, but not limited to, invasive plant species. Spot application of Forest Service-approved herbicides is a typical method to control noxious weeds and other undesirable, mostly herbaceous, vegetation. WAPA applies herbicides on a limited basis to control vegetation in areas around transmission line towers. The herbicide is applied directly to the vegetation using a hand or powered sprayer. WAPA does not apply herbicides over water. WAPA would only use herbicides approved for use in ROW maintenance and approved by the Forest Service. Herbicides are registered for use by the EPA and State, and would be applied in accordance with the label requirements by appropriately licensed and certified applicators. Use of herbicides in this manner is not expected to impact water quality.

Beneficial, Adverse, Long-term, and Short-term Impacts

The most beneficial effect of the Proposed Action would be the decreased frequency of required vegetation treatments. This is due to a more integrated, self-sustaining approach to ensuring compatibility between transmission line ROWs and the types of vegetation allowed to occupy the ROWs. The reduced frequency of reentries into ROWs for required treatments should translate directly to a reduced level of impacts to water resources. While the direct impacts of this approach might be greater over the short term, over the long term water-related impacts associated with treatment of ROW vegetation could be as little as 10 to 20 percent of their current magnitudes. This is based on the reduced frequency of required re-entry into ROWs for treatments.

Provided the currently proposed design features and standard maintenance procedures are implemented everywhere they apply, WAPA's Proposed Action for vegetation management should not adversely affect the existing good quality of waterbodies in the project area. This is true even during the fairly intensive maintenance activities that would be required initially to reset the vegetation conditions so they would be more self-sustaining and compatible with the transmission line ROWs. Over the long term, the level of disturbance related to vegetation management should be considerably reduced from present levels.

Arapaho-Roosevelt National Forest

Four different WAPA transmission lines cross 18 miles of NFS lands in the Arapaho-Roosevelt National Forest. The ROWs cover approximately 288.2 acres. Of the total ROW acreage, 20 percent is in Categories 1, 5, and 6, and require very infrequent maintenance. Seven percent of the ROWs are in Category 4, which requires an initial treatment and then very infrequent maintenance. A combined total of 73 percent of the ROWs are in Categories 2 and 3, which would require maintenance every 2 to 6 years. The required return interval is longer for the vegetation in each category than it is for the current approach to vegetation management under the No Action Alternative.

Only one stream segment that intersects a WAPA ROW in the Arapaho-Roosevelt National Forest has been officially listed by the State of Colorado as being impaired. Segment COSPLA2a is listed as being impaired by low pH. This segment does not serve as source water for a public drinking water system. Vegetation management activities under the Proposed Action near this stream segment, which is upstream of Steamboat Springs, would not be expected to exacerbate the current pH problem.

All other waterbodies, either intersected by, or running parallel to WAPA ROWs, have water quality that is better than necessary to protect their classified beneficial uses. Provided the currently proposed design features and standard maintenance procedures are implemented everywhere they apply, WAPA's Proposed Action for vegetation management should not adversely affect the existing good quality in these waterbodies. This is true even during the fairly intensive maintenance activities that would be required initially to reset the vegetation conditions so they would be more self-sustaining and compatible with the transmission line ROWs. Over the long term, the level of disturbance related to vegetation management should be considerably reduced from present levels.

Ashley National Forest

Two different WAPA transmission lines cross 26.1 miles of NFS lands in the Ashley National Forest. The ROWs cover approximately 252.6 acres, of which 77 percent is in Categories 1, 5, and 6, and requires very infrequent maintenance. Ten percent of the ROWs are in Category 4, which requires an initial treatment and then very infrequent maintenance. A combined total of 13 percent of the ROWs is in

Categories 2 and 3, which would require maintenance every 2 to 6 years. The required return interval is longer for the vegetation in each category than it is for the current approach to vegetation management under the No Action Alternative.

The Utah Water Quality Board has designated all of the waterbodies in WAPA ROWs in the Ashley National Forest to be of exceptional recreational or ecological significance, or has determined they are a state or national resource that requires protection. These waters must be maintained at their existing high quality, so no point source discharges would be allowed under the Proposed Action. But, given that no construction of roads or facilities is contemplated and herbicides would not be applied over or near water, no point source discharges are anticipated. The State of Utah has not listed any of the waterbodies that intersect or run parallel to WAPA ROWs in Ashley National Forest as impaired. Only one waterbody segment that intersects a WAPA ROW in this forest (Big Brush Creek and its tributaries from Tyzack Dam to the headwaters) serves as source water for a public drinking water supply. All waterbodies near the WAPA ROWs have water quality that is better than necessary to protect their classified beneficial uses. Provided the currently proposed design features and standard maintenance procedures are implemented everywhere they apply, WAPA's Proposed Action for vegetation management should not adversely affect the existing good quality in these waterbodies.

Grand Mesa, Uncompahgre, and Gunnison National Forest

Six different transmission lines cross 76.5 miles of NFS lands in the Grand Mesa, Uncompahgre, and Gunnison National Forest. The ROWs cover approximately 1,201.8 acres. Of the total ROW acreage, 58 percent is in Categories 1, 5, and 6 and require very infrequent maintenance. Three percent of the ROWs are in Category 4, which requires an initial treatment and then very infrequent maintenance. A combined total of 39 percent of the ROWs are in Categories 2 and 3, which would require maintenance every 2 to 6 years. The required return interval is longer for the vegetation in each category than it is for the current approach to vegetation management under the No Action Alternative.

With two exceptions, the waterbodies WAPA ROWs intersect in the Grand Mesa, Uncompahgre, and Gunnison National Forest have better water quality than necessary to protect classified beneficial uses. However, WAPA ROWs intersect two stream segments the State of Colorado has officially listed as being impaired. Waterbody Segment COGUUN12, which the Hesperus-Montrose portion of WAPA's transmission line intersects, is listed as being impaired by selenium. Segment COLCLC15, which the North Fork-Rifle portion of WAPA's transmission line intersects, is listed as impaired for both selenium and total recoverable iron. The standards for selenium and total recoverable iron were established to protect aquatic life. These constituents are natural components of the soils in the impaired waterbodies. Vegetation management activities under the Proposed Action near these stream segments would not be expected to exacerbate the current selenium or total recoverable iron problem due to implementation of design features and standard maintenance procedures.

Both of these impaired waterbodies serve as source waters for public drinking water systems, as do all but one of the waterbodies in these national forests that the Proposed Action could affect. The one exception is segment COGUSM9 of the San Miguel River, which does not provide source water.

Medicine Bow-Routt National Forest

Six different transmission lines cross 62.1 miles of NFS lands in the Medicine Bow-Routt National Forest. The ROWs cover approximately 935.5 acres. Of the total ROW acreage, 43 percent is in Categories 1, 5, and 6, and require very infrequent maintenance. Six percent of the ROW is in Category 4, which requires an initial treatment and then very infrequent maintenance. A combined total of 51 percent of the ROWs is in Categories 2 and 3, which would require maintenance every 2 to 6 years. The required return interval is longer for the vegetation in each category than it is for the current approach to vegetation management under the No Action Alternative.

WAPA ROWs intersect one stream segment in the Medicine Bow-Routt National Forest the State of Colorado has officially listed as impaired. Waterbody segment COUCNP4a, which the Ault-Craig and Gore Pass-Muddy Pass ROW portions intersect, is listed as being impaired for the aquatic life use. This waterbody serves as source waters for public drinking water systems. The vegetation in the Gore Pass-Muddy Pass ROW is in Category 1 and would not require vegetation maintenance; therefore, no effects would occur in this area. The vegetation in the Ault-Craig ROW is in Category 3 and would require relatively frequent vegetation maintenance activities (i.e., every 2 to 6 years). Vegetation management activities near these impaired waterbodies could exacerbate the water quality problems. Special care would be required to keep soil disturbances to a minimum and to prevent organic (oxygen-consuming) slash materials and sediment from entering the waterways. The environmental consequences of WAPA's Proposed Action would not allow water quality to become unacceptable.

Nebraska National Forest

One WAPA transmission line crosses 9.2 miles of NFS lands in the Nebraska National Forest. The ROW covers approximately 83.5 acres. Of the total ROW acreage, 95 percent is in Category 1, and would require very infrequent maintenance. No acreage of the ROW is in Categories 5 and 6. Five percent of the ROW is in Category 4, which requires an initial treatment and then very infrequent maintenance. The required return interval is longer for the vegetation in each category than it is for the current approach to vegetation management under the No Action Alternative.

One waterbody segment (No. 11120) in the Nebraska National Forest intersects the Box Butte-Chadron portion of WAPA's transmission line. This stream does serve as source water for a public water system, and the State of Nebraska has not listed it as being impaired. While most of the ROW would not need vegetation maintenance, there are four areas where waterbodies cross the transmission line ROW that are in Category 4. Provided the currently proposed design features and standard maintenance procedures are implemented in these areas, WAPA's Proposed Action for vegetation management should not adversely affect the existing good quality in this waterbody.

Pike and San Isabel National Forest

Three different WAPA transmission lines cross 17.3 miles of NFS lands in the Pike and San Isabel National Forest. The ROWs cover approximately 211.6 acres. Of the total ROW acreage, 60 percent is in Categories 1, 5, and 6, and require very infrequent maintenance. Nine percent of the ROW is in Category 4, which requires an initial treatment and then very infrequent maintenance. A combined total of 31 percent of the ROW is in Categories 2 and 3, which would require maintenance every 2 to 6 years. The required return interval is longer for the vegetation in each category than it is for the current approach to vegetation management under the No Action Alternative.

Two waterbody segments intersect WAPA's ROWs in the Pike and San Isabel National Forest. Neither is impaired. One (segment COARUA13) has water quality that is better than necessary to protect beneficial uses. Waterbody segment COARUA10, which the Malta-Mt Elbert portion of WAPA's transmission line intersects, is listed as being impaired by low pH, low dissolved oxygen, and excessive copper. With WAPA's the currently proposed design features and standard maintenance procedures implemented everywhere they apply, WAPA's Proposed Action for vegetation management should not adversely affect the existing good quality in these waterbodies over the short or long term.

San Juan National Forest

Four different WAPA transmission lines cross 50.8 miles of NFS lands managed in the San Juan National Forest. The ROWs have variable widths and cover approximately 898.4 acres. Of the total ROW acreage, 83 percent is in Categories 1, 5, and 6, and require very infrequent maintenance. Four percent of the ROWs is in Category 4, which requires an initial treatment and then very infrequent maintenance. A combined total of 13 percent of the ROWs is in Categories 2 and 3, which would require maintenance every 2 to 6 years. The required return interval is longer for the vegetation in each category than it is for the current approach to vegetation management under the No Action Alternative.

WAPA ROWs intersect two waterbody segments in the San Juan National Forest. Neither is impaired. In fact, both have water quality that is better than necessary to protect beneficial uses. So long as the currently proposed design features and standard maintenance procedures are implemented everywhere they apply, WAPA's Proposed Action for vegetation management should not jeopardize the good quality in these waterbodies, either over the short or long term.

White River National Forest

Four different WAPA transmission lines cross 12.9 miles of NFS lands in the White River National Forest. The ROWs have variable widths and cover approximately 183.4 acres. Of the total ROW acreage, 67 percent is in Categories 1 and 6, and require very infrequent maintenance. No ROW acreage is in Category 5. Thirteen percent of the ROW is in Category 4, which requires an initial treatment and then very infrequent maintenance. A combined total of 20 percent of the ROW is in Categories 2 and 3, which would require maintenance every 2 to 6 years. The required return interval is longer for the vegetation in each category than it is for the current approach to vegetation management under the No Action Alternative.

WAPA ROWs intersect four waterbody segments, all of which serve as source waters for public water systems. The State of Colorado does not list any of these waterbodies as being impaired. Each of the four intersecting waterbodies has better quality than necessary to protect their classified beneficial uses. Provided the currently proposed design features and standard maintenance procedures are implemented everywhere they apply, WAPA's Proposed Action for vegetation management should not jeopardize the good quality in these waterbodies, either over the short term or long-term.

3.2.5.3 Cumulative Effects

Because of other past, present, and future activities taking place in the watersheds in addition to WAPA's vegetation maintenance program, cumulative impacts could occur. However, these cumulative effects should not result in surface water quality degradation that violates federal or state water quality standards or causes a long-term loss of human use or use by aquatic wildlife and plants. Nor should these effects alter the existing drainage patterns that would result in adverse effects to adjacent properties.

The projects listed in Appendix A would likely result in similar potential impacts to water resources as WAPA's proposed vegetation management program. There are six impaired waterbody segments of a total of 39 that include WAPA's transmission lines. However, waterbody segments can encompass very large areas with many streams included that are not in the vicinity of WAPA's ROWs. In fact, only one of WAPA's transmission lines (the Ault-Craig ROW) directly intersects and traverses a specific stream (versus an entire segment) that is listed as impaired. Because the Forest Service and WAPA are planning or implementing these projects, it is likely that environmental control measures would be required to mitigate potential impacts. The design features and standard maintenance procedures required for all vegetation management activities are expected to be sufficient to control erosion, sedimentation, and other types of contamination that might be associated with vegetation management.

Other past, present, or reasonably foreseeable projects that could result in cumulative impacts include a project for two parallel transmission lines between West Loveland and Estes Park (WAPA), the Bighorn Sheep Habitat Improvement Process, the Thunder Trails Project, the Buffalo Gap (West Geographic Area) and Oglala National Grasslands Grazing RAMP, and Nebraska National Forest Travel Management. The transmission project between West Loveland and Estes Park is likely to result in similar potential impacts to water resources as WAPA's proposed vegetation management program, but because WAPA is planning and implementing the project, similar environmental control measures would be required to mitigate potential impacts to water resources. The Bighorn Sheep Habitat Improvement Process is on hold indefinitely. The Thunder Trails Project and the Buffalo Gap (West Geographic Area) and Oglala National Grasslands Grazing RAMP should help to control erosion and sedimentation associated with grazing and motorized vehicles operating in Nebraska National Forest, not resulting in adverse cumulative impacts to water resources. These and other future projects would require NEPA compliance, including a cumulative impact assessment.

3.3 Soils

3.3.1 Introduction

This section describes soil characteristics in the project area that vegetation management and maintenance activities could affect. Section 3.3.2 describes the regulatory and policy framework; Section 3.3.3 describes methods and assumptions for analysis; Section 3.3.4 describes the soils affected environment, in particular, general soil characteristics, erosion hazard, hydrologic soil group, and slope gradient; and Section 3.3.5 describes potential impacts to soils, including cumulative impacts.

3.3.2 Regulatory and Policy Framework

There are several independent legal and policy frameworks that apply to the protection of soil resources on NFS lands. The entire project area, except for Ashley National Forest, is in Forest Service Region 2. The Soil Management Handbook for Region 2 (Forest Service 1992) in the Forest Service Handbook establishes regional soil quality standards for site management activities. The handbook requires that management activities be performed so as to not exceed the soil quality standards. Soil quality standards are specified for bulk density, soil displacement, accelerated erosion,[4] and effective ground cover (herbaceous and woody material and rock fragments).

Forest Service Region 2 Watershed Conservation Practices Handbook, Chapter 10 (Forest Service 2006a), in the Forest Service Handbook prescribes management measures (environmental goals to protect soil, aquatic, and riparian systems) and design features (specific practices to attain the management measures) that apply to activity areas in national forests in Region 2. The five areas covered by the handbook are hydrologic function, riparian areas and wetlands, sediment control, soil quality, and water

[4] *Water erosion rates that are higher than normal geologic erosion rates and caused by human activities.*

purity. The design features related to soils include factors such as runoff management, ground cover, heavy equipment entry into sensitive areas, and maintenance of the soil litter layer.

Ashley National Forest is in Forest Service Region 4. There is no soil management handbook for this national forest, although soil management practices in the forest are guided by the Soil and Water Conservation Handbook (FSH) 2509.22 (Forest Service 1988). The current (issued 1986) Forest Plan for the forest also provides guidance on soil management.

3.3.3 Methods and Assumptions for Analysis

WAPA based the impact assessment on soils information from the Natural Resources Conservation Service (NRCS) Soil Survey Geographic (SSURGO) database, supplemented with hard-copy soil survey reports for parts of the ROWs SSURGO did not cover. WAPA reviewed the soils information and described soil parent materials and landforms.

WAPA then reviewed the SSURGO data and soil survey reports for soil characteristics that could constrain vegetation treatment activities or that vegetation treatment activities could adversely affect, in particular texture, drainage class, slope class, depth, runoff rate, and water erosion hazard.

WAPA assessed impacts on soils by considering the types and intensity of the vegetation treatment actions in relation to the soils' susceptibility to adverse effects from the actions.

Assumptions

WAPA made the following important assumption for identifying and analyzing the soil resources the alternatives would affect:

- Existing NRCS soil survey mapping provides enough detail to form the basis for determining whether there could be an adverse impact on soils.

Impact Criteria and Indicators

There could be an impact on soils if the proposed project caused the following:

- Substantial erosion (loss of 25 percent or more of the A horizon, E horizon, or both) due to disturbances in areas of steep (greater than 20 percent) slopes
- Compaction or mixing of soils that would result in long-term loss of productivity or that substantially alters current use or revegetation growth
- Loss of soils from erosion, excavation, or overcovering that uniquely support threatened or endangered plant species, or contamination of soils that support an existing sensitive ecosystem
- Violations of Soil Quality Standards specified in the Forest Service Region 2 Soil Management Handbook
- Formation of a substantial hydrophobic soil layer (i.e., a repellency index of 1 or greater [DeBano 1981]) from slash pile burning

3.3.4 Affected Environment

The soils along the ROWs exist in a wide variety of landform and slope conditions, are under a range of vegetation types, are formed from an array of parent materials, and are subject to climatic differences. Consequently, the soils vary greatly in their morphological and chemical properties among the national forests and along a given ROW. The typical ROW crosses many individual soil map units. Some soils are more subject to potential adverse effects of vegetation management than others.

The tables in Appendix B for each national forest provide soils information pertinent to vegetation management activities (slope gradient, hydrologic soil group, and erosion hazard). The data in the tables were derived from the SSURGO database (NRCS 2011). Percent slope gradient (expressed as the weighted average for the soil map unit) was based on the SSURGO element "slopegradw." Hydrologic soil group was based on the SSURGO element "hydgrpdcd." Erosion hazard was based on the SSURGO element "forpehrtd," which corresponds to the relative potential erosion hazard for the soil map unit when used as a site for forest roads and trails. Appendix B provides more detailed information about these characteristics.

Slope and soil characteristics along the ROWs could affect the ability of heavy equipment to work in the area without adversely affecting soils, present the potential for management activities to cause increases in runoff and erosion, and cause the formation of a hydrophobic soil layer. Management activities also could be constrained by the presence of wet soils, which might be particularly sensitive to rutting and compaction. Table 3-20 lists these factors. Appendix B includes soil characteristics by forest and ROW upon which some of the ratings in Table 3-20 are based.

Table 3-20. Ratings of Slope and Soil Characteristics that Could Constrain or be Adversely Affected by Vegetation Management Activities

National Forest(s)	Transmission Line Section	Constraint to Heavy Equipment Use Due to Steep Slopes[1]	Potential for Increases in Runoff[2]	Potential for Increases in Water Erosion Rate[3]	Relative Potential for Formation of Hydrophobic Soil Layer[4]	Presence Of Significant Areas Of Wet Soils[5]
Arapaho-Roosevelt	Archer-North Park	Moderate	Moderate	Moderate to severe	Moderate	No
	Ault-Craig	Moderate	Moderate	High	Moderate	Yes
	Blue River-Gore Pass	Moderate	Moderate	High	High	No
	Green Mountain-Blue Ridge Repeater	Moderate	Moderate	High	Moderate	Yes
Ashley	Flaming Gorge-Vernal line 1	Low	Low	Moderate	Moderate	No
	Flaming Gorge-Vernal line 3	Moderate	Moderate	High	Low	No

Table 3-20. Ratings of Slope and Soil Characteristics that Could Constrain or be Adversely Affected by Vegetation Management Activities

National Forest(s)	Transmission Line Section	Constraint to Heavy Equipment Use Due to Steep Slopes[1]	Potential for Increases in Runoff[2]	Potential for Increases in Water Erosion Rate[3]	Relative Potential for Formation of Hydrophobic Soil Layer[4]	Presence Of Significant Areas Of Wet Soils[5]
Grand Mesa, Gunnison, and Uncompahgre	Curecanti-Lost Canyon	Low	Low	Moderate	Moderate	No
	Curecanti-North Fork	Moderate	Moderate	High	Moderate	No
	Curecanti-Poncha	Moderate	Moderate	High	Moderate	No
	Hesperus-Montrose	Low	Low	Low to moderate	Moderate	No
	North Fork-Rifle	Moderate	Moderate	High	Moderate	No
	North Gunnison-Salida	Moderate	Moderate	High	Moderate	No
Medicine Bow-Routt	Archer-North Park	Moderate	Moderate	Moderate to severe	Moderate	No
	Ault-Craig	Moderate	Moderate	Moderate to severe	High	No
	Gore Pass-Hayden	No data	No data	No data	No data	No data
	Gore Pass-Muddy Pass	Moderate	Moderate	High	High	No
	Hayden-Gore Pass	Low to moderate	Low to moderate	Low to high	High	No
	Hayden-North Park[6]	Moderate	Moderate	High	High	Yes
Nebraska	Box Butte-Chadron	Moderate	Moderate	High	Low	No
Pike and San Isabel	Curecanti-Poncha	Moderate	Moderate	High	Moderate	No
	Malta-Mt Elbert	Low	Low	Moderate	High	No
	North Gunnison-Salida	Moderate	Moderate	High	Moderate	No
San Juan	Curecanti-Lost Canyon	Low	Low	Moderate	Moderate	No
	Great Cut SWYD-Great Cut Tap	Low	Moderate	High	Low	No
	Great Cut-McPhee	Low to high	Low to high	Moderate to high	Moderate	No
	Hesperus-Montrose	Low	Low	Low to moderate	Moderate	No

Table 3-20. Ratings of Slope and Soil Characteristics that Could Constrain or be Adversely Affected by Vegetation Management Activities

National Forest(s)	Transmission Line Section	Constraint to Heavy Equipment Use Due to Steep Slopes[1]	Potential for Increases in Runoff[2]	Potential for Increases in Water Erosion Rate[3]	Relative Potential for Formation of Hydrophobic Soil Layer[4]	Presence Of Significant Areas Of Wet Soils[5]
White River	Blue River-Gore Pass	Moderate to high	Moderate	High	High	
	Curecanti-Rifle	Moderate	Moderate	Severe	Moderate	No
	Green Mountain-Blue Ridge Repeater	Moderate	Moderate	High	Moderate	Yes
	Green Mountain-Kremmling	Moderate	Moderate	High	Moderate	No

Source: NRCS 1999-2010

[1]Constraint to heavy equipment use due to steep slope is based on the weighted average percent slope of the predominant soil map units in the ROW (see Appendix B) and on professional judgment. Low = 0 to 14 percent slope; Moderate = 15 to 35 percent slope; High = greater than 35 percent slope.

[2]Potential for increases in runoff (from vegetation removal and soil compaction) is based on soil hydrologic group, the weighted average percent slope of the predominant soil map units in the ROW (see Appendix B), and on professional judgment. The two variables were considered in combination to arrive at the qualitative constraint level.

[3]Potential for increases in water erosion rate is based on the erosion hazard class of the predominant soil map units in the ROW (see Appendix B).

[4]Relative potential for the formation of a hydrophobic soil layer (from burning) is based on the extent of surface soils with a sandy loam or coarser texture of the predominant soil map units in the ROW (see soil characteristic descriptions in Appendix B) and professional judgment.

[5]Presence of significant areas of wet soils is based on presence or absence of a predominant soil map unit having a moderately well drained soil drainage class or in an aquic suborder (see Appendix B).

[6]No SSURGO database information available for this transmission line; however, some information obtained using hardcopy soil surveys.

3.3.5 Environmental Consequences

The following paragraphs describe mechanisms that impact soils.

Accelerated Erosion

Although erosion is a natural and ongoing process, erosion rates can markedly increase when vegetation is treated or the soil surface disturbed. Vegetation cover is important in controlling erosion; the vegetation canopy and the plant litter layer (duff) covering the soil dissipate the erosive energy of raindrops and reduce runoff. Plant roots and organic acids formed from decomposed vegetation bind individual soil particles into aggregates, thereby making the soil more resistant to erosion, particularly sandy soils.

Removing or disturbing vegetation and the litter layer can result in water erosion rates greater than normal geologic erosion rates. In addition to mass wasting (e.g., debris flows), accelerated erosion rates can be in the form of sheet, rill, and gully erosion. The potential for accelerated erosion depends on slope gradient and shape, the inherent erodibility of the soil, and the characteristics of vegetation removal or disturbance. Removing woody vegetation can increase the potential for soil mass movement because of loss of soil strength as the roots decay.

Targeted grazing (which is not included under the No Action Alternative but is included under the Proposed Action) could cause soil compaction from excessive congregation of the livestock.

Substantial erosion can also promote establishment of noxious weeds by exposing soil horizons favorable to their colonization.

Wheeled vehicles removing vegetation and pulverizing soil aggregates can also make soil more subject to wind erosion. However, this is not a substantial concern where appreciable vegetation detritus is present, which tends to increase surface roughness and retard wind erosion.

Eroded soil particles can degrade water quality through increased sedimentation.

Soil Compaction and Rutting

Excessive ground pressure from vehicles, animals, or humans compacts soil. Compaction can reduce soil productivity and other soil functions by slowing infiltration, degrading soil structure, impeding root growth, and reducing populations of soil organisms. Soil compaction can also lead to accelerated erosion from reduced infiltration capacity and increased runoff and overland flow. Fine- to medium-fine-textured soils are most subject to compaction. Dry soils do not compact well, regardless of their texture.

Compaction can also inhibit growth of beneficial soil fungi (known as mycorrhizal fungi) that provide nutrients to plant roots.

Soil rutting can occur from vehicle traffic in wet soils and especially in saturated soils. Rutting can cause concentrated runoff and accelerate erosion rates. Rutting also adversely affects soil structure, which can reduce infiltration capacity, aeration, root growth, and soil productivity.

Changes in Soil Chemistry

Vegetation management activities can alter the chemical characteristics of soil. For example, removing logs and other plant material deprives soils of the nutrients released by decaying organic material. Cutting nitrogen-fixing species, such as red alder or ceanothus, can reduce soil nitrogen levels and cause a loss of associated plant productivity. Removing the duff, herbaceous plant layer, and brush cover can eventually reduce the quantity of carbon in the soil if revegetation does not occur.

Large amounts of woody debris (especially as wood chips) scattered onto the soil surface can decrease the amount of soil nitrogen available for plant growth until debris decomposition is nearly complete.

Hydrophobic Soil Formation

Fire can adversely affect soil productivity and site stability. Fires can cause combustion of the duff layer and soil organic matter that helps to form soil aggregates in the topsoil. Fire heat can increase soil hydrophobicity (water repellency), particularly in moist, coarse-textured soils. Water-repellant soils experience a lower infiltration capacity, which can result in increased runoff and erosion. Hydrophobic layers are likely to form under burn piles or wildfire conditions with a high fuel load, where the temperature is relatively high and the fire burns a long time.

Fire can also make soil nutrients volatile and reduce populations of soil organisms. Severe, stand-replacing fires can increase the hazard of mass wasting.

Burning of slash piles is limited under the No Action Alternative and would be limited under the Proposed Action and no effects to soils are anticipated under either alternative.

3.3.5.1 No Action Alternative

Under the No Action Alternative, there would be no change in vegetation management practices and therefore no change in the type and magnitude of direct and indirect effects of the management practices on soils. Danger-tree removal, fuels reduction, and other ROW maintenance activities would continue to cause localized soil disturbance, which could subject the soils to increased runoff and erosion rates. Management practices would continue to adversely affect soil compaction, soil quality, organic matter content, nutrient cycling, and soil productivity. However, these impacts would be short term and occur in localized areas. Vegetation management activities in ROWs would continue to meet Forest Service Soil Quality Standards.

3.3.5.2 Proposed Action

Direct Effects

Potential short-term increase in accelerated soil erosion from mechanical treatments

Vegetation management practices could cause accelerated soil erosion from runoff. As more fully described in the impact mechanisms discussion above, there could be accelerated erosion from vegetation and soil duff layer removal and concentration of runoff along skid trails and tire tracks. The potential for this impact would be more acute for vegetation treatment categories 2 and 4, for which comparatively intensive initial treatments would be required to reach the desired condition, mechanized equipment would be used, and salvageable material would be removed from the ROWs.

The impact would be adverse but minor because project design features include several measures to ensure adequate groundcover (minimum 70 percent) (Design Feature 6); restoration of landings, roads, and skid trails (Design Feature 8); and site preparation work performed on the slope contour (Design Feature 9). These measures would ensure that accelerated erosion would not exceed the impact criteria of 25 percent of the A horizon, the E horizon, or both, as described in under Soils Impact Criteria and Indicators. Accelerated erosion would tend to be localized and more likely to occur during the first few years of the Proposed Action.

No further mitigation would be required.

Potential increase in compaction and accelerated soil erosion from grazing

Targeted grazing is not included under the No Action Alternative, but is included under the Proposed Action. Grazing could compact soil if there were areas of excessive animal congregation. Increased soil compaction could lead to accelerated erosion.

However, the impact would not be adverse because project design features include a measure (Design Feature 10) requiring “concentrated-use sites” to be designated in particular areas. In the case of grazing, designated sites would be in areas that have slope gradients of three percent or less and where soils have low susceptibility to compaction, such as coarse-textured soils. Adherence to this design feature would ensure that livestock congregation would not cause excessive soil compaction or accelerated erosion.

No further mitigation would be required.

Potential short-term increase in soil compaction and rutting from mechanical treatments

Vegetation management practices could cause an increase in soil compaction. As more fully described in the impact mechanisms discussion above, there could be compaction from vehicles being operated over the soil, particularly where the soils are fine textured and at a moisture content that would promote compaction.

There could be soil rutting along skid trails. The No Action Alternative could involve skidding of logs in some situations. There could be an increase in the removal of timber by skidding under the Proposed Action, especially in treatment areas requiring the removal of many trees. Under the Proposed Action, there could be some additional soil compaction from skidding during the initial treatment of some areas. Further, because over the long term the Proposed Action would result in the establishment of fewer mature trees, the amount of skidding required would likely decrease.

Soil rutting by vehicle traffic is of particular concern in saturated soils such as in wetlands and riparian zones. The potential for this impact would be more acute for vegetation treatment categories 2 and 4, where comparatively intensive initial treatments would be required to reach the desired condition, and mechanized equipment would be used.

The impact would be adverse but minor because project design features include several measures to ensure no excessive compaction. Design Feature 5 specifies that heavy equipment be operated only when soil is below the liquid limit. Elements of Design Feature 8 provide for the proper salvage, storage, handling, and spread of topsoil. These measures would ensure that compaction would not result in a long-term loss of productivity or in a condition that would substantially alter current use or revegetation.

No further mitigation would be required.

Potential short-term change in soil chemistry from mechanical treatments

Under the Proposed Action, vegetation management practices could cause changes in soil chemistry. Potential changes in soil chemistry from vegetation management practices are more fully described in the impact mechanisms discussion above. However, the only appreciable change in soil chemistry that would likely occur from vegetation management is a temporary decrease in soil nitrogen levels where large amounts of wood chips are broadcast onto the soil surface. The potential for this impact would be more acute for vegetation treatment categories 2 and 4, where comparatively intensive initial treatments would be required to reach the desired condition, which could require application of a heavy concentration of wood chips. The decrease in nitrogen would be expected to continue until the wood chips decomposed and the soil returned to the preexisting carbon-to-nitrogen ratio.

The impact would be adverse but minor because project design features include a measure to ensure that an excessive thickness of chipped material is not applied. Design Feature 7 specifies that the thickness of the chipped material would be limited, based on consultation with the Forest Service, and that wood chips in areas exceeding acceptable thicknesses would be re-spread. This measure would ensure that reductions in soil nitrogen levels would not be significant and not result in a long-term loss of soil productivity.

No further mitigation would be required.

Indirect Effects

There would be no substantial indirect effects of the Proposed Action.

All effects described above would be the same in all the national forests except Nebraska National Forest, where effects would be similar to those described for the No Action Alternative. Minimal vegetation management activities would be required for Nebraska National Forest. Because this is also the case under the No Action Alternative, there would be few effects under the Proposed Action. No further mitigation is required.

3.3.5.3 Cumulative Effects

The Proposed Action would not cause a direct cumulative effect on soils. This is because direct effects on soils would be restricted to the ROW and access routes, and would not act in combination with other existing and reasonably foreseeable projects (see Appendix A) or public use of access routes.

The Proposed Action could cause an indirect cumulative effect on receiving waters from sedimentation caused by accelerated erosion along ROWs. The existing and reasonably foreseeable projects listed in Appendix A that could act in combination with the Proposed Action to cause this indirect effect are the Willow Creek Salvage and Fuels Reduction Project, Winter Park Resort Vegetation Project, Forest-wide Hazard Tree Removal and Fuels Reduction Project, Blue Ridge Forest Health Project, Arrow Fuels Mitigation Project, Spruce Creek Hazardous Fuels Reductions, Morrison Creek Fuel Reductions, and the Emergency Power Line Clearing Project. Sediment generated from accelerated erosion from these projects could combine with that generated under the Proposed Action to cause an adverse effect on receiving waters. However, the potential effect would be short-term, minor, and restricted to conditions in which one or more of the identified projects are in the same watershed as the Proposed Action watersheds.

3.4 Wetlands/Riparian Areas/Floodplains

3.4.1 Introduction

This section addresses potential impacts to wetlands, riparian areas, and floodplains in the project area. Section 3.4.2 describes the regulatory and policy framework, Section 3.4.3 describes the methods and assumptions for analysis, Section 3.4.4 describes the affected environment (existing conditions), and Section 3.4.5 describes potential impacts to wetland, riparian, and floodplain resources from vegetation management actions in the project area, including cumulative impacts.

Generally, wetlands are lands where saturation with water is the dominant factor determining the nature of soil development and the types of plant and animal communities living in the soil and on its surface (Cowardin *et al.* 1979). They are important biological resources that perform many functions, including groundwater recharge, flood-flow attenuation, erosion control, and water quality improvement. They also provide habitat for many plants and animals, including threatened and endangered species.

Riparian areas and floodplains are lands adjacent to rivers, streams, or other waterbodies that are, at least periodically, influenced by flooding (Mitsch and Gosselink 2000). Riparian zones are often transitional ecosystems situated between wetlands or other aquatic habitats, and uplands. These areas can be especially important for wildlife because they can provide excellent refuge, diversity of habitat, abundant water, and migration corridors (Mitsch and Gosselink 2000; Forest Service 2006a). WAPA has a policy to avoid actions in wetland areas to the extent practicable, and to traverse wetland areas using existing roads wherever possible.

<u>Regulatory and Policy Framework</u>

Wetlands are defined by the U.S. Army Corps of Engineers (33 CFR 328.3, 1986) and the U.S. Environmental Protection Agency (40 CFR 230.3, 1980) as "areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." Certain wetlands (and other aquatic features, including ephemeral, intermittent, and perennial streams) are considered to be waters of the United States, and these "jurisdictional" areas are protected under Section 404 of the Clean Water Act. The Clean Water Act requires that the Corps of Engineers issue a permit for discharge of dredged or fill material into these waters.

Wetlands and floodplains are also protected by two Executive Orders. Executive Order 11990, *Protection of Wetlands* (42 FR 26961, 3 CFR, 1977), states that federal agencies should "avoid to the extent possible the long and short term adverse impacts associated with the destruction or modification of wetlands and to avoid direct or indirect support of new construction in wetlands wherever there is a practicable alternative." Executive Order 11988, Floodplain Management (42 FR 26951, 3 CFR, 1977) states that federal agencies should "avoid to the extent possible the long and short term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative." In addition, the Department of Energy Compliance with Floodplain and Wetland Environmental Review Requirements (10 CFR 1022) establish policies and procedures for considering floodplain and wetland factors in planning and decision making. Section 3.4 provides information and analysis that address the Department of Energy's requirements in 10 CFR 1022, to incorporate floodplain management goals and wetland protection considerations into its planning, regulatory, and decision making processes.

The State of Utah also has a stream and floodplain protection statute (Utah Division of Water Rights 2011). Section 73-3-29 of the Utah Code requires "any person, governmental agency, or other organization wishing to alter the bed or banks of a natural stream to obtain written authorization from the State Engineer prior to beginning work." This "stream alteration permit" applies to any activity that is "within two times the width of the active channel up to a maximum of 30-feet away from water's edge; within continuous riparian areas adjacent to the stream; or in areas of the floodplain that have been observed conducting or storing water during high flow events or show physical evidence of conducting or storing water during high flows" (Utah Division of Water Rights No Date). WAPA avoids actions in wetlands or riparian areas to the maximum extent possible.

3.4.2 Methods and Assumptions for Analysis

Because of the scale of the project area, there was no fieldwork to confirm the presence, location, or extent of any wetland features. WAPA used GIS databases (Forest Service 2011c; Colorado Division of Wildlife 2011), which included available digital data from the National Wetland Inventory Program, to locate and identify wetlands and riparian areas in the proposed project area. If required, WAPA would conduct an appropriate survey of the portions of the ROWs affected by the project before ground-disturbing activities.

No determinations have been made regarding the jurisdictional status under Section 404 of the Clean Water Act or other selectively applicable regulations of any of the identified wetlands in the project area. Once the project incorporates the assumptions below, applicable design features, and standard maintenance procedures, the need for Section 404 or other permits would be determined for each site when WAPA considers actions that would involve regulated activities. All plant nomenclature follows the PLANTS database (NRCS 2012).

Using GIS software, WAPA superimposed the wetland and riparian habitat maps (from the GIS databases) on the ROW maps. Areas of overlap were considered areas of potential vegetation management. WAPA compared these areas with the six Proposed Action treatment categories to identify areas of potential impact. Only wetlands, riparian areas, and floodplains included in the GIS database were included in this analysis.

Assumptions

The following are important assumptions for identifying and analyzing the resources the No Action Alternative and Proposed Action could affect:

- There would be minimal vegetation treatments in palustrine emergent (PEM) or palustrine scrub-shrub (PSS) wetlands due to these areas having compatible vegetation that is dominated by herbaceous vegetation (PEM) and woody vegetation (shrubs) less than 20 feet tall (PSS).
- There would be minimal direct impacts to wetlands, riparian areas, or floodplains other than from vegetation management. There would generally be no fill placement or other earthwork in these areas or in areas near enough to modify hydrology.

Impact Criteria and Indicators

There could be an impact on wetlands if project activities caused any of the following:

- Non-reversible degradation or loss of a "wetland," as defined in Forest Service Manual 2500, Watershed and Air Management (Forest Service 2004).
- Indirect loss of wetlands or riparian areas from degradation of water quality, introduction or spread of noxious weeds, diversion of water sources, or erosion and sedimentation from altered drainage patterns.
- Adverse impacts to long-term stream health or riparian ecosystem conditions, as discussed in the Forest Service Watershed Practices Conservation Handbook (Forest Service 2006a).
- Modification of a floodplain that would impede or redirect flood flows and cause property damage on or off the wetland sites.

3.4.3 Affected Environment

Wetlands in the project area can be classified into three main types based on the dominant vegetation (Cowardin *et al.* 1979): PEM, PSS, and palustrine forested (PFO). PEM wetlands are those dominated by herbaceous vegetation (grasses, grass-likes, and forbs) and PSS wetlands are those dominated by woody vegetation less than 20 feet tall (shrubs). PFO wetlands are dominated by woody vegetation taller than 20 feet (trees). For purposes of this EIS, ponds and other standing, open waterbodies are included with PEM wetlands.

Typical plants found in PEM wetlands in the project area include cattail (*Typha* spp.) and bulrushes (*Scirpus* and *Schoenoplectus* spp.) at lower elevations, and primarily sedges (*Carex* spp.), rushes (*Juncus* spp.), and other grasses and forbs at elevations of 8,000 feet above mean sea level and higher. Plants common in PSS wetlands include willow (*Salix* spp.), alder (*Alnus* spp.), and birch (*Betula* spp.). The most common overstory plants in PFO wetlands are Engelmann spruce (*Picea engelmanni*), subalpine fir (*Abies lasiocarpa*), quaking aspen (*Populus tremuloides*), and cottonwood (*Populus* spp.) (Carsey *et al.* 2003).

Some wetlands in the project area are likely to be classified as peatlands. These wetlands accumulate partially decayed plant matter, or peat (Mitsch and Gosselink 2000). In the Rocky Mountains, most peatlands are considered "fens." A fen is defined as a peatland supported principally by groundwater and has at least eight inches of organic soils (organic carbon content of at least 12 percent by weight) in at least some part of the contiguous wetland (USFWS 1999, NRCS 2012). These wetlands typically provide unique biotic assemblages and are essentially irreplaceable because they typically take thousands of years to develop (USFWS 1999).

Riparian areas in the project area are likely to be dominated by cottonwood, quaking aspen, and blue spruce (*Picea pungens*). If these tree species are present, they usually occur as woodlands, with 26 to 60 percent canopy cover (Thompson *et al.* 1996), and often contain a multi-strata understory (Carsey *et al.* 2003). Common shrubs found in this setting include willow, alder, birch, and shrubby cinquefoil (*Dasiphora fruticosa*).

The Federal Emergency Management Agency (FEMA) has mapped most of the floodplains in the United States near towns or cities. These maps, called Flood Insurance Rate Maps (FIRMs), identify the areas that would be inundated by a flood event having a one percent chance of being equaled or exceeded in any given year, or the 100-year flood (FEMA 2011). Moderate flood hazard areas are also shown on the FIRMs, and are the areas between the limits of the base flood and the 0.2 percent annual chance (or 500-year) flood. Given its rural nature, FEMA has mapped very few floodplains in the project area. The only national forest with FEMA-mapped floodplains is San Juan. However, nearly all ephemeral, intermittent, and perennial waterways are associated with a floodplain. It is the area that is susceptible to being inundated by flood waters (FEMA 2011).

The overall project area contains 6,540 linear feet and 90.3 acres of wetlands and riparian areas, 6.7 acres of FEMA-mapped floodplains, and 84 named waterways. The majority of the wetlands within the project area are less than 0.5 acre in size; however, it is necessary to note that these wetlands are often part of a larger system. Using design features and standard maintenance procedures, direct impacts to these smaller areas and resulting indirect impacts to the larger system should be avoided or minimized. Table 3-21 summarizes these resources; sections following the table provide a brief summary for each national forest. Appendix C includes the locations of individual wetlands and riparian areas by forest.

Table 3-21. Summary of Wetland, Riparian, and Floodplain Resources

National Forest(s)	T-Line Section	Resources: Linear Wetland/Riparian Features in the ROW (feet)				Non-Linear Wetland/Riparian Features in the ROW (acres)				FEMA-Mapped Floodplains (acres)	Number of Crossings of Named Waterways[1]
		PEM/Ponds and Unknown	PSS	Riparian/PFO	Total Feet in ROW	PEM/Ponds and Unknown	PSS	Riparian/PFO	Total Acres in ROW		
Arapaho-Roosevelt	Archer-North Park	0	0	0	0	0	0	0	0	0	2
	Ault-Craig	83	0	0	83	0	0.02	0	0.02	0	3
	Blue River-Gore Pass	595	0	0	595	0	0	0	0	0	2
	Green Mountain-Blue Ridge Repeater	0	0	0	0	0	0	0	0	0	0
	Subtotal	855	0	0	855	0	0.02	0	0.02	0	7
Ashley	Flaming Gorge-Vernal Line 1	0	0	0	0	0.6	0	0	0.6	0	2
	Flaming Gorge-Vernal Line 3	0	0	0	0	11.1	0	0	11.1	0	5
	Subtotal	0	0	0	0	11.7	0.0	0.0	11.7	0	7
Grand Mesa, Uncompahgre and Gunnison	Curecanti-Lost Canyon	0	0	0	0	0.3	0	0.7	1.0	0	2
	Curecanti-North Fork	0	0	0	0	0	0	0.2	0.2	0	1
	Curecanti-Poncha	0	0	0	0	0.5	0.04	1.2	1.74	0	1
	Hesperus-Montrose	0	0	0	0	0.5	0	0.8	1.3	0	8
	North Fork-Rifle	0	0	0	0	0.7	6.3	0.7	7.7	0	16
	North Gunnison-Salida	0	0	0	0	0.2	1.6	0.3	2.1	0	4
	Subtotal	0	0	0	0	2.2	7.9	3.9	14.04	0	32

Table 3-21. Summary of Wetland, Riparian, and Floodplain Resources

National Forest(s)	T-Line Section	Resources									
		Linear Wetland/Riparian Features in the ROW (feet)				Non-Linear Wetland/Riparian Features in the ROW (acres)				FEMA-Mapped Floodplains (acres)	Number of Crossings of Named Waterways[1]
		PEM/Ponds and Unknown	PSS	Riparian/PFO	Total Feet in ROW	PEM/Ponds and Unknown	PSS	Riparian/PFO	Total Acres in ROW		
Medicine Bow-Routt	Archer-North Park	0	0	0	0	0	0	0	0	0	1
	Ault-Craig	0	1,038	357	1,395	3.8	0.3	0	4.0	0	4
	Gore Pass-Hayden	0	681	79	760	3.1	4.9	0	7.9	0	10
	Gore Pass-Muddy Pass	665	465	0	1,130	0	0.9	0	0.9	0	0
	Hayden-Gore Pass	0	1,334	38	1,372	2.2	5.6	0	7.9	0	13
	Hayden-North Park	0	0	0	0	0	0.8	0	0.8	0	2
	Subtotal	665	3,518	474	4,657	9.1	12.5	0.00	21.5	0	30
Nebraska	Box Butte-Chadron	0	0	0	0	0	0	0	0	0	0
	Subtotal	0	0	0	0	0.00	0.00	0.00	0.00	0	0
Pike and San Isabel	Curecanti-Poncha	543	0	0	543	7.1	0	0	7.1	0	4
	Malta-Mount Elbert	0	0	0	0	0	0	0	0	0	0
	North Gunnison-Salida	485	0	0	485	6.4	0	0	6.4	0	3
	Subtotal	1,028	0	0	1,028	13.5	0.00	0.00	13.5	0	7
San Juan	Curecanti-Lost Canyon	0	0	0	0	16.4	0.02	1.8	18.3	0	3
	Great Cut SWYD-Great Cut Tap	0	0	0	0	0	0	0	0	0	0
	Great Cut-McPhee	0	0	0	0	0.1	0	0.2	0.2	2.6	2
	Hesperus-Montrose	0	0	0	0	3.3	0.7	6.3	10.4	4.1	19
	Subtotal	0	0	0	0	19.8	0.7	8.3	28.9	6.7	24

Table 3-21. Summary of Wetland, Riparian, and Floodplain Resources

National Forest(s)	T-Line Section	Resources									
		Linear Wetland/Riparian Features in the ROW (feet)				Non-Linear Wetland/Riparian Features in the ROW (acres)				FEMA-Mapped Floodplains (acres)	Number of Crossings of Named Waterways[1]
		PEM/Ponds and Unknown	PSS	Riparian/PFO	Total Feet in ROW	PEM/Ponds and Unknown	PSS	Riparian/PFO	Total Acres in ROW		
White River	Blue River-Gore Pass	0	0	0	0	0	0	0	0	0	7
	Green Mountain-Blue Ridge Repeater	0	0	0	0	0	0	0	0	0	0
	Green Mountain-Kremmling	0	0	0	0	0	0	0	0	0	0
	Curecanti-Rifle	0	0	0	0	0	0	0	0	0	0
	Subtotal	0	0	0	0	0	0	0	0	0	7
	TOTAL	**2,548**	**3,518**	**474**	**6,540**	**56.3**	**21.12**	**12.2**	**89.7**	**6.7**	**114**

Sources: FEMA 2011; NHD 2012; Forest Service 2011c

[1]Includes waterways (e.g., streams, rivers, ditches, and canals) named in the National Hydrography Dataset (NHD 2012); could include multiple crossings of the same waterway.

FEMA Federal Emergency Management Agency
PEM palustrine emergent
PFO palustrine forested
PSS palustrine scrub-shrub
SWYD switchyard
T-line transmission line

3.4.3.1 Arapaho-Roosevelt National Forest

According to the Forest Service GIS database (Forest Service 2011c), there are 855 linear feet and 0.02 acre of wetlands and riparian areas in the WAPA transmission line ROWs in Arapaho-Roosevelt National Forest. This includes 0.02 acre of PSS wetlands. WAPA does not know the specific wetland and riparian types for the linear features because they were not defined in the GIS database. However, most of these wetlands and riparian areas are associated with small drainages, mainly perennial streams.

There are seven crossings of four named waterways in the Arapaho-Roosevelt National Forest project area (NHD 2012): Fish Creek, Pole Creek, Battle Creek, and South Battle Creek. There are no FEMA-mapped floodplains in the forests (FEMA 2011).

3.4.3.2 Ashley National Forest

According to the Forest Service GIS database (Forest Service 2011c), there are 11.7 acres of wetlands and riparian areas in the WAPA transmission line ROWs in Ashley National Forest. WAPA does not know the specific wetland and riparian types because they were not defined in the GIS database. However, most are associated with small drainages, mainly perennial streams.

There are seven crossings of six named waterways in the Ashley National Forest project area (NHD 2012): Bassett Creek, Cart Creek, Gorge Creek, Little Brush Creek, Pipe Creek, and Reader Creek. There are no FEMA-mapped floodplains in the forest (FEMA 2011).

3.4.3.3 Grand Mesa, Uncompahgre, and Gunnison National Forest

According to the Forest Service GIS database (Forest Service 2011c), there are 14 acres of wetlands and riparian areas in the WAPA transmission line ROWs in Grand Mesa, Uncompahgre, and Gunnison National Forest. This includes 7.9 acres of PSS wetlands, 2.2 acres of PEM wetlands (including one pond), and 3.9 acres of riparian woodland/possible PFO wetlands. Most of these wetlands and riparian areas are associated with small drainages, mainly perennial streams.

There are 32 crossings of 26 named waterways in Grand Mesa, Uncompahgre, and Gunnison National Forest (NHD 2012): Beaver Creek, Big Alder Creek, Brier Creek, Clay Creek, Cow Creek, Crane Creek, Crooked Creek, Dyke Creek, East Fork Terror Creek, Gas Creek, Gold Creek, Hanks Creek, Hightower Creek, Horsefly Creek, Hubbard Creek, Major Creek, McKenzie Creek, North Creek, North Fork Agate Creek, Owens Creek, Park Creek, Quacker Creek, South Fork Clay Creek, Terror Ditch, West Hubbard Creek, and West Muddy Creek. There are no FEMA-mapped floodplains in these national forests (FEMA 2011).

3.4.3.4 Medicine Bow-Routt National Forest

Medicine Bow-Routt National Forest has information about linear and non-linear wetland and riparian areas in its GIS database (Forest Service 2011c). The linear information describes features that are narrower than 80 feet. The non-linear features include all others.

According to the Forest Service GIS database (Forest Service 2011c), there are 4,657 linear feet and 21.5 acres of wetlands and riparian areas in WAPA transmission line ROWs in Medicine Bow-Routt National Forest. The linear features include 3,518 feet of PSS wetlands, 665 feet of PEM wetlands, and 474 feet of riparian/possible PFO wetlands. The non-linear features include 12.5 acres of PSS wetlands and 9.1 acres of PEM wetlands. Most of these wetlands and riparian areas are associated with small drainages, mainly perennial streams.

There are 30 crossings of 17 named waterways in the Medicine Bow-Routt National Forest project area (NHD 2012): Blacktail Creek, Decker Creek, Devils Slide Creek, Farnham Creek, Gore Creek, Jolley Creek, Lawson Creek, Little Grizzly Creek, Little Rock Creek, North Fork Fish Creek, Pass Creek, Pinkham Creek, Porcupine Creek, Rock Creek, Spring Creek, Tepee Creek, and Toponas Creek. There are no FEMA-mapped floodplains in this national forest (FEMA 2011).

3.4.3.5 Nebraska National Forest

There are no wetlands, named waterways, or FEMA-mapped floodplains in the Nebraska National Forest project area (Forest Service 2011c; NHD 2012; FEMA 2011).

3.4.3.6 Pike and San Isabel National Forest

According to the Forest Service GIS database (Forest Service 2011c), there are 1,028 linear feet and 13.5 acres of wetlands and riparian areas in the WAPA transmission line ROWs in Pike and San Isabel National Forest. WAPA does not know the specific wetland and riparian types because they were not defined in the GIS database. However, most are associated with small drainages, mainly perennial streams.

There are seven crossings of five named waterways in Pike and San Isabel National Forest (NHD 2012): Cree Creek, Lost Creek, North Fooses Creek, North Fork Arkansas River, and South Arkansas River. There are no FEMA-mapped floodplains in these national forests (FEMA 2011).

3.4.3.7 San Juan National Forest

According to the Forest Service GIS database (Forest Service 2011c), there are 28.9 acres of wetlands and riparian areas in the WAPA transmission line ROWs in San Juan National Forest. This includes 0.7 acre of PSS wetlands, 19.8 acres of PEM wetlands, and 8.3 acres of riparian woodland/possible PFO wetlands. Most of these wetlands and riparian areas are associated with small drainages, mainly perennial streams.

There are 24 crossings of 19 named waterways in the San Juan National Forest project area (NHD 2012): Beaver Creek, Cherry Creek, Chicken Creek, Cottonwood Creek, Crystal Creek Ditch, Dolores River, Dove Creek Canal, East Fork Cherry Creek, East Mancos River, House Creek, Long Park Ditch, Jackson Gulch Inlet Canal, Lost Canyon Creek, Middle Mancos River, Starvation Creek, Turkey Creek, Turkey Creek Ditch, Weber Reservoir Inlet Ditch, and West Mancos River.

San Juan National Forest is the only forest in the project area with FEMA-mapped 100-year floodplains (FEMA 2011). Table 3-22 summarizes information about those three locations.

Table 3-22. Summary of Mapped Floodplain Resources in San Juan National Forest

Transmission Line Section	General Location	Area (acres)
Great Cut-McPhee	Dolores River at McPhee Reservoir	2.6
Hesperus-Montrose	West Mancos River near Mancos State Park	1.9
Hesperus-Montrose	Dolores River upstream of Dolores	2.2
TOTAL		**6.7**

Source: FEMA 2011

3.4.3.8 White River National Forest

According to the Forest Service GIS database (Forest Service 2011c) there are no wetlands in the WAPA ROWs in White River National Forest. Pasture Creek is the only named waterway in the White River National Forest project area (NHD 2012) and ROWs cross it seven times. There are no FEMA-mapped floodplains in this national forest (FEMA 2011).

3.4.4 Environmental Consequences

3.4.4.1 No Action Alternative

Direct effects to wetlands, riparian areas, and floodplains under the No Action Alternative would mainly be associated with the removal of danger trees and maintenance of existing access roads. WAPA cannot quantify these impacts because they might or might not occur, and WAPA does not know the potential actions that may occur at each location. The potential for impacts to wetlands from vegetation management activities increases with the number of wetlands present; therefore, forests with the most wetland (especially PFO wetlands), riparian, and floodplain resources within the ROWs would have the highest potential for impacts. However, using standard maintenance procedures would potentially avoid or minimize impacts to these areas. See Table 3-21 for a summary of the wetland, riparian, and floodplain resources present in the ROWs in each forest.

Removing danger trees could result in the conversion from a wooded or forested wetland/riparian habitat type to a shrub- or herbaceous-dominated type, generally reducing ecological functions like wildlife habitat value, flood flow attenuation, and sediment stabilization. Additional direct effects from danger-tree removal and other vegetation management could include the accumulation of woody debris. Accumulation of debris could have beneficial effects (adding to the complexity of both the terrestrial and aquatic habitats), but could cause stream flow alterations (causing new erosion and sedimentation problems), channel and culvert blockages, and other adverse effects. There could be other direct effects associated with routine or emergency actions like culvert replacement and maintenance, road grading, tower-footing repair, and other similar actions, including soil disturbance or compaction, and otherwise altering floodplains.

Potential indirect effects on wetlands, riparian areas, and floodplains under the No Action Alternative would mainly be associated with erosion (including streambed and bank instability), sedimentation, and inadvertent diversion of surface water. These effects could occur from actions like culvert replacement and maintenance, road grading, tower-footing repair, and construction or maintenance of water bars. As with direct effects, WAPA cannot quantify these impacts because they might or might not occur, and WAPA does not know the specific locations of potential actions. The potential for impacts from these activities increases with the number of wetland features present. Therefore, forests with ROWs that cross the most wetlands (especially PFO wetlands), riparian, and floodplain resources would have the highest potential for impacts (see Table 3-21). Implementing standard maintenance procedures (see Table 2-15) would minimize these impacts.

3.4.4.2 Proposed Action

The direct and indirect effects on wetlands, riparian areas, and floodplains under the Proposed Action would be essentially the same as those under the No Action Alternative, and were not quantified. Generally, the Proposed Action would not result in planned areas of vegetation management in wetland, riparian, or floodplain environments. Many of these habitats are dominated by low-growing vegetation and are already compatible with the transmission lines. Furthermore, as discussed in Chapter 2, the transmission lines span canyons (the locations of wetlands, riparian, and floodplain habitats) and generally have adequate clearance between vegetation and the transmission line conductors. This effectively avoids vegetation management in habitats that are not already compatible.

As under the No Action Alternative, effects would mainly be associated with the removal of danger trees and maintenance of existing access roads (see Section 3.4.4.1). The nature of these potential impacts is the same for the Proposed Action as for the No Action Alternative, and forests with the most wetland (especially PFO wetlands), riparian, and floodplain resources would have the highest potential for impacts. See Table 3-21 for a summary of the resources present in the ROWs in each forest. WAPA and the Forest Service jointly developed design features (see Table 2-13), which are part of the Proposed Action, to protect environmental resources including wetlands, riparian areas, and floodplain. Implementation of the design features and standard maintenance procedures would potentially avoid or minimize impacts to wetlands, riparian areas, and floodplains.

3.4.4.3 Cumulative Effects

The Forest Service is implementing many forest management projects in the project area, most of which focus on enhancing forest health by reducing fuel loads and reducing susceptibilities to insects and diseases. Because project ROWs are linear and spread over a large geographical area, implementation of the No Action Alternative or Proposed Action would contribute relatively minor overall cumulative impacts when considered together with other actions in the region. The primary cumulative effects on wetlands, riparian areas, and floodplains would be overall changes in stream flow from the conversion of forested wetlands/riparian areas to non-forested and the accumulation of downed danger trees. If stream flows were altered over time, it could cause increased sediment loading and decreased bank stability.

3.5 Forest Health and Vegetation

3.5.1 Introduction

This section describes aspects of forest health and vegetation conditions in or near WAPA transmission line ROWs in the project area relevant to the need for vegetation treatment, and the impacts of treatments. Section 3.5.2 describes the regulatory and policy framework, Section 3.5.3 describes methods and assumptions for analysis of impacts on forest health and vegetation, Section 3.5.4 describes the forest health and vegetation affected environment, and Section 3.5.5 describes potential impacts to forest health and vegetation.

3.5.2 Regulatory and Policy Framework

NFMA (P.L. 94-588) and its implementing regulations and guidelines provide the primary regulatory and policy framework guiding management of utility corridors on NFS lands. For example, NFMA directly limits clearcutting in national forests. NFMA also requires preparation of land and resource management plans for each unit of the NFS (referred to herein as forest plans) that assign lands to various use classes and specify policies guiding vegetation management for each class.

Forest plans for each of the national forests that include WAPA transmission line ROWs discuss utility corridors as a special type of land use. Most of these discussions are brief and focus on types of land incompatible with utilities; they typically provide little direction for maintenance (e.g., vegetation management) of existing utility corridors. Some of the forest plans (e.g., the Arapaho-Roosevelt National Forest and Medicine Bow-Routt National Forest plans) discuss desired conditions for utility corridors, such as corridors in which larger trees have been removed for safety while smaller trees are retained, and water bars have been installed on access roads to minimize soil erosion (Forest Service 1997; Forest Service 1998a). The Medicine Bow-Routt National Forest plan also requires vegetation management plans for all utility corridors. Some forest plans specify that management goals for utility corridors be compatible with the scenic integrity objectives and other goals of the areas through which they pass (Forest Service 1997; Forest Service 1984). The White River National Forest plan specifies that utility corridor vegetation management follow the principles and concepts provided in *National Forest Landscape Management,* Volume 2, Chapter 2, Utilities (Forest Service 2002).

Forest Service policy requires payment to the federal treasury for trees harvested from national forest utility ROWs if removal of logs from the sites would be economically and environmentally feasible. Felled trees may be left on the site without payment for stumpage value if the trees are determined to have no economic value and if leaving the felled trees is consistent with other resource objectives. This policy generally means that payment would be required for trees felled in utility corridors only if ROW maintenance cuts or destroys timber incidental to the operation that would be economical if included as part of a larger federal timber sale. Forest Service Manual (FSM) 2464 identifies the conditions under which payment is and is not required.

3.5.3 Methods and Assumptions for Analysis

WAPA used baseline data from the Forest Service, interpreted the most recent available satellite imagery to identify vegetation cover types, and obtained pest condition data from maps produced by trained observers conducting annual low-elevation overflights with fixed-wing aircraft (Colorado State Forest Service and USDA Region 2 Forest Service 2005 and 2010). For this analysis, WAPA tabulated pest detections for ROWs and land within 100 yards of a ROW because high fuel loads associated with pest outbreaks in or next to ROWs pose a direct hazard to utility facilities.

There would be an adverse impact on the health of forest vegetation if vegetation management caused overly dense stocking (e.g., abnormally large numbers of small trees per acre), high rates of mechanical damage to trees, or aging trees in ROWs, leading to high risk of stand-replacing pest attacks. Conversely, management that reduces stocking density and removes damaged or aging trees would benefit the health of forest vegetation.

WAPA assessed impacts using two variables: (1) proximity to an ongoing pest outbreak, and (2) susceptibility of vegetation type to pest attack. WAPA used GIS data on pest occurrences to assess proximity.

Assumptions

Important assumptions for identifying and analyzing potential impacts to forest health and vegetation are as follows:

- Aspen, lodgepole pine, ponderosa pine, and Engelmann spruce are the most susceptible species to the main pests that are active regionally.
- Existing cover-type data are appropriate for the analysis.
- Forest vegetation issues are restricted to forest health because all other issues related to forest conditions (e.g., fire hazards, soil erosion and compaction, rare plants, and visual resources) are addressed under other resources.

Impact Criteria and Indicators

Under the No Action Alternative and the Proposed Action, there could be an impact on forest health and vegetation if vegetation management caused overly dense stocking, high rates of mechanical damage to trees, or aging trees in ROWs, leading to a high risk of stand-replacing pest attacks.

3.5.4 Affected Environment

Dominant forest vegetation within 100 yards of the project area ROWs include aspen (*Populus spp.*), big sagebrush (*Artemisia tridentata*), forb species, Gambel oak (*Quercus gambelii*), grass species, lodgepole pine (*Pinus contorta*), ponderosa pine (*Pinus ponderosa*), spruce (*Picea spp.*) and Douglas fir (*Pseudotsuga menziesii*). Table 3-23 lists acres of vegetation types in the project area.

Table 3-23. Acres of Vegetation Types in the Project Area

Vegetation	Acres
Alder-leaf mountain mahogany	1.6
Aspen	200.6
Bare	9.4
Big sagebrush	219.4
Black sagebrush	3.4
Bristlecone pine	1.4
Cleared	1,590.2
Cottonwood	3.0
Douglas fir	33.6
Forb	297.5
Gambel oak	485.1
Grass	370.4
Limber pine	0.9
Lodgepole pine	235.8
Mixed coniferous forest	2.0
Mountain big sagebrush	82.3
Other sagebrush	96.1
Pinyon/juniper	25.5
Ponderosa pine	103.1
Rock	0.2
Rock soil	6.1
Rushes	0.22
Seral aspen/lodgepole pine forest	0.1
Seral aspen/mixed conifer forest	2.2
Seral aspen/ponderosa pine forest	0.4
Shrub	60.7
Snowberry	21.6
Spruce/fir	107.1
True mountain mahogany	43.1
Tufted hairgrass - sedge	23.9
Water	1.3
Willow	26.7
TOTAL	**4,054.7**

Aspen, lodgepole pine, and Gambel oak are the fastest-growing species that could require relatively frequent maintenance and treatments. Spruces, firs, ponderosa pines, and big sagebrush generally grow relatively slowly, andtypically require less frequent maintenance and treatment (although tree growth rate varies with soil productivity, exposure, moisture, and other variable site characteristics). All grass and forb species have a low-growth habit and might not require vegetation maintenance or treatment. However, these species could be susceptible to indirect vegetation impacts if they are in the understory of larger-growth forest species such as aspen or pines.

Vegetation treatments in ROW segments within economical hauling distance of manufacturing infrastructure could produce logs convertible to lumber or wood pellet fuel, therefore helping meet regional or national material or energy needs and contributing to regional employment and income. There is a large sawmill in Montrose, Colorado; there also are several small family operated sawmills in the project area. There are wood pellet fuel manufacturing facilities in Kremmling and Walden, Colorado (Mason 2012). In 2010, other than lumber and wood pellet fuel, the only commodity vegetation management would produce is firewood. In 2013, the Eagle Valley Clean Energy facility started operations and uses biomass from National Forest lands...

There have been severe outbreaks of forest insects and diseases in the project area over the past decade because of persistent drought, unusually warm temperatures, and uncharacteristically high tree densities. In particular, bark beetle infestations have killed forest cover throughout large areas of the Rocky Mountains. Some of these outbreaks include ROW segments (Figure 3-9). Pest conditions are important predictors of future fuel loads because trees weakened, damaged, or killed by pests usually produce heavy fuel accumulations that are hazardous to transmission facilities. Treating vegetation and fuels in or next to pest outbreaks sometimes can increase the treated stands' resilience to pests, wildfire, and drought. Table 3-24 lists acres of pests in or within 100 yards of project area ROWs.

Figure 3-9. Pest Conditions in the Project Area

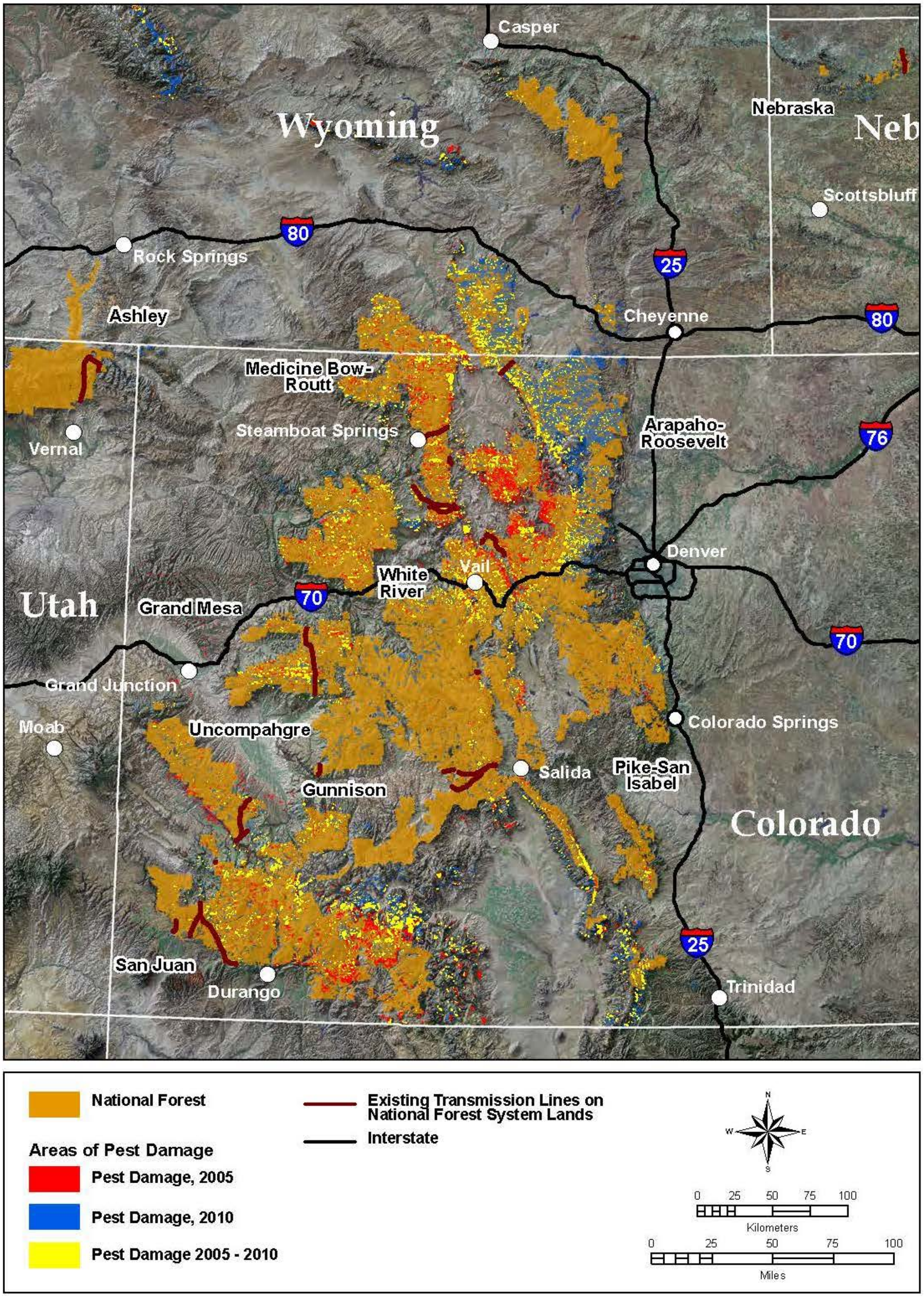


Table 3-24. Acres of Forest Pest Detections in or within 100 Yards of Project Area Rights-of-Way in 2005 and 2010

	Arapaho-Roosevelt National Forest		Ashley National Forest		Grand Mesa, Uncompahgre, and Gunnison National Forest		Medicine Bow-Routt National Forest		Nebraska National Forest		Pike and San Isabel National Forest		San Juan National Forest		White River National Forest		Total 2005	Total 2010
	2005	2010	2005	2010	2005	2010	2005	2010	2005	2010	2005	2010	2005	2010	2005	2010		
Mountain pine beetle	360	289	-	-	-	-	325	361	-	-	3	-	-	-	343	1	1,031	651
Subalpine fir mortality	12	17	-	-	3	-	172	-	-	-	46	58	-	-	-	-	233	75
Douglas-fir beetle	-	-	-	-	10	15	-	-	-	-	-	-	-	-	-	-	10	15
Unknown defoliator	-	-	-	-	-	30	-	3	-	-	-	-	-	-	-	-	0	33
Sudden aspen decline	-	-	-	-	-	36	-	<1	-	-	-	-	81	195	-	-	81	231
Spruce beetle	-	-	-	-	22	-	15	2	-	-	-	-	-	-	-	-	37	2
Unknown pest	-	-	-	-	70	-	-	-	-	-	-	-	-	-	-	-	70	0
TOTAL	**372**	**306**	**0**	**0**	**105**	**81**	**512**	**366**	**0**	**0**	**49**	**58**	**81**	**195**	**343**	**1**	**1,392**	**1,007**

Sources: Colorado State Forest Service and USDA Forest Service Region 2 2005 and 2010

3.5.4.1 Arapaho-Roosevelt National Forest

Project ROWs in Arapaho-Roosevelt National Forest cover approximately 288 acres, 37 of which have been cleared (Table 3-25). Most of the lands that would eventually need treatment have relatively fast-growing vegetation species. ROWs in Arapaho-Roosevelt National Forest have been heavily affected by forest pests, particularly the mountain pine beetle and spruce beetle. ROWs and lands within 100 yards of ROWs where pest outbreaks were detected in 2005 totaled 129 percent of ROW acres in 2005 (outbreak detection percentages can exceed 100 because the area in the ROW and within 100 yards of the ROW exceeds the area in the ROW). In 2010, infested areas within 100 yards of ROWs comprised 106 percent of the total ROW acres. These relatively high percentages show that, in both 2005 and 2010, extensive pest outbreaks were detected in or adjacent to the ROWs. Infested trees in outbreak sites detected in 2005 but not in 2010 had probably died and fallen during the intervening five years, therefore creating fuel loads potentially presenting fire hazards to utility facilities. Many additional infested trees would have fallen or have begun to fall by 2017.

Table 3-25. Acres of Vegetation Types in the Rights-of-Way in Arapaho-Roosevelt National Forest

Vegetation Type	Acres
Aspen	11.6
Bare	0.6
Big sagebrush	16.0
Cleared	37.0
Douglas fir	6.9
Forb	49.9
Grass	56.0
Limber pine	0.9
Lodgepole pine	78.3
Rock soil	5.9
Shrub	6.3
Spruce/fir	18.9
Water	0.1
TOTAL	**288.2**

3.5.4.2 Ashley National Forest

Project ROWs in Ashley National Forest cover a total of 253 acres, 95 of which have previously been cleared (Table 3-26). Most of the lands requiring treatment do so because of high fuel loads rather than physical hazards to power lines or towers. No pest outbreaks were detected within 100 yards of project ROWs in Ashley National Forest in 2005 or 2010 (Table 3-24).

Table 3-26. Acres of Vegetation Types in the Rights-of-Way in Ashley National Forest

Vegetation Type	Acres
Alder-leaf mountain mahogany	1.6
Aspen	1.4
Bare	0.9
Black sagebrush	3.4
Cleared	94.9
Douglas fir	1.7
Grass	12.8
Lodgepole pine	1.4
Mixed coniferous forest	2.0
Mountain big sagebrush	82.3
Pinyon/juniper	2.4
Ponderosa pine	20.1
Seral aspen/lodgepole pine forest	0.1
Seral aspen/mixed conifer forest	2.2
Seral aspen/ponderosa pine forest	0.4
Shrub	24.5
Water	0.7
TOTAL	**252.6**

3.5.4.3 Grand Mesa, Uncompahgre, and Gunnison National Forest

Grand Mesa, Uncompahgre, and Gunnison National Forest encompass 1,202 acres in project ROWs. Of these acres, 483 have previously been cleared (Table 3-27). Most lands requiring treatment do so because of fire hazards or they have fast-growing vegetation species. Lands within 100 yards of ROWs where pests were detected accounted for nine percent of ROW acres in 2005 and seven percent in 2010 (Table 3-24).

Table 3-27. Acres of Vegetation Types in the Rights-of-Way in Grand Mesa, Uncompahgre, and Gunnison National Forest

Vegetation Type	Acres
Aspen	90.3
Bare	0.1
Big sagebrush	118.6
Cleared	483.1
Cottonwood	1.1
Douglas fir	0.1
Forb	20.9
Gambel oak	237.7
Grass	56.5
Lodgepole pine	27.1
Other sagebrush	91.6
Pinyon/juniper	0.1
Ponderosa pine	29.6
Shrub	8.4
Snowberry	21.6
Spruce/fir	9.1
Willow	5.9
TOTAL	**1,201.7**

3.5.4.4 Medicine Bow-Routt National Forest

Medicine Bow-Routt National Forest project ROWs comprise 936 acres, 443 of which have been cleared (Table 3-28). Among cover types requiring treatment, most lands contain fast-growing vegetation that might require vegetation treatments, depending on the rate of growth and proximity to transmission line structures. Lands within 100 yards of ROWs where pests were detected comprised 55 percent of the total ROW acres in 2005 and 39 percent in 2010, with mountain pine beetle accounting for most of the infested acres (Table 3-24).

Table 3-28. Acres of Vegetation Types in the Rights-of-Way in Medicine Bow-Routt National Forest

Vegetation Type	Acres
Aspen	22.6
Cleared	442.7
Forb	175.4
Grass	81.4
Lodgepole pine	95.7
Rock soil	0.2
Shrub	21.4
Spruce/fir	56.6
Tufted hairgrass – sedge	18.6
Willow	20.8
TOTAL	**935.5**

3.5.4.5 Nebraska National Forest

Of the 83 acres of Nebraska National Forest in a project ROW, all but four have grass cover that would not need treatment (Table 3-29). No forest pests were detected in or next to this ROW in 2005 or 2010 (Table 3-24).

Table 3-29. Acres of Vegetation Types in the Rights-of-Way in Nebraska National Forest

Vegetation Type	Acres
Grass	79.7
Ponderosa pine	3.8
TOTAL	**83.5**

3.5.4.6 Pike and San Isabel National Forest

Pike and San Isabel National Forest have 212 acres in project ROWs, including approximately 103 acres that have already been cleared (Table 3-30). Most lands requiring treatment do so because of fire hazards or they have fast-growing vegetation species. Lands within 100 yards of ROWs where insect pests were detected totaled 23 percent of ROW acres in 2005 and 27 percent in 2010 (Table 3-24).

Table 3-30. Acres of Vegetation Types in the Rights-of-Way in Pike and San Isabel National Forest

Vegetation Type	Acres
Aspen	4.6
Bare	0.3
Bristlecone pine	1.4
Cleared	102.9
Douglas fir	6.0
Forb	2.6
Grass	20.8
Lodgepole pine	9.7
Pinyon/juniper	7.9
Ponderosa pine	2.7
Spruce/fir	12.1
True mountain mahogany	40.7
TOTAL	**211.6**

3.5.4.7 San Juan National Forest

San Juan National Forest includes 898 acres in project ROWs. Of this area, 428 acres were previously cleared (Table 3-31). Among lands requiring treatment, the most prominent cover type is ponderosa pine, which might require vegetation treatments, depending on the rate of growth and proximity to transmission line structures. Sudden aspen decline was the only pest detected within 100 yards of San Juan National Forest ROWs, with infected areas comprising nine percent of the total ROW acres in 2005, but increasing to 22 percent in 2010 (Table 3-24).

Table 3-31. Acres of Vegetation Types in the Rights-of-Way in San Juan National Forest

Vegetation Type	Acres
Aspen	57.1
Bare	7.5
Big sagebrush	57.5
Cleared	427.7
Cottonwood	1.9
Douglas fir	9.8
Forb	2.4
Gambel oak	218.6
Grass	60.5
Pinyon/juniper	5.3
Ponderosa pine	42.8
Rock	0.2
Rushes	0.2
Shrub	0.2
True mountain mahogany	0.9
Tufted hairgrass – sedge	5.3
Water	0.5
TOTAL	**898.3**

3.5.4.8 White River National Forest

Project ROWs in White River National Forest cover a total of 183 acres, only two of which have already been cleared (Table 3-32). On lands that would require treatment, the most prominent cover type is trees and shrubs that pose a substantial fire hazard. In 2005, mountain pine beetle infestations within 100 yards of ROWs totaled 343 acres, but in 2010, only one acre of infestation was detected. This sharp decline in pest detections implies that nearly all trees infested in 2005 had diedby 2010, therefore potentially posing substantial fire hazards to power lines (Table 3-24).

Table 3-32. Acres of Vegetation Types in the Rights-of-Way in White River National Forest

Vegetation Type	Acres
Aspen	13.0
Bare	00.2
Big sagebrush	27.3
Cleared	1.9
Douglas fir	9.1
Forb	46.1
Gambel oak	28.9
Grass	2.8
Lodgepole pine	23.6
Other sagebrush	4.5
Pinyon/juniper	9.8
Ponderosa pine	4.1
Spruce/fir	10.6
True mountain mahogany	1.5
TOTAL	**183.4**

3.5.5 Environmental Consequences

3.5.5.1 No Action Alternative

The most potentially substantial impact of ROW vegetation management on forest vegetation would involve improving forest health by removing dead and dying trees, and by thinning abnormally dense forest stands that typically characterize unhealthy forest stands and create conditions conducive to expanded pest outbreaks. Because WAPA's current authorizations limit vegetation treatment to removing trees that present direct hazards to facilities, rather than proactively thinning overstocked stands and removing dead and dying trees that do not pose immediate hazards, implementing the No Action Alternative would have no appreciable effect on forest health and vegetation.

3.5.5.2 Proposed Action

Under the Proposed Action, vegetation management would be scheduled and implemented based on ROW condition category. Category 2 lands would be treated in the first year following authorization, while Category 3 lands would be treated within 2 to 6 years of authorization. Treatment of areas currently affected by pests within these time frames would benefit forest vegetation by improving forest health. Treatments occurring over a longer time frame, as WAPA proposes for Categories 4 through 6, are not expected to affect forest health.

WAPA developed information on recent project-area detections of pest outbreaks based on human observations made during overflights of Colorado (Colorado State Forest Service and USDA Forest Service Region 2 2005 and 2010). The surveyed area includes all national forest ROWs that make up the project area, except for the Flaming Gorge Vernal #1 and #3 transmission lines, which are in Utah, and the Box Butte-Chadron transmission line in Nebraska National Forest.

A total of 46 acres in the Region 2 ROWs that coincide with 2010 pest outbreak detections are in treatment Category 2, and there are 105 acres with 2010 pest detections in Category 3. Compared to the approximately 1.8 million acres in Colorado with active pest outbreaks, areas with pest outbreaks proposed for treatment within the next six years are negligible and unlikely to have an appreciable effect on forest health.

Proposed vegetation treatments would produce accumulations of woody debris that could provide breeding habitat for destructive forest insects such as bark beetles, and substantially increase fuel loads. However, the Proposed Action includes debris treatments that would largely eliminate bark beetle breeding habitat in the debris and return fuel loads approximately to their pretreatment levels.

Under the Proposed Action, WAPA would use the same types of vegetation treatments as under the No Action Alternative. The same range of forest stand conditions in ROWs would occur under both alternatives, although under the Proposed Action stands on average would be younger and less dense. Considered in the context of the surrounding forest landscapes, long-term differences between the alternatives' forest conditions would be negligible, and there would be no appreciable long-term impact under the Proposed Action.

Forest vegetation conditions from implementing the Proposed Action would not conflict with the plans or policies of other agencies and tribes with jurisdictions in the project area.

3.5.5.3 Cumulative Effects

The Forest Service is implementing many forest management projects in the project area, most of which focus on enhancing forest health by reducing fuel loads and reducing susceptibilities to insects and diseases (see Appendix A). By implementing ROW stand treatments on an accelerated basis compared to the No Action Alternative, the Proposed Action would contribute to a beneficial impact on forest health resulting from the Forest Service's overall forest management program in the project area.

3.6 Invasive Species

3.6.1 Introduction

This section addresses the presence of invasive species in the project area and analyzes potential impacts on those species from proposed vegetation management activities along WAPA ROWs. Section 3.6.2 describes the regulatory and policy framework, Section 3.6.3 describes the methods and assumptions for analysis of impacts on invasive species, Section 3.6.4 describes the affected environment (existing conditions), and Section 3.6.5 describes potential impacts to invasive species under the No Action Alternative and the Proposed Action.

The Federal Government defines invasive species as "alien species whose introduction does or is likely to cause economic or environmental harm or harm to human health" (Office of the President 1999). For purposes of this EIS, invasive species are defined as terrestrial plants listed as noxious by the Federal Government or the states in which they occur, or nonnative species of management concern present in a particular national forest.

EO 13112 also directs federal agencies to prevent and control the introduction of invasive species in a cost-effective and environmentally sound manner. The EO established the National Invasive Species Council (NISC), which is made up of federal agencies and departments, and a supporting Invasive Species Advisory Committee (ISAC) made up of non-federal stakeholders at the state, local, and private levels. The NISC and ISAC prepared a national invasive-species management plan (National Invasive Species Council 2008) that recommends objectives and measures to implement the EO and to prevent the introduction and spread of invasive species. The EO requires consideration of invasive species in NEPA analyses, including their identification and distribution, their potential impacts, and measures to prevent or eradicate them.

3.6.2 Regulatory and Policy Framework

Federal policy (Section 403 of the Plant Protection Act [7 U.S.C. 7701 *et seq.*]) defines noxious weeds as:

> Any plant or plant product that can directly or indirectly injure or cause damage to crops (including nursery stock or plant products), livestock, poultry, or other interests of agriculture, irrigation, navigation, the natural resources of the United States, the public health, or the environment.

The Plant Protection Act prohibits the import, introduction, export, or movement in interstate commerce of any noxious weed, "unless the importation, entry, exportation, or movement is authorized under general or specific permit and is in accordance with such regulations as the Secretary [of Agriculture] may issue to prevent the introduction of plant pests into the United States or the dissemination of plant pests within the United States."

The following is a brief summary of the noxious weed designations in the three states encompassing the project area.

Colorado

The Colorado Noxious Weed Act (Colorado Department of Agriculture 2011) ranks weeds on three lists (A, B, and C) depending on their noxious and invasive tendencies. List A species are noxious weeds that have the potential to pose a substantial threat to local economies, ecosystems, and habitats. At present, A-list species are either not present in Colorado or have a very limited distribution. Preventing invasions and eradicating infestations is the highest priority. It is against Colorado law to let an A-list species go to seed. List B weeds are species present in only limited and specific parts of the state. In areas with severe B-list species infestations, management plans should be designed to contain the infestation and prevent further spread. In areas where the infestations are small, eradication would be the proposed management. List C weeds are species that are widespread throughout the state. Management decisions for these species should be determined at the local level based on feasibility of control and severity of infestation (Forest Service 2011d).

Utah

There are now 27 weeds on the Utah Noxious Weed List, which are prioritized as follows:

- Class A (Early Detection Rapid Response [EDRR]) – Declared noxious weeds not native to Utah that pose a serious threat to the state and should be considered as a very high priority for control.
- Class B (Control) – Declared noxious weeds not native to Utah that pose a threat to the state and should be considered a high priority for control. These weeds are thought to be controllable in most areas.
- Class C (Containment) – Declared noxious weeds not native to Utah that are widely spread but pose a threat to the agricultural industry and agricultural products with a focus on stopping expansion. Statewide efforts would generally be toward containment of smaller infestations.

Each county in Utah could have different priorities regarding specific state-designated noxious weeds, and is therefore able to reprioritize these weeds as they deem appropriate for their own needs (Utah Weed Control Association 2012).

Nebraska

The Nebraska Legislature last revised Nebraska's noxious weed law in 1989. The term "noxious" is a legal term used to denote a destructive or harmful pest for purposes of regulation. When a specific pest (in this case, a weed) is determined to present a serious threat to the economic, social, or aesthetic wellbeing of the residents of the state, it may be declared noxious. The Director of Agriculture determines which plants are to be deemed noxious and the control measures to be used in preventing their spread (Nebraska Weed Control Association 2012).

3.6.3 Methods and Assumptions for Analysis

Table 3-33 lists terrestrial noxious weeds documented as present in the ROWs of the eight national forests in the project area. It also lists species documented to be present in the eight forests but outside the ROWs. Finally it includes species on the Colorado or Utah noxious weed lists not documented to be present in the forests, but would be of concern if project activities introduced them into the forests. WAPA compiled the list of noxious weeds present in the ROWs and forests from background technical documents (Elliott 2012, 2013a-2013g; Elliott 2010-2012) and from a Forest Service GIS database of weed locations. All transmission line ROWs were surveyed for weeds (Elliott 2010-2012). To ensure consistency, nomenclature for invasive species follows the accepted names provided on the USDA plants website (NRCS 2012). WAPA excluded from the analysis native plants and plants with ranges entirely outside the project area.

In addition to the noxious weed status of each species by state, Table 3-33 summarizes the type of plant or organism. This information would be useful in determining inventory and monitoring needs, and management requirements for different types of plants.

Table 3-33 also lists aquatic invasive plants and algae, and crustaceans and mollusks based on a list of Colorado Aquatic Nuisance Species (Colorado Division of Wildlife 2009).

WAPA's vegetation management activities on NFS lands could introduce or spread invasive plant species. Motor vehicles and activities that disturb the land surface and soil increase the potential to introduce and spread invasive species. Adverse impacts come from actions that contribute to the decline in abundance, distribution, or functionality of native vegetation. Conversely, beneficial impacts come from activities that protect or restore proper ecological conditions to vegetation communities and habitat types, and limit opportunities for invasive species to establish and spread. The introduction of invasive species can threaten the stability of ecosystems and cause substantial economic burdens for the recreation industry if invasives begin to outcompete native sport fish populations.

Assumptions

The following are important assumptions for identifying and analyzing the impacts of invasive species:

- Motor vehicles and activities that disturb the land surface can contribute to the introduction and spread of invasive species.
- Transportation routes and vehicles provide opportunities for invasive species to establish and spread.

Impact Criteria and Indicators

Vegetation could be adversely affected if the No Action Alternative or Proposed Action introduced or increased the spread of noxious weeds that replace native plants and impact sensitive plants or plants protected under state law.

Table 3-33. Invasive Species Present in the Project Area or on Colorado or Utah Noxious Weed Lists, and Summary of Noxious Weed or Other Status in Colorado, Nebraska, and Utah

Common Name	Scientific Name	Noxious Weed Status[1, 2, 3, 4, 5]	Present within Forest Rights-of-Way[6]	Present within Forest[7]	On Colorado or Utah Noxious Weed lists, not documented within Forests[2]	Type of Plant or Organism
Terrestrial Plants						
Absinthium	*Artemisia absinthium*	COB	N/A	GMUG; SJNF; WRNF	No	Perennial subshrub
African rue	*Peganum harmala*	COA	N/A	N/A	Yes	Perennial forb
Bermuda grass	*Cynodon dactylon*	UTB	N/A	N/A	Yes	Perennial grass
Black henbane	*Hyoscyamus niger*	COB, UTA	ARNF	ARNF; ANF; GMUG; MBRNF; PSINF; SJNF	No	Annual or Biennial forb
Bouncing bet	*Saponaria officinalis*	COB	N/A	ARNF; PSINF	No	Perennial forb
Broadleaved pepperweed	*Lepidium latifolium*	COB, UTB	N/A	ARNF; ANF; SJNF	No	Perennial forb
Bull cottonthistle (Scotch thistle)	*Onopordum tauricum*	COB	N/A	N/A	Yes	Biennial forb
Bull thistle	*Cirsium vulgare*	COB	GMUG; MBRNF; SJNF	ARNF; ANF; GMUG; MBRNF; NNF; PSINF; SJNF; WRNF	No	Biennial forb
Butter and eggs (Yellow toadflax)	*Linaria vulgaris*	COB, UTA	MBRNF; PSINF; SJNF	ARNF; ANF; GMUG; PSINF; MBRNF; SJNF; WRNF	No	Perennial forb
Camelthorn	*Alhagi pseudalhagi*	COA	N/A	N/A	Yes	Perennial shrub
Canada thistle	*Cirsium arvense*	COB, UTC, NE	ARNF; ANF; GMUG; MBRNF; NNF; PSINF; SJNF; WRNF	ARNF; ANF; GMUG; MBRNF; NNF; PSINF; SJNF; WRNF	No	Perennial forb
Caraway	*Carum carvi*	COB	N/A	GMUG	No	Biennial forb
Cheatgrass (Downy brome)	*Bromus tectorum*	COC	MBRNF	ARNF; GMUG; MBRNF; PSINF; SJNF; WRNF	No	Annual grass
Chicory	*Cichorium intybus*	COC	N/A	ARNF; GMUG; SJNF	No	Biennial or Perennial forb
Common crupina	*Crupina vulgaris*	COA	N/A	N/A	Yes	Annual forb
Common mullein	*Verbascum thapsus*	COC	ARNF; GMUG; SJNF	ARNF; GMUG; NNF; SJNF; WRNF	No	Biennial forb

Table 3-33. Invasive Species Present in the Project Area or on Colorado or Utah Noxious Weed Lists, and Summary of Noxious Weed or Other Status in Colorado, Nebraska, and Utah

Common Name	Scientific Name	Noxious Weed Status[1, 2, 3, 4, 5]	Present within Forest Rights-of-Way[6]	Present within Forest[7]	On Colorado or Utah Noxious Weed lists, not documented within Forests[2]	Type of Plant or Organism
Common tansy	*Tanacetum vulgare*	COB	N/A	GMUG; SJNF; WRNF	No	Perennial forb
Common St. Johnswort	*Hypericum perforatum*	COC, UTA	N/A	ARNF; ANF; MBRNF; SJNF	No	Perennial forb
Corn chamomile	*Anthemis arvensis*	COB	GMUG	ARNF; PSINF; SJNF; WRNF	No	Annual forb
Crownvaria	*Securigera varia*	None	N/A	NNF	No	Perennial forb or vine
Cutleaf teasel	*Dipsacus laciniatus*	COB	N/A	N/A	Yes	Biennial forb
Cypress spurge	*Euphorbia cyparissias*	COA	N/A	PSINF	No	Perennial forb
Dalmatian toadflax	*Linaria dalmatica ssp. dalmatica*	COB, UTB	SJNF	ARNF; ANF; GMUG; MBRNF; PSINF; SJNF; WRNF	No	Perennial forb
Dames rocket	*Hesperis matronalis*	COB	N/A	ARNF	No	Biennial or Perennial forb
Diffuse knapweed	*Centaurea diffusa*	COB, UTA, NE	WRNF	ARNF; GMUG; SPI; SJNF; WRNF	No	Biennial forb
Dyer's woad	*Isatis tinctoria*	COA, UTB	N/A	ANF	No	Biennial or Perennial forb
Field bindweed	*Convolvulus arvensis*	COC, UTC, NE	ARNF; GMUG; PSINF; SJNF	ARNF; GMUG; NNF; PSINF; SJNF; WRNF	No	Perennial forb
Fivestamen tamarisk (Salt cedar)	*Tamarix chinensis*	COB	N/A	N/A	Yes	Shrub or tree
Fuller's (Common) teasel	*Dipsacus fullonum*	COB	ARNF	ARNF; WRNF	No	Perennial forb
Gypsyflower (Houndstongue)	*Cynoglossum officinale*	COB, UTC	GMUG; MBRNF; NNF; SJNF; WRNF	ARNF; ANF; GMUG; MBRNF; NNF; PSINF; SJNF; WRNF	No	Perennial or Biennial forb
Halogeton	*Halogeton glomeratus*	COC	N/A	N/A	Yes	Annual forb
Johnsongrass	*Sorghum halepense*	COC, UTA	N/A	ARNF	No	Perennial grass

Table 3-33. Invasive Species Present in the Project Area or on Colorado or Utah Noxious Weed Lists, and Summary of Noxious Weed or Other Status in Colorado, Nebraska, and Utah

Common Name	Scientific Name	Noxious Weed Status[1, 2, 3, 4, 5]	Present within Forest Rights-of-Way[6]	Present within Forest[7]	On Colorado or Utah Noxious Weed lists, not documented within Forests[2]	Type of Plant or Organism
Jointed goatgrass	*Aegilops cylindrica*	COB	N/A	N/A	Yes	Annual grass
Knapweed spp.	*Centaurea spp.*	N/A	MBRNF	MBRNF	N/A	Perennial forb
Leafy spurge	*Euphorbia esula*	COB, UTA, NE	SJNF	ARNF; ANF; MBRNF; NNF; PSINF; SJNF; WRNF	No	Perennial forb
Lesser (Common) burdock	*Arctium minus*	COC	GMUG	GMUG; PSINF; SJNF; WRNF	No	Biennial herb
Meadow knapweed	*Centaurea pratensis*	COA	N/A	N/A	Yes	Perennial forb
Mediterranean sage	*Salvia aethiopis*	COA	N/A	N/A	Yes	Biennial forb
Medusahead	*Taeniatherum caput-medusae*	COA, UTA	N/A	N/A	Yes	Annual grass
Moth mullein	*Verbascum blattaria*	COB	N/A	N/A	Yes	Biennial forb
Myrtle spurge	*Euphorbia myrsinites*	COA	N/A	ARNF	No	Biennial or Perennial forb
Narrow-leaved dalmatian toadflax	*Linaria genistifolia*	COB	N/A	N/A	Yes	Perennial forb
Nodding plumeless thistle (musk thistle)	*Carduus nutans*	COB, UTB, NE	ARNF; ANF; GMUG; MBRNF; NNF; SJNF; WRNF	ARNF; ANF; GMUG; MBRNF; NNF; PSINF; SJNF; WRNF	No	Biennial forb
Orange hawkweed	*Hieracium aurantiacum*	COA	N/A	ARNF; PSINF	No	Perennial forb
Oriental virginsbower (Chinese clematis)	*Clematis orientalis*	COB	N/A	PSINF; WRNF	No	Perennial vine
Oxeye daisy	*Leucanthemum vulgare*	COB, UTA	GMUG; SJNF	ARNF; ANF; GMUG; MBRNF; PSINF; SJNF; WRNF	No	Perennial forb
Perennial sowthistle	*Sonchus arvensis*	COC	N/A	SJNF	No	Perennial forb
Poison hemlock	*Conium maculatum*	COC, UTB	N/A	N/A	Yes	Biennial forb
Puncturevine	*Tribulus terrestris*	COC	N/A	N/A	Yes	Annual forb
Purple loosestrife	*Lythrum salicaria*	COA, UTA	N/A	N/A	Yes	Perennial subshrub

Table 3-33. Invasive Species Present in the Project Area or on Colorado or Utah Noxious Weed Lists, and Summary of Noxious Weed or Other Status in Colorado, Nebraska, and Utah

Common Name	Scientific Name	Noxious Weed Status[1, 2, 3, 4, 5]	Present within Forest Rights-of-Way[6]	Present within Forest[7]	On Colorado or Utah Noxious Weed lists, not documented within Forests[2]	Type of Plant or Organism
Quackgrass	*Elymus repens*	COB, UTC	SJNF	SJNF	No	Perennial grass
Redstem filaree	*Erodium cicutarium*	COC	N/A	N/A	Yes	Annual forb
Rush skeletonweed	*Chondrilla juncea*	COA	N/A	N/A	Yes	Perennial forb
Russian knapweed	*Acroptilon repens*	COB, UTB	SJNF	ANF; NNF; SJNF; WRNF	No	Perennial forb
Russian olive	*Elaeagnus angustifolia*	COB	N/A	ARNF; SJNF; WRNF	No	Tree or shrub
Saltcedar	*Tamarix ramosissima*	COB, UTC, NE	SJNF	GMUG; NNF; PSINF; SJNF; WRNF	No	Shrub or tree
Scentless false mayweed	*Tripleurospermum perforatum*	COB	WRNF	GMUG; SJNF; WRNF	No	Annual, Biennial or short-lived Perennial forb
Scotch cottonthistle	*Onopordum acanthium*	COB, UTB	NNF; SJNF	ARNF; ANF; GMUG; NNF; PSINF; SJNF; WRNF	No	Biennial forb
Sericea lespedeza	*Lespedeza cuneata*	COA	N/A	NNF	No	Perennial subshrub
Sickleweed	*Falcaria vulgaris*	None	N/A	NNF	No	Perennial forb
Smallflower tamarisk (Salt cedar)	*Tamarix parviflora*	COB, NE	N/A	PSINF	No	Shrub or tree
Spiny plumeless thistle	*Carduus acanthoides*	COB, NE	N/A	GMUG; PSINF; SJNF; WRNF	No	Biennial forb
Spotted knapweed	*Centaurea stoebe ssp. micranthos*	COB, UTA, NE	ANF; SJNF	ARNF; ANF; GMUG; MBRNF; NNF; PSINF; SJNF; WRNF	No	Perennial forb
Spurred anoda	*Anoda cristata*	COB	N/A	N/A	Yes	Annual forb
Squarrose knapweed	*Centaurea virgata*	COA, UTB	N/A	N/A	Yes	Perennial forb
Stinking (Mayweed) chamomile	*Anthemis cotula*	COB	GMUG	GMUG; SJNF; WRNF	No	Annual forb
Stinking willie (Tansy ragwort)	*Senecio jacobaea*	COA	N/A	GMUG	No	Perennial forb
Sulfur cinquefoil	*Potentilla recta*	COB, UTA	GMUG	ARNF; GMUG; NNF; PSINF; SJNF; WRNF	No	Perennial forb

Table 3-33. Invasive Species Present in the Project Area or on Colorado or Utah Noxious Weed Lists, and Summary of Noxious Weed or Other Status in Colorado, Nebraska, and Utah

Common Name	Scientific Name	Noxious Weed Status[1, 2, 3, 4, 5]	Present within Forest Rights-of-Way[6]	Present within Forest[7]	On Colorado or Utah Noxious Weed lists, not documented within Forests[2]	Type of Plant or Organism
Velvetleaf	*Abutilon theophrasti*	COC	N/A	N/A	Yes	Annual forb
Venice mallow	*Hibiscus trionum*	COB	N/A	N/A	Yes	Annual forb
Whitetop (Hoary cress)	*Cardaria draba*	COB, UTB	ANF; GMUG	ARNF; ANF; GMUG; MBRNF; NNF; PSINF; SJNF; WRNF	No	Perennial forb
Wild proso millet	*Panicum miliaceum*	COC	N/A	N/A	Yes	Annual grass
Yellow nutsedge	*Cyperus esculentus*	COB	N/A	N/A	Yes	Perennial graminoid
Yellow starthistle	*Centaurea solstitialis*	COA, UTA	N/A	N/A	Yes	Annual forb
Aquatic Plants and Algae						
African elodea	*Lagarosiphon major*	FNW	N/A	N/A	No	Aquatic plant
Brazilian elodea	*Egeria densa*	ANS	N/A	N/A	No	Aquatic plant
Didymo or rocksnot (algae)	*Didymosphenia geminata*	ANS	N/A	N/A	No	Algae
Eurasian watermilfoil	*Myriophyllum spicatum*	COB, ANS	N/A	N/A	Yes	Aquatic plant
Giant salvinia	*Salvinia molesta*	FNW, COA, ANS	N/A	N/A	Yes	Aquatic plant
Hydrilla	*Hydrilla verticillata*	FNW, COA, ANS	N/A	N/A	Yes	Aquatic plant
Parrotfeather	*Myriophyllum aquaticum*	ANS	N/A	N/A	No	Aquatic plant
Water hyacinth	*Eichornia crassipes*	ANS	N/A	N/A	No	Aquatic plant
Yellow floating heart	*Nymphoides peltata*	ANS	N/A	N/A	No	Aquatic plant
Other Invasive Species						
Fishhook waterflea	*Cercopagis pengoi*	N/A	N/A	N/A	No	Crustacean
New Zealand mudsnail	*Potamopyrgus antipodarum*	N/A	N/A	PSINF	No	Mollusk
Quagga mussel	*Dreissena bugensis*	N/A	N/A	N/A	No	Mollusk
Rusty crayfish	*Orconectes rusticus*	N/A	N/A	N/A	No	Crustacean

Table 3-33. Invasive Species Present in the Project Area or on Colorado or Utah Noxious Weed Lists, and Summary of Noxious Weed or Other Status in Colorado, Nebraska, and Utah

Common Name	Scientific Name	Noxious Weed Status[1, 2, 3, 4, 5]	Present within Forest Rights-of-Way[6]	Present within Forest[7]	On Colorado or Utah Noxious Weed lists, not documented within Forests[2]	Type of Plant or Organism
Spiny waterflea	*Bythotrephes longimanus (also known as Bythotrephes cederstroemi)*	N/A	N/A	N/A	No	Crustacean
Waterflea	*Daphnia lumholtzii*	N/A	N/A	N/A	No	Crustacean
Zebra mussel	*Dreissena polymorpha*	N/A	N/A	N/A	No	Mollusk

[1]FNW = Federally Listed Noxious Weed 11/10/11. Available online: http://www.aphis.usda.gov/plant_health/plant_pest_info/weeds/downloads/weedlist.pdf
[2]COA, COB, COC = Colorado Noxious Weed List A, B or C. Available online: http://www.colorado.gov/cs/Satellite/Agriculture-Main/CDAG/1174084048733
[3]UTA, UTB, UTC = Utah Listed Noxious Weed List A, B or C. Available online: http://www.utahweed.org/PDF/weed_act.pdf
[4]NE = Nebraska Noxious Weed. Available online: http://www.neweed.org/noxiousweeds.htm
[5]Colorado Aquatic Nuisance Species (ANS). Available online: http://wildlife.state.co.us/SiteCollectionDocuments/DOW/WildlifeSpecies/AquaticNuisance/PARKS_ANS_Regs_Approved.pdf
[6]Forest abbreviations: Arapaho-Roosevelt (ARNF); Ashley (ANF); Grand Mesa, Uncompahgre, and Gunnison (GMUG); Medicine Bow-Routt (MBRNF) Nebraska (NNF); Pike and San Isabel (PSINF); San Juan (SJNF); White River (WRNF)
[7]Based on GIS layer provided by the Forest Service.

N/A Not applicable

3.6.4 Affected Environment

According to the list of terrestrial plants in Table 3-33, there are 26 invasive species present in the ROWs and 29 invasive species present outside ROWs but documented in the eight forests. There are also 22 species not documented to be present in any of the eight forests, but are on the Colorado or Utah noxious weed lists and the Forest Service requested that they be included (Pearce 2012). Appendix D provides short descriptions of the 26 species documented to be present in the ROWs; the descriptions are taken from the Colorado Department of Agriculture Noxious Weed Management website (Colorado Department of Agriculture 2011), the Learning Center of the American Southwest (Learning Center of the American Southwest 2011), and the Alberta Invasive Plant Council (Alberta Invasive Plant Council 2011).

3.6.4.1 Arapaho-Roosevelt National Forest

Noxious weed surveys were performed in the Sulphur District of Roosevelt National Forest in 2008 and 2009 and in the Canyon Lakes District of Roosevelt National Forest in 2007 (Elliott 2013f). For both districts, the target weed list for the surveys included all species from the Colorado noxious weed list. Findings from the surveys were as follows:

- Noxious weeds were found in the transmission line ROWs, including Canada thistle, nodding plumeless thistle, scented mayweed, common mullein, houndstongue, and spotted knapweed (Elliott 2013f).
- The Archer-Hayden and Ault-Craig transmission lines were free of weeds; no noxious weeds were found in the transmission line ROW (Elliott 2013f).

Table 3-34 lists the terrestrial noxious weeds documented to be present in the ROWs in Arapaho-Roosevelt National Forest, and in the forest outside the ROWs. The area of occurrence for these species is relatively minor, with population sizes ranging from several individuals up to several hundred covering up to one acre in a ROW.

Table 3-34. Terrestrial Noxious Weeds Documented in Arapaho-Roosevelt National Forests

Common Name	Scientific Name	Present in Rights-of-Way	Present in Forest
Black henbane	*Hyoscyamus niger*	No	Yes[2,3]
Bouncing bet	*Saponaria officinalis*	No	Yes[2]
Broadleaved pepperweed	*Lepidium latifolium*	No	Yes[2]
Bull thistle	*Cirsium vulgare*	No	Yes[2]
Butter and eggs (Yellow toadflax)	*Linaria vulgaris*	No	Yes[2]
Canada thistle	*Cirsium arvense*	Yes[1,3]	Yes[1,2,3]
Cheatgrass (Downy brome)	*Bromus tectorum*	No	Yes[2]
Chicory	*Cichorium intybus*	No	Yes[2]
Common mullein	*Verbascum thapsus*	Yes[3]	Yes[1,2]
Common St. Johnswort	*Hypericum perforatum*	No	Yes[2]
Corn chamomile	*Anthemis arvensis*	No	Yes[2]
Dalmatian toadflax	*Linaria dalmatica*	No	Yes[2]
Dames rocket	*Hesperis matronalis*	No	Yes[2]
Diffuse knapweed	*Centaurea diffusa*	No	Yes[2]
Field bindweed	*Convolvulus arvensis*	No	Yes[2,3]
Fuller's (Common) teasel	*Dipsacus fullonum*	No	Yes[1,2]
Gypsyflower (Houndstongue)	*Cynoglossum officinale*	Yes[3]	Yes[2]
Johnsongrass	*Sorghum halepense*	No	Yes[2]
Leafy spurge	*Euphorbia esula*	No	Yes[2]
Myrtle spurge	*Euphorbia myrsinites*	No	Yes[2]
Nodding plumeless thistle (Musk thistle)	*Carduus nutans*	Yes[3]	Yes[1,2]
Orange hawkweed	*Hieracium aurantiacum*	No	Yes[2]
Oxeye daisy	*Leucanthemum vulgare*	No	Yes[2]
Russian olive	*Elaeagnus angustifolia*	No	Yes[2]
Scentless false mayweed	*Tripleurospermum perforatum*	Yes[3]	Yes[1]
Scotch cottonthistle	*Onopordum acanthium*	No	Yes[2]
Spotted knapweed	*Centaurea stoebe ssp. micranthos*	Yes[3]	Yes[2]
Sulfur cinquefoil	*Potentilla recta*	No	Yes[2]
Whitetop (Hoary cress)	*Cardaria draba*	No	Yes[2]

[1]Elliott 2013f
[2]Forest Service 2011c
[3]Elliott 2010-2012

3.6.4.2 Ashley National Forest

Noxious weed surveys were performed in Ashley National Forest in 2009 (Elliott 2012). Noxious weeds identified during the ROW surveys include nodding plumeless thistle and Canada thistle. Whitetop was observed in the forest, but not in the ROW (Elliott 2010-2012). Table 3-35 lists the terrestrial noxious weeds documented in the ROWs in Ashley National Forest, and in the forest outside the ROWs. The area of occurrence for these species is relatively minor with population sizes comprising up to 0.5 acres.

Table 3-35. Terrestrial Noxious Weeds Documented in Ashley National Forest

Common Name	Scientific Name	Present in Rights-of-Way	Present in Forest
Black henbane	*Hyoscyamus niger*	No	Yes[2]
Broadleaved pepperweed	*Lepidium latifolium*	No	Yes[2]
Bull thistle	*Cirsium vulgare*	No	Yes[2]
Butter and eggs (Yellow toadflax)	*Linaria vulgaris*	No	Yes[2]
Canada thistle	*Cirsium arvense*	Yes[1,2,3]	Yes[1,2,3]
Common St. Johnswort	*Hypericum perforatum*	No	Yes[2]
Dalmatian toadflax	*Linaria dalmatica ssp. dalmatica*	No	Yes[2]
Dyer's woad	*Isatis tinctoria*	No	Yes[2]
Gypsyflower (Houndstongue)	*Cynoglossum officinale*	No	Yes[2]
Leafy spurge	*Euphorbia esula*	No	Yes[2]
Nodding plumeless thistle (Musk thistle)	*Carduus nutans*	Yes[1,2,3]	Yes[1,2,3]
Oxeye daisy	*Leucanthemum vulgare*	No	Yes[2]
Russian knapweed	*Acroptilon repens*	No	Yes[2]
Saltcedar	*Tamarix ramosissima*	No	Yes[1]
Scotch cottonthistle	*Onopordum acanthium*	No	Yes[2]
Spotted knapweed	*Centaurea stoebe ssp. micranthos*	No	Yes[2]
Whitetop (Hoary cress)	*Cardaria draba*	No	Yes[2,3]

[1]Elliott 2012
[2]Forest Service 2011c
[3]Elliott 2010-2012

3.6.4.3 Grand Mesa, Uncompahgre, and Gunnison National Forest

Noxious weed surveys were performed during the summers of 2008 and 2009 in the Paonia, Gunnison, and Norwood Districts of Grand Mesa, Uncompahgre, and Gunnison National Forest (Elliott 2013e). The target weed list for the surveys included all species from the Colorado noxious weed list. Several noxious weeds were present in the transmission line ROWs, including musk thistle, Canada thistle, field bindweed, hound’s tongue, and oxeye daisy. Table 3-36 lists the terrestrial noxious weeds in the ROWs in Grand Mesa, Uncompahgre, and Gunnison National Forest, and in the forest outside the ROWs. The area of occurrence for these species was highly variable; there were observations of infestations with only a few individuals, to large occurrences encompassing up to 5 to 10 acres. GMUG has continued to conduct yearly surveys for noxious weeds.

Table 3-36. Terrestrial Noxious Weeds Documented in Grand Mesa, Uncompahgre, and Gunnison National Forests

Common Name	Scientific Name	Present in Rights-of-Way	Present in Forest
Absinthium	*Artemisia absinthium*	No	Yes[2]
Black henbane	*Hyoscyamus niger*	No	Yes[2]
Bull thistle	*Cirsium vulgare*	Yes	Yes[2]
Butter and eggs (Yellow toadflax)	*Linaria vulgaris*	No	Yes[2]
Canada thistle	*Cirsium arvense*	Yes[1,2,3]	Yes[1,2,3]
Caraway	*Carum carvi*	No	Yes[2]
Cheatgrass (Downy brome)	*Bromus tectorum*	No	Yes[2]
Chicory	*Cichorium intybus*	No	Yes[2]
Common mullein	*Verbascum thapsus*	Yes	Yes[2]
Common tansy	*Tanacetum vulgare*	No	Yes[2]
Corn chamomile	*Anthemis arvensis*	Yes	Yes[2]
Dalmatian toadflax	*Linaria dalmatica*	No	Yes[2]
Diffuse knapweed	*Centaurea diffusa*	No	Yes[2]
Field bindweed	*Convolvulus arvensis*	Yes[1,3]	Yes[1,2,3]
Gypsyflower (Houndstongue)	*Cynoglossum officinale*	Yes[1,2,3]	Yes[1,2,3]
Lesser (Common) burdock	*Arctium minus*	No	Yes[2]
Nodding plumeless thistle (Musk thistle)	*Carduus nutans*	Yes[1,2,3]	Yes[1,2,3]
Oxeye daisy	*Leucanthemum vulgare*	Yes[1,2,3]	Yes[1,2,3]
Russian knapweed	*Acroptilon repens*	No	Yes[2]
Russian leafy spurge	*Euphorbia esula var. uralens*	No	Yes[2]
Saltcedar	*Tamarix ramosissima*	No	Yes[2]
Scentless false mayweed	*Tripleurospermum perforatum*	No	Yes[2]
Scotch cottonthistle	*Onopordum acanthium*	No	Yes[2]
Spiny plumeless thistle	*Carduus acanthoides*	No	Yes[2]
Spotted knapweed	*Centaurea stoebe ssp. micranthos*	Yes	Yes[2]
Stinking (Mayweed) chamomile	*Anthemis cotula*	No	Yes[2,3]
Stinking willie (Tansy ragwort)	*Senecio jacobaea*	No	Yes[2]
Sulfur cinquefoil	*Potentilla recta*	No	Yes[2]
Whitetop (Hoary cress)	*Cardaria draba*	No	Yes[2]

[1]Elliott 2013e
[2]Forest Service 2011c
[3]Elliott 2010-2012

3.6.4.4 Medicine Bow-Routt National Forest

Botanical surveys were performed in summer 2007 (Elliott 2013c), and no noxious weeds were observed in the ROWs at that time. Table 3-37 lists the terrestrial noxious weeds in Medicine Bow-Routt National Forest outside the ROWs.

Table 3-37. Terrestrial Noxious Weeds Documented in Medicine Bow-Routt National Forests

Common Name	Scientific Name	Present in Rights-of-Way	Present in Forest[1]
Black henbane	*Hyoscyamus niger*	No	Yes
Bull thistle	*Cirsium vulgare*	No	Yes
Butter and eggs (Yellow toadflax)	*Linaria vulgaris*	No	Yes
Canada thistle	*Cirsium arvense*	No	Yes
Cheatgrass (Downy brome)	*Bromus tectorum*	No	Yes
Common St. Johnswort	*Hypericum perforatum*	No	Yes
Dalmatian toadflax	*Linaria dalmatica ssp. dalmatica*	No	Yes
Gypsyflower (Houndstongue)	*Cynoglossum officinale*	No	Yes
Knapweed spp.	*Centaurea spp.*	No	Yes
Leafy spurge	*Euphorbia esula*	No	Yes
Nodding plumeless thistle (Musk thistle)	*Carduus nutans*	No	Yes
Oxeye daisy	*Leucanthemum vulgare*	No	Yes
Spotted knapweed	*Centaurea stoebe ssp. micranthos*	No	Yes
Whitetop (Hoary cress)	*Cardaria draba*	No	Yes

[1]Forest Service 2011c

3.6.4.5 Nebraska National Forest

Botanical surveys were performed during summer 2008 in the Pine Ridge District of Nebraska National Forest (Elliott 2013a). Pedestrian surveys were initiated in response to proposed and ongoing maintenance activities on approximately 15 miles of the transmission line ROW. Target plant species included threatened, endangered, and candidate species, and Region 2 Forest Service sensitive species, species of local concern, and noxious weeds. Four invasive species were present in ROWs, including Canada thistle, nodding plumeless thistle, houndstongue, and Scotch thistle. Table 3-38 lists the terrestrial noxious weeds present in the ROW in Nebraska National Forest, and in the forest outside the ROW. Occurrence for each of these invasive species was very minor, with the largest population having approximately 50 individuals in a localized area. Other observed populations had between 2 and 40 individuals.

Table 3-38. Terrestrial Noxious Weeds Documented in Nebraska National Forest

Common Name	Scientific Name	Present in Rights-of-Way	Present in Forest
Bull thistle	*Cirsium vulgare*	No	Yes[2]
Canada thistle	*Cirsium arvense*	Yes[1,2,3]	Yes[1,2,3]
Common mullein	*Verbascum thapsus*	No	Yes[2]
Crownvaria	*Securigera varia*	No	Yes[2]
Field bindweed	*Convolvulus arvensis*	No	Yes[2]
Gypsyflower (Houndstongue)	*Cynoglossum officinale*	Yes[1,3]	Yes[1,2,3]
Leafy spurge	*Euphorbia esula*	No	Yes[2]
Nodding plumeless thistle (Musk thistle)	*Carduus nutans*	Yes[1,3]	Yes[1,2,3]
Russian knapweed	*Acroptilon repens*	No	Yes[2]
Saltcedar	*Tamarix ramosissima*	No	Yes[2]
Scotch cottonthistle	*Onopordum acanthium*	Yes[1,3]	Yes[1,2,3]
Sericea lespedeza	*Lespedeza cuneata*	No	Yes[2]
Sickleweed	*Falcaria vulgaris*	No	Yes[2]
Spotted knapweed	*Centaurea stoebe ssp. micranthos*	No	Yes[2]
Sulfur cinquefoil	*Potentilla recta*	No	Yes[2]
Whitetop (Hoary cress)	*Cardaria draba*	No	Yes[2]

[1]Elliott 2013a
[2]Forest Service 2011c
[3]Elliott 2010-2012

3.6.4.6 Pike and San Isabel National Forest

Noxious weed surveys were performed during the summers of 2008 and 2009 in the Salida District of Pike and San Isabel National Forest (Elliott 2013c). The target weed list for the surveys included all species from the Colorado noxious weed list. Two noxious weed species were present in the transmission line ROWs – Canada thistle and field bindweed. Table 3-39 lists the terrestrial noxious weeds in the ROWs in Pike and San Isabel National Forest, and in the forests outside the ROWs. Occurrence for each of these invasive species was very minor, with the largest population density being approximately several hundred individuals in a localized area.

Table 3-39. Terrestrial Noxious Weeds Documented in Pike and San Isabel National Forest

Common Name	Scientific Name	Present in Rights-of-Way	Present in Forest
Black henbane	*Hyoscyamus niger*	No	Yes[2]
Bouncing bet	*Saponaria officinalis*	No	Yes[2]
Bull thistle	*Cirsium vulgare*	No	Yes[2]
Butter and eggs (Yellow toadflax)	*Linaria vulgaris*	No	Yes[2]
Canada thistle	*Cirsium arvense*	Yes[1,3]	Yes[1,2,3]
Cheatgrass (Downy brome)	*Bromus tectorum*	No	Yes[2]
Corn chamomile	*Anthemis arvensis*	No	Yes[2]
Cypress spurge	*Euphorbia cyparissias*	No	Yes[2]
Dalmatian toadflax	*Linaria dalmatica*	No	Yes[2]
Diffuse knapweed	*Centaurea diffusa*	No	Yes[2]
Field bindweed	*Convolvulus arvensis*	Yes[1,3]	Yes[1,2,3]
Gypsyflower (Houndstongue)	*Cynoglossum officinale*	No	Yes[2]
Hairy whitetop	*Cardaria pubescens*	No	Yes[2]
Leafy spurge	*Euphorbia esula*	No	Yes[2]
Lesser (Common) burdock	*Arctium minus*	No	Yes[2]
Nodding plumeless thistle (Musk thistle)	*Carduus nutans*	No	Yes[2]
Orange hawkweed	*Hieracium aurantiacum*	No	Yes[2]
Oriental virginsbower (Chinese clematis)	*Clematis orientalis*	No	Yes[2]
Oxeye daisy	*Leucanthemum vulgare*	No	Yes[2]
Saltcedar	*Tamarix ramosissima*	No	Yes[2]
Scotch cottonthistle	*Onopordum acanthium*	No	Yes[2]
Slender Russian thistle	*Salsola collina*	No	Yes[2]
Smallflower tamarisk (Salt cedar)	*Tamarix parviflora*	No	Yes[2]
Spiny plumeless thistle	*Carduus acanthoides*	No	Yes[2]
Spotted knapweed	*Centaurea stoebe ssp. micranthos*	No	Yes[2]
Sulfur cinquefoil	*Potentilla recta*	No	Yes[2]
Whitetop (Hoary cress)	*Cardaria draba*	No	Yes[2]

[1]Elliott 2013c
[2]Forest Service 2011c
[3]Elliott 2010-2012

3.6.4.7 San Juan National Forest

Noxious weed surveys were performed during the summers of 2008 and 2009 in the Mancos-Dolores District (Elliott 2014c). The target weed list for the surveys included all species from the Colorado noxious weed list. Twelve weed species were present at numerous sites in the ROWs – Canada thistle, musk thistle, houndstongue, field bindweed, bull thistle, Russian knapweed, oxeye daisy, leafy spurge, St. John's wort, salt cedar, quackgrass, and Dalmatian toadflax. Table 3-40 lists the terrestrial noxious weeds in the ROWs in San Juan National Forest, and in the forest outside the ROWs. The area of occurrence for these species was highly variable; there were observations of infestations with only a few individuals, and large occurrences encompassing up to five or more acres.

Table 3-40. Terrestrial Noxious Weeds Documented in San Juan National Forest

Common Name	Scientific Name	Present in Rights-of-Way	Present in Forest
Absinthium	*Artemisia absinthium*	No	Yes[2]
Black henbane	*Hyoscyamus niger*	No	Yes[2]
Broadleaved pepperweed	*Lepidium latifolium*	No	Yes[2]
Bull thistle	*Cirsium vulgare*	Yes[1,2]	Yes[1,2]
Butter and eggs (Yellow toadflax)	*Linaria vulgaris*	No	Yes[2]
Canada thistle	*Cirsium arvense*	Yes[1,2]	Yes[1,2]
Cheatgrass (Downy brome)	*Bromus tectorum*	No	Yes[2]
Chicory	*Cichorium intybus*	No	Yes[2]
Common mullein	*Verbascum thapsus*	No	Yes[2]
Common St. John's wort	*Hypericum perforatum*	Yes[1]	Yes[1], Yes[3]
Common tansy	*Tanacetum vulgare*	No	Yes[2]
Corn chamomile	*Anthemis arvensis*	No	Yes[2]
Dalmatian toadflax	*Linaria dalmatica*	Yes[1,2]	Yes[1,2]
Diffuse knapweed	*Centaurea diffusa*	No	Yes[2]
Field bindweed	*Convolvulus arvensis*	Yes[1]	Yes[1,2]
Field sowthistle	*Sonchus arvensis*	No	Yes[2]
Gypsyflower (Houndstongue)	*Cynoglossum officinale*	Yes[1,2]	Yes[1,2]
Leafy spurge	*Euphorbia esula*	Yes[1]	Yes[1,2]
Lesser (Common) burdock	*Arctium minus*	No	Yes[2]
Nodding plumeless thistle (Musk thistle)	*Carduus nutans*	Yes[1,2]	Yes[1,2]
Oxeye daisy	*Leucanthemum vulgare*	Yes[1]	Yes[1,2]
Quackgrass	*Elymus repens*	Yes[1]	Yes[1]
Russian knapweed	*Acroptilon repens*	Yes[1,2]	Yes[1,2]
Russian olive	*Elaeagnus angustifolia*	No	Yes[2]
Saltcedar	*Tamarix ramosissima*	Yes[1,2]	Yes[1,2]
Scentless false mayweed	*Tripleurospermum perforatum*	No	Yes[2]
Scotch cottonthistle	*Onopordum acanthium*	No	Yes[2]
Spiny plumeless thistle	*Carduus acanthoides*	No	Yes[2]
Spotted knapweed	*Centaurea stoebe ssp. micranthos*	No	Yes[2]
Stinking (Mayweed) chamomile	*Anthemis cotula*	No	Yes[2]
Sulfur cinquefoil	*Potentilla recta*	No	Yes[2]
Whitetop (Hoary cress)	*Cardaria draba*	No	Yes[2]

[1]Elliott 2014c
[2]Forest Service 2011c
[3]Elliott 2010-2012

3.6.4.8 White River National Forest

Noxious weed surveys were performed during the summers of 2007 to 2009 in White River National Forest (Elliott 2013b). The target weed list for the surveys included all species from the Colorado noxious weed list. Four noxious weeds were present in the transmission line ROWs – diffuse knapweed, mayweed, Canada thistle, and houndstongue. Table 3-41 lists the terrestrial noxious weeds in the ROWs in White River National Forest, and in the forest outside the ROWs. Occurrence for each of these invasive species was very minor, with the largest population occupying less than0.25 acres.

Table 3-41. Terrestrial Noxious Weeds Documented in White River National Forest

Common Name	Scientific Name	Present in Rights-of-Way	Present in Forest
Absinthium	*Artemisia absinthium*	No	Yes[2]
Bull thistle	*Cirsium vulgare*	No	Yes[2]
Butter and eggs (Yellow toadflax)	*Linaria vulgaris*	No	Yes[2]
Canada thistle	*Cirsium arvense*	Yes[1,2,3]	Yes[1,2,3]
Cheatgrass (Downy brome)	*Bromus tectorum*	No	Yes[2]
Common mullein	*Verbascum Thapsus*	No	Yes[2]
Common tansy	*Tanacetum vulgare*	No	Yes[2]
Corn chamomile	*Anthemis arvensis*	No	Yes[2]
Dalmatian toadflax	*Linaria dalmatica*	No	Yes[2]
Diffuse knapweed	*Centaurea diffusa*	Yes[1,2,3]	Yes[1,2,3]
Field bindweed	*Convolvulus arvensis*	No	Yes[2]
Fuller's (Common) teasel	*Dipsacus fullonum*	No	Yes[2]
Gypsyflower (Houndstongue)	*Cynoglossum officinale*	Yes[1,3]	Yes[1,2,3]
Leafy spurge	*Euphorbia esula*	No	Yes[2]
Lesser (Common) burdock	*Arctium minus*	No	Yes[2]
Nodding plumeless thistle (Musk thistle)	*Carduus nutans*	No	Yes[1,2]
Oriental virginsbower (Chinese clematis)	*Clematis orientalis*	No	Yes[2]
Oxeye daisy	*Leucanthemum vulgare*	No	Yes[2]
Russian knapweed	*Acroptilon repens*	No	Yes[2]
Russian olive	*Elaeagnus angustifolia*	No	Yes[2]
Saltcedar	*Tamarix ramosissima*	No	Yes[2]
Scentless false mayweed	*Tripleurospermum perforatum*	Yes[1,3]	Yes[1,2,3]
Scotch cottonthistle	*Onopordum acanthium*	No	Yes[2]
Slender Russian thistle	*Salsola collina*	No	Yes[2]
Spiny plumeless thistle	*Carduus acanthoides*	No	Yes[2]
Spotted knapweed	*Centaurea stoebe ssp. micranthos*	No	Yes[2]
Stinking (Mayweed) chamomile	*Anthemis cotula*	No	Yes[2]
Sulfur cinquefoil	*Potentilla recta*	No	Yes[2]
Whitetop (Hoary cress)	*Cardaria draba*	No	Yes[2]

[1]Elliott 2013b
[2]Forest Service 2011c
[3]Elliott 2010-2012

3.6.5 Environmental Consequences

This section describes potential adverse and beneficial impacts on invasive species from management actions under the No Action Alternative and the Proposed Action. The primary goal when treating invasive species, regardless of method used, is elimination of targeted populations from an area.

For purposes of analysis, the focus is on invasive vegetation species because there is a negligible possibility for actions associated with invasive aquatic plant and animal species. The No Action Alternative and the Proposed Action could potentially cause proliferation of noxious and invasive weeds into areas considered to be free of weeds, and there is concern that there could be an increase in noxious and invasive weeds where they already exist.

Design Features for Invasive Species

WAPA uses standard maintenance procedures and design features for invasive species management in the project area to minimize potential effects from project activities. These invasive species management design features are summarized below. Chapter 2 provides full details on all design features (Table 2-13) and standard maintenance procedures (Table 2-15) WAPA uses.

- Noxious weeds will be controlled and managed pursuant to Forest Service Manual 2900 - Invasive Species Management.
- Revegetation might be required in areas where ground cover is disturbed. If required, areas will be revegetated using Forest Service-approved certified weed-free seed mixes to prevent soil erosion or establishment of noxious weeds.
- Herbicides selected for use in project area ROWs will comply with Forest Service requirements, be registered and approved for ROW application, and be administered by licensed applicators.
- Project materials, including gravel, sand, hay, and fill, will be from weed-free sources.
- Staging areas will not be located in weed infested areas, and maintenance work will take place along weed-free designated travel pathways where possible.
- Green pine or fir tree debris over 4-inches in diameter and Douglas-fir tree boles over 8-inches in diameter will be removed to prevent the spread of bark beetle populations.
- Off-road equipment shall not be moved into the project area without first taking reasonable measures to ensure it is free of soil, seeds, vegetation matter, or other debris that could contain noxious weed seeds. Equipment should also be inspected before moving it from areas infested with invasive species of concern to areas free of these species.

3.6.5.1 No Action Alternative

Direct Effects

Under the No Action Alternative, in general, invasive species are expected to spread. Actions that disturb soil or otherwise create environments (seed beds) for the establishment of invasive species typically cause direct impacts to the management of invasive species.

Direct effects associated with hand and mechanized vegetation clearing activities could include surface disturbances in the form of overturned soil from felled trees, trampling or mortality of individuals from in-breaking, crushing, or uprooting plants from driving machinery or skidding material, and the introduction of invasive species seed and plant matter from machinery and other equipment. Direct beneficial effects from hand and mechanized clearing could include mortality of invasive species populations and increased potential for establishment of native vegetation. Direct adverse impacts could include spread of invasive plant seeds to overturned soil and smothering of non-target plant species from wood chips or slash piles.

Under the No Action Alternative, WAPA would use Forest Service-approved herbicides in targeted locations as needed. Direct effects from herbicide use can include alterations to species composition and a reduction in diversity of native plants as less herbicide-tolerant species are replaced by more herbicide-tolerant species. The use of herbicides is typically directed toward a target invasive species with the purpose of eliminating individuals from an area, which would result in a beneficial impact. Direct adverse effects on non-targeted vegetation species would likely be localized and short term, although an accidental spill could result in more intense effects because of the number and extent of non-target plants affected.

Overall, management actions under the No Action Alternative could cause short-term impacts to invasive vegetation species by decreasing vegetation production and increasing establishment of native early successional species. Long-term impacts could include increased production and diversity of native vegetation communities, thereby controlling the spread of invasive species. Overall, short-term adverse effects would largely be offset by the long-term benefits of treatment.

Indirect Effects

Invasive species generally possess dispersal and establishment strategies that provide a competitive advantage over native plant species due to their rapid growth and ability to produce large amounts of seed and plant biomass. Indirect effects result from activities that would increase the potential for introduction and establishment of invasive species in the project area.

WAPA would primarily use manual and mechanical clearing methods during maintenance activities to prevent vegetation coming in contact with existing transmission lines and structures. Indirect effects of these clearing activities could include transfer of invasive species seed or propagules from machinery or worker clothing, surface disturbances and exposed soil available for invasive species seed dispersal, increased penetration of sunlight through the canopy from removed vegetation, increased potential for soil erosion, creation of potential new habitat for both native and invasive plant species, and alterations to soil chemistry due to nutrients leached into the ground surface from residual slash and wood chippings.

Indirect effects from the spot application of herbicides could include herbicide drift, which is when fine clouds of the chemical blow or vaporize into untargeted areas, resulting in adverse impacts on non-targeted plants and animals. Another indirect impact could be inhibited growth of invasive plants in spring following original herbicide application due to minor residual persistence of the herbicide chemicals in the soil surface. The use of herbicides over recently disturbed land and for spot application can prevent the establishment of invasive plant species, which would provide increased potential for native species to establish, resulting in a short- to long-term beneficial effect.

Effects of the No Action Alternative on Invasive Species

Under the No Action Alternative, there would be no change from existing management, and current transmission line maintenance and associated direct and indirect effects on invasive species would remain approximately the same. Anticipated direct impacts on invasive species would be localized to areas in the project area ROWs identified as having potential occurrences of invasive species. Treatment would be reactive and would not have a substantial adverse or beneficial effect on these or other vegetation populations. Indirect effects could result from the gradual steady encroachment of newly established invasive plant populations over the long term. There is more potential for increased spread of invasive species due to the reactive nature of management under the No Action Alternative and the aggressive, successional nature of the invasive species present.

3.6.5.2 Proposed Action

The Proposed Action is projected to involve more surface disturbance compared to the No Action Alternative, and would have more potential to increase the spread of invasive species.

Direct Effects

Direct and indirect effects from the use of manual and mechanized equipment and herbicides would be similar to those described in Section 3.6.5.1 for the No Action Alternative. In addition to these vegetation management methods, WAPA would potentially use grazing, as needed, for maintenance and vegetation clearing in the project area ROWs.

Hand and mechanized vegetation clearing can result in vegetation slash piles, which would be treated or removed using various methods, including burning. However, to the extent possible, slash-pile burning would be eliminated or minimized as part of project activities. Vegetation response following slash removal and mechanical and chemical treatment varies depending on certain factors, such as fire-fuel density, timing, and pre- and post-treatment weather conditions. The potential use of grazing in project ROWs, depending on its timing and intensity, could cause variable impacts to invasive species. Short- and long-term adverse impacts associated with grazing are anticipated primarily where these species concentrate (e.g., water sources, trails, and favored forage) and can include weed-seed transport and soil disturbance that creates environments for the spread of invasive species. Direct effects of grazing could include herbivory of non-target vegetation, soil compaction, trampling and physical damage to native or non-target vegetation, and reduced plant populations.

Indirect Effects

Similar to direct effects associated with slash pile accumulation and removal, indirect effects would be a mix of beneficial and adverse outcomes depending on site-specific conditions and vegetation species present. Most weeds can outcompete native species and typically move rapidly to disturbed areas, resulting in an indirect adverse effect. Areas of exposed soil can result in indirect adverse or beneficial effects because they would provide a seedbed for both native plants and invasive species.

Indirect effects associated with using grazing for vegetation management could include transport of invasive species seed or other plant parts to other locations, thereby expanding the distribution or increasing the range of spread of weeds and native vegetation. Additional indirect effects from grazing could include compositional shifts in vegetation communities, and increased potential for soil erosion and sediment runoff due to soil compaction.

Impacts under the Proposed Action

Direct and indirect effects associated with invasive species management under the Proposed Action would be the same for all but one (San Juan) of the forests in the project area, as described below.

Based on the localized, low-density areas of identified invasive weeds in project ROWs in seven of the eight project area forests, direct and indirect impacts under the Proposed Action are anticipated to be relatively minor.

Due to the low occurrence and diversity of invasive vegetation in those seven forests, all vegetation management methods analyzed under the Proposed Action would have a lower risk of further spread or establishment of invasive species. Proactive, targeted management of vegetation under the Proposed Action could lead to the elimination of invasive species at multiple locations through effective clearing practices and application of species-specific herbicides. Also, the use of herbicides on areas of exposed soil following land disturbances, including manual/mechanical clearing and grazing, would have a short-term beneficial impact through the continued control of invasive species populations and increased potential for the establishment of native vegetation.

Proactive management of vegetation in project ROWs would increase the amounts of short-term ground disturbance compared to the No Action Alternative. These increases in disturbance could provide favorable conditions for the spread of aggressive invasive species, resulting in direct and indirect adverse impacts. However, as previously stated, the low density and localized nature of invasive species in this forest mean there would be minimal risk for invasive species to spread and establish from vegetation management activities under the Proposed Action.

Compared to the other national forests in the project area, the opportunity for invasive species to spread is greatest in San Juan National Forest because of the diverse volume and number of existing invasive species in project area ROWs in this forest.

Because invasive species often exhibit aggressive growth habits and an ability to quickly colonize, as well as establish seed banks in the soil, manual and mechanical vegetation management techniques might not be very effective where there are dense populations of invasive species across tracts of the landscape. Similar difficulties can be expected with grazing. Therefore, management actions in this forest could require more reliance on the use of a broad application of herbicides in combination with other management techniques to effectively control invasive species. As previously discussed, WAPA expects more ground disturbance under the Proposed Action; however, increased risk for invasive plant species to establish and spread is expected only in the small percentage of the project area where proposed management actions would occur. In addition, design features would help to minimize adverse impacts.

3.6.5.3 Cumulative Effects

The WAPA transmission line ROWs in the project area cross numerous habitats in Colorado, western Nebraska, and Utah. Appendix A identifies approximately 20 past, present, and reasonably foreseeable programs, activities, or events adjacent to the project area ROWs that could affect invasive species. These primarily include wildland urban interface fire hazard reduction, wildfire landscape restoration and fuel reduction, salvage operations on forested areas afflicted with mountain pine beetle or spruce beetle, logging and danger-tree removal, ponderosa pine conservation and restoration, vegetation removal for wildlife conservation and habitat creation, management of noxious weeds and nonnative invasive vegetation, analysis and construction of motorized single-track recreation trails, and grazing management. Cumulatively, these 20 identified actions could remove and reduce the potential establishment of invasive plants, and they could contribute to establishment of native vegetation species. Some of these actions might also have adverse effects that lead to management difficulties, such as mimicking natural-disturbance regimes to which the plants are adapted, stimulating increased growth through habitat alterations, or reducing native vegetation and creating successional opportunities for invasive plants.

Because project ROWs are linear and spread over a large geographical area, implementation of the No Action Alternative or Proposed Action would contribute relatively minor overall cumulative impacts when considered together with other actions in the region. Cumulative impacts on invasive species could include decreased plant diversity, reduction or expansion of colonization of noxious weeds on disturbed sites, and potential herbicide damage to non-targeted plants.

There are no historical population data for the invasive populations analyzed in this EIS. WAPA does not know whether these species have always been present or if management activities from previous and current projects have made them more or less prevalent across the landscape due to cumulative effects. However, by performing site surveys and protecting or enhancing native vegetation populations, the potential for adverse cumulative effects associated with the spread of invasive species would be minimized.

3.7 Rare Plants

3.7.1 Introduction

No federal or state listed threatened, endangered, or candidate species are located in project area ROWs (Elliott 2012, 2013a-2013f; 2014a-2014c). More than 40 Forest Service sensitive species and over 100 species of local concern (SOLC) (hereinafter referred to as rare plants) are present or have habitat within the project area. Locations and habitats for rare plant species in the project area vary with topography, ecosystems, soil types, and climate. WAPA surveyed within the boundaries of all project area ROWs to determine existing conditions and any occurrence of rare plants, designated and proposed critical habitats, and potentially suitable habitat. This section describes species and their habitats that have been documented or are known to be present in the project area.

Section 3.7.2 describes the regulatory and policy framework; Section 3.7.3 describes the methods and assumptions for analysis of potential impacts to rare plants; Section 3.7.4 describes existing conditions (affected environment); and Section 3.7.5 describes potential impacts to rare plants, including cumulative impacts.

3.7.2 Regulatory and Policy Framework

The U.S. Fish and Wildlife Service (USFWS) has jurisdiction over species listed as threatened or endangered pursuant to the federal Endangered Species Act (ESA) (16 U.S.C. 1536). The ESA provides for the protection of listed species and critical habitat, if designated. Section 7 of the ESA of 1973, as amended, requires federal agencies to ensure via consultation with USFWS that actions authorized, funded, or carried out by them are not likely to jeopardize the continued existence of threatened or endangered species, or result in the destruction or adverse modification of their designated critical habitat.

Forest Service Manual, 2600 – Wildlife, Fish, and Sensitive Plant Habitat Management, provides policies pertaining to the management of wildlife on Forest Service-administered land, including Chapter 2670 – Threatened, Endangered, and Sensitive Plants and Animals. The manual also requires that the Forest Service manage habitats at levels that accomplish the recovery of federally listed species, according to

U.S. Department of the Interior recovery plans (2672.1), and special management emphasis for sensitive species to ensure their viability and preclude trends toward federal listing (2672.1).

Some national forests identify SOLCs to be considered for various management or observation purposes. This list is voluntarily compiled by the individual forests for the protection of species biodiversity. The WRNF is the only forest in the project area with specific Forest Plan direction for SOLC.

3.7.3 Methods and Assumptions for Analysis

WAPA used GIS mapping to identify habitats and documented locations of plant populations, and then surveyed all of its ROWs for rare plants and their habitats (Elliott 2012, 2013 a-f, 2014c). WAPA analyzed the potential direct and indirect effects of the No Action Alternative and Proposed Action on rare plants and their habitats. Elliott (2014 a,b) reported detailed findings of surveys in project ROWs.

WAPA made the following important assumptions for identifying and analyzing potential impacts to rare plant resources:

- No new road construction will be required.
- Transmission line ROWs comprise a very small portion of the national forest areas and the vegetated habitat areas they cross.
- Protection and conservation of identified rare plants and their habitats in the project area are the major objectives WAPA must address.

Impact Criteria and Indicators

Project activities could cause the following:

- Loss of rare plants and alterations in habitat structure.
- Introduction of or increase in the spread of noxious weeds that impact rare plants or their habitats.

3.7.4 Affected Environment

Many of the WAPA ROWs were cleared of taller vegetation, especially trees, when the transmission lines were first constructed. Since then, vegetation management activities along the ROWs have continued. Along most lines, vegetation management focused on danger-tree management. Rare plants do grow in and adjacent to WAPA's ROWs. Rare plants in ROWs can be affected by herbicides, debris from vegetation management, and disturbance.

Threatened and Endangered Plant Species

Table 3-42 identifies federally listed species with potential to occur in the national forests considered in this analysis. There is 1 federally delisted and 19 federally listed threatened, endangered, or candidate plant species with potential to occur in the national forests where WAPA's ROWs are located. Of these, one species, the Ute ladies'-tresses, has the potential to be present in the WAPA's ROWs based on species habitat descriptions. Based on the lack of observation and occurrence of suitable habitat for federally listed threatened, endangered, and candidate plant species in project area ROWs, all other species listed in Table 3-42 were excluded from detailed analysis. Appendix D provides brief species descriptions.

Ashley National Forest – Ute ladies'-tresses

Ute ladies'-tresses (*Spiranthes diluvialis*) was listed as a threatened species by the USFWS in 1992. Ute ladies'-tresses is a perennial of the orchid family that typically blooms late July through August. It grows in moist soils found in riparian, spring, wet meadow and lakeshore habitats and is a wide-ranging species in Idaho, Nebraska, Nevada, Utah, Washington, and Wyoming. The Utah Natural Heritage Program shows four occurrences of the Ute ladies'-tresses in the Green River basin downstream from Flaming Gorge Reservoir. These masked sites are mapped approximately five miles east of WAPA's Flaming Gorge #1 and #3 transmission lines in the Ashley National Forest (Elliott 2014b). The presence of Ute ladies'-tresses in WAPA's ROW near Flaming Gorge Reservoir appears unlikely due to elevation (WAPA's transmission lines are at the upper edge of the species' known elevation range) and limited appropriate habitat (WAPA's transmission lines cross few streams in the project area).

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Table 3-42. Federally Listed Plant Species that Could be Present in the Project Area

Common Name	Scientific Name	Status	Forest Occurrence or Potential Habitat								Habitat	Species Excluded	Reason for Exclusion
			ARNF	ANF	GMUG	MBRNF	NNF	PSINF	SJNF	WRNF			
Clay-loving wild buckwheat	*Eriogonum pelinophilum*	Endangered	-	-	X	-	-	-	-	-	Found on Mancos shale badlands amongst mixed salt-desert shrub community; 5,200 to 6,400 feet.	Yes	No individuals or suitable habitat present in project area ROWs
Clay reed-mustard	*Schoenocrambe argillacea*	Threatened	-	X	-	-	-	-	-	-	Narrowly endemic to the Tabaputs Plateau.	Yes	No individuals or suitable habitat present in project area ROWs
Colorado butterfly plant	*Gaura neomexicana ssp. coloradensis*	Delisted	X	-	-	-	-	-	-	-	Plants are usually found in moist prairie meadows in the transition zone between the wet stream bottoms and alluvial floodplains. Occurrences are generally surrounded by mixed-grass prairies (Fertig *et al.* 1994; Elliott 2013f; Spackman *et al.* 1997).	Yes	No individuals or suitable habitat present in project area ROWs
Colorado hookless cactus	*Sclerocactus glaucus*	Threatened	-	-	X	-	-	-	-	X	Found on cobbly, gravelly, or rocky alluvial soils on river terraces and mesa slopes in Delta, Garfield, Mesa, and Montrose counties in Colorado; 4,500 to 6,000 feet (Elliot 2013c).	Yes	No individuals or suitable habitat present in project area ROWs
De Beque phacelia	*Phacelia submutica*	Threatened	-	-	-	-	-	-	-	X	Restricted to shrink-swell clay soils of the Atwell Gulch and Shire members of the Wasatch Formation (Ladyman 2003) of the Piceance Basin.	Yes	No individuals or suitable habitat present in project area ROWs
Knowlton cactus	*Pediocactus knowltonii*	Endangered	-	-	-	-	-	-	X	-	Alluvial deposits on rolling, gravelly hills.	Yes	No individuals or suitable habitat present in project area ROWs
North Park phacelia	*Phacelia formosula*	Endangered	X	-	-	X	-	-	-	X	Sparsely vegetated habitats of sandy soils derived from the Coalmont Formation.	Yes	No individuals or suitable habitat present in project area ROWs
Osterhout milkvetch	*Astragalus osterhoutii*	Endangered	X	-	-	X	-	-	-	X	Seleniferous clay soils derived from shales of the Niobrara, Pierre and Troublesome formations (Spackman *et al.* 1997).	Yes	No individuals or suitable habitat present in project area ROWs
Pagosa skyrocket	*Ipomopsis polyantha*	Endangered	-	-	X	-	-	-	X	-	In wide variety of vegetation types on Upper Cretaceous Mancos Shale; 6,800 to 7,300 feet.	Yes	No individuals or suitable habitat present in project area ROWs
Parachute beardtongue	*Penstemon debilis*	Threatened	-	-	-	-	-	-	-	X	Known only from Parachute Creek member of the Green River Formation, with substrates consisting of white shale talus and clay (O'Kane and Anderson 1987).	Yes	No individuals or suitable habitat present in project area ROWs
Pariette cactus	*Sclerocactus brevispinus*	Threatened	-	X	-	-	-	-	-	-	Fine-textured clay soils in southeastern Duchesne County, Utah.	Yes	No individuals or suitable habitat present in project area ROWs
Penland alpine fen mustard	*Eutrema penlandii*	Threatened	X	-	-	-	-	X	-	X	Alpine fens on the lee side of mountain crests where deep wind-deposited snow accumulates (Roy *et al.* 1993).	Yes	No individuals or suitable habitat present in project area ROWs
Penland beardtongue	*Penstemon penlandii*	Endangered	X	-	-	X	-	-	-	X	Seleniferous clay-shale soils in steep barren areas with little competition from other plant species; found from 7,500 to 7,700 feet.	Yes	No individuals or suitable habitat present in project area ROWs
Schmoll (Chapin Mesa) milk-vetch	*Astragalus schmolliae*	Candidate	-	-	-	-	-	-	X	-	Mature pinyon-juniper woodlands at elevations ranging from 6,500 to 7,500 (Elliott 2014c).	Yes	No individuals or suitable habitat present in project area ROWs
Shrubby reed-mustard	*Schoenocrambe suffrutescens*	Endangered	-	X	-	-	-	-	-	-	Narrowly endemic to the Tabaputs Plateau.	Yes	No individuals or suitable habitat present in project area ROWs
Skiff milkvetch	*Astragalus microcymbus*	Candidate	-	-	X	-	-	-	-	-	Extremely limited distribution, primarily along Southern Beaver Creek in Gunnison, Colorado.	Yes	No individuals or suitable habitat present in project area ROWs
Uintah Basin hookless cactus	*Sclerocactus wetlandicus*	Threatened	-	X	-	-	-	-	-	-	Gravelly terrace and bluff margins, usually over clay or silty clay surfaces in shadscale and mixed desert scrub communities; 4,700 to 5,800 feet.	Yes	No individuals or suitable habitat present in project area ROWs
Ute ladies'-tresses	*Spiranthes diluvialis*	Threatened	X	X	-	-	-	X	-	X	Mesic to wet riparian meadows, marshes, and riparian areas from 4,250 to 6,800 feet.	Yes	No individuals or suitable habitat present in project area ROWs
Western prairie fringed orchid	*Platanthera praeclara*	Threatened	X	-	-	-	-	-	-	-	Grasslands of Nebraska.	Yes	No individuals or suitable habitat present in project area ROWs
White River penstemon	*Penstemon scariosus var. albifluvis*	Candidate	-	X	-	-	-	-	-	-	Semi-barren shale slopes and mixed desert shrub and pinyon-juniper communities.	Yes	No individuals or suitable habitat present in project area ROWs

Sources: Ecosystem Research Group 2015a,b; Elliott 2012, 2013a – 2013f, 2014a –2014c; Forest Service 2017

ANF Ashley National Forest
ARNF Arapaho-Roosevelt National Forest
GMUG Grand Mesa, Uncompahgre, and Gunnison National Forest
MBRNF Medicine Bow-Routt National Forest
NNF Nebraska National Forest
PSINF Pike and San Isabel National Forest
SJNF San Juan National Forest
WRNF White River National Forest

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Sensitive Plant Species

Forest Service sensitive plant species are plants identified by the Regional Forester for which population viability is a concern (FSM 2670.5). Forest Service objectives for sensitive species management (FSM 2670.22) include preventing the need for listing under the ESA, and maintaining viable populations distributed throughout their geographic range on Forest Service lands. The Forest Service currently manages sensitive species habitats to achieve recovery objectives so that special protection measures provided under the ESA are no longer necessary (FSM 2670.21). All ESA threatened, endangered, delisted, and candidate species are included in the Forest Service sensitive plant species list.

There is potential habitat for Forest Service sensitive plants in the project area. To facilitate the impacts analysis, these species are grouped into guilds with similar habitat associations and the assumption that members of these habitat associations will respond similarly to impacts from proposed activities. For purposes of this analysis, WAPA uses the following spatially defined habitat guilds:

- MOIST habitat guild – Plants that typically inhabit moist areas such as swales or riparian borders
- WET habitat guild – Plants that typically inhabit wet or saturated soils, including fens
- OPEN habitat guild – Plants that typically inhabit open areas adjacent to forests, including meadows, rock outcrops, sagebrush, and areas of old disturbance
- FOREST habitat guild – Plants that typically inhabit forested areas
- ALPINE habitat guild – Plants that typically inhabit alpine areas

Table 3-43 provides details regarding sensitive species in the project area. Species with no potential to occur in the project area are excluded and not further discussed. Appendix D provides short descriptions of the sensitive plant species in the project area.

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Table 3-43. Forest Service Sensitive Plant Species that Could be Present in the Project Area

Common Name	Scientific Name	Forest Service Region	Forest Occurrence or Potential Habitat								Habitat/Guild	Species Excluded	Reason for Exclusion
			ARNF	ANF	GMUG	MBRNF	NNF	PSINF	SJNF	WRNF			
Altai cotton-grass	*Eriophorum altaicum var. neogaeum*	Region 2	X	-	X	X	-	X	X	X	Alpine wetlands; 9,500 to 14,000 feet	Yes	No habitat present in the project area
American cranberry bush	*Viburnum opulus var. americanum*	Region 2				X				X	Wetlands and riparian areas; 4,200 to 5,500 feet; No documented occurrences of this species in Colorado.	Yes	No habitat present in the project area
Arctic braya	*Braya glabella*	Region 2	-	-	X	-	-	X	X	X	Sparsely vegetated slopes above timberline, especially on calcareous substrates; 12,000 to 13,000 feet; ALPINE Guild	No	-
Arctic poppy	*Papaver radicatum var. pygmaeum*	Region 4	-	X	-	-	-	-	-	-	Talus slopes amongst alpine tundra; 11,000 to 12,800 feet. Endemic to Duchesne County, Utah and Summit County, Colorado	Yes	No potential habitat in project area
Arizona willow	*Salix arizonica*	Region 2	-	-	-	-	-	X	X	-	Meadows, springs, seeps, riparian areas, and wetlands; 8,300 to 10,800 feet; MOIST Guild	No	-
Autumn willow	*Salix serissima*	Region 2	X	-	-	X	-	X	X	X	Wetland areas including marshes, fens, and bogs; 7,800 to 10,200 feet	Yes	No habitat present in the project area
Aztec milkvetch	*Astragalus proximus*	Region 2	-	-	-	-	-	-	X	-	Pinyon-juniper, ponderosa pine/Gambel oak, sagebrush, desert scrub, and open ground, usually on San Jose Formation, Nacimiento Formation, Pictured Cliffs Sandstone-Lewis Shale, and Animas Formation; 5,400 to 7,500 feet; OPEN Guild	No	-
Baltic sphagnum	*Sphagnum balticum*	Region 2	-	-	X	-	-	X	X	X	Nutrient poor fens, iron fens, and intermediate poor fens; 9,600 to 11,483 feet.	Yes	No habitat present in the project area
Barr's milkvetch	*Astragalus barrii*	Region 2	-	-	-	X	X	-	-	-	Semi-barren slopes with little vegetation on soils derived from shale, sandstone, silts and limestone, usually on badland or badland-like sites; OPEN Guild	No	-
Blueberry willow	*Salix myrtillifolia*	Region 2	-	-	-	-	-	X	-	-	Mountain fens from foothills to alpine; 9,300 feet	Yes	No habitat present in the project area
Brandegee's buckwheat	*Eriogonum brandegei*	Region 2	-	-	-	-	-	X	-	-	Pinyon-juniper or sagebrush, often on grayish limestone soils; 5,700 to 7,600 feet	Yes	No habitat present in the project area
Brownie lady's-slipper orchid	*Cypripedium fasciculatum*	Region 4	-	X	-	-	-	-	-	X	Shade of coniferous forests; 8,000 to 9,000 feet; FOREST Guild	No	-
Caespitose beardtongue	*Thelesperma caespitosa*	Region 4	-	X	-	-	-	-	-	-	Badlands of Green River and Uinta formations; approximately 5,900 feet	Yes	No habitat present in the project area
Chamisso's cotton-grass	*Eriophorum chamissonis*	Region 2	-	-	X	-	-	X	X	X	Alpine wetlands; 10,400 feet	Yes	No habitat present in the project area
Clawless draba	*Draba exunguiculata*	Region 2	X	-	-	X	-	X	X	X	Alpine and subalpine on tundra, gravelly slopes or fell fields; 11,500 to 14,000 feet; ALPINE Guild	No	-
Club spikemoss	*Selaginella selaginoides*	Region 2	-	-	-	X	-	X	-	-	Marshy areas and wet spruce forests; Wet Guild	No	-
Colorado false needlegrass/Porter feathergrass	*Ptilagrostis porteri*	Region 2	-	-	-	-	-	X	X	X	Hummocks in fens and willow carrs; 9,200 to 12,000 feet	Yes	No habitat present in the project area
Colorado tansy-aster	*Machaeranthera coloradoensis*	Region 2	-	-	X	X	-	X	X	X	Mountain parks, slopes and rock outcrops and dry tundra; 8,500 to 12,500 feet; OPEN Guild	No	-
Cushion bladderpod	*Physaria pulvinata*	Region 2	-	-	-	-	-	-	X	-	Grayish, argillaceous shale substrates; San Miguel and Dolores counties, Colorado.	Yes	No habitat present in the project area
Dainty moonwort	*Botrychium crenulatum*	Region 4	-	X	-	-	-	-	-	-	Moist and wet meadows; approximately 8,000 feet; MOIST Guild	No	-
Degener's beardtongue	*Penstemon degeneri*	Region 2	-	-	-	-	-	X	-	-	Pinyon-juniper, ponderosa pine woodlands, and montane grasslands with coarse gravelly or rocky reddish soil with igneous bedrock, rock slab cracks; 6,000 to 9,500 feet; OPEN Habitat	No	-
Dropleaf buckwheat	*Eriogonum exilifolium*	Region 2	X	-	-	X	-	-	-	X	Sagebrush flats over carbonate and selenium soils; 7,500 to 9,000 feet; OPEN Guild	No	-

Table 3-43. Forest Service Sensitive Plant Species that Could be Present in the Project Area

Common Name	Scientific Name	Forest Service Region	Forest Occurrence or Potential Habitat								Habitat/Guild	Species Excluded	Reason for Exclusion
			ARNF	ANF	GMUG	MBRNF	NNF	PSINF	SJNF	WRNF			
Dwarf milkweed	*Asclepias uncialis*	Region 2	X	-	-	-	-	X	-	-	Plains, short- grass prairie, outwash mesas and gravelly side-slopes; 4,000 to 6,500 feet	Yes	No habitat present in the project area
Dwarf raspberry	*Rubus arcticus var. acaulis (= Cylactis arctica ssp. acaulis)*	Region 2	X	-	X	X	-	X	-	X	Wetlands in willow carrs and mossy streamsides; 8,600 to 9,700 feet; WET Guild	No	-
Elliptic spikerush	*Eleocharis elliptica*	Region 2	-	-	-	X	-	-	-	-	Wetlands; widely distributed in North America, but with few confirmed Colorado records.	Yes	No habitat present in the project area
English sundew	*Drosera anglica*	Region 2	-	-	-	-	-	-	X	-	Peatlands, bogs, and fens; in Region 2 known from 7,900 to 8,500 feet; circumboreal, and in Region 2 known from Park County, Wyoming and La Plata County, Colorado.	Yes	No habitat present in the project area
Foxtail sedge	*Carex alopecoidea*	Region 2	-	-	-	X	-	-	-	-	Riparian wetlands; in Region 2 only known from the Black Hills National Forest; from 4,500 to 6,500 feet.	Yes	No habitat present in the project area
Front Range cinquefoil	*Potentilla rupincola (= P. effusa var. rupincola)*	Region 2	X	-	-	-	-	X	-	-	Subalpine or montane granitic outcrops amongst ponderosa or limber pine; 6,900 to 10,500 feet; OPEN Guild	No	-
Golden columbine	*Aquilegia chrysantha var. rydbergii*	Region 2	-	-	-	-	-	X	-	-	Along streams and in rocky ravines in mountains; 5,500 to 6,000 feet	Yes	No habitat present in the project area
Goodrich stickleaf	*Mentzelia goodrichii*	Region 4	-	X	-	-	-	-	-	-	White shale of the Green River Formation amongst limber pine, pinyon pine, Douglas-fir, mountain mahogany and rabbitbrush; 8,100 to 8,800 feet	Yes	No habitat present in the project area
Graham columbine	*Aquilegia grahamii*	Region 4	-	X	-	-	-		-	-	Cliffs, ledges, and sandy drip line of wet cliffs and ledges on Weber Sandstone; approximately 7,600 feet; MOIST Guild	No	-
Gray's draba	*Draba grayana*	Region 2	X	-	-	X	-	X	X	X	Alpine on rocky and gravelly slopes or fell fields, usually on granitic substrates; 12,000 to 14,000 feet; ALPINE Guild	No	-
Greenland primrose	*Primula egaliksensis*	Region 2	-	-	-	-	-	X	-	-	Wet meadows, streambanks, willow carrs, fens, and on hummocks; 9,000 to 10,000 feet	Yes	No habitat present in the project area
Hall's bulrush	*Schoenoplectus hallii*	Region 2	-	-	-	-	X	-	-	-	Obligate wetland species of damp areas such as shores and bottoms of shallow ephemeral pools, sinkhole ponds, coastal plain marshes, roadside ditches, small lakes, sandy swales, stock ponds, depressions in cultivated fields, and sand pits; 230-2,805 feet	Yes	No habitat present in the project area
Hall's fescue	*Festuca hallii*	Region 2	X	-	-	X	-	X	-	X	Alpine and subalpine grasslands and meadows; 11,000 to 12,000 feet; OPEN Guild	No	-
Harrington beardtongue	*Penstemon harringtonii*	Region 2	X	-	-	X	-	-	X	X	Montane shrublands and pinyon-juniper, often on carbonate soil; 6,400 to 9,400 feet; OPEN Guild	No	-
Hoary willow	*Salix candida*	Region 2	X	-	X	X	-	X	X	X	Fens and pond and stream edges in foothill/montane wetlands; 8,800 to 10,600 feet; WET Guild	No	-
Ice cold buttercup	*Ranunculus karelinii (= R. gelidus ssp. grayi)*	Region 2	X	-	X	X	-	X	X	X	Alpine slopes and summits amongst rocks and scree; 12,000-14,100 feet	Yes	No habitat present in the project area
Kotzebue's grass of Parnassus	*Parnassia kotzebuei*	Region 2	X	-	-	X	-	X	X	X	Alpine and subalpine, in wet rocky areas, amongst moss mats and along streamlets; 10,000 to 12,000 feet; MOIST Guild	No	-
Laramie columbine	*Aquilegia laramiensis*	Region 2	-	-	-	X	-	-	-	-	Igneous and metamorphic rock outcrops in soil pockets of shaded sites such as ledges and large crevices; 5,400 to 10,100 feet. Endemic to Laramie Mountains in Albany and Converse counties, Wyoming.	Yes	No habitat present in the project area
Largeflower triteleia	*Triteleia grandiflora*	Region 2	-	-	-	X	-	-	X	-	Meadows and openings in ponderosa pine/Gambel oak: 7,500 to 8,000 feet; OPEN Guild	No	-
Lesser bladderwort	*Utricularia minor*	Region 2	X	-	X	X	X	X	X	X	Shallow water of ponds; 5,500 to 9,000 feet; WET Guild	No	-

Table 3-43. Forest Service Sensitive Plant Species that Could be Present in the Project Area

Common Name	Scientific Name	Forest Service Region	Forest Occurrence or Potential Habitat								Habitat/Guild	Species Excluded	Reason for Exclusion
			ARNF	ANF	GMUG	MBRNF	NNF	PSINF	SJNF	WRNF			
Lesser panicled sedge	*Carex diandra*	Region 2	X	-	-	X	X	X	X	X	Wet meadows and willow carrs; 7,400 to 9,000 feet; WET Guild	No	-
Livid sedge	*Carex livida*	Region 2	X	-	-	X	-	X	-	X	Fens and wetlands; 9,000 to 10,000 feet; WET Guild	No	-
Missouri milkvetch	*Astragalus missouriensis var. humistratus*	Region 2	-	-	-	-	-	-	X	-	Open sites with little vegetation on substrates formed from Mancos Shale, Lewis Shale, Mesa Verde Formation, and San Jose Formation; 7,100 to 8,600 feet; OPEN Guild	No	-
Narrow-leaved moonwort (slender moonwort)	*Botrychium lineare*	Region 2 Region 4	X	X	-	X	-	X	-	X	Disturbed sites, grassy slopes among medium height grasses, along edges of streamside forests, alpine areas & aspen forests; 7,900 to 9,500 feet; OPEN Guild	No	-
Pagosa bladderpod	*Lesquerella pruinosa*	Region 2	-	-	-	-	-	-	X	-	Narrowly endemic on Mancos Shale Formation, usually on exposed, gray clay barrens within montane grasslands, rarely amongst ponderosa pine or Gambel oak; 6,800 to 8,800 feet;	Yes	No habitat present in the project area
Paradox moonwort	*Botrychium paradoxum*	Region 2	-	-	X	X	-	X	X	X	The range and habitat affinity for this species is not well understood throughout its range; OPEN Guild	No	-
Park milkvetch	*Astragalus leptaleus*	Region 2	X	-	-	X	-	X	X	X	Moist swales and meadows, 7,500 to 10,000 feet; MOIST Guild	No	-
Petiolate wormwood	*Artemisia campestris ssp. borealis var. petiolata*	Region 4	-	X	-	-	-	-	-	-	Red Pine shale outcrops with curlleaf mountain mahogany, manzanita, and ponderosa pine; approximately 8,900 feet; FOREST Guild	Yes	No habitat present in the project area
Prairie dodder	*Cuscuta plattensis*	Region 2	-	-	-	X	-	-	-	-	Sand prairie hills; Converse, Goshen, and Platte counties, Wyoming. From 4,200 to 4,900 feet.	Yes	No habitat present in the project area
Prairie moonwort	*Botrychium campestre*	Region 2	X	-	-	X	-	X	-	-	Dry, gravelly hillsides; 3,700 to 10,800 feet; OPEN Guild	No	-
Rock cress draba	*Draba globosa*	Region 4	-	X	-	-	-	-	-	-	Alpine slopes in the Uinta Mountains	Yes	No habitat present in the project area
Rock-loving aletes	*Neoparrya lithophila*	Region 2	-	-	-	-	-	X	-	-	Pinyon-juniper woodlands, rocky places, montane grasslands and openings, and sometimes on Dry Union formation; 7,000 to 10,000 feet; OPEN Guild	No	-
Rocky Mountain alpineparsley	*Oreoxis humilis*	Region 2	-	-	-	-	-	X	-	-	Granite substrates in high elevation habitats; 10,800 to 14,000 feet. Endemic to El Paso and Teller counties, Colorado.	Yes	No habitat present in the project area
Roundleaf sundew	*Drosera rotundifolia*	Region 2	X	-	X	X	-	X	-	X	Among sphagnum on the margins of ponds, fens, and floating peat mats; 9,100 to 9,800 feet	Yes	No habitat present in the project area
Sandhill goosefoot	*Chenopodium cycloides*	Region 2	X	-	-	-	-	X	-		Sandy soils, most often on vegetated dunes surrounding blowouts; 4,000 to 5,500 feet	Yes	No habitat present in the project area
Sea pink	*Armeria maritima ssp. sibirica*	Region 2	X	-	-	X	-	X	X	X	Grassy tundra slopes, on wet, sandy, or spongy organic soils; 11,900 to 13,000 feet	Yes	No habitat present in the project area
Selkirk violet	*Viola selkirkii*	Region 2	X	-	-	X	-	X	-	-	Forests from montane to subalpine; 6,000 to 9,100 feet; FOREST Guild	No	--
Simple kobresia	*Kobresia simpliciuscula*	Region 2	X	-	X	X	-	X	-	X	Alpine areas including tundra, fens, moist gravel, and glacial outwash	Yes	No habitat present in the project area
Slender cottongrass	*Eriophorum gracile*	Region 2	X	-	X	X	-	X	X	X	Montane and subalpine wetlands, wet meadows and pond edges; 8,100 to 12,000 feet; WET Guild	No	-
Smith's draba	*Draba smithii*	Region 2	-	-	-	-	-	X	X	-	Upper montane, subalpine, and alpine, 8,000 to 11,000 feet; OPEN Guild	No	-
Sphagnum moss	*Sphagnum angustifolium*	Region 2	-	-	X	X	-	X	X	X	Acidic fens with high concentrations of iron and other ions	Yes	No habitat present in the project area
Stemless beardtongue	*Penstemon acaulis var. acaulis*	Region 4	-	X	-	-	-	-	-	-	Mixed desert shrub, sagebrush, and pinyon-juniper, often on semi-barren sites; 5,900 to 8,200 feet	Yes	No habitat present in the project area
Stonecrop gilia	*Gilia sedifolia*	Region 2	-	-	X	-	-	-	X	-	Alpine on tuffaceous sandstone; 11,750 to 13,000 feet	Yes	No habitat present in the project area
Stream orchid	*Epipactis gigantea*	Region 2	-	-	-	-	-	X	X	X	Seeps, springs, riparian areas and wetlands; 4,800 to 8,000 feet; WET Guild	No	-

Table 3-43. Forest Service Sensitive Plant Species that Could be Present in the Project Area

Common Name	Scientific Name	Forest Service Region	Forest Occurrence or Potential Habitat								Habitat/Guild	Species Excluded	Reason for Exclusion
			ARNF	ANF	GMUG	MBRNF	NNF	PSINF	SJNF	WRNF			
Sun-loving meadow rue	*Thalictrum heliophilum*	Region 2	-	-	X	-	-	-	X	X	Dry shale barren communities between 6,200 and 8,800 feet	Yes	No habitat present in the project area
Untermann daisy	*Erigeron untermannii*	Region 4	-	X	-	-	-	-	-	-	Sandstone, shale, and siltstone of the Uinta and Green River formations among pinyon-juniper, Douglas-fir, and limber pine-bristle cone pine; 7,000 to 9,400 feet	Yes	No habitat present in the project area
Upswept moonwort	*Botrychium ascendens*	Region 2	X	-	-		-	X	X	X	The range and habitat affinity for this species is not well understood as this species is considered a habitat generalist, occurring across various locations in the landscape; OPEN Guild	No	-
Visher's buckwheat	*Eriogonum visheri*	Region 2	-	-	-	X	X	-	-	-	Badlands, usually in the least vegetated parts, amongst mixed grassland and saltbush communities; 1,886 to 2,707 feet	Yes	No habitat present in the project area
Weber's draba	*Draba weberi*	Region 2	-	-	-	-	-	X	X	X	Dry, sandy to gritty soil types in crevices along rocky streamsides; 11,500 to 11,600 feet; ALPINE Guild	No	-
Weber's monkeyflower	*Mimulus gemmiparus*	Region 2	X	-	-	X	-	X	-	-	Granitic seeps, slopes, and alluvium in open sites within spruce-fir and aspen forests; 8,500 to 10,500 feet; WET Guild	No	-
White adder's-mouth orchid	*Malaxis brachypoda (= M. monophyllus spp. brachypoda)*	Region 2	X	-	-	X	-	X	-	-	Riparian areas, among mosses; 7,200 to 8,000 feet; MOIST Guild	No	-
Yellow lady's slipper	*Cypripedium parviflorum (= C. calceolus spp. parviflorum)*	Region 2	X	-	-	X	-	X	X	X	Moist forests and aspen groves; 7,400 to 8,500 feet; MOIST Guild	No	-
Yellow widelip orchid	*Liparis loeselii*	Region 2	-	-	-	-	X	-	-	-	Fens, marshes, and wetlands; 328 to 3,609 feet	Yes	No habitat present in the project area

Sources: Elliott 2012, 2013a – 2013f; 2014c

ANF Ashley National Forest
ARNF Arapaho-Roosevelt National Forest
GMUG Grand Mesa, Uncompahgre, and Gunnison National Forest
MBRNF Medicine Bow-Routt National Forest
NNF Nebraska National Forest
PSINF Pike and San Isabel National Forest
SJNF San Juan National Forest
WRNF White River National Forest

Species of Local Concern

Plant SOLC lists were provided by Forest botanists for the ARNF, GMUG, and MBRNF. The PSINF (and GMUG) tier to the CNHP list (2011) for their SOLC. Plants in tiers 1 and 2 of the Nebraska Natural Legacy Program were used as SOLC for the NNF. Neither the ANF nor the SJNF have specific lists identifying SOLC.

3.7.5 Environmental Consequences

This section describes potential impacts to rare plants under the No Action Alternative and the Proposed Action. Impacts to rare plants under the two alternatives considered are summarized below.

Design Features for Rare Plants

WAPA uses standard maintenance procedures and design features in the project area to minimize potential effects on rare plants and other natural resources from project activities. These design features are summarized below. Chapter 2 provides full details about all design features (Table 2-13) and vegetation standard maintenance procedures (Table 2-15) WAPA uses.

- Before implementing new vegetation treatments and maintenance activities, WAPA will review the project area using existing data, or if appropriate, survey the area using established protocol, where available, for threatened, endangered, and sensitive plant species and plant species of local concern.
- The Forest Service will identify activity restrictions and requirements in areas of known declining plant species (e.g., timing and measures to provide connectivity and linkage of habitats) so that the activity would not increase the trend toward federal listing or loss of population viability in the project area.
- Activities in areas needed by sensitive species would be modified in coordination with the Forest Service.
- Revegetation also might be required in areas where ground cover is disturbed (e.g., landings, and skid trails). If required, WAPA would revegetate areas with Forest Service-approved certified weed-free seed mixes to prevent soil erosion or noxious weeds.
- Selection of herbicide for use in project ROWs should consider potential effects on non-target vegetation, and which herbicide presents the least amount of risk to rare plants. All herbicides selected for use will comply with Forest Service requirements, be registered and approved for ROW application, and administered by certified and licensed applicators.

The development and use of an integrated weed management plan could help avoid adverse effects on rare plant species and non-target plants. The use of site-specific project designs (e.g., herbicide application rate and method, timing of ground-disturbing activities and grazing in relation to the growing season, and avoidance buffers) can also help mitigate the potential for adverse disturbance, contaminant exposure, or both.

3.7.5.1 No Action Alternative

As vegetation management needs are identified through periodic line patrols, WAPA would continue to manage vegetation along ROW segments using manual, mechanical, and spot application of Forest Service-approved herbicides. This section describes the direct and indirect effects on rare plants from these types of treatments, followed by potential direct and indirect effects for each national forest.

Direct Effects

Direct effects under the No Action Alternative would primarily result from hand treatments, mechanical treatments, or both. Potential direct effects on vegetation could include trampling or mortality of individuals from driving machinery or skidding material. Other direct effects to rare plants could result from the smothering effects of slash, wood chips, overturned soil, felled trees, and accidental physical damage or mortality.

Direct effects under the No Action Alternative would generally occur on fewer acres and be less widespread compared to the Proposed Action, because the No Action Alternative focuses on removing danger trees.

Manual vegetation and spot herbicide application are selective, typically only affecting vegetation targeted for removal. Potential short- and long-term adverse effects on rare plants from use of herbicides could include accidental spills that kill rare plant individuals, surface runoff, and accidental direct deposition of herbicide. Vegetation management through mechanical methods is used to remove large areas of vegetation biomass, but causes more ground disturbance and indirect effects. The potential magnitude of direct short- and long-term adverse effects on rare plants would depend on whether management activities take place in the specific areas where rare plants are present. Potential short- and long-term adverse effects could include mistakes from mechanized vegetation treatment, which could harm rare plants, and the potential spread of invasive plants.

Indirect Effects

Under the No Action Alternative, there could be indirect effects on rare plants and their habitats from hand or mechanical treatments. These treatments could cause changes in vegetation communities in the project area ROWs from increased or decreased sunlight passing through the vegetation canopy, and transportation of seeds and creation of habitat for invasive plant and noxious weed species.

Similar to direct effects, under the No Action Alternative, indirect effects are anticipated to occur on fewer acres and be less widespread compared to the Proposed Action.

Short- and long-term adverse effects under the No Action Alternative could include changes to rare plant habitats, which could render them less suitable for rare plant colonization; potential increases in nonnative or aggressive noxious weed populations; creation of habitat for early-seral rare species; and alteration of local hydrologic patterns and soil characteristics (e.g., compaction and erosion).

Except for moonwort species, which generally thrive in disturbed areas, there would be a low potential for short- or long-term beneficial effects on rare plants or their habitat under the No Action Alternative, as there are few occurrences of these species in or adjacent to project area ROWs. Moonwort species are discussed in greater detail below.

Impacts to Rare Plants

No threatened, endangered, delisted, or candidate plant species, or areas of potential habitat for such species, were identified during project area surveys. Table 3-43 lists sensitive species by forest that were either found during site surveys or are expected to be present in the project area.

Direct and indirect effects to rare plants resulting from continued project area vegetation maintenance would be the same for all forests in the project area. Under the No Action Alternative, there would be no change from existing management, and current transmission line maintenance and associated direct and indirect effects to rare plant species would remain approximately the same. All anticipated direct and indirect impacts on sensitive status species would be localized to areas in the ROWs having suitable habitat, and would not have a substantial effect on these species.

Ashley National Forest – Ute ladies'-tresses Orchid Effects

The presence of Ute ladies'-tresses orchid in WAPA's ROW near Flaming Gorge Reservoir appears unlikely due to elevation (WAPA's transmission lines are at the upper edge of the species' known elevation range) and limited appropriate habitat (WAPA's transmission lines cross few streams in the project area). To prevent impacts to Ute ladies'-tresses orchid on Ashley National Forest, the following conservation measures would be implemented:

- Field surveys to determine the presence or absence of Ute ladies'-tresses orchid within WAPA's Flaming Gorge #1 and #3 transmission line ROWs would occur during the appropriate time of year (August - September).
- Prior to the field surveys, no ground disturbing activities would take place within the Flaming Gorge #1 and #3 transmission line ROWs or in riparian areas crossed by access roads.
- If ground-disturbing activities are proposed prior to field surveys, WAPA would perform a habitat survey to delineate potential habitat for avoidance.

Based on lack of presence in 2014 surveys, critical habitat not present, and Forest Service information (Ecosystem Research Group 2015 a,b; Forest Service 2017), the No Action Alternative will have no effect on Ute ladies'-tresses orchid.

3.7.5.2 Proposed Action

This section describes potential direct and indirect effects under the Proposed Action. Direct and indirect effects to rare plants resulting from proposed vegetation maintenance actions under the Proposed Action would be similar for all forests in the project area. Impacts associated with the proposed vegetation treatments are discussed below under *Direct* and *Indirect Effects*. Impacts from vegetation management under the Proposed Action are further analyzed by rare plant habitat guild under *Impacts to Rare Plants*.

Direct Effects

Under the Proposed Action, there could be direct effects on rare plant species and communities from mechanical and manual vegetation treatments, application of herbicides and growth regulators, and grazing, if utilized.

Direct effects on rare plants from hand and mechanical treatments are similar and differ mainly in degree. Mechanical and manual treatments can cause direct effects on rare plants when plants and their habitats are physically affected during management activities, which can include trampling, breaking, crushing, or uprooting of vegetation from driving machinery or skidding materials. Also, slash, chips, soil, or felled trees could smother plants. Direct effects on rare plant habitats can also be caused by the compaction of soil from mechanized machinery and human foot traffic; increased amounts of sunlight after clearing activities; transport of invasive plant seeds and/or propagules, affecting pollinators or mycorrhizae associated with rare plants; and alterations of hydrologic characteristics (i.e., runoff and erosion) in rare plant habitats. Under the Proposed Action, WAPA would use Forest Service-approved herbicides and growth regulators under controlled processes. Primary direct effects from herbicides and growth regulators could include altered species composition and reduced diversity of native plants, as more herbicide-tolerant species replace less herbicide-tolerant species. Other direct effects could include mortality of individuals and reduced or eliminated growth and reproduction of affected plants, further adding to changes in vegetative diversity and species composition. Herbicide use could involve accidental spills, which can affect non-targeted rare plant species; herbicide drift; direct application to plants; and surface runoff from herbicide-treated areas.

WAPA would potentially use grazing in project ROWs when appropriate and in coordination with the local forest. The potential use of grazing can lead to direct effects in the form of physical damage or mortality to rare plant resources from herbivory, trampling, and trailing. Trampling and trailing refers to the breaking, smashing, or shearing of plant tissues from animal movement or loitering. These direct impacts are similar to those caused by herbivory – the loss of plant tissues available for photosynthesis. Also, the use of livestock in concentrated areas can result in soil compaction, which adversely affects plant root growth and establishment.

Short-term adverse effects on rare plants under the Proposed Action could include plant mortality, physical damage, and reduced reproduction. In the event that slash pile burning is used as a removal method, the area of burned ground could potentially expose patches of mineral soil for seedling germination and establishment, but this action could also destroy existing seed banks. However, slash burning would be utilized as a very minimal part of proposed project activities.

Overall short- and long-term beneficial effects from vegetation management under the Proposed Action include reduction in the spread of noxious or invasive species through the use of herbicide treatments.

Indirect Effects

Indirect effects from vegetation management and transmission line maintenance under the Proposed Action could include shifts in the biological characteristics of rare plant habitats, such as alterations in hydrology characteristics (i.e., changes in runoff or erosion), altered soil compositions, introduction of noxious weeds and invasive plants, reduction in invertebrate pollinators following the application of herbicides, reduced habitat, and changes in local population densities.

Indirect effects can be beneficial or adverse, and are often species specific. Under the Proposed Action, vegetation management associated with transmission line maintenance could have a beneficial effect on rare plants adapted for open, sunny environments, because the proposed treatments would maintain ROWs in a more open, non-forested condition. Potential indirect adverse effects under the Proposed Action could include soil erosion, degradation of existing seedbeds, and spread of noxious weed species.

Areas that receive an increased volume of sunlight following removal of overstory vegetation can become warmer and drier, with lower humidity. Accumulation of plant debris and slash piles can create a warm and dry microclimate, or, in the case of heavier slash loading, a shaded and moist microclimate.

Surface disturbed areas following hand and mechanical treatments would be susceptible to invasive and noxious weed establishment. Most noxious weeds are early successional species that thrive in open sites with recently disturbed soils (Elliott 2013a). Establishment of invasive and noxious weeds would have indirect impacts on native and rare plant species through competition for nutrients, light, and water.

Alterations of hydrologic function resulting from the use of hand or mechanical treatment could result in increased runoff and erosion. Erosion removes organic matter and soil cover, leading to altered microclimates within rare plant communities. Also, using machinery to remove vegetation can compact soils, which would reduce rates of water infiltration. Soil compaction also adversely affects seed germination, emergence, and establishment.

Indirect effects to rare plants from herbicide treatment are primarily associated with impacts to pollinators. Impacts to pollinators from herbicide treatment are associated with reductions in available pollen resources, and mortality from direct contact with herbicides. If pollinator populations are diminished from herbicide application, reduced reproduction of rare plant species that depend on those pollinator species can be expected.

Indirect impacts associated with effects of grazing include changes in rare plant community composition, potential introduction of invasive plants, and soil compaction and erosion. Direct selection of palatable species by livestock and different levels of sensitivity to grazing by plant species are responsible for shifts in individual species abundance and frequency at the local scale, and community conversion at the landscape scale (Elliott 2013a). However, when managed properly, grazing can lead to an increase in biological diversity by maintaining the land in a variety of seral states. Indirect impacts that lead to introduction of invasive species or compaction of soils are similar to those discussed above.

Impacts to Rare Plants

The potential for adverse effects to rare plants is greater under the Proposed Action than under the No Action Alternative because of increased activity with vegetation management practices and proactive versus as-needed vegetation management methodologies.

No threatened, endangered, delisted, or proposed plant species, or areas of potential habitat were identified during project area surveys. Table 3-43 lists sensitive species and associated habitat guilds that were found during site surveys or are expected to be present in the project area. The following paragraphs describe impacts to rare plants and their habitat guilds from Proposed Action vegetation management activities.

Ashley National Forest – Ute ladies'-tresses Orchid Effects

As identified under the No Action Alternative above, based on lack of presence in 2014 surveys, critical habitat not present, and Forest Service information (Ecosystem Research Group 2015 a,b; Forest Service 2017), the Proposed Action will have no effect on Ute ladies'-tresses orchid.

Hand and Mechanized Treatments

Rare plants and their habitats in WET and MOIST habitat guilds are less likely to experience direct and indirect impacts associated with hand and mechanical clearing activities than rare plant habitats in OPEN or FORESTED habitat guilds. This is because hand-equipment and mechanized-equipment operators would avoid working in muddy, wet locations, as appropriate.

Open areas are often used as staging sites for equipment or as log decks, which would result in locally concentrated impacts to rare plant species in the OPEN habitat guild. However, rare plants growing in open but inaccessible areas, such as rock outcrops, are less likely to be directly affected by mechanical treatment because such areas are mostly unsuitable for operation of machinery. Vegetation treatments under the Proposed Action could have a beneficial effect on species in the OPEN habitat guild because proposed treatments will maintain areas in a more open, non-forested condition. Long-term beneficial indirect effects would be reduced from trampling, soil erosion or degradation, and potential for introduction and spread of invasive and noxious weeds that may occur during hand and mechanized treatment operations.

Individuals of the *Botrychium* genus (moonworts), which occur in the OPEN and MOIST habitat guilds, would likely experience indirect beneficial effects from clearing activities because these species are often associated with old disturbances such as roadsides, ski runs, reservoirs, mines, and transmission line ROWs. Clearing activities would also have short-term adverse direct impacts, which would likely affect individuals during vegetation management activities. These impacts from clearing activities would include plant mortality, physical damage, and reduced reproduction in present populations.

Rare plants in the FORESTED habitat guild are most likely to be directly affected from hand and mechanized clearing because danger trees are associated with the FORESTED habitat guild. Also, species in the FORESTED habitat guild are typically the species most in need of maintenance in the project area, and therefore would receive the most intensive treatment. Indirect impacts to rare plants in the FORESTED habitat guild include alterations in vegetation communities. Rare plants that inhabit interior forest sites are adapted to closed-canopy forests and low light conditions; removing the overstory would have indirect adverse effects on rare plant species adapted for cool, moist, and shaded conditions.

Herbicide and Growth Regulator Treatments

WAPA would use herbicides and growth regulators under controlled processes. Direct effects from herbicide drift and herbicide spills present a potential adverse impact to members of all habitat guilds. However, use of herbicides in the project area would be localized to targeted vegetation management areas; therefore, they are not anticipated to have substantial direct or indirect effects on rare plants.

In the event of an herbicide spill, species in the MOIST and WET habitat guilds would be exposed to much higher concentrations of herbicides than could be expected from drift, runoff, or even direct deposition of herbicide at the label concentration due to rapid spread of herbicides through surface and groundwater in these habitats. As a result, the MOIST and WET guilds have an increased risk of exposure to herbicide runoff compared to other guilds.

Herbicide spills and potential for herbicide drift are more likely in the OPEN and FOREST habitat guilds, because staging operations typically occur in these areas. A spill in OPEN or FOREST guild habitats would likely be over soil, away from water. Herbicide would move more slowly in soil; thus, impacts would be intensive but localized to the spill area. Impacts to soils in all guilds following an herbicide spill would depend on the chemical degradation properties of the individual herbicides, the soil type, ambient and soil temperatures, soil pH, and soil moisture holding capacity.

Grazing

WAPA would potentially use grazing in the project ROWs. Rare plants in the WET and MOIST habitat guilds would likely experience direct effects from grazing, including physical removal through grazing and trampling due to the tendency of cattle to loiter in wet or riparian areas. Rare plants in the OPEN habitat guild are typically in the most productive of montane settings, and consequently would be most likely to experience direct and indirect effects from grazing. Indirect effects from biological treatments in OPEN habitat guilds include prevention of tree and shrub encroachment into rare plant habitat. Rare plants in the FORESTED habitat guild would likely experience the fewest direct and indirect impacts from grazing; however, trampling and physical damage may result.

3.7.5.3 Cumulative Effects

There are two legal definitions for cumulative effects as they relate to impacts analysis for threatened and endangered plant species. Under NEPA, cumulative impacts are the incremental impacts of the Proposed Action when added to other past, present, and reasonably foreseeable future federal, state, and private activities (40 CFR 1508.7). Under the ESA, "cumulative effects" only consider future non-federal activities that are reasonably certain to occur in the action area for listed species considered in the analysis (USFWS 1998). Future federal activities and activities permitted by federal agencies are not included under ESA cumulative effects, because agencies performing activities that could adversely affect threatened or endangered species must consult with the USFWS, pursuant to ESA Section 7.

Primary effects from past, present, and reasonably foreseeable actions in the project area include surface disturbances that result in removal or alteration of suitable and potentially suitable habitats for threatened, endangered, and sensitive plants. WAPA transmission line ROWs in the project area cross numerous habitats in Colorado, western Nebraska, and Utah. Appendix A identifies approximately 20 past, present and reasonably foreseeable programs, activities, or events adjacent to the project area ROWs that could affect threatened, endangered, and sensitive plants or their habitats. These primarily include wildland urban interface fire hazard reduction; wildfire landscape restoration and fuel reduction; salvage operations on forested areas afflicted with mountain pine beetle or spruce beetle; logging and danger-tree removal; ponderosa pine conservation and restoration; vegetation removal for wildlife conservation and habitat creation; management of noxious weeds and nonnative invasive vegetation; analysis and construction of motorized single-track recreation trails; and grazing management. These actions could have a cumulative adverse effect on listed plants, their habitats, or their pollinators, and could contribute to habitat fragmentation. Some of these actions might also provide beneficial effects, such as mimicking natural disturbance regimes to which the plants are adapted, stimulating increased growth through habitat alterations, or controlling erosion.

There are no historic population data for the rare plant species analyzed in this EIS. WAPA does not know whether these species have always been rare or if management activities have made them less common across the landscape due to cumulative effects. WAPA also does not know whether other projects in the area are affecting or have affected sensitive species. If proposed activities impact sensitive plant species, those losses would be in addition to other cumulative impacts throughout the region. However, through botanical surveys and protecting or enhancing known populations of these species, the contribution of WAPA's Proposed Action to cumulative effects would be minimized.

Because project ROWs are linear and spread over a large geographic area, implementation of the No Action Alternative or Proposed Action would contribute relatively minor overall cumulative impacts when considered together with other actions in the region. Cumulative impacts on vegetation could include beneficial or adverse alterations in plant diversity, the spread of noxious weeds to disturbed sites, and potential herbicide damage to non-targeted plants.

3.8 Wildlife

3.8.1 Introduction

This section evaluates the effects of the alternatives on terrestrial (land-based) wildlife and their habitats. Terrestrial animals evaluated are birds, mammals, amphibians (frogs and toads), reptiles, and invertebrates (butterflies and snails). Specific analyses are focused on threatened, endangered, and sensitive species; management indicator species (MIS); migratory birds; big game; local species of concern; and their associated habitats.

The affected environment and environmental effects analysis focuses on habitat in the project area (transmission line ROWs). In certain instances, the analysis extends beyond ROWs to characterize the environment where there could be indirect impacts, such as impacts to habitat connectivity, from the Proposed Action.

Section 3.8.2 describes the regulatory and policy framework; Section 3.8.3 describes the methods and assumptions for analysis of potential impacts to wildlife; Section 3.8.4 describes existing conditions (affected environment); and Section 3.8.5 describes potential impacts to wildlife, including cumulative impacts.

3.8.2 Regulatory and Policy Framework

The USFWS has jurisdiction over terrestrial and aquatic species from the project area that are listed as threatened, endangered, or candidate under Section 9 of the Federal ESA (16 U.S.C. 1536). The ESA provides for the protection of listed species. Section 7 of the ESA of 1973, as amended, requires federal agencies to “ensure” that actions authorized, funded, or carried out by them are not likely to jeopardize the continued existence of threatened or endangered species, or result in the destruction or adverse modification of their critical habitats. The ESA and 50 CFR 402 direct each federal agency to confer or consult with the USFWS on any action that is likely to jeopardize or affect the continued existence of a species or its habitat. Appendix F includes consultation letters with the USFWS.

Forest Service Manual, 2600 - Wildlife, Fish, and Sensitive Plant Habitat Management, provides policies on the management of wildlife on Forest Service-administered land, including Chapter 2670 – Threatened, Endangered, and Sensitive Plants and Animals. The manual requires the coordination of wildlife habitat requirements with other resource needs in all Forest Service planning activities, including whether MIS are likely to be found in the area, and the examination of projects that affect wildlife management prescriptions, including objectives for MIS (2634.1). The manual also requires that the Forest Service manage habitats at levels that accomplish the recovery of federally listed species, according to U.S. Department of the Interior recovery plans (2672.1), and special management emphasis for sensitive species to ensure their viability and preclude trends toward federal listing (2672.1).

The NFMA of 1976 requires every national forest or grassland managed by the Forest Service to develop and maintain an effective Land Management Plan (also known as a Forest Plan). The process for the development and revision of plans, along with the required content, is outlined in planning regulations, often referred to as the planning rule (the 2012 Planning Rule is the current rule). The 1982 Planning Rule requires maintaining viable populations of all native and desired non-native vertebrate species. Agency policy is to “Ensure that specific management objectives and legal and biological requirements for the conservation of endangered, threatened, proposed, and sensitive plants and animals are included in Regional and Forest planning (Forest Service Manual 2670.44). Forests should therefore consider endangered, threatened, candidate, proposed, and sensitive plants and animals when selecting species of viability concern. In addition, Forests may consider species of local concern, if these can be identified using a process similar to that used to select Regional sensitive species, but focused at the unit level.” Some national forests in the project area identify SOLC to be considered for various management purposes. Regional Forest Service offices compile this list voluntarily, and it is not a requirement of the Forest Service Manual or other Forest Service guidance.

3.8.3 Methods and Assumptions for Analysis

WAPA and the Forest Service used land and resource management plans and existing information regarding habitat suitability and species occupancy. WAPA re-mapped vegetation community types using 2011 NAIP aerial imagery within a mile of ROWs to more accurately delineate habitat types. This section summarizes the wildlife information for each of the eight national forests in the project area (Elliott 2012, 2013a-f, 2014c). Field-based verifications for wildlife habitat were conducted for the ROWs, but species-specific surveys were not. WAPA and the Forest Service analyzed the potential direct and indirect effects of the No Action Alternative and Proposed Action on wildlife resources.

Assumptions

Important assumptions for identifying and analyzing the wildlife resources affected by the alternatives are:

- The best available occurrence information and science was used to describe the current environment and the analysis of effects.
- The depth of analysis and information presented is equal to the level of viability concern for a species or its relative management importance.
- The degree of impact to wildlife reflects the interplay between the nature of the action with the characteristics of species, their habitat, and their populations that potentially use the project area or areas affected by the alternatives.
- Aspects of the No Action Alternative and Proposed Action that affect the limiting factors of each species, such as factors likely to make individuals and populations vulnerable to changes in their environment, are most likely to impact wildlife species.
- The impact on wildlife species depends on the degree of habitat modification or disturbance; the frequency, intensity, and duration of activity associated with the alternatives; and their potential effects on the limiting factors of affected species.
- Adverse effects to wildlife species may also result from aspects of the alternatives that conflict with existing Forest Service management direction intended to protect or enhance wildlife species habitat in the affected area.
- The Proposed Action and No Action Alternative are unlikely to affect species that, based upon known distribution and habitat associations, are not expected or highly unlikely to occur in the project area.
- Disturbance during sensitive periods may adversely affect wildlife.
- Habitat fragmentation may adversely affect wildlife by diminishing habitat availability, quality, and effectiveness.
- Changes to habitat may benefit some wildlife species and have adverse effects on other species.
- The more vegetation removal that occurs on steep slopes or on highly erosive soils, the greater the potential for adverse impacts to wildlife habitats because revegetation on these sites often takes longer to achieve, plant cover may be incomplete, and invasive or low value vegetation may establish.
- Protection and conservation of wildlife and special status species are integral to the objectives of the vegetation management program, and related design features and standard maintenance procedures are in place to mitigate impacts on these species during implementation of vegetation management and maintenance practices.

- Recommended Colorado Parks and Wildlife (CPW) raptor nest buffers and timing restrictions would be followed during vegetation management and maintenance activities to limit disturbance due to human encroachment (Colorado Division of Wildlife 2008). Alternatively, WAPA will comply with the Migratory Bird Treaty Act in accordance with its Special Purpose Utility Permit.
- Ongoing and timely coordination will occur between WAPA and local Forest Service offices to share current, site-specific information on activities and resource issues of concern. Coordination will include annual pre- and post-treatment meetings to discuss appropriate strategies for minimizing impacts to key wildlife resources within a ROW segment, and other as-needed meetings to address unexpected wildlife conflicts encountered during implementation.

Impact Criteria

Impacts to wildlife may occur when proposed actions contribute to the loss or disturbance of habitats or individuals, or promote higher levels of human access and longer-term disturbances of wildlife in localized areas, compared to the present condition. The magnitude of the impact depends in part on the sensitivity of the population to activities associated with the vegetation management program. An impact on wildlife may result if any of the following were to occur:

- Violations of statutes, regulations, and agency policies pertaining to wildlife.
- Substantial interference with the movement of sensitive native, resident, or migratory wildlife species for more than two reproductive seasons, to the extent that long-term population viability may be adversely affected.
- Substantial local loss of wildlife habitat (as compared to total available resources within the area) or habitat productivity to the extent that long-term population viability may be adversely affected.
- Interference with nesting or breeding periods of migratory birds, other wildlife species, or special status or protected species.

3.8.4 Affected Environment

This section describes the environment of the project area as it pertains to wildlife species and their associated habitats. Included is a list of threatened, endangered, sensitive, and management indicator species by national forest that potentially occur in the project area and the habitats where these species typically occur. Changes in species ESA listing status and changes to the Regional Forester's sensitive species list since publication of the Draft EIS have been updated for this Final EIS. This section also summarizes SOLC by national forest (if the national forest compiles a list) and their habitat in the project area. For some species, effects could extend beyond the project ROWs (e.g., habitat connectivity, edge effects, and raptor nest buffers). In these cases, the affected environment could include habitat that extends beyond the project area.

The project area includes wildlife habitat distributed along approximately 273 miles of fairly narrow (25 to 175 feet wide) ROWs, encompassing about 4,055 acres, across three states and eight national forests. Most of the ROWs were cleared of taller vegetation, especially trees, when the transmission lines were first constructed. Since then, vegetation management activities along the ROWs have continued. Along most lines, vegetation management has focused on danger tree management. Because of these previously approved management strategies, mature forest habitats are less common within the ROWs, while lands supporting a variety of herbaceous vegetation types, shrublands, and regenerating forestland are more abundant. See Table 3-23 for the vegetation types in the project area. Prevalent vegetation types that provide habitat for wildlife include: cleared lands (1,590.2 acres), Gambel oak (485.1 acres), grassland (370.4 acres), forb-dominated areas (297.5 acres), lodgepole pine (235.8 acres), big sagebrush (219.4 acres), and aspen (200.6 acres). Aspen, Gambel oak, and lodgepole pine are relatively fast-growing species that can require more frequent maintenance treatments in the ROW. Slow-growing forest types found in the ROWs include spruce/fir (107.1 acres), ponderosa pine (103.1 aces), and Douglas fir (33.6 aces).

Riparian habitats that occur adjacent to rivers, streams, or other waterbodies represent transitional zones between upland and aquatic resources. These areas can be especially important for wildlife because they can provide excellent refuge, habitat diversity, water, and movement corridors (Mitsch and Gosselink 2000; Forest Service 2006a). Riparian habitats in the project area support a variety of forest and shrub species including cottonwood, quaking aspen, blue spruce, alder, birch, willow, and shrubby cinquefoil. Many of these riparian areas also support wetland habitat. Three types of wetlands occur in the project area: PEM, PSS, and PFO wetlands. Typical plants found in the PEM wetlands include cattail and bulrushes at lower elevations, and primarily sedges, rushes, and other grasses and forbs at elevations above 8,000 feet. Plants common in PSS wetlands include willow, alder, and birch. The most common trees that occur in PFO wetlands are Engelmann spruce, subalpine fir, quaking aspen, and cottonwood (Carsey *et al.* 2003). In total, the project area contains about 90 acres of wetland and riparian habitats, as summarized in Table 3-23.

Threatened or Endangered Wildlife Species

Four of 16, ESA, threatened or endangered, wildlife species within the national forests potentially occur within WAPA's ROWs: the Canada lynx, Gunnison sage-grouse, Mexican spotted owl, and yellow-billed cuckoo. Each of these species also has critical habitat. The greater sage-grouse is a Forest Service sensitive species (see Table 3-45) and discussed as a sensitive wildlife species. Table 3-44 identifies the listed species that could occur in the project area, the habitat types typically used by each species, and whether the species is carried forward for or excluded from detailed analysis. Appendix D provides brief species descriptions.

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Table 3-44. Federally Listed Wildlife Species that Could Occur in the Project Area

Common Name	Scientific Name	Status	Forest Occurrence or Potential Habitat								Habitat	Species Excluded	Reasons for Exclusion
			ARNF	ANF	GMUG	MBRNF	NNF	PSINF	SJNF	WRNF			
Mammals													
Black-footed ferret	*Mustela nigripes*	Endangered	-	-	-	X	X	X	-	-	Prairie dog towns in arid grasslands/shrublands, populations are tracked	Yes	No suitable habitat in project area Project area outside of species known range
Canada lynx	*Lynx canadensis*	Threatened	X	X	X	X	-	X	X	X	Boreal forests with deep snows, and closed canopy montane forests adjacent to boreal forests	No	
New Mexico meadow jumping mouse	*Zapus hudsonius luteus*	Endangered	-	-	-	-	-	-	X	-	Persistent emergent herbaceous wetlands and scrub-shrub wetlands; shrubby riparian habitats in extreme SW Colorado	Yes	Project area lacks suitable habitat and is likely outside the range of the species
Preble's meadow jumping mouse	*Zapus hudsonius preblei*	Threatened	X	-	-	X	-	X	-	-	Riparian and shrublands in foothills along Front Range	Yes	No suitable habitat in project area Project area outside of species known range
Birds													
Gunnison sage-grouse	*Centrocercus minimus*	Threatened	-	-	X	-	-	X	X	-	Sagebrush steppe on western slope of Colorado	No	
Least tern	*Sterna antillarum*	Endangered	X	-	-	X	X	-	-	-	Breeds widely along major rivers of interior North America	Yes	No suitable habitat in project area
Lesser prairie-chicken	*Tympanuchus pallidicinctus*	Under review	-	-	-	-	-	X	-	-	Arid grasslands	Yes	No suitable habitat in project area
Mexican spotted owl	*Strix occidentalis lucida*	Threatened	X	X	X	-	-	X	X	X	Closed canopy lower elevation montane forests with cliff features, canyons	No	
Piping plover	*Charadrius melodus*	Threatened	X	-	-	X	-	X	-	-	Sandy beaches, sandbars, alkali flats, and broad open areas around waters	Yes	No suitable habitat in project area Project area outside of species known range
Southwestern willow flycatcher	*Empidonax traillii extimus*	Endangered	-	-	-	-	-	-	X	-	Shrubby riparian habitats in riparian areas.	No	
Whooping crane	*Grus americana*	Endangered	X	-	-	X	X	X	-	-	Winters along gulf coast and southern New Mexico, summers in Canada. Large river systems in Great Plains used as migratory stopovers.	Yes	No suitable habitat in project area Project area outside of species known range
Yellow-billed cuckoo	*Coccyzus americanus*	Threatened	X	X	X	X	X	X	X	-	Large riparian woodlands	Yes	No suitable habitat in project area
Amphibians													
Wyoming toad	*Bufo baxteri*	Endangered	-	-	-	X	-	-	-	-	Wetlands in southern Wyoming, around Laramie	Yes	Project area outside of species known range
Insects/Invertebrates													
American burying beetle	*Nicrophorus americanus*	Endangered	-	-	-	-	X	-	-	-	Wide range of habitats, but appear to favor woodlands	Yes	Project area outside of species known range
Pawnee montane skipper	*Hesperia leonardus montana*	Threatened	-	-	-	-	-	X	-	-	Ponderosa pine woodlands along South Platte	Yes	No suitable habitat in project area
Uncompahgre fritillary	*Boloria acrocnema*	Endangered	-	-	X	-	-	X	X	X	Alpine habitats with snow willow (*Salix nivalis*)	Yes	No suitable habitat in project area

Sources: RMES, Inc. and PENDO Solutions, Inc. 2014a-2014g; RMES, Inc. 2014

ARNF Arapaho-Roosevelt National Forest
ANF Ashley National Forest
GMUG Grand Mesa, Uncompahgre, and Gunnison National Forest
MBRNF Medicine Bow-Routt National Forest
NNF Nebraska National Forest
PSINF Pike and San Isabel National Forest
SJNF San Juan National Forest
WRNF White River National Forest

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Sensitive Wildlife Species

Forest Service sensitive species are plants and animals identified by the Regional Forester for which population viability is a concern (FSM 2670.5). Forest Service objectives for sensitive species management (FSM 2670.22) include preventing the need for listing under the ESA and maintaining viable populations distributed throughout their geographic range on NFS lands. The Forest Service currently manages sensitive species habitats to achieve recovery objectives so that special protection measures provided under the ESA are no longer necessary (FSM 2670.21). All ESA candidate species are included in the Forest Service sensitive species list; greater sage-grouse is a Forest Service sensitive species. There is potential habitat for 61 Forest Service sensitive wildlife species to occur in the project area. Table 3-45 provides details regarding sensitive species and their preferred habitat in the project area. Twenty-five species with no potential to occur in the project area are left out of further discussion, leaving 36 species for analysis. Appendix D provides brief species descriptions.

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Table 3-45. Forest Service Sensitive Species (Wildlife) that Could Occur in the Project Area

Common Name	Scientific Name	Region	Forest Occurrence or Potential Habitat								Habitat	Species Excluded	Reasons for Exclusion
			ARNF	ANF	GMUG	MBRNF	NNF	PSINF	SJNF	WRNF			
Mammals													
Rocky Mountain bighorn sheep	*Ovis canadensis*	Region 2 Region 4	X	X	X	-	X	X	X	X	Montane areas with escape cover (cliffs)	No	
Desert bighorn sheep	*Ovis canadensis nelsoni*	Region 2	-	-	X	-	X	-	X	-	Arid shrublands with cliffs	Yes	No suitable habitat in project area Project area outside of species known range
North American wolverine	*Gulo gulo*	Region 2 Region 4	X	X	X	X	-	X	X	X	Shrublands, montane forests, boreal forests, alpine habitats, generally away from human activities	No	
River otter	*Lontra canadensis*	Region 2	X	-	X	X	X	X	X	X	Larger streams and rivers with higher prey bases (fish)	No	
American marten	*Martes americana*	Region 2	X	-	X	X	-	X	X	X	Montane and boreal forests with higher amounts of coarse woody debris	No	
Kit fox	*Vulpes macrotis*	Region 2	-	-	X	-	-	-	X	-	Arid grasslands and shrublands	No	
Swift fox	*Vulpes velox*	Region 2	X	-	-	X	X	X	-	-	Arid grasslands and shrublands	No	
American hog-nosed skunk	*Comepatus leuconotus*	Region 2	-	-	-	-	-	X	-	-	Woodlands/shrublands in eastern plains	Yes	No suitable habitat in project area Project area outside of species known range
Townsend's big-eared bat	*Corynorhinus townsendii*	Region 2 Region 4	X	X	X	X	X	X	X	X	Widespread across shrublands and montane forests, needs caves, mines or structures for roosts/hibernacula	No	
Spotted bat	*Euderma maculata*	Region 2 Region 4	-	X	X	-	-	-	X	X	Patchy distribution dependent upon large, isolated cliffs for roosting; forage in a wide range of habitats	No	
Hoary bat	*Lasiurus cinereus*	Region 2	X	-	X	X	X	X	X	X	Deciduous woodlands, roosts in dense foliage	No	
Fringed myotis	*Myotis thysanodes*	Region 2	X	-	X	X	X	X	X	X	Ponderosa pine/pinyon-juniper woodlands	No	
Gunnison's prairie dog	*Cynomys gunnisoni*	Region 2	-	-	X	-	-	X	X	-	Arid shrublands/grasslands in montane areas and sagebrush flats	No	
White-tailed prairie dog	*Cynomys leucurus*	Region 2	-	-	X	X	X	-	-	-	Arid shrublands/grasslands in western Colorado, eastern Utah & Wyoming	Yes	No suitable habitat in project area
Black-tailed prairie dog	*Cynomys ludovicianus*	Region 2	X	-	-	X	X	X	-	-	Arid grasslands/shrublands on eastern plains	Yes	No suitable habitat in project area Project area outside of species known range
Wyoming pocket gopher	*Thomomys clusius*	Region 2	-	-	-	X	-	-	-	-	Very narrow range in Wyoming sagebrush habitats	Yes	Project area outside of species known range
Pygmy shrew	*Sorex hoyi*	Region 2	X	-	X	X	-	-	-	X	Mesic forests and riparian areas	No	
Birds													
Bald eagle	*Haliaeetus leucocephalus*	Region 2 Region 4	X	X	X	X	X	X	X	X	Summers near larger rivers and reservoirs/lakes, winters along larger open rivers	No	
Ferruginous hawk	*Buteo regalis*	Region 2	X	-	X	X	X	X	X	X	Grasslands, prairies, and open shrublands	No	
Northern goshawk	*Accipiter gentilis*	Region 2 Region 4	X	X	X	X	X	X	X	X	Montane and boreal forests	No	
Northern harrier	*Circus cyaneus*	Region 2	X	-	X	X	X	X	X	X	Moist grasslands, grasslands, low shrublands	No	
American peregrine falcon	*Falco peregrinus anatum*	Region 2 Region 4	X	X	X	X	X	X	X	X	Widespread, needs large cliffs for nesting	No	
Boreal owl	*Aegolius funereus*	Region 2 Region 4	X	X	X	X		X	X	X	Boreal forests	No	
Short-eared owl	*Asio flammeus*	Region 2	-	-	-	-	X	X	X	-	Wide variety of grasslands, woodlands, shrublands	No	
Burrowing owl	*Athene cunicularia*	Region 2	X	-	X	X	X	X	X	-	Grasslands, prairies, and xeric shrublands	No	
Flammulated owl	*Otus flammeolus*	Region 2 Region 4	X	X	X	X	-	X	X	X	Ponderosa pine woodlands, aspen stands on western slope	No	
Great gray owl	*Strix nebulosa*	Region 4	-	X	-	-	-	-	-	-	Boreal forests	Yes	Project area outside of species known range
Trumpeter swan	*Cygnus buccinator*	Region 2	-	-	-	-	X	-	-	-	Moderate to large ponds and streams	Yes	No suitable habitat in project area

Table 3-45. Forest Service Sensitive Species (Wildlife) that Could Occur in the Project Area

Common Name	Scientific Name	Region	Forest Occurrence or Potential Habitat								Habitat	Species Excluded	Reasons for Exclusion
			ARNF	ANF	GMUG	MBRNF	NNF	PSINF	SJNF	WRNF			
Black tern	*Chlidonias niger*	Region 2	X	-	-	X	X	X	-	-	Wetlands and open water systems	No	
American bittern	*Botaurus lentiginosus*	Region 2	X	-	X	X	X	X	X	-	Freshwater wetlands containing tall, emergent vegetation	Yes	No suitable habitat in project area
Long-billed curlew	*Numenius americanus*	Region 2	X	-	-	X	X	X	-	-	Short-grass wetlands, mudflats, agricultural fields	No	
Mountain plover	*Charadrius montanus*	Region 2	X	-	-	X	X	X	-	-	Short-grass steppe	Yes	No suitable habitat in project area
Greater sage-grouse	*Centrocercus urophasianus*	Region 2 Region 4	X	X	-	X	X	-	-	X	Sagebrush steppe	No	
Columbian sharp-tailed grouse	*Tympanuchus phasianellus columbianus*	Region 2	-	-	X	X	-	-	X	X	Mixed mountain shrublands	No	
Greater prairie-chicken	*Tympanuchus cupido*	Region 2					X				Grasslands	Yes	Project area outside of species known range
White-tailed ptarmigan	*Lagopus leucurus*	Region 2	X	-	X	X	-	X	X	X	Alpine habitats	No	
Lewis's woodpecker	*Melanerpes lewis*	Region 2	X	-	X	X	X	X	X	X	Montane deciduous woodlands, usually associated with cottonwoods in Colorado, and low-elevation ponderosa pine	No	
Three-toed woodpecker	*Progne subis*	Region 4	-	X	-	-	-	-	-	-	Aspen stands near open water or larger wetlands	No	
Black swift	*Cypseloides niger*	Region 2	X	-	X	X	-	X	X	X	Breeds on cliffs near wetlands and waterfalls	Yes	No suitable habitat in project area
Olive-sided flycatcher	*Contopus cooperi*	Region 2	X	-	X	X	-	X	X	X	Montane and boreal forests around openings	No	
Purple martin	*Progne subis*	Region 2	X	-	X	X	-	X	X	X	Aspen stands near open water or larger wetlands	No	
Loggerhead shrike	*Lanius ludovicianus*	Region 2	X	-	X	X	X	X	X	X	Xeric woodlands and shrublands	No	
Cassin's sparrow	*Aimophila cassini*	Region 2	X	-	-	-	-	X	-	-	Arid shrub grasslands and southern High Plains	Yes	No suitable habitat in project area Project area outside of species known range
Grasshopper sparrow	*Ammodramus savannarum*	Region 2	X	-	-	X	X	X	X	-	Grasslands and prairies	No	
Sage sparrow	*Amphispiza bellii*	Region 2	-	-	X	X	X	X	X	X	Xeric sagebrush shrublands (primarily larger stands of *Artemisia tridentata tridentata*)	No	
Brewer's sparrow	*Spizella breweri*	Region 2	X	-	X	X	X	X	X	X	Sagebrush shrublands	No	
McCown's longspur	*Calcarius mccownii*	Region 2	X	-	-	X	X	-	-	-	Grasslands	No	
Chestnut-collared longspur	*Calcarius ornatus*	Region 2	X	-	-	X	X	X	-	-	Grasslands	No	
Amphibians													
Boreal toad	*Anaxyrus boreas*	Region 2 Region 4	X	X	X	X	-	X	X	X	Montane and boreal wetlands	No	
Plains leopard frog	*Lithobates blairi*	Region 2	-	-	-	-	X	X	-	-	Plains wetlands	Yes	No suitable habitat in project area Project area outside of species known range
Columbia spotted frog	*Lithobates luteiventris*	Region 4	-	X	-	-	-	-	-	-	Semi-desert and foothill wetlands	Yes	No suitable habitat in project area
Northern leopard frog	*Lithobates pipiens*	Region 2	X	-	X	X	X	X	X	X	Grassy wetlands in montane areas	No	
Wood frog	*Lithobates sylvatica*	Region 2	X	-	-	X	-	-	-	-	Wetlands/ponds in montane areas	No	
Reptiles													
Desert massasauga rattlesnake	*Sistrurus catenatus edwardsii*	Region 2	-	-	-	-	-	X	-	-	Xeric grasslands	Yes	No suitable habitat in project area Project area outside of species known range
Insects/Invertebrates													
Cooper's Rocky Mountain snail	*Oreohelix strigosa cooperi*	Region 2	-	-	-	-	X	-	-	-	Ponderosa pine and deciduous taller shrubs and trees	Yes	No suitable habitat in project area Project area outside of species known range
Hudsonian emerald dragonfly	*Somatochlora hudsonica*	Region 2	X	-	-	X	-	X	-	-	Ponds and wetlands in woodlands, with bog violet (*Viola nephrophylla*)	No	
Ottoe skipper	*Hesperia ottoe*	Region 2	-	-	-	-	X	X	-	-	Prairie and grassland habitats	No	

Table 3-45. Forest Service Sensitive Species (Wildlife) that Could Occur in the Project Area

Common Name	Scientific Name	Region	Forest Occurrence or Potential Habitat								Habitat	Species Excluded	Reasons for Exclusion
			ARNF	ANF	GMUG	MBRNF	NNF	PSINF	SJNF	WRNF			
Regal fritillary	*Speyeria idalia*	Region 2	X	-	-	-	X	-	-	-	Wet meadows; mixed- and tallgrass-prairies	No	
Nokomis fritillary (aka Great Basin silverspot)	*Speyeria nokomis*	Region 2	-	-	X	-	-	-	X	X	Springs and seeps in xeric sagebrush environments	No	
Rocky Mountain capshell	*Acroloxus coloradensis*	Region 2	X	-	-	X	-	X	-	-	High elevation lakes and ponds	Yes	No suitable habitat in project area
Susan's pursemaking caddisfly	*Ochrotrichia susanae*	Region 2	-	-	-	-	-	X	-	-	Montane springs and cold, clear streams	No	

Sources: RMES, Inc. and PENDO Solutions, Inc. 2012a-2012d, 2013b-2013e; RMES, Inc. 2014

ARNF Arapaho-Roosevelt National Forest
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Wildlife MIS and Species of Local Concern

MIS are "plant and animal species, communities, or special habitats selected for emphasis in planning, and which are monitored during forest plan implementation in order to assess the effects of management activities on their populations and the populations of other species with similar habitat needs which they may represent" (FSM 2620.5). Forest plans developed under the 1982 National Forest Management Act Planning Rule include consideration of MIS. Important characteristics of the MIS designation include the ability to effectively monitor and understand relationships between species, habitats, and their response to management activities. The MIS designation is not intended to provide special protective status, serve as biological diversity benchmarks, or represent every species of plant or animal found in the forest. There are 34 MIS identified from the national forests crossed by the ROWs, with a potential for 28 of those species to occur within the project ROWs. Table 3-46 provides details on MIS and their habitats in the project area. Species with no potential to occur in the project area are left out of further discussion.

Species of local concern is a voluntarily created list of wildlife species produced by a national forest and national grassland, and is not a requirement of agency policy or direction. The Forest Service observes and manages individual species on this list and their habitats in an effort to minimize or eliminate threats affecting the status of each species. Arapaho-Roosevelt (2 species), Nebraska (2 species), San Juan (27 species), and White River (2 species) are the only national forests in the project area with records for wildlife SOLC. Table 3-46 identifies these species of local concern by national forests. Management and uses of these lists are forest specific. Appendix D provides brief species descriptions.

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Table 3-46. Forest Service Wildlife Management Indicator Species (MIS) and Species of Local Concern (SOLC) that Could Occur in the Project Area

Common Name	Scientific Name	Forest Occurrence or Potential Habitat								Management Indicator Community (MIS) or Preferred Habitat (SOLC)	Species Excluded	Reasons for Exclusion
		ARNF	ANF	GMUG	MBRNF	NNF	PSINF	SJNF	WRNF			
Mammals												
Elk	*Cervus elaphus*	MIS	-	MIS	-	-	MIS	MIS	MIS	Young to mature forests and openings; road density and use; early successional habitats	No	
Mule deer	*Odocoileus hemionus*	MIS	-	-		SOLC	-	MIS	-	Young to mature forests and openings; early successional habitats	No	
Bighorn sheep[1]	*Ovis canadensis*	MIS	-	-	-	-	-	-	-	Forest openings	No	
Black bear	*Ursus americanus*	-	-	-	-	-	-	MIS	-	Montane shrublands and forests, subalpine forests	No	
Canada lynx	*Lynx canadensis*	-	-	-	-	-	-	MIS	-	Boreal forests and closed canopy montane forests	No	
River otter[1]	*Lontra canadensis*	-	-	-	-	-	-	MIS	-	Larger streams and rivers with higher prey bases	No	
American marten[1]	*Martes americana*	-	-	MIS	-	-	-	MIS	-	Late successional mixed conifer subalpine forests; mixed conifer and aspen forests	No	
Beaver	*Castor canadensis*	-	-	-	-	-	-	MIS	-	Aquatic habitats	No	
Black-tailed prairie dog[1]	*Cynomys ludovicianus*	-	-	-	MIS	MIS	-	-	-	Grassland management	Yes	No suitable habitat or known populations
Abert's squirrel	*Sciurus abertii*	SOLC	-	MIS	-	-	MIS	MIS	-	Mid and late succession ponderosa pine	No	
Deer mouse	*Peromyscus manicula*	-	-	-	-	-	-	MIS	-	Early successional habitats	No	
Allen's big-eared bat	*Idionycteris phyllotis*	-	-	-	-	-	-	SOLC	-	Roosts in abandoned mine shafts in ponderosa pine, pinyon-juniper, and riparian woodlands	Yes	No suitable habitat in project area
Big free-tailed bat	*Nyctinomops macrotis*	-	-	-	-	-	-	SOLC	-	Frequents rocky areas or canyon where it roosts in crevices	Yes	No suitable habitat in project area
Birds												
Golden eagle	*Aquila chrysaetos*	-	-	-	-	-	-	SOLC	-	Grasslands, shrublands and open woodlands with cliffs or other suitable nest sites	No	
Northern goshawk[1]	*Accipiter gentilis*	-	-	MIS	MIS	-	-	MIS	-	Lodgepole pine timber management; mixed conifer and aspen forests	No	
Mexican spotted-owl	*Strix occidentalis lucida*	-	-	-	-	-	-	MIS	-	Closed canopy lower elevation montane forests with cliff features, canyons	No	
Osprey	*Pandion haliaetus*	SOLC	-	-	-	-	-	-	-	Lakes, reservoirs, and rivers with abundant accessible fish and open nest sites free from predators	No	
Barrow's goldeneye	*Bucephala islandica*	-	-	-	-	-	-	-	SOLC	Nests at subalpine lakes	Yes	No suitable habitat in project area
Mallard	*Anas platyrhynchos*	-	-	-	-	-	-	MIS	-	Economic important, wetland indicator	No	
Merriam's wild turkey	*Meleagris gallopavo*	-	-	MIS	-	-	-	MIS	-	Mountain shrub, pinyon-juniper, and low-elevation ponderosa pine	No	
Greater sage-grouse[1]	*Centrocercus urophasianus*	-	-	-	-	MIS	-	-	-	Sagebrush steppe	Yes	No suitable habitat in project area
Dusky grouse	*Dendragapus obscurus*	-	-	-	-	-	-	SOLC	-	Breeds in aspen-sagebrush areas, as well as subalpine meadows and creek bottoms; winters in conifer forest stands	No	
Plains sharp-tailed grouse	*Tympanuchus phasianellus*	-	-	-	-	MIS	-	-	-	Mosaic of mesic grassland and shrublands	No	
Columbian sharp-tailed grouse[1]	*Tympanuchus phasianellus columbianus*	-	-	-	-	-	-	MIS	-	Mixed mountain shrublands	No	
Band-tailed pigeon	*Patagioenas fasciata*	-	-	-	-	-	-	SOLC	-	Dry montane forests	No	
White-faced Ibis	*Plegadis chihi*	-	-	-	-	-	-	SOLC	-	Shallow, freshwater wetlands and marshes	Yes	No suitable habitat in project area
Willet	*Tringa semipalmata*	-	-	-	-	-	-	SOLC	-	Shallow wetlands and adjacent grasslands	Yes	No suitable habitat in project area
Broad-tailed hummingbird	*Selasphorus platycercus*	-	-	-	-	-	-	SOLC	-	Open subalpine meadows and shrubby habitats with nearby forests	No	
Hairy woodpecker	*Picoides villosus*	MIS	-	-	-	-	-	MIS	-	Young to mature forest; snags	No	
Red-naped sapsucker	*Sphyrapicus nuchalis*	-	-	MIS	-	-	-	SOLC	-	Mature aspen	No	
Williamson's sapsucker	*Sphyrapicus thyroideus*	-	-	-	-	-	-	SOLC	-	Mid to high elevation conifer and mixed conifer-deciduous forests	No	

Table 3-46. Forest Service Wildlife Management Indicator Species (MIS) and Species of Local Concern (SOLC) that Could Occur in the Project Area

Common Name	Scientific Name	Forest Occurrence or Potential Habitat								Management Indicator Community (MIS) or Preferred Habitat (SOLC)	Species Excluded	Reasons for Exclusion
		ARNF	ANF	GMUG	MBRNF	NNF	PSINF	SJNF	WRNF			
Hammond's flycatcher	*Empidonax hammondii*	-	-	-	-	-	-	SOLC	-	Mature coniferous forests, coniferous-aspen, and pure aspen	No	
Cordilleran flycatcher	*Empidonax occidentalis*	-	-	-	-	-	-	SOLC	-	Boreal forests of pine, fir, and spruce	No	
Southwestern willow flycatcher	*Empidonax trailii extimus*	-	-	-	-	-	-	MIS	-	Shrubby riparian habitats	No	
American pipit	*Anthus rubescens*	-	-	-	-	-	-	SOLC	MIS	Alpine habitat	Yes	No suitable habitat in project area
Violet-green swallow	*Tachycineta thalassina*	-	-	-	-	-	-	SOLC	-	Montane coniferous forests	No	
Pinyon jay	*Gymnorhinus cyanocephalus*	-	-	-	-	-	-	SOLC	-	Pinyon-juniper woodland	No	
Juniper titmouse	*Baeolophus ridgwayi*	-	-	-	-	-	-	SOLC	-	Juniper and pinyon-juniper woodlands	No	
Pygmy nuthatch	*Sitta pygmaea*	MIS	-	-	-	MIS	-	-	SOLC	Old growth ponderosa pine forests	No	
American dipper	*Cinclus mexicanus*	-	-	-	-	-	-	SOLC	-	Fast-moving streams with cascades, riffles, and waterfalls	No	
Golden-crowned kinglet	*Regulus satrapa*	MIS	-	-	MIS	-	-	-	-	Spruce-fir timber management; interior forests	No	
Mountain bluebird	*Salia currucoides*	MIS	-	-	-	-	-	MIS	-	Openings in forest; cavity nesters	No	
Warbling vireo	*Vireo gilvus*	MIS	-	-	-	-	-	-	-	Aspen forests	No	
Green-tailed towhee	*Pipilo chlorurus*	-	-	-	-	-	-	MIS	-	Oakbrush and mixed mountain shrublands	No	
Vesper sparrow	*Pooecetes gramineus*	-	-	-	MIS	-	-	-	-	Rangelands of residual forage	Yes	No suitable habitat or known populations
Brewer's sparrow[1]	*Spizella breweri*		-	MIS	-	-	-	-	MIS	Sagebrush habitats	No	
MacGillivray's warbler	*Geothlypis tolmiei*	-	-	-	-	-	-	SOLC	-	Riparian habitat and clearcuts of northern coniferous forests	No	
Grace's warbler	*Setophaga graciae*	-	-	-	-	-	-	SOLC	-	Park-like stands of mature pines	No	
Virginia's warbler	*Vermivova virginiae*	-	-	-	-	-	-	SOLC	MIS	Mixed mountain shrublands	No	
Wilson's warbler	*Wilsonia pusilla*	-	-	-	MIS	-	-	SOLC	-	Herbivory in riparian areas	No	
Lark bunting	*Calamospiza melanocorys*	MIS	-	-	-	-	-	-	-	Midgrass prairie	Yes	No suitable habitat in project area
Lazuli bunting	*Passerina amoena*	-	-	-	-	-	-	SOLC	-	Brushy habitats, especially arid bushy hillsides, riparian habitats, sagebrush steppe, and recent post-fire areas	No	
Cassin's finch	*Carpodacus cassinii*	-	-	-	-	-	-	SOLC	-	Open coniferous forests	Yes	No suitable habitat in project area
Brown-capped rosy-finch	*Leucosticte australis*	-	-	-	-	-	-	SOLC	-	Alpine habitat with suitable nesting cliffs	Yes	No suitable habitat in project area
Amphibians												
Boreal toad[1]	*Anaxyrus boreas*	MIS	-	MIS	-	-	-	-	-	Montane riparian and wetlands	No	
Canyon treefrog	*Hyla arenicolor*	-	-	-	-	-	-	SOLC	-	Intermittent streams in deep, rocky canyons	Yes	No suitable habitat in project area
Reptiles												
Longnose leopard lizard	*Gambelia wislizenii*	-	-	-	-	-	-	SOLC	-	Greasewood and sagebrush shrublands on deep sandy soils in or near the mouths of canyons	Yes	No suitable habitat in project area
Desert spiny lizard	*Sceloporus magister*	-	-	-	-	-	-	SOLC	-	Shrub-covered dirt banks and sparsely vegetated rocky areas near flowing streams or arroyos	Yes	No suitable habitat in project area

Table 3-46. Forest Service Wildlife Management Indicator Species (MIS) and Species of Local Concern (SOLC) that Could Occur in the Project Area

Common Name	Scientific Name	Forest Occurrence or Potential Habitat								Management Indicator Community (MIS) or Preferred Habitat (SOLC)	Species Excluded	Reasons for Exclusion
		ARNF	ANF	GMUG	MBRNF	NNF	PSINF	SJNF	WRNF			
Insects/Invertebrates												
Uncompahgre fritillary butterfly	*Boloria acrocnema*	-	-	-	-	-	-	MIS	-	Alpine habitats with snow willow (*Salix nivalis*)	Yes	No suitable habitat in project area Project area outside of species known range
Tawny crescent butterfly	*Phyciodes batesii*	-	-	-	-	SOLC	-	-	-	Moist meadows	No	

Sources: RMES, Inc. and PENDO Solutions, Inc. 2012a-2012d, 2013b-2013e; Poole 2012; RMES, Inc. 2014

[1]Also a Forest Service sensitive species.

ARNF Arapaho-Roosevelt National Forest
ANF Ashley National Forest
GMUG Grand Mesa, Uncompahgre, and Gunnison National Forest
MBRNF Medicine Bow-Routt National Forest
MIS Management Indicator Species
N/A Not applicable
NNF Nebraska National Forest
PSINF Pike and San Isabel National Forest
SJNF San Juan National Forest
SOLC Species of Local Concern
WRNF White River National Forest

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Migratory Birds

The term "migratory birds" applies generally to native bird species protected under the Migratory Bird Treaty Act (MBTA). As used in the MBTA, migratory birds include most native resident species that remain in an area throughout the year, as well migrant species that move from northern to southern latitudes or from higher to lower elevations to avoid harsh winter conditions and a seasonal shortage of food. Migratory birds serve an important ecological function and are a key indicator of ecosystem health. Continental and local declines in numerous bird populations have led to concern for the future viability of some migratory birds. The primary causes of declines are thought to be habitat loss and fragmentation in the nesting, wintering, and migratory stop-over habitats used by migrating birds. Even where habitat remains, it is often fragmented into small patches that cannot support healthy bird populations.

The project area ROWs provide habitat for a wide variety of native resident and migrant birds found throughout the central Rocky Mountain region. For most migrant and native resident birds, nesting habitat is of special importance because it is critical for supporting reproduction in terms of both nesting sites and food. Because birds are generally territorial during the nesting season, their ability to find sufficient food is limited by the quality of the territory occupied. During non-breeding seasons, birds are generally non-territorial and able to feed across a larger area and wider range of habitats.

Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds (January 2001), outlines responsibilities of federal agencies under the MBTA and requires each federal agency whose actions have, or are likely to have, a measurable negative effect on migratory bird populations to develop a Memorandum of Understanding (MOU) with the USFWS to promote the conservation of migratory bird populations. On lands managed by the Forest Service, compliance with the MBTA is achieved through the Forest Plan amendment process, in which the Forest Service plans for management in order to provide for diverse, healthy, and available habitat types for migratory birds. Migratory birds that have indicators of habitat or population stressors are targeted by the Regional Forester for additional consideration through the Regional sensitive species listing process. Pursuant to Executive Order 13186, the Forest Service and USFWS entered into an MOU to promote the conservation of migratory birds (FS Agreement #08-MU-1113-2400-264). The MOU outlines a number of requirements to be implemented by the Forest Service, with coordination with the USFWS, in order to protect declining migratory bird species populations. The USFWS will focus on migratory bird species listed in the Partners in Flight program and by the Rocky Mountain Bird Observatory as being rapidly declining. Most species on these current lists that have suitable habitats on National Forest System lands are currently listed as sensitive species by the Regional Forester.

Big Game

Big game species that may occur in the project area ROWs (i.e., elk, mule deer, bighorn sheep, black bear, and mountain lion) are very important socially and economically to the region. Colorado, in which most ROW segments lie, contains the largest elk and mule deer herds in the United States. Hunting and fishing in Colorado generates about $1 billion annually to the state's economy, with wildlife viewing contributing an additional $1.3 billion (U.S. Dept. of the Interior-Fish and Wildlife Service and U.S. Dept. of Commerce-U.S. Census Bureau 2008).

Winter range is the primary limiting factor for most ungulate populations (hooved mammals including elk, mule deer, bighorn sheep) and is very important to sustaining their populations. During the winter, most ungulates migrate to lower-elevation areas where the snow is not as deep. Although these animals use physiological and behavioral adaptations to reduce energy requirements during stressful periods of cold temperatures and deep snow, most ungulates lose weight throughout the winter. Human disturbances, especially unpredictable or erratic occurrences, can increase energy costs and contribute to poor over-winter survival and declines in reproductive success (Cole *et al.* 1997). The quality of their summer habitat is also very important to overall nutritional status of ungulate populations. Animals that leave summer ranges in good body condition have higher survival and reproductive rates the following spring. Most ungulates use traditional migration corridors to move between winter and summer ranges. Severing, or reducing the effectiveness of a migration corridor can result in less effective use or even loss of winter or summer ranges.

Mountain lions have large home ranges that overlap with their primary prey – deer and other ungulates. In the project area, they are most abundant in the woodlands and brushlands of the foothills, canyons, and mesas, and less common in dense forestland and open prairies (Armstrong 2012). Maintaining healthy and well-distributed populations of ungulates and providing secluded habitats sustain source populations of mountain lions. Black bears are locally common in suitable habitats in the montane portions of the project area where they primarily feed on grasses, forbs, berries, nuts, insects, and a variety of smaller mammals (CPW 2012).

3.8.5 Environmental Consequences

This section describes impacts to wildlife resources on and adjacent to project area ROWs under the No Action Alternative and the Proposed Action. These actions could affect wildlife and their habitat along approximately 273 miles of fairly narrow (25 to 175 feet wide) ROWs, encompassing about 4,055 acres, across three states and eight national forests. Impacts to wildlife from ROW vegetation management, access road maintenance, and transmission line maintenance would include loss, alteration, or degradation of wildlife habitat; incidental mortality or injury of wildlife; and temporary disturbance or displacement of individuals due to noise and human presence.

Federally listed threatened, endangered, under review, and candidate wildlife species, as well as Forest Service MIS and sensitive species, could be present in the project area. The analyses are summarized in the sections that follow. ESA consultations for the eight forests analyzing the potential effects of the Proposed Action on federally listed wildlife species were completed in 2014. In addition, ESA consultations for the Gunnison sage-grouse on the GMUG were completed in 2017 and 2018.

Standard Maintenance Procedures for Protection of Wildlife

WAPA currently uses and would continue to follow standard maintenance procedures with vegetation management in the project area to minimize potential effects on wildlife resources from project activities. These standard maintenance procedures are summarized below. Chapter 2 provides full details about design features (Table 2-13) and vegetation standard maintenance procedures (Table 2-15) WAPA uses.

- Protect nesting birds and be aware that nests may occur within the ROW. Perform maintenance after the nesting season, unless logistical or site-specific circumstances do not permit such delays. In those cases, a qualified biologist will survey for nesting birds within one week of the start of activities that may disturb nests.
- WAPA and the Forest Service will continue ongoing coordination prior, during, and following activities to ensure resource conflicts with other wildlife, fish, and plants of Regional or local concern are minimized during field operations.

- Excavations over three feet deep (e.g., for pole replacements) would be fenced, covered, or filled at the end of each working day, or have escape ramps to prevent entrapping wildlife. Inspect trenches and holes to ensure wildlife is not entrapped before filling. Allow wildlife to escape without harassment.
- Pets must be under active restraint and not allowed to harm wildlife. No firearms are allowed at the work site.
- Equip vehicles with required noise abatement devices.
- All herbicide applicators shall be trained and licensed/certified in the appropriate categories.
- There will be no aerial application of herbicides for routine maintenance practices.
- Herbicides used near surface water such as wetlands, riparian areas, or streams and springs would be approved for use near aquatic environments.
- All spills of hazardous materials (e.g., solvents, gasoline, diesel fuel, etc.) shall be promptly cleaned up and contaminated soil, rags, absorbents, etc., shall be disposed of in accordance with the state and local waste disposal requirements. Any notifications required by the regulations shall be done.
- Report mortalities or injuries to wildlife species that occur during maintenance activities to a WAPA biologist or the local Forest Service office.
- Comply with applicable federal, state, and local environmental requirements. Before beginning project activities, instruct supervisory WAPA and contractor personnel on the protection of cultural and environmental resources at the site. Include the appropriate precautions related to cultural resources, wildlife, water quality, and other requirements in work orders and contracts.

3.8.5.1 No Action Alternative

Under the No Action Alternative, WAPA would continue its current ROW vegetation management, access road maintenance, and transmission line maintenance practices throughout the project area. Because current practices would not change, impacts to wildlife would remain about the same. The standard maintenance procedures noted above and detailed in Table 2-15 would serve to minimize potential effects on wildlife from activities taken under the No Action Alternative. Potential impacts to wildlife associated with the No Action Alternative are described below under Direct and Indirect Effects. The consequences these actions would have on wildlife and their habitats are further analyzed under Effects of the No Action Alternative on Wildlife Resources. Effects on wildlife resources from these continued activities would be similar for all national forests in the project area.

Direct Effects

Direct effects from project activities generally occur at the same time and place as the management activity or action causing the impact. Direct effects on wildlife resources under the No Action Alternative are primarily associated with vegetation clearing and the use of mechanized equipment in project area ROWs during transmission line maintenance. Potential direct effects on wildlife resources could include loss or alteration of habitat during tree removal or vegetation management activities; destruction of avian nests not detected during nesting bird surveys when tree removal or vegetation management activities cannot be scheduled outside of the breeding season; wildlife mortality or injury from collisions with vehicles, equipment traveling off road through the ROWs; temporary disturbance or displacement of wildlife due to noise and human presence; and exposure to hazardous substances.

Indirect Effects

Indirect effects often occur at some distance or time from the activity or action. Indirect effects to wildlife under the No Action Alternative could include degradation of water quality in wetlands and ponds from increased erosion and runoff; habitat degradation from the spread of noxious weeds; changes in the availability of forage or prey along the ROWs; behavioral disruptions to regular feeding or foraging activities, breeding and rearing of young; and long-term changes to the abundance and diversity of wildlife using the ROWs.

Effects of the No Action Alternative on Wildlife Resources

As noted above, the types of direct and indirect effects to wildlife resources from project activities would be similar for all forests in the project area across similar habitat types. The extent of these impacts would depend upon the species and habitats present, the specific maintenance activities undertaken in each forest, the timing of these activities, and species sensitivity to disturbance. Under the No Action Alternative, existing ROW inspections (including both ground-based and aerial), maintenance of infrastructure, danger tree management, and access road maintenance would continue. WAPA's activities in ROWs occur during daylight hours and generally during the summer months. Maintenance may also occur in the spring and fall depending upon accessibility and other factors, and some aerial inspections of infrastructure and potential danger tree management can occur during the winter months. Emergency maintenance during the winter months relies upon over-the-snow vehicles to address infrastructure or danger tree issues. Standard maintenance procedures would serve to minimize potential effects on wildlife from ROW activities taken under the No Action Alternative.

Effects Common to Wildlife

Danger tree management would involve intermittent low-to-moderate use of mechanical felling or hand-felling of hazardous trees to mitigate immediate threats to infrastructure. Trees would be allowed to grow to a height of anywhere from 10 to 20 feet (depending on threats to infrastructure), but they would then be removed to maintain line safety and reduce threats to infrastructure. This type of maintenance regime would allow for early and mid-seral habitat conditions to persist or develop within forested landscapes, benefiting wildlife that favor these habitat conditions while providing little suitable habitat for species that require mature or interior forest conditions. Felling of danger trees could decrease canopy cover, alter the canopy structure, and increase the amount of large woody debris present, which would alter foraging habitat and prey species abundance for some species. Willows and other riparian vegetation are usually considered compatible with transmission lines and generally do not require intensive management. Many times, due to topography and tower placement, transmission lines span streams or rivers high enough to provide adequate clearance between riparian vegetation and the line. In limited cases where riparian vegetation may pose a hazard to a transmission line, hand-felling of hazardous trees would occur. Vegetation treatments would be anticipated in sagebrush, other xeric shrub habitats, prairies and xeric grasslands, generally to control noxious weeds or remove brush from around structures in fire-prone habitats. Consequently, minor to moderate habitat alteration would be expected for species that favor these habitat types.

If danger tree removal occurs during the spring and early summer nesting season for birds, the No Action Alternative could result in the destruction of nests and the loss of eggs or chicks. However, this risk would be minor because nesting surveys would be conducted prior to tree removal and active nests would be protected from harm until nesting is completed. Danger tree management could include cutting large conifers, hardwoods such as aspen, and snags from within the ROWs and in areas immediately adjacent to the ROWs if these trees are determined to pose a transmission line hazard.

Since the ROWs have been managed for many years to reduce danger trees, the occurrence of suitable nesting trees in the ROW is likely much lower than in adjacent habitats. Nevertheless, some nesting in trees and snags may occur in ROWs at this time, and small numbers of undetected nests could be at risk. Adult and fledged birds would flush during tree felling and thus avoid direct mortality.

Aerial inspections, ground-based inspections, and maintenance of infrastructure and roads could result in temporary, short-term noise and disturbances to wildlife on and adjacent to the ROWs. Because these events are generally of short duration and spatially limited, most of these disturbance impacts are unlikely to have a significant impact on wildlife's ability to forage, seek shelter, and reproduce effectively. Helicopter flights over transmission lines would occur 50 to 300 feet off the ground, at 50 to 95 miles per hour. During inspection flights, the helicopter generally makes one pass over an area but may circle or hover briefly to obtain a closer look at a potential issue. Flights may occur multiple times along a line throughout the year, but generally not on consecutive days. Aerial and ground inspections of the power lines that must occur during the avian breeding season may temporarily disrupt normal foraging or nesting activities for birds nesting near ROWs. This disturbance could result in various responses such as a startle response and/or flushing off nest, perch, or roost sites. Flushing could leave eggs and nestlings vulnerable to overheating, chilling, and predation, or could result in decreased prey delivery by adults to nestlings. Perch-and-hunt foraging activities of many raptors and other birds (e.g., flycatchers) could be disrupted by these activities. Large and medium-sized mammals would likely flee the disturbance area while small mammals, reptiles, and amphibians would seek nearby security cover. Although disturbance during the winter months when wildlife are often energy stressed can be adverse, the helicopter over flights would generally only last a few seconds in an area, limiting potential impacts to over winter survivorship, and ground based access would likely only occur if infrastructure was at immediate risk.

Disposal of danger trees and incompatible vegetation typically includes grinding and chipping. The work would include use of loud heavy equipment, or could be performed using a chainsaw or whole-tree chipper. Noise from chainsaws (106 to 117 decibels) or from chippers (150 decibels) could cause birds to flush and other wildlife to flee the area or seek cover. When these disturbances must occur during the breeding season, this could affect reproductive behavior, alter foraging activities, cause temporary or permanent abandonment of nests or dens, and expose young to the elements and to predation. The duration of these disposal efforts is generally short and lasts from one day to a week at a time within a specific given area. These disturbance effects are considered short-term and would be insignificant in relation to most species ability to forage, breed, and disperse. Individual animals may be adversely affected, but it is not expected that there would be measureable changes to populations or species densities.

Wildlife mortality or injury due to collisions with vehicles could occur when WAPA's staff and contractors access ROWs and drive to inspect infrastructure or conduct maintenance. Given the slow road speeds within ROWs and on access roads to ROWs, most wildlife should easily be able to avoid vehicular traffic. However, when moving between ROW access points, WAPA's crews may use improved roads outside of ROWs where traffic speeds are much higher. This could contribute to a small incremental increase in traffic-related wildlife mortalities. At times, there is a need for vehicles and equipment to leave existing roads and travel overland across the ROWs. Those species and individuals with small home ranges or a reduced capacity to flee, such as some small mammals, amphibians, and reptiles, particularly burrowing species, could be susceptible to crushing hazards. Undetected nests of ground nesting birds are also at risk when these events must occur during the nesting season. Helicopters used for aerial inspections of the transmission lines pose another mortality hazard for birds. These flights would occur at moderate to high speeds within the typical non-migratory flight altitude for most birds (i.e., below 500 feet [Smithsonian Migratory Bird Center 2012]). These various mortality hazards pose only a minor risk for wildlife due to the infrequent occurrence of these activities.

Increased erosion associated with maintenance of access roads, use of heavy equipment, and other soil disturbing activities can affect water quality and effectiveness of wetland habitats by washing fine sediments into adjacent ponds and wetland habitat. These fine sediments can degrade habitat for amphibians, resulting in longer incubation periods for frog and salamander egg masses, or even asphyxiation of eggs if sedimentation is extreme. Fine sediment delivery to wetlands and aquatic habitats can also reduce macro- and micro-invertebrate densities, thus reducing aquatic prey species for amphibians. Accidental spills or leaks of substances hazardous to wildlife may also occur during maintenance and could wash into wetlands and aquatic habitats. However, WAPA responds to any spills immediately and they are quickly cleaned up. WAPA would continue to follow standard maintenance procedures that minimize the delivery of sediments and contaminants to wetlands and aquatic habitats, limiting potential risk to wildlife. Use of herbicides for vegetation management within ROWs could pose a minor hazard to some wildlife species. This risk would be minimized by using spot applications (hand or powered sprayer) of Forest-Service approved herbicides, by following other standard maintenance procedures for herbicide use (see Table 2-15), and by following the application instructions per label requirements. WAPA uses herbicides to control noxious weeds or other undesirable, mostly herbaceous vegetation, generally around transmission line towers. While treatment of noxious weeds is generally beneficial to wildlife, some flowering noxious weeds (e.g., various thistles [*Cirsium* spp. and *Carduus* spp.]) could be removed that provide food and nectar sources for bees, butterflies, and other insects. These localized feeding losses would likely impact only small numbers of insects and would be short-term in duration, and management of noxious weeds and protection of native plant sources is more beneficial for wildlife species, rather than allowing noxious weeds to proliferate. Removal of noxious weeds allows native species to re-populate.

Threatened, Endangered, and Sensitive Wildlife

A detailed evaluation of the direct, indirect, and cumulative effects to threatened, endangered, and sensitive wildlife from the No Action Alternative is presented in the BE and MIS reports prepared for each national forest. These detailed analyses address species known or expected to occur in or near the project area, and those species having suitable habitat or documented ranges that lie on or near the ROWs. In reaching effects determinations, site specific factors unique to each forest and ROW, as well as standard maintenance procedures that would serve to minimize potential effects on wildlife, were considered relative to the life history and habitat needs of each species addressed. The general types of impacts considered are described above in *Effects Common to Wildlife*.

Table 3-47 presents a summary of the effects determinations. Four federally listed wildlife species: the Canada lynx, Gunnison sage-grouse, Southwestern willow flycatcher, and Mexican spotted owl, may be affected by the No Action Alternative. However, adverse effects are anticipated only for the lynx and only in the Grand Mesa, Uncompahgre, and Gunnison National Forest (GMUG). These adverse impacts to the lynx are described below in more detail. As many as 35 Forest Service sensitive species could be impacted by the No Action Alternative, but these effects would not be severe enough cause a trend to federal listing or a loss of species' viability.

Table 3-47. Effects Determinations Reached for Threatened, Endangered, and Forest Service Sensitive Species (Wildlife) Analyzed in the Biological Evaluations and Biological Assessments

Common Name	Scientific Name	Status	ARNF		ANF		GMUG		MBRNF		NNF		PSINF		SJNF		WRNF	
			No Action	Proposed Action	No Action	Proposed Action	No Action	Proposed Action	No Action	Proposed Action	No Action	Proposed Action	No Action	Proposed Action	No Action	Proposed Action	No Action	Proposed Action
Federally Listed Species																		
Canada lynx	*Lynx canadensis*	Threatened	MANLAA	MALAA	MANLAA	MANLAA	MALAA	MALAA	MANLAA	MALAA	-	-	MANLAA	MANLAA	No Effect	MANLAA	MANLAA	MALAA
New Mexico meadow jumping mouse	*Zapus hudsonius luteus*	Endangered	-	-	-	-	-	-	-	-	-	-	-	-	No Effect	No Effect	-	-
Mexican spotted owl	*Strix occidentalis lucida*	Threatened	-	-	MANLAA	MANLAA	MANLAA	MANLAA	-	-	-	-	MANLAA	MANLAA	MANLAA	MANLAA	-	-
Gunnison sage-grouse	*Centrocercus minimus*	Threatened	-	-	-	-	MANLAA	MANLAA	-	-	-	-	-	-	-	-	-	-
Southwestern willow flycatcher	*Empidonax traillii extimus*	Endangered	-	-	-	-	-	-	-	-	-	-	-	-	MANLAA	MANLAA	-	-
Uncompahgre fritillary	*Boloria acrocnema*	Endangered	-	-	-	-	No Effect	No Effect	-	-	-	-	No Effect	No Effect	-	-	-	-
Forest Service Sensitive Species																		
Rocky Mountain bighorn sheep	*Ovis canadensis*	Sensitive	No Impact	No Impact	MIINLV	MIINLV	-	-	-	-	MIINLV	MIINLV	MIINLV	MIINLV	-	-	-	-
North American wolverine	*Gulo gulo*	Sensitive	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	-	-	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact
River otter	*Lontra canadensis*	Sensitive	No Impact	No Impact	-	-	No Impact	MIINLV	-	-	-	-	-	-	No Impact	MIINLV	-	-
American marten	*Martes americana*	Sensitive	MIINLV	MIINLV	-	-	MIINLV	MIINLV	MIINLV	MIINLV	-	-	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV
Kit fox	*Vulpes macrotis*	Sensitive	-	-	-	-			-	-	-	-	-	-	MIINLV	MIINLV	-	-
Swift fox	*Vulpes velox*	Sensitive			-	-	-	-	-	-	No Impact	No Impact	-	-	-	-	-	-
Townsend's big-eared bat	*Corynorhinus townsendii*	Sensitive	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact
Spotted bat	*Euderma maculata*	Sensitive	-	-	No Impact	No Impact	No Impact	No Impact	-	-	-	-	-	-	No Impact	No Impact	No Impact	No Impact
Hoary bat	*Lasiurus cinereus*	Sensitive	MIINLV	MIINLV	-	-	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV
Fringed myotis	*Myotis thysanodes*	Sensitive	-	-	-	-	No Impact	No Impact	-	-	MIINLV	MIINLV	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact
Gunnison's prairie dog	*Cynomys gunnisoni*	Sensitive	-	-	-	-	MIINLV	MIINLV	-	-	-	-	-	-	MIINLV	MIINLV	-	-
Pygmy shrew	*Sorex hoyi*	Sensitive	MIINLV	MIINLV	-	-	MIINLV	MIINLV	MIINLV	MIINLV	-	-	-	-	-	-	MIINLV	MIINLV
Bald eagle	*Haliaeetus leucocephalus*	Protected by BGEPA	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV	-	-	-	-	-	-	MIINLV	MIINLV	MIINLV	MIINLV
Ferruginous hawk	*Buteo regalis*	Sensitive	No Impact	No Impact	-	-	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	-	-	No Impact	No Impact	No Impact	No Impact
Northern goshawk	*Accipiter gentilis*	Sensitive	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV
Northern harrier	*Circus cyaneus*	Sensitive	MIINLV	MIINLV	-	-	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV	-	-	MIINLV	MIINLV	MIINLV	MIINLV
American peregrine falcon	*Falco peregrinus anatum*	Sensitive	-	-	MIINLV	MIINLV	MIINLV	MIINLV	-	-	MIINLV	MIINLV	-	-	-	-	No Impact	No Impact
Boreal owl	*Aegolius funereus*	Sensitive	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV			MIINLV	MIINLV	-	-	MIINLV	MIINLV
Short-eared owl	*Asio flammeus*	Sensitive	-	-	-	-	-	-	-	-	No Impact	No Impact	-	-	-	-	-	-
Burrowing owl	*Athene cunicularia*	Sensitive	-	-	-	-	-	-	-	-	MIINLV	MIINLV	-	-	MIINLV	MIINLV	-	-
Flammulated owl	*Otus flammeolus*	Sensitive	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV	-	-	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV

Table 3-47. Effects Determinations Reached for Threatened, Endangered, and Forest Service Sensitive Species (Wildlife) Analyzed in the Biological Evaluations and Biological Assessments

Common Name	Scientific Name	Status	ARNF		ANF		GMUG		MBRNF		NNF		PSINF		SJNF		WRNF	
			No Action	Proposed Action	No Action	Proposed Action	No Action	Proposed Action	No Action	Proposed Action	No Action	Proposed Action	No Action	Proposed Action	No Action	Proposed Action	No Action	Proposed Action
Black tern	*Chlidonias niger*	Sensitive	No Impact	No Impact	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Long-billed curlew	*Numenius americanus*	Sensitive	-	-	-	-	-	-	-	-	MIINLV	MIINLV	-	-	-	-	-	-
Greater sage-grouse	*Centrocercus urophasianus*	Sensitive	MIINLV	MIINLV	MIINLV	MIINLV	-	-	MIINLV	MIINLV	-	-	-	-	-	-	MIINLV	MIINLV
Columbian sharp-tailed grouse	*Tympanuchus phasianellus columbianus*	Sensitive	-	-	-	-	-	-	MIINLV	MIINLV	-	-	-	-	No Impact	MIINLV	-	-
White-tailed ptarmigan	*Lagopus leucurus*	Sensitive	-	-	-	-	No Impact	No Impact	No Impact	No Impact	-	-	No Impact	No Impact	-	-	-	-
Lewis's woodpecker	*Melanerpes lewis*	Sensitive	-	-	-	-	MIINLV	MIINLV	-	-	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV	-	-
Three-toed woodpecker	*Progne subis*	Sensitive	-	-	MIINLV	MIINLV	-	-	-	-	-	-	-	-	-	-	-	-
Olive-sided flycatcher	*Contopus cooperi*	Sensitive	MIINLV	MIINLV	-	-	MIINLV	MIINLV	MIINLV	MIINLV	-	-	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV
Purple martin	*Progne subis*	Sensitive	-	-	-	-	MIINLV	MIINLV	MIINLV	MIINLV	-	-	-	-	MIINLV	MIINLV	MIINLV	MIINLV
Loggerhead shrike	*Lanius ludovicianus*	Sensitive	MIINLV	MIINLV	-	-	No Impact	No Impact	No Impact	No Impact	-	-	No Impact	No Impact	MIINLV	MIINLV	No Impact	No Impact
Grasshopper sparrow	*Ammodramus savannarum*	Sensitive	-	-	-	-	-	-	-	-	MIINLV	MIINLV	-	-	-	-	-	-
Sage sparrow	*Amphispiza bellii*	Sensitive	-	-	-	-	-	-	-	-	-	-	-	-	MIINLV	MIINLV	-	-
Brewer's sparrow	*Spizella breweri*	Sensitive	MIINLV	MIINLV	-	-	MIINLV	MIINLV	MIINLV	MIINLV	-	-	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV
McCown's longspur	*Calcarius mccownii*	Sensitive	-	-	-	-	-	-	-	-	MIINLV	MIINLV	-	-	-	-	-	-
Chestnut-collared longspur	*Calcarius ornatus*	Sensitive	-	-	-	-	-	-	-	-	MIINLV	MIINLV	-	-	-	-	-	-
Boreal toad	*Anaxyrus boreas boreas*	Sensitive	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV	-	-	MIINLV	MIINLV	MIINLV	MIINLV	-	-
Northern leopard frog	*Lithobates pipiens*	Sensitive	MIINLV	MIINLV	-	-	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV	-	-
Wood frog	*Lithobates sylvatica*	Sensitive	MIINLV	MIINLV	-	-	-	-	MIINLV	MIINLV	-	-	-	-	-	-	-	-
Hudsonian emerald dragonfly	*Somatochlora hudsonica*	Sensitive	MIINLV	MIINLV	-	-	-	-	MIINLV	MIINLV	-	-	-	-	-	-	-	-
Ottoe skipper	*Hesperia ottoe*	Sensitive	-	-	-	-	-	-	-	-	MIINLV	MIINLV	-	-	-	-	-	-
Regal fritillary	*Speyeria idalia*	Sensitive	-	-	-	-	-	-	-	-	MIINLV	MIINLV	-	-	-	-	-	-
Nokomis fritillary (aka Great Basin silverspot)	*Speyeria nokomis nokomis*	Sensitive	-	-	-	-	-	-	-	-	-	-	-	-	MIINLV	MIINLV	-	-
Susan's pursemaking caddisfly	*Ochrotrichia susanae*	Sensitive	-	-	-	-	-	-	-	-	-	-	MIINLV	MIINLV	-	-	-	-

Sources: RMES, Inc. and PENDO Solutions, Inc. 2012a-2012d, 2013b-2013e; RMES, Inc. & PENDO Solutions, Inc. 2014a-2014g; RMES, Inc. 2014

ARNF Arapaho-Roosevelt National Forest
ANF Ashley National Forest
GMUG Grand Mesa, Uncompahgre, and Gunnison National Forest
MALAA May affect, and is likely to adversely affect
MANLAA May affect, but is not likely to adversely affect
MIINLV May adversely impact individuals, but is not likely to result in a loss of viability on the project area, nor cause a trend to federal listing or a loss of species viability range-wide.
BGEPA Bald and Golden Eagle Protection Act
NNF Nebraska National Forest
PSINF Pike and San Isabel National Forest
MBRNF Medicine Bow-Routt National Forest
SJNF San Juan National Forest
WRNF White River National Forest

Grand Mesa, Uncompahgre, and Gunnison National Forest - Lynx Effects

Lynx occur in mesic coniferous forests that have cold snowy winters and support a prey base of snowshoe hare (Ruggiero *et al.* 2000). Lynx are occasionally documented near WAPA ROWs in the GMUG, although much of the ROWs have been cleared for many years and do not provide suitable lynx habitat (RMES, Inc. and PENDO Solutions, Inc. 2013c; RMES, Inc. and PENDO Solutions, Inc. 2014c). Danger tree management under the No Action Alternative would generally retain smaller trees and other vegetation that does not pose a hazard to transmission line infrastructure. This can allow for some snowshoe hare habitat and potential lynx foraging habitat to persist along project ROWs, or to become established in the future. Given WAPA's regular, though infrequent entries into the ROWs for aerial or ground-based inspections, maintenance, or danger tree treatments, lynx are subjected to low levels of human activities and disturbances. However, lynx should be able to avoid these activities and still use parts of the treatment areas and ROWs at night. Maintenance activities under the No Action Alternative are not expected to result in direct lynx mortality or prevent lynx from traveling through or using the ROWs, but traffic speeds on State Highway 50 over Monarch Pass are fast enough to pose a moderate to high-level risk to lynx from vehicle strikes. Considering the low amount of traffic anticipated to be generated by the No Action Alternative and low lynx numbers in this area, impacts to lynx from vehicle strikes are unlikely, but not discountable.

Long-term impacts under the No Action Alternative would include the continued absence of tree canopy cover from within the ROWs, sustained by the ongoing thinning of trees as they reach heights that pose a transmission line hazard and by incidental trampling of smaller understory trees from equipment and vehicles. Habitat for snowshoe hares and lynx within the ROWs would continue to decline in suitability and may effectively become non-habitat in many areas. Project ROWs through the GMUG lie within seven Lynx Analysis Units (LAUs) designated to evaluate the effects of land management actions on lynx habitat. These include Huntsman Mountain, Chalk Mountain, and Crater Lake LAUs on the Paonia Ranger District; Black Mesa, Pitkin, and Upper Tomichi LAUs within the Gunnison Ranger District; and Spring Creek and Lone Cone LAUs on the Ouray and Norwood Ranger Districts. Danger tree management may affect up to 160 acres of suitable lynx habitat in these LAUs, representing a very minor reduction in available and effective lynx habitat in the LAUs (on average, LAUs would see potential impacts to 0.06 percent of lynx habitats in the LAU) (RMES, Inc. and PENDO Solutions, Inc. 2013c; RMES, Inc. and PENDO Solutions, Inc. 2014c). These small losses should not stop lynx from using these LAUs as a home range or prevent a lynx from foraging, finding shelter, or reproducing.

The No Action Alternative could influence lynx distribution and habitat use patterns within the Crater Lake and Chalk Mountain LAUs. The ROWs lie adjacent to larger, more contiguous blocks of suitable lynx habitat, and could serve as an access route for snowmobilers from the Electric Mountain Lodge area to enter this suitable lynx habitat. Although snowmobile use of the ROWs already occurs, continued tree removal may result in additional snowmobile use. This could lead to more snow compaction deeper into larger blocks of lynx habitat in the Chalk Mountain and Crater Lake LAUs, allowing increased use by coyotes and other species that compete with lynx for prey. Consequently, an indirect impact to adjacent lynx habitats from the possible incursion of competitors into adjacent soft-snow habitats could occur. While the impact from ROW removal of danger trees would be insignificant to lynx, the potential increase of snowmobilers into lynx habitat blocks could reduce habitat effectiveness outside of the ROW.

In summary, the small amount of high quality lynx habitat that would be impacted for ROW maintenance would not cause lynx to abandon these areas and would not prevent lynx from establishing a home range in the affected LAUs. The No Action Alternative would not preclude lynx dispersal activities in the GMUG. With the exception of the Crater Lake and Chalk Mountain LAUs, the effects of these impacts would not likely produce a measureable, meaningful, or detectable impact to lynx, and impacts to lynx or lynx habitat would not likely rise to the level of take. However, considering the potential indirect impacts to lynx habitat in the Crater Lake and Chalk Mountain LAUs and a potential decline in habitat suitability around the ROW, there could be an adverse effect in the ability for lynx to fully use habitats in these LAUs, specifically for day-to-day use of a territory. For the reasons discussed above, the No Action Alternative *"may affect, and is likely to adversely affect"* Canada lynx.

Grand Mesa, Uncompahgre, and Gunnison National Forest – Gunnison Sage-Grouse Effects

Gunnison sage-grouse currently occur in seven populations in Colorado and Utah, the largest of which occupies Gunnison Basin including the Grand Mesa, Uncompahgre, and Gunnison National Forest. Approximately 14 percent of the oocupied Gunnison sage-grouse range in Gunnison Basin is managed by the U.S. Forest Service. Gunnison sage-grouse are sagebrush obligates that depend on a variety of shrub-steppe habitats for breeding, late-brood-rearing, fall, and winter requirements (USFWS 2005).

Breeding habitat includes leks, pre-laying, nesting, and early brood-rearing areas. Male Gunnison sage-grouse attend leks from mid-March to mid-May, which are typically in the same location from year to year. Leks have good visibility, low vegetation structure, and acoustical qualtities that allow sounds of breeding displays to carry. Leks are often surrounded by denser shrub-stepps cover, which is used for escape, thermal, and feeding cover. Nesting occurs from mid-April to June. The sagebrush understory of productive nesting areas contains native grasses and forbs, with horizontal and vertical structural diversity that provides food and cover for both the nesting female and offspring (USFWS 2005).

Danger tree management under the No Action Alternative would generally retain smaller trees and other vegetation that do not pose a hazard to transmission line infrastructure. Trees are not suitable habitat for Gunnison sage-grouse, which rely on a variety of sagebrush, forbs, and grasses to meet seasonal habitat requirements. Given WAPA's regular, though infrequent entries into the ROWs for aerial or ground-based inspections, maintenance, or danger tree treatments, Gunnison sage-grouse are subjected to low levels of human activities and disturbances, though they should be able to avoid these activities and still use parts of the treatment areas and ROWs both during the day and at night. Maintenance activities under the No Action Alternative are not expected to result in direct Gunnison sage-grouse mortality or prevent Gunnison sage-grouse from traveling through or using the ROWs. Considering the low amount of traffic anticipated to be generated by the No Action Alternative, timing of traffic generally occurring during the day, and the typical low vehicle speeds in ROWs, impacts to Gunnison sage-grouse from vehicle strikes are discountable.

Long-term impacts under the No Action Alternative would include the continued absence of tree canopy cover from within the ROWs, sustained by the ongoing thinning of trees as they reach heights that pose a transmission line hazard and by incidental trampling of smaller understory trees from equipment and vehicles. Habitat for Gunnison sage-grouse within the ROWs would generally improve as non-habitat (trees) are removed and convert naturally to habitat (shrubs, grasses, and forbs). Within 50 feet of transmission structures, trees and shrubs (including sagebrush) will be removed and maintained as absent. Within 50 feet of transmission structures, short grasses and forbs that do not affect WAPA's ability to meet human safety, Occupational Safety and Health Administration (OSHA) requirements for maintenance work on energized power lines will be permitted, as feasible.

The No Action Alternative could influence Gunnison sage-grouse distribution and habitat use patterns. As trees are removed from ROWs, ROWs may increase in use as access routes for snowmobilers. Although snowmobile use of the ROWs already occurs, continued tree removal may result in additional snowmobile use. This could lead to more snow compaction and more damage to shrubs including sagebrush. Consequently, while the impact from ROW removal of danger trees would benefit Gunnison sage-grouse and its designated critical habitat, the potential increase of snowmobilers into Gunnison sage-grouse habitat could reduce habitat effectiveness.

In summary, danger tree management may benefit designated critical habitat for the Gunnison sage-grouse. The small amount of sagebrush habitat that would be impacted for ROW maintenance would not cause Gunnison sage-grouse to abandon these areas and would not prevent Gunnison sage-grouse from using ROWs for lifecycle habitat requirements. As discussed, Gunnison sage-grouse are unlikely to be incidentally killed by vehicle traffic. For these reasons, the No Action Alternative *"may affect, but is not likely to adversely affect"* the Gunnison sage-grouse and its designated critical habitat.

Migratory Birds

If danger tree mitigation cannot be avoided during the spring and early summer nesting season, the No Action Alternative could destroy nests and eggs or chicks that are present. Pre-maintenance surveys for active nests would limit this potential impact to nests. Indirect take (e.g., nest failure due to abandonment) of nearby nests (including nests off of the ROWs) could also occur with disturbance, although reactions vary between bird species. Reactions can range from subtle body changes undetectable to human observers to aggressive defense behavior. Some birds may fly from the nest, leaving eggs and nestlings vulnerable to overheating, chilling, predation, or starvation.

Fledged birds and adults would likely avoid direct impacts, and birds that have not begun their seasonal migration would likely move to adjacent habitats to avoid loud machinery, vehicles, and human activity. Suitable nesting habitat along the ROWs would generally remain available for use by birds. During intensive vegetation management or infrastructure repair periods, increased traffic from WAPA's crews could contribute to a small incremental increase in injury or mortality from vehicle-bird collisions. This would likely be limited to improved roads outside of the ROWs where traffic speeds are much higher. Within ROWs and on access roads to ROWs, most birds should easily be able to avoid vehicular traffic because road speeds are slow. It is unlikely that the increased use of improved roadways would have a measurable effect on migratory bird nesting activities as areas adjacent to well-traveled roadways generally support lower nesting densities (Parris and Schneider 2008; Forman *et al.* 2002; Reinjnen *et al.* 1995).

Research indicates that noise associated with operation of heavy machinery can also lead to lower avian density and diversity in areas around the source (Forman 2000; Forman and Deblinger 2000). Noise can decrease usable habitat for birds by reducing the distance over which their calls and songs are heard, affecting territory defense, mate selection, and reproductive potential. Because most noise events associated with the No Action Alternative are of short duration and spatially limited, these disturbance impacts are not likely to have a significant impact on migratory bird populations. It is also important to recognize that the ROWs are infrequently visited by WAPA, and the ROWs see long periods of time with no human activities occurring along them. For the most part, there would be no activities along the ROWs which could impact otherwise available habitats.

Big Game

Big game species including mule deer, Rocky Mountain elk, bighorn sheep, and black bear may seasonally use portions of the project ROWs. Most big game species should easily avoid WAPA's maintenance activities, and direct impacts would likely be minor. There is a possibility of vehicular collisions with big game on access roads, but given the relatively low vehicle speeds on most access roads, this would likely be a rare occurrence. Increased traffic along improved roadways (outside of ROWs) during periods of intensive vegetation management or infrastructure repair could contribute to a small incremental increase in injury or mortality from vehicle collisions.

Continued danger tree management would keep ROWs relatively open, which would promote and sustain grass, forb, and shrub communities. This would provide additional grazing opportunities for big game during the growing season and allow for increased browsing on shrubs during the winter when snow cover may be present. Overall, continued maintenance of ROW vegetation should provide beneficial foraging conditions for most big game species.

Noise and human disturbances associated with danger tree mitigation and maintenance of transmission lines could cause big game to flee areas where actions are occurring. This could disrupt feeding and loafing behavior, disturb females during calving and fawning times, and affect use of big game winter range. Since WAPA's activities along ROWs are of relatively short duration and spatially limited, big game would be able to avoid most project-associated activities and would not likely be subjected to repeated disruptions. Survivorship of very young animals could be reduced if young were to become separated from their mothers. However, this is relatively unlikely given the narrow window when young are most susceptible to separation from their mothers, the short duration of the disturbances, and the limited areas subject to ROW inspections and maintenance. In CPW designated elk production (calving) areas, WAPA and the Forest Service may decide to preclude maintenance activities until after the calving season is over. WAPA generally does not conduct ground-based inspections or ROW maintenance activities during the winter months. Therefore, disturbances to big game wintering on or in the vicinity of the ROWs would be limited to helicopter inspections of the transmission lines and occasional emergency repairs to infrastructure. These short duration activities could temporarily cause big game to flee nearby areas, and could energetically stress animals coping with harsh winter conditions. However, because of the rarity and short-term nature of these winter activities, measureable impacts to big game populations would not be expected.

3.8.5.2 Proposed Action

This section describes direct and indirect effects of ROW vegetation management, access road maintenance, and transmission line maintenance practices under the Proposed Action. The general types of effects to wildlife resources from these proposed maintenance activities would be similar for all national forests in the project area across comparable habitats. In addition to standard maintenance procedures, WAPA would implement the design features presented in Table 2-13 to further protect environmental resources, including wildlife. Proposed activities in areas with sensitive wildlife species or important habitat features (e.g., big game winter range, sensitive avian nesting areas) would be modified to minimize or avoid adverse impacts based on additional coordination with the Forest Service. When maintenance cannot be scheduled after the avian nesting season, nesting surveys would be conducted before activities commence with the goal of avoiding disturbance or take of an active nest or migratory bird protected under the MBTA. If activity occurs during the raptor nesting seasons, WAPA would perform surveys and establish buffers to ensure noise and human disturbance do not contribute to nest abandonment.

Impacts to wildlife associated with the Proposed Action are described below under *Direct* and *Indirect Effects*. The consequences these actions would have on wildlife and their habitats are further analyzed under *Effects of the Proposed Action on Wildlife Resources*.

Direct Effects

Under the Proposed Action, the types of direct effects to wildlife resources would be similar to those described for the No Action Alternative. However, the magnitude of the effects from vegetation management would be greater than the No Action Alternative due to the more intensive vegetation management that would occur within the ROWs, especially in the short term (i.e., during the initial years when the vegetation management program is rolled out) until desired vegetation conditions are achieved. Added direct effects on wildlife under the Proposed Action could include those from increased manual and mechanical clearing, increased area subject to Forest Service-approved herbicides and plant growth regulators, and potentially the use of grazing to regulate vegetation in specific areas (however, this management tool would be employed infrequently and in small, discrete areas). Wildlife mortality or injury from vegetation clearing and from collisions with vehicles or equipment traveling off road through the ROWs could increase. Noise and disturbance impacts to wildlife associated with vegetation management would also exceed that of the No Action Alternative during the initial years when vegetation management would be more intensive. However, once desired vegetation conditions are achieved within ROWs, the frequency of these vegetation maintenance activities and their associated effects on wildlife would be reduced.

Indirect Effects

The types of indirect effects to wildlife resources under the Proposed Action would also be very similar to the No Action Alternative. As with direct effects, the magnitude of these indirect effects would be greater than the No Action Alternative due to the more intensive vegetation management actions occurring within the ROWs. Indirect effects to wildlife could include degradation of water quality and decreased wetland habitat effectiveness in wetlands and ponds from increased erosion and runoff; habitat degradation from the spread of noxious weeds or from grazing by livestock within ROWs; changes in the availability of forage or prey along the ROWs; behavioral disruptions to breeding and rearing of young during the initial years when vegetation management would be more intensive; changes in movements or dispersal of some wildlife across the ROWs; and long-term, but minor changes to the abundance and diversity of wildlife using the ROWs.

Effects of the Proposed Action on Wildlife Resources

As noted above, the types of direct and indirect effects to wildlife resources from project activities would be similar for all forests and comparable habitats and species in the project area. The extent of these impacts would depend upon the species and habitats present, the specific maintenance activities undertaken in each forest and habitat type, the timing of these activities, and species sensitivity to disturbance. The Proposed Action would address WAPA's ongoing ROW inspections (including both ground-based and aerial), as well as infrastructure and access road maintenance, in a manner similar to that described for the No Action Alternative. However, treatment of incompatible vegetation within ROWs would be more intensive under the Integrated Vegetation Management approach of the Proposed Action. Under this approach, WAPA would proactively manage vegetation growth and fuel conditions that could threaten transmission lines and infrastructure. ROW activities would continue to be performed during daylight hours and generally during the summer months. Maintenance would most likely occur during snow free periods depending upon accessibility and other factors, and some aerial inspections of infrastructure and emergency maintenance could occur during the winter. The implementation of standard maintenance procedures and design features would serve to minimize potential effects on wildlife from ROW activities taken under the Proposed Action. Once desired vegetation conditions are achieved within ROWs, the frequency of the vegetation maintenance activities and their associated effects on wildlife would be reduced.

Effects Common to Wildlife

The magnitude of impact to wildlife resources is higher under the Proposed Action than the No Action Alternative because the Proposed Action includes a more comprehensive, long-term, proactive vegetation management strategy for the ROWs, generally converting forested areas to grass and forb-dominated community types. Under the No Action Alternative, individual trees or small clumps of trees that pose a transmission line hazard are removed on an as-needed basis. ROWs would support a mix of young forest stands, riparian and wetland habitats, sagebrush and other xeric shrub communities, meadows, prairies and xeric grasslands. Woody debris has accumulated in some ROWs due to many years of vegetation management. Under the Proposed Action, WAPA has identified six categories of existing conditions in the ROWs to be used to guide vegetation management (see Table 2-3). These categories span vegetative conditions that pose little hazard to transmission lines and need relatively little vegetation management, to areas supporting incompatible vegetation in need of significant treatment to reach a desirable condition. Incompatible vegetation generally includes mature or fast growing trees which, because of their height potential, pose a transmission line hazard (e.g., coniferous trees and aspen), as well as vegetation and debris that present a potential fire hazard due to excessive fuel loading (e.g., regenerating stands of lodgepole pine and aspen, xeric shrub communities such as sagebrush and Gambel oak). However, though relatively small, there are areas where large mature trees may be maintained where lines span drainages and canyons if adequate clearance exists between vegetation and the transmission line conductors. Areas of incompatible vegetation would be cleared and ROWs would be maintained predominantly as stable, low growth communities of grasses and forbs, or as shrub communities or low growing trees that do not support high fuel loads. Removal and long-term management of incompatible vegetation would keep ROWs more open than under the No Action Alternative. Habitat conditions achieved under the Proposed Action would primarily benefit wildlife species that favor open herbaceous communities, low-density shrub communities, and forest-edge habitat.

Treatment of incompatible vegetation would be more intensive in the short-term (i.e., during the initial years when the vegetation management program is rolled out) until desired vegetation conditions are achieved, with less frequent follow-up treatments as determined by vegetation monitoring. Effects on wildlife from manual and mechanical clearing and from herbicide use would be similar to that described for the No Action Alternative. Because under the Proposed Action the treatments would generally be more intensive than under the No Action, overall impacts on wildlife would be greater. As detailed in Table 2-4, WAPA anticipates initially treating up to 1,610 acres of incompatible vegetation within the ROWs (Vegetation Management Categories 2, 4, and 6) under the Proposed Action, or 40 percent of the project area. Another 1,720 acres (42 percent of the project area) is currently in acceptable condition, but over the long-term will require monitoring and treatment for incompatible vegetation (Vegetation Management Categories 3 and 5). Vegetation management that cannot be conducted outside the avian nesting season (spring and early summer) could result in the destruction of nests and the loss of eggs or chicks. Noise and disturbance associated with heavy equipment, chain saws, chippers, and vehicles could also cause birds to flush and other wildlife to flee the area. When these activities occur during the breeding season, this could impact reproductive behavior, alter foraging activities and feeding of young, cause temporary or permanent abandonment of nests or dens, and expose young to the elements and to predation. Timing restrictions imposed for activities in sensitive wildlife habitat and pre-maintenance surveys for nesting birds would minimize these risks to wildlife. About 725 acres of ROW (18 percent of the project area) are not expected to require treatment for the duration of the authorization, but would be monitored to ensure conditions have not changed (Vegetation Management Category 1). Wildlife within these ROW segments would be subjected to infrequent, minor impacts, such as occasional disturbance associated with road maintenance or transmission line inspection and repair.

Reduced security cover in the treated ROWs could hamper movements by some small mammals, amphibians, and reptiles across the ROWs, reducing habitat connectivity for these species. This impact would be mitigated somewhat by the relatively narrow widths of the ROWs (25 to 175 feet), with potential impact to wildlife movements more likely with the wider ROWs. Wildlife associated with forest interiors is anticipated to still cross wider ROWs, albeit more likely when some cover from shrubs and regenerating trees is present, or where dense herbaceous cover occurs. Spanned drainages and canyons where little vegetation removal is planned would provide opportunities for movement and dispersal for those species most sensitive to a reduction in security cover.

Little alteration of wetland or riparian habitat is expected because standard maintenance procedures and design features would limit potential effects on these habitats and their associated wildlife. Willows and other wetland vegetation are generally considered by WAPA to be compatible with transmission lines. Protective measures in place would include restrictions on use of mechanical equipment within 100 feet of streams, riparian habitat, or wetlands (except as noted and authorized by the Forest Service); hand felling of danger trees within the 100-foot buffer; retaining trees within isolated wetlands and their buffer if the trees do not violate applicable electrical safety standards; and other measures to limit impacts to these high value wildlife habitats (see Table 2-13). In addition, a decontamination protocol would be followed for equipment used in areas that may harbor the chytrid fungus to prevent its spread to wetlands and ponds used by amphibians as breeding sites. The chytrid fungus is responsible for a potentially lethal skin disease that has contributed to amphibian population declines and species extinctions worldwide.

WAPA could use targeted grazing by livestock to control vegetation within ROWs. However, application of this control method is expected to be rare, if it is used at all. Grazing can have adverse effects on wildlife and their habitat by contributing to soil compaction, altering vegetation composition and diversity, and by competing with wildlife for available forage. Livestock often concentrate in riparian and wetland areas where trampling and overgrazing can degrade these sensitive wildlife habitats. Potential impacts to wetland and riparian resources would be minimized by limiting this vegetative management prescription to open field and pasture areas in the ROWs, away from water, wetland, and riparian locations. Use of grazing by WAPA to manage vegetation would be conducted in close coordination with the Forest Service to minimize potential impacts.

Wildlife mortality or injury due to collisions with vehicles could occur when WAPA's staff and contractors access ROWs and drive to inspect infrastructure or conduct maintenance. The slow road speeds within ROWs and on ROW access roads should allow most wildlife to avoid vehicular traffic. However, a small incremental increase in traffic-related wildlife mortalities could occur on improved roads outside of ROWs, where traffic speeds are much higher, as crews move between ROW access points. Wildlife mortalities could also occur when vehicles and equipment leave existing roads and travel overland across the ROWs. Those species and individuals with small home ranges or a reduced capacity to flee (e.g., amphibians, reptiles, small mammals, insects) would be susceptible to crushing hazards, as would undetected nests of ground nesting birds. Helicopters used for aerial inspections of the transmission lines represent another mortality hazard for birds. These various mortality hazards pose only a minor risk for wildlife due to the infrequent occurrence of these activities. However, the magnitude of impact to wildlife from vehicle collisions and equipment operating within ROWs could be higher than the No Action Alternative because more intensive vegetation management would occur during the initial years.

Impacts to wildlife from aerial inspections, ground-based inspections, and maintenance for infrastructure and roads are expected to be similar in scope and scale to that described for the No Action Alternative. These actions would result in temporary, short-term noise and disturbances to wildlife that are spatially limited and thus not expected to have a significant impact on wildlife's ability to forage, seek shelter, and reproduce effectively. Although disturbance from helicopter overflights during the winter months when wildlife are often energy stressed can be adverse, these overflights would generally only last a few seconds in an area and be relatively infrequent, limiting potential impacts to over-winter survivorship.

Mobilization of fine sediments into adjacent ponds and wetland habitat due to increased erosion from soil disturbing activities could degrade habitat for amphibians and aquatic macroinvertebrates. Accidental spills or leaks of substances hazardous to wildlife may also occur during maintenance and could wash into wetlands and aquatic habitats. WAPA would adhere to standard maintenance procedures and design features that limit the delivery of sediments and contaminants to wetlands and aquatic habitats and would comply with all federal and state wetland regulations, greatly minimizing the risk to wildlife. Use of herbicides and plant growth regulators for vegetation management within ROWs could also pose a hazard to some wildlife species, particularly insects and other invertebrates. This risk would be limited by targeting individual plants or small clumps of plants with spot or localized (site-specific) applications of Forest Service-approved herbicides, mainly to control noxious weeds or other undesirable vegetation, and by following herbicide label requirements. Treatment of some flowering noxious weeds (e.g., various thistles) could result in localized, short-term losses of food and nectar sources for bees, butterflies, and other insects, but control of noxious weeds and protection of native plant sources is more beneficial for wildlife species, rather than allowing noxious weeds to proliferate. In the event that herbicides accidentally enter water through either drift or misapplication, the potential risk would be limited by the low toxicity of the chemical, coupled with natural degradation and dilution. Nonetheless, the potential risk to wildlife from sediment runoff and contaminants may increase with the Proposed Action because more intensive vegetation management would occur within ROWs during the initial years as the vegetation management program is implemented.

Threatened, Endangered, and Sensitive Wildlife

A detailed evaluation of the direct, indirect, and cumulative effects to threatened, endangered, and sensitive wildlife from the Proposed Action is presented in the BE and MIS reports prepared for each national forest. These detailed analyses address species known or expected to occur in or near the project area, and those species having suitable habitat or documented ranges that lie on or in the vicinity of the ROWs. In reaching effects determinations, site specific factors unique to each forest and ROW, as well as standard maintenance procedures and design features that would minimize potential effects on wildlife, are considered relative to the life history and habitat needs of each species addressed. The general types of impacts considered are described above in *Effects Common to Wildlife*.

See Table 3-47 for a summary of the effects determinations. Four federally listed species: the Canada lynx, Gunnison sage-grouse, Southwestern willow flycatcher, and the Mexican spotted owl, could be affected by the Proposed Action. However, adverse effects are anticipated only for lynx in the Arapaho and Roosevelt National Forests; the Grand Mesa, Uncompahgre, and Gunnison National Forest; the Medicine Bow-Routt National Forest; and the White River National Forest. These adverse impacts to lynx are summarized below in more detail (see Appendix F for 2014 Biological Opinion with USFWS for more information). As many as 36 Forest Service sensitive species could be impacted by the Proposed Action, but these effects would not be severe enough to cause a trend toward federal listing or a loss of species' viability.

Arapaho and Roosevelt National Forests – Lynx Effects

The Proposed Action encompasses WAPA's ongoing inspection and maintenance of infrastructure and access roads, and a change from danger tree mitigation to a more comprehensive and intensive vegetation management strategy as part of the reauthorization of WAPA's ROWs. The proposed vegetation management strategy would involve the conversion of incompatible vegetation within ROWs (i.e., fast growing trees and fire prone vegetation) to compatible grass, forb, and low-growing shrub communities. This would lead to long, linear corridors maintained in a grass/forb dominated condition, effectively converting suitable lynx habitat into non-habitat within treated ROWs. Little to no winter foraging or hiding cover for lynx prey (i.e., snowshoe hare) would remain within treated ROWs; however, the treated ROWs would not likely create a barrier to lynx movement or dispersal because the lynx design feature, if needed, would retain connectivity between suitable habitat on either side of the ROW where vegetation requires ROW treatment. Ultimately, lynx presence in and around these linear ROWs would depend upon the extent and suitability of the surrounding landscape to support lynx.

Although lynx are occasionally observed north of I-70 in the Arapaho-Roosevelt National Forest, no significant lynx activities are known in and around the Project ROWs (RMES, Inc. and PENDO Solutions, Inc. 2013b; RMES, Inc. and PENDO Solutions, Inc. 2014b). Given WAPA's regular though infrequent entries into the ROWs for aerial or ground-based inspections, maintenance, and danger tree treatments, lynx are already subjected to low levels of human activities and disturbances. Although disturbances may increase under the Proposed Action in the initial years when the vegetation management program is implemented, lynx should be able to avoid these activities and still use parts of the treatment areas and ROWs at night. Once desired vegetation conditions are achieved within ROWs, the frequency of these vegetation maintenance activities and their associated disturbances on lynx would be reduced. Maintenance activities under the Proposed Action are not expected to result in direct lynx mortality or prevent lynx from traveling through ROWs or using adjacent suitable habitats. Roadways within the Arapaho-Roosevelt National Forest would see continued use by WAPA's staff and contractors, but none are high-speed roadways that could pose a risk to lynx from vehicle strikes. Off-forest traffic increases are expected to be very minor (i.e., less than 0.01 percent increase in daily traffic), and represent a discountably low potential effect to lynx considering how small the increase in traffic would be (RMES, Inc. and PENDO Solutions, Inc. 2013b; RMES, Inc. and PENDO Solutions, Inc. 2014b).

ROWs through the Arapaho-Roosevelt National Forest lie within two LAUs designated to evaluate the effects of land management actions on lynx habitat. These include the Laramie LAU on the Canyon Lakes Ranger District and the Williams Fork LAU within the Sulphur Ranger District. In the Laramie LAU, increased ROW clearing may lead to an increase in snowmobile use and associated snow compaction in areas currently dominated by poor quality lynx habitat due to widespread mountain pine beetle mortality and recent Forest Service salvage efforts. Since the ROW already supports consistent snowmobiling use during the winter months, opportunities already exist for coyote and other species that compete with lynx for prey to access these areas. Nevertheless, implementation of the Proposed Action could lead to additional snow compaction into the surrounding area. Vegetation management along ROWs within the Laramie LAU would convert about 122 acres of mapped lynx habitat to non-habitat, which is approximately 0.19 percent of remaining effective habitats in the LAU (RMES, Inc. and PENDO Solutions, Inc. 2013b; RMES, Inc. and PENDO Solutions, Inc. 2014b). Given the predominance of poor quality habitat for snowshoe hare and lynx in this area, these losses would not likely have a significant impact on lynx or lynx habitats in the LAU. As the surrounding area recovers from mountain pine beetle damage and conditions improve for snowshoe hare and lynx, the Proposed Action would not preclude the ability for snowshoe hare or lynx to use these habitats.

ROWs in the Williams Fork LAU are relatively steep and have poor snowmobiling access. Similar to the Laramie LAU, substantial areas of lodgepole pine habitat have been decimated by the mountain pine beetle. The Proposed Action would not improve access or increase suitability for snowmobiling, and no significant increase in snow compaction would be expected. Long-term, clearing of incompatible vegetation within the ROWs would convert a very small amount of potentially suitable lynx habitat (about 82 acres or 0.09 percent of suitable habitat in the LAU) to non-habitat. In these dead lodgepole pine stands, snowshoe hare densities would likely be on the lower end of the density spectrum (i.e., <0.5 hares/ha), and lynx foraging opportunities would be more limited in these early seral stand types adjacent to the ROW.

In summary, the Proposed Action would result only in minor direct losses of available and effective lynx habitat in the ROWs, due in part to WAPA's many years of managing the ROWs for transmission line safety. However, in areas where removal of incompatible vegetation and maintenance of early seral, unsuitable habitats would occur, no effective snowshoe hare or lynx habitat would likely remain. The conversion of small areas of suitable habitat to non-habitat should not prevent lynx from establishing a home range or to deter lynx from foraging, finding shelter, or reproducing in the affected LAUs. However, habitat suitability along the ROWs may decline due to increased snowmobile use, snow compaction, and decreased snowshoe hare densities. The long-term management of the ROWs as non-habitat may reduce habitat connectivity for resident lynx but would not likely impact dispersing lynx. As the surrounding forest recovers from mountain pine beetle mortality, suitable habitat may re-develop. Mitigation using blocks of denser vegetation cover could improve connectivity across the ROW and help maintain movement of resident lynx. Within these two LAUs, these impacts would not likely rise to the level of take. However, any additional loss of suitable habitat may likely be an adverse effect given that these LAUs have a large amount of habitat currently impacted by mountain pine beetle. For the reasons summarized above and described in more detail in the 2014 USFWS Biological Opinion (see Appendix F), the Proposed Action "may affect, and is likely to adversely affect" Canada lynx.

Grand Mesa, Uncompahgre, and Gunnison National Forests - Lynx Effects

Lynx are occasionally documented near WAPA ROWs in the GMUG, although much of the ROWs have been cleared for many years and do not provide suitable lynx habitat (RMES, Inc. and PENDO Solutions, Inc. 2013c; RMES, Inc. and PENDO Solutions, Inc. 2014c). Given WAPA's regular though infrequent entries into the ROWs for aerial or ground-based inspections, maintenance, and danger tree treatments, lynx are already subjected to low levels of human activities and disturbances. Although disturbances may increase under the Proposed Action in the initial years when the vegetation management program is rolled out, lynx should be able to avoid these activities and still use parts of the treatment areas and ROWs. Once desired vegetation conditions are achieved within ROWs, the frequency of these vegetation maintenance activities and their associated disturbances on lynx would be reduced. Maintenance activities under the Proposed Action are not expected to result in direct lynx mortality or prevent lynx from traveling through ROWs or using adjacent suitable habitats. Roadways within the GMUG would see continued use by WAPA's staff and contractors, including State Highway 50 over Monarch Pass, which is the only high speed roadway through lynx habitat likely to be used by WAPA's staff and contractors. Traffic increases on SH-50 are expected to be very minor (i.e., less than 0.01 percent increase in daily traffic), and represent a discountably low potential effect to lynx considering how small the increase in traffic would be (RMES, Inc. and PENDO Solutions, Inc. 2013c; RMES, Inc. and PENDO Solutions, Inc. 2014c). Nevertheless, should a vehicle strike occur, the impact to lynx would be significant.

Project ROWs through the GMUG lie within seven designated Lynx Analysis Units: Huntsman Mountain, Chalk Mountain, and Crater Lake LAUs on the Paonia Ranger District; Black Mesa, Pitkin, and Upper Tomichi LAUs within the Gunnison Ranger District; and Spring Creek and Lone Cone LAUs on the Ouray and Norwood Ranger Districts. Vegetation management associated with the Proposed Action would result in the long-term conversion of small amounts of suitable or potentially suitable habitat for lynx to non-habitat, as follows: Huntsman Mountain LAU - 5.8 acres; Chalk Mountain LAU - 3.5 acres; Crater

Lake LAU - 17.2 acres; Black Mesa LAU - 7.2 acres; Pitkin LAU – 4.1 acres; Upper Tomichi LAU – 46.3 acres; and Spring Creek LAU – 84.9 acres. No lynx habitat would be affected on the Lone Cone LAU. WAPA's many years of managing the ROWs for transmission line safety account, in part, for the limited abundance of suitable lynx habitat in the ROWs. In areas where removal of incompatible vegetation and maintenance of early seral, unsuitable habitats would occur, no effective snowshoe hare or lynx habitat would likely remain in the ROWs. Nevertheless, the conversion of these small areas of suitable habitat to non-habitat should not prevent lynx from establishing a home range or to deter lynx from foraging, finding shelter, or reproducing in the affected LAUs.

The Proposed Action could indirectly contribute to an increase in human activities (primarily winter recreation) within some ROWs on the GMUG, which may reduce the effectiveness of lynx habitat adjacent to the ROWs. Where access is available, increased ROW clearing may lead to higher snowmobile use within the ROWs. The resulting snow compaction from snowmobiles can allow for increased movement by coyotes and other species that compete with lynx for prey into adjacent soft-snow habitats where lynx are superior predators. In addition, increased noise and human presence from snowmobiles and other winter recreational activities along the ROWs could further diminish suitability of adjacent lynx habitat. Within ROWs on the GMUG, these conflicts could be problematic on the Crater Lake and Chalk Mountain LAUs where the ROWs pass through large, intact blocks of lynx habitat. These ROWs also occur near the locally popular Buzzard Park and Electric Mountain Lodge snowmobiling areas. Although snowmobile use of the ROWs is already occurring during the winter months, the opportunity for additional snowmobile use could occur under the Proposed Action. While the ROWs would not be promoted as a snowmobiling route, the indirect impacts of creating a long, open corridor through the Crater Lake and Chalk Mountain LAUs cannot be discounted, there may be minor adverse impacts to lynx and lynx habitat that may result from increased snowmobile use on the ROWs. Snowmobile impacts may also occur on other LAUs crossed by ROWs (e.g., Pitkin, Upper Tomichi, Spring Creek), but these would not substantially affect existing conditions due to factors such as poor snowmobiling access and terrain, presence of low quality lynx habitat, and existing widespread use by snowmobiles.

As the ROW passes through larger, contiguous blocks of suitable habitat in the Crater Lake and Chalk Mountain LAUs, the more open ROW conditions would likely create a "soft-barrier" for a lynx using the area as a home range. Lynx using a home range would not likely choose to crisscross the ROW multiple times during foraging bouts, and a lynx may choose to reduce their home range or change the boundary of a home range in order to avoid crisscrossing a ROW. This may be considered an adverse effect to lynx. A dispersing lynx (as opposed to a lynx using a home range) would likely adapt to crossing the ROW.

Within the Crater Lake and Chalk Mountain LAUs mitigation to maintain connectivity could be applied to the treated ROWs. Creating retention blocks of denser vegetation cover periodically and on a rotational basis, would help to maintain habitat connectivity and help to prevent the effects of fragmentation described above for resident lynx. With the exception of the Crater Lake and Chalk Mountain LAUs, there would be only minor potential impacts to lynx or lynx habitat, and impacts to lynx or lynx habitat would not likely rise to the level of take. However, considering the potential indirect impacts to lynx habitat connectivity and habitat effectiveness in the Crater Lake and Chalk Mountain LAUs for the full use of a lynx territory, and a potential decreased effectiveness of habitats around these ROWs, there could be an adverse effect in the ability for lynx to fully use habitats in these LAUs as a home range. Using mitigation to retain blocks of denser vegetation cover would decrease the effects of fragmentation on resident lynx to maintain habitat connectivity, but this may not completely avoid impacts. For the reasons discussed above, the Proposed Action “may affect, and is likely to adversely affect” Canada lynx.

Grand Mesa, Uncompahgre, and Gunnison National Forest - Grouse Effects

Habitat for Gunnison sage-grouse within the ROWs would generally improve as non-habitat (trees) are removed and convert naturally to habitat (shrubs, grasses, and forbs). Within 50 feet of transmission structures, trees and shrubs (including sagebrush) will be removed and maintained as absent. Within 50 feet of transmission structures, short grasses and forbs that do not affect WAPA’s ability to meet human safety, Occupational Safety and Health Administration (OSHA) requirements for maintenance work on energized power lines will be permitted, as feasible.

The Proposed Action could influence Gunnison sage-grouse distribution and habitat use patterns. As trees are removed from ROWs, ROWs may increase in use as access routes for snowmobilers. Although snowmobile use of the ROWs already occurs, continued tree removal may result in additional snowmobile use. This could lead to more snow compaction and more damage to shrubs including sagebrush. Consequently, while the impact from ROW removal of danger trees would benefit Gunnison sage-grouse and its designated critical habitat, the potential increase of snowmobilers into Gunnison sage-grouse habitat could reduce habitat effectiveness.

In summary, danger tree management may benefit designated critical habitat for the Gunnison sage-grouse. The small amount of sagebrush habitat that would be impacted for ROW maintenance would not cause Gunnison sage-grouse to abandon these areas and would not prevent Gunnison sage-grouse from using ROWs for lifecycle habitat requirements. As discussed, Gunnison sage-grouse are unlikely to be incidentally killed by vehicle traffic. For these reasons, the Proposed Action *“may affect, but is not likely to adversely affect”* the Gunnison sage-grouse and its designated critical habitat.

Medicine Bow-Routt National Forest - Lynx Effects

Although lynx are occasionally observed north of I-70 in the Medicine Bow-Routt National Forest, the extent of lynx use of habitats around the Project ROWs is not known (RMES, Inc. and PENDO Solutions, Inc. 2013d; RMES, Inc. and PENDO Solutions, Inc. 2014d). Given WAPA’s regular though infrequent entries into the ROWs for aerial or ground-based inspections, maintenance, and danger tree treatments, lynx are already subjected to low levels of human activities and disturbances. Although disturbances may increase under the Proposed Action in the initial years when the vegetation management program is rolled out, lynx should be able to avoid these activities and still use parts of the treatment areas and ROWs at night. Once desired vegetation conditions are achieved within ROWs, the frequency of these vegetation maintenance activities and their associated disturbances on lynx would be reduced. Maintenance activities under the Proposed Action are not expected to result in direct lynx mortality, or prevent lynx from traveling through ROWs or using adjacent suitable habitats. Roadways within the Medicine Bow-Routt National Forest would see continued use by WAPA’s staff and contractors, including State Highway 134 over Lynx Pass, which is the only high speed roadway through lynx habitat likely to be used by WAPA’s staff and contractors. Traffic increases on SH-134 are expected to be very minor (i.e., less than one percent increase in daily traffic), and represent a discountable low potential effect to lynx considering how small the increase in traffic would be (RMES, Inc. and PENDO Solutions, Inc. 2013d; RMES, Inc. and PENDO Solutions, Inc. 2014d). Nevertheless, should a vehicle strike occur, the impact to lynx would be significant.

ROWs through the Medicine Bow-Routt National Forest lie within five designated Lynx Analysis Units: Horse Thief, Walton Peak, Mount Werner, Lynx Pass, and Red Dirt. ROWs through the Horse Thief and Walton Peak LAUs cross areas that lack suitable lynx habitat, and the Proposed Action is not expected to impact lynx or lynx habitat in these LAUs. ROWs in the Mount Werner LAU occur within the Rabbit Ears & Buffalo Pass Winter Recreation Area. This recreation area is heavily used by snowmobilers and other non-motorized winter recreationists, and supports multiple compacted routes in and around the ROWs. The area also generally lacks large blocks of diurnal security habitat for lynx. Extensive snowmobile use of the ROWs already provides access for coyote and other species that compete with lynx for prey, and may reduce suitability of the area for snowshoe hare use. Although the Proposed Action could lead to additional snow compaction into the surrounding area, habitat suitability of this area for lynx is already poor due to the high winter recreation use and widespread mountain pine beetle mortality to lodgepole pine stands. Vegetation management along ROWs within the Mount Werner LAU would convert about 108 acres of suitable lynx habitat to non-habitat, representing a 0.34 percent decline in suitable habitat in the LAU (RMES, Inc. and PENDO Solutions, Inc. 2013d; RMES, Inc. and PENDO Solutions, Inc. 2014d). An additional 10.4 acres of unsuitable habitat would be converted to non-habitat in perpetuity. Since most of the surrounding lynx habitat is not conducive for long-term lynx residency, the Proposed Action would not likely have a significant impact on lynx or lynx habitat in the Mount Werner LAU. As the surrounding area recovers from mountain pine beetle damage and conditions improve for snowshoe hare and lynx, the Proposed Action would not preclude the ability for snowshoe hare or lynx to use these habitats. The ROWs may, however, diminish habitat connectivity for lynx using a home range within a larger block of suitable and effective habitats.

Widespread conversion of suitable lynx habitats to young regenerating forest stands has occurred in much of the Lynx Pass and Red Dirt LAUs, a consequence of mountain pine beetle damage and related Forest Service salvage logging. Prior danger tree management has also rendered much of the habitat within the ROWs unsuitable for lynx. Further vegetation removal under the Preferred Action could result in additional snowmobile use on the more accessible sections of the ROWs. Since snowmobile activities already occur throughout most of the Lynx Pass and Red Dirt LAUs, some incursion by coyote and other species that compete with lynx for prey may already be occurring. An increase in snowmobile use within the ROWs could allow further access by competitors into blocks of adjacent soft-snow habitats used by lynx. Vegetation management along ROWs within the Lynx Pass LAU would convert about 135 acres of suitable lynx habitat to non-habitat, representing a 0.24 percent decline in suitable habitat in the LAU (RMES, Inc. and PENDO Solutions, Inc. 2013d; RMES, Inc. and PENDO Solutions, Inc. 2014d). Vegetation management in the Red Dirt LAU would remove about 71.4 acres of suitable lynx habitat, a 0.36 percent decrease in suitable habitats. Although these expected losses are very small, these LAUs have already incurred substantial losses of suitable lynx habitat—about 36 percent of the Lynx Pass LAU is currently unsuitable for lynx, and 50 percent of the Red Dirt LAU is currently unsuitable. Further losses of suitable habitat in these LAUs could be detrimental towards snowshoe hare and lynx. Applying mitigation by retaining blocks of denser vegetation cover in the parts of the ROWs with surrounding suitable habitat would help to retain habitat connectivity for movements of resident lynx and could help to retain winter habitat conditions for both lynx and snowshoe hares in the Lynx Pass and Red Dirt LAUs.

In summary, the Proposed Action would result only in minor direct losses of available and effective lynx habitat in the ROWs, due in part to WAPA's many years of managing the ROWs for transmission line safety. However, in areas where removal of incompatible vegetation and maintenance of early seral, unsuitable habitats would occur, no effective snowshoe hare or lynx habitat would likely remain. The conversion of small areas of suitable habitat to non-habitat should not prevent lynx from establishing a home range or to deter lynx from foraging, finding shelter, or reproducing in the affected LAUs. However, habitat suitability along the ROWs may decline due to increased snowmobile use, snow compaction, and decreased snowshoe hare densities. Disturbances from increased snowmobiling and other winter recreational activities along the ROWs could further diminish habitat suitability. The open

ROW conditions in larger blocks of suitable lynx habitat may reduce habitat connectivity for resident lynx but would not likely impact dispersing lynx. When considering that currently unsuitable habitat conditions for lynx in the Lynx Pass and Red Dirt LAUs already comprise 36 percent and 50 percent of the LAUs, respectively, additional loss of suitable habitat may be considered an adverse effect. Lynx using a home range may see a decrease in habitat connectivity across a ROW. Mitigation applied to retain blocks of denser vegetation cover in these areas would help to maintain habitat connectivity and permit movement of resident lynx. Therefore, for the reasons discussed above, the Proposed Action "may affect, and is likely to adversely affect" Canada lynx.

White River National Forest - Lynx Effects

Given WAPA's regular though infrequent entries into the ROWs for aerial or ground-based inspections, maintenance, and danger tree treatments, lynx are already subjected to low levels of human activities and disturbances. Although disturbances may increase under the Proposed Action in the initial years when the vegetation management program is rolled out, lynx should be able to avoid these activities and still use parts of the treatment areas and ROWs. Once desired vegetation conditions are achieved within ROWs, the frequency of these vegetation maintenance activities and their associated disturbances on lynx would be reduced. Maintenance activities under the Proposed Action are not expected to result in direct lynx mortality, or prevent lynx from traveling through ROWs or using adjacent suitable habitats. Other roadways would see continued WAPA traffic, but there are no high-speed roadways likely to be used by WAPA that are within the White River National Forest. Off-forest increased traffic is expected to be very minor (i.e., less than 0.01 percent increase in daily traffic), and there is a discountable low potential effect to lynx given how little increased traffic would occur. Nevertheless, should a vehicle strike occur, the impact to lynx would be significant.

ROWs through the White River National Forest lie within three designated LAUs: Blue River, Mahan, and Divide Creek. In the Divide Creek and Mahan LAUs, there would be no impact to lynx habitat, and no activities or management of the ROW would prevent lynx from dispersing across the mostly ineffective habitats within and around the ROW.

In the Blue River LAU, widespread conversion of suitable lynx habitats to young regenerating forest stands has occurred due to mountain pine beetle damage, danger tree mitigation, and salvage logging. In the long-term, approximately 43 acres (or 0.06%) of potentially suitable habitats in the Blue River LAU would be converted to non-habitat, which is a very small amount of habitat; however, the Blue River LAU is currently 48 percent unsuitable habitat. In recently killed lodgepole pine stands (including salvaged and un-salvaged stands), snowshoe hare densities would likely be on the lower end of the density spectrum (i.e., less than 0.5 hares per hectare), and lynx foraging opportunities would be limited in these early seral stand types adjacent to the ROWs.

In summary, the Proposed Action would result in minor direct losses in available and effective lynx habitat in the ROWs, due in part to WAPA's many years of managing the ROWs for transmission line safety. However, in areas where removal of incompatible vegetation and maintenance of early seral, unsuitable habitats would occur, no effective snowshoe hare or lynx habitat would likely remain. The conversion of suitable and unsuitable habitats to non-habitat should not prevent lynx from establishing a home range or to prevent lynx from foraging, finding shelter, or reproducing in the Blue River LAU. However, habitat suitability along the ROWs may decline due to potential increased snowmobile use, snow compaction, and decreased snowshoe hare densities. The cleared ROW could produce a "soft" boundary for a resident lynx using a territory where a lynx would not repeatedly crisscross a ROW during foraging bouts, and therefore there may be some level of habitat fragmentation for a resident lynx. This "soft" boundary would not be a deterrent for a dispersing lynx or a lynx making more long-range movements. Given that the Blue River LAU is already 48 percent in unsuitable habitat condition, additional loss of suitable habitat may be considered detrimental to lynx. Therefore, for the reasons discussed above, the Proposed Action “may affect, and is likely to adversely affect” Canada lynx.

Migratory Birds

The Proposed Action would convert approximately 1,610 acres of incompatible, right of way vegetation (mainly of regenerating forest and high fuel shrub stands) within the ROWs to grass/forb community types, and another 1,720 acres would require long-term monitoring and treatment for incompatible, right of way vegetation. Because of these actions, nesting habitat within the treated ROWs would decline for migratory birds associated with younger forest stands of lodgepole pine, spruce-fir, aspen, and ponderosa pine, as well as those species that use dense stands of shrubs such as sagebrush and Gambel oak. Declines could also occur for some interior forest bird species in forestland adjacent to recently treated ROWs. However, nesting habitat for migratory birds that favor grassland/meadow habitats, open shrublands, and forest edge would increase.

Vegetation management conducted during the spring and early summer nesting season could result in the destruction of nests, eggs, and/or chicks. However, timing restrictions and pre-maintenance surveys for nesting birds would limit this potential impact to nests that go undetected during surveys. Indirect take (e.g., nest failure due to abandonment) of nearby nests (including nests off of the ROWs) could also occur because of noise and human presence associated with the use of heavy equipment, chain saws, chippers, and vehicles. Project-associated increases in traffic along improved roads outside of ROWs could contribute to a small incremental increase in injury or mortality from vehicle-bird strikes. These potential risks to migratory birds would be greater than under the No Action Alternative because more intensive vegetation management would occur within the ROWs, especially in the initial years as the vegetation management program is rolled out. However, once desired vegetation conditions are achieved within ROWs, the frequency of these vegetation maintenance activities and their associated effects on migratory birds would be reduced.

The Proposed Action could contribute to a local reduction in migratory bird species that use young forest stands of lodgepole pine, spruce-fir, aspen, and ponderosa pine, and dense shrublands of sagebrush and Gambel oak. Some of these birds would be displaced to adjacent suitable or suboptimal habitats outside of the project area where they may successfully compete for remaining available resources. Conversely, the Proposed Action may result in a local increase in migratory birds that favor grasslands, meadows, open shrublands, and forest edge. When considered at the regional scale, these local changes to migratory bird habitats would be minor due to the relatively small amount of habitat to be modified and the broad geographic extent of the ROWs. No detectable changes in migratory bird populations would be anticipated.

Big Game

The more intensive removal and the long-term management of incompatible vegetation would keep ROWs more open than under the No Action Alternative, as regenerating forest and high fuel shrub stands are converted to grass/forb community types. This would provide additional grazing opportunities for big game during the growing season, but could lead to a decline in available browse, berries, and mast (acorns) as shrubs and resprouting aspen are regularly treated. However, big game’s ability to procure browse outside of the linear ROWs would not be affected. Although security cover within the ROWs would decline, this should not deter use by big game (e.g., foraging, movements) because the corridors are relatively narrow (25 to 175 feet). Overall, the more intensive management of ROW vegetation should provide beneficial foraging conditions for most big game species, exceeding that under the No Action Alternative.

The likelihood of vehicular collisions with big game is very small on ROW access roads given the low vehicle speeds. However, a small incremental increase in traffic-related mortalities could occur on improved roads outside the ROWs where traffic speeds are much higher whenever WAPA's staff and contractors move between ROW access points. This collision risk, though small, would exceed that for the No Action Alternative during the initial years when more intensive vegetation management (and associated traffic) would occur.

Similar to the No Action Alternative, most big game species should easily be able to avoid WAPA's transmission line inspections and maintenance activities, and direct impacts would likely be minor. Although there would be intermittent, short-term disturbances to big game using habitats within and adjacent to the ROWs, significant or long-term disturbances are not expected. Disturbances to big game wintering on or in the vicinity of the ROWs would be limited to helicopter inspections of the transmission lines and occasional emergency repairs to infrastructure. Because of the rarity and short-duration of these winter activities, measureable impacts to big game populations would not be expected. Noise and human disturbances associated with the proactive vegetation management of the Proposed Action would exceed that of the No Action Alternative during the initial years as the vegetation management program is implemented. These disturbances should have no adverse impacts on forest-level populations of big game species.

3.8.5.3 Cumulative Effects

There are two legal definitions for cumulative effects as they relate to impacts analysis for threatened and endangered wildlife species. Under NEPA, cumulative impacts are the incremental impacts of the Proposed Action when added to other past, present, and reasonably foreseeable future federal, state, and private activities (40 CFR 1508.7). Under the ESA, "cumulative effects" only consider future non-federal activities that are reasonably certain to occur in the action area for listed species considered in the analysis (USFWS 1998). Future federal activities and activities permitted by federal agencies are not included under ESA cumulative effects because agencies conducting activities that could adversely affect threatened or endangered species must consult with the USFWS, pursuant to ESA Section 7.

The WAPA transmission line ROWs analyzed in the project area cross numerous habitats in Colorado, western Nebraska, and Utah. Appendix A identifies approximately 20 past, present, and reasonably foreseeable programs, activities, or events adjacent to the project area ROWs that could affect wildlife and their habitat. These primarily include wildland urban interface fire hazard reduction, wildfire landscape restoration and fuel reduction, salvage operations on forested areas afflicted with mountain pine beetle or spruce beetle, logging and danger tree removal, ponderosa pine conservation and restoration, vegetation removal for wildlife conservation and habitat creation, management of noxious weeds and nonnative invasive vegetation, analysis and construction of motorized single-track recreation trails, and grazing management. These actions could have both adverse and beneficial and cumulative effect on wildlife resources. Adverse effects could include loss and degradation of wildlife habitat, further fragmentation of wildlife habitat, and disturbance and displacement of wildlife. However, wildlife would benefit cumulatively from actions to improve forest health and reduce fire hazards, lowering the risk for catastrophic stand-replacing fires. Control of noxious weeds, as well as habitat conservation and restoration efforts, would also be beneficial for wildlife.

Project ROWs are fairly narrow (25 to 175 feet wide) and spread across 273 miles in three states and eight national forests. Implementation of the No Action Alternative or the Proposed Action would, therefore, contribute relatively minor overall cumulative impacts when considered together with other actions in the region. Cumulative impacts on wildlife resources could include further loss, alteration, or degradation of wildlife habitats; incidental mortality or injury of wildlife; and temporary disturbance or displacement of individuals due to noise and human actions. These cumulative effects are expected to continue into the foreseeable future. A cumulative effects analysis for each forest has been conducted. Cumulatively, this project would not detrimentally add threats or long-term adverse impacts to wildlife resources or their habitat.

In considering the projects in Appendix A, there would be no changes to the effects determinations for Canada lynx for the No Action Alternative or Proposed Action.

3.9 Fisheries

3.9.1 Introduction

This section describes the existing conditions and potential impacts resulting from implementation of the alternatives that could be associated with fisheries resources in the project area. The section includes a review of listed threatened, endangered, and candidate fish species, Forest Service sensitive fish species, management indicator species (MIS), and fish species of local concern and their associated habitats.

Section 3.9.2 describes the regulatory and policy framework; Section 3.9.3 describes the methods and assumptions for analysis of potential impacts to fisheries and fish species; Section 3.9.4 describes existing conditions (affected environment); and Section 3.9.5 describes potential impacts to fisheries and fish species.

3.9.2 Regulatory and Policy Framework

The USFWS and the National Marine Fisheries Service have jurisdiction over species listed as threatened or endangered under Section 9 of the federal ESA (16 U.S.C. 1536). The ESA provides for the protection of listed species. Section 7 of the ESA of 1973, as amended, requires federal agencies to "ensure" that actions authorized, funded, or carried out by them are not likely to jeopardize the continued existence of threatened or endangered species, or result in the destruction or adverse modification of their critical habitats. The ESA and 50 CFR 402 direct each federal agency to confer or consult with the USFWS on any action that is likely to jeopardize or affect the continued existence of a species or its habitat.

Forest Service Manual 2600 – Wildlife, Fish, and Sensitive Plant Habitat Management, provides policies pertaining to the management of wildlife on Forest Service-administered land, including Chapter 2670 – Threatened Endangered, and Sensitive Plants and Animals. The manual also requires that the Forest Service manage habitats at levels that accomplish the recovery of federally listed species, according to U.S. Department of the Interior recovery plans (2672.1), and special management emphasis for sensitive species to ensure their viability and preclude trends toward federal listing (2672.1).

The Fish and Wildlife Conservation Act of 1980 (16 U.S.C. 2901 *et seq*.) encourages federal agencies to conserve and promote conservation of nongame fish and wildlife species and their habitats. In addition, the Fish and Wildlife Coordination Act (16 U.S.C. 661 *et seq*.) requires federal agencies undertaking projects affecting water resources to consult with the USFWS and the state agency responsible for fish and wildlife resources.

Section 404 of the Clean Water Act provides some additional protection for jurisdictional wetlands and non-wetland waters of the United States, including requiring permits for discharging dredge or fill material into rivers, streams or wetlands. WAPA's vegetation management practices would not result in placement of dredge or fill within or directly adjacent to these areas.

3.9.3 Methods and Assumptions for Analysis

WAPA used land and resource management plans and best available science to describe existing fisheries conditions. WAPA also used publicly available GIS data for documented fish population locations in the project area. A total of eight BAs and eight BE and MIS reports were prepared for this project; one BA and one BE and MIS report for each national forest affected. Specifically, these BAs and BE and MIS reports provide data for and analyze threatened, endangered, and candidate fish species as well as sensitive fish species and MIS, including fish and their prey.

WAPA analyzed impacts on fisheries resources and habitat by assessing the potential for the No Action Alternative and the Proposed Action to have direct, indirect, and cumulative effects on the quality of the fisheries resources.

Assumptions

The following are assumptions used in the identification and analysis of impacts to the fisheries resource:

- No new road construction will be required.
- Transmission line ROWs make up a very small portion of the national forest areas and the vegetated habitat areas they cross.
- Transmission lines typically cross surface waters perpendicularly at point locations or follow utility corridors, which generally are located in upland areas outside riparian zones, wetlands, or actual drainages.
- Because much of the project area is forested, there are well-vegetated buffer zones between most ROW maintenance activities and surface water areas.
- Protection and conservation of fish species and their habitats in the project area are objectives WAPA would follow.

Impact Criteria

There can be impacts to fisheries when habitats or individual fish are disturbed or lost during project activities. The magnitude of the impacts depends in part on the sensitivity of the fish population and habitat. There could be an impact on fisheries if either of the following occurred:

- Violation of statutes and regulations pertaining to fisheries.
- Substantial interference with the movement of native fish species for more than two reproductive seasons that would adversely impact regionally important populations.

3.9.4 Affected Environment

This section gives an overview of existing conditions for fisheries resources throughout the project area, including quality of habitat, species potentially occurring, ROWs within or near aquatic habitat, and potential threats to fisheries resources.

Portions of WAPA's transmission lines cross perennial and intermittent waterways and their associated water influence zones in all of the national forests in the project area. Table 3-48 summarizes the existing watershed acres, and the acres of water influence zones in the impacted streams of watersheds along the ROW. As defined by the Watershed Conservation Practices Handbook (Forest Service 2006a), the water influence zone is a buffer around streams and water bodies that is the greater length of 100 feet, or the mean height of mid-seral riparian vegetation. For analysis purposes in this report, a 100-foot buffer distance from both sides of the centerline linear stream segments was utilized as an approximation of the water influence zone. Connected disturbances within a water influence zone (i.e., soil disturbance, compaction, removal of vegetation) have the potential to negatively influence aquatic resources through erosion and fine sediment deposition. To provide some scale of analysis, Table 3-48 details the acres of ROW within the various watersheds across the eight national forests and the acres of ROWs that intersect water influence zones. While most indicate a very small percentage (less than one percent) of the ROWs are within water influence zones, approximately 10 percent of the ROWs on the Nebraska and White River national forests coincide with water influence zones. Acres of water influence zone impacted by the Proposed Action are discussed further under Section 3.9.5.

Table 3-48. Acres of Rights-of-Way within Watersheds and Water Influence Zones

National Forest	Rights-of-Way in Watershed (acres)	Rights-of-Way in Water Influence Zone (acres)	Water Influence Zone Impacted by Proposed Action (acres)
Ashley	252.6	13.4	7.6
Arapaho-Roosevelt	288.2	22.5	16.9
Grand Mesa, Uncompahgre, and Gunnison	1,201.7	77.8	62.7
Medicine Bow-Routt	935.5	54.8	26.5
Nebraska	83.5	8.9	2.1
Pike and San Isabel	211.7	18.2	15.8
San Juan	898.3	71	47.8
White River	183.4	17.4	13.3
TOTAL	**4,054.9**	**284**	**192.7**

Sources: RMES, Inc. and PENDO Solutions, Inc. 2012a-2012d, 2013b-2013e

Fish species analyzed in this EIS only occur in perennial water systems; however, intermittent waterways affected by project activities are commonly present could connect to perennial waters. Therefore, WAPA also assessed intermittent waterways for potential impacts. In most cases, transmission lines span well above deeply cut stream channels, leaving the channel and associated fish habitat unchanged. Trees and shrubs growing near water may grow faster and need more frequent maintenance actions to ensure that vegetation does not grow into the transmission line, which could result in some woody debris falling into waterways.

Most of the national forest areas with transmission line ROWs are near the headwaters of major drainage basins, where water quality is typically very good and minimally affected by human activities. Many of the waterways in these forested areas provide a wide range of aquatic habitats that support healthy populations of aquatic life and various fish populations. Primary fisheries habitat identified in these forests includes lakes, ponds, and perennial and intermittent streams and creeks. See the Surface Water sections for a detailed description of the various waterways and water quality of the streams in the project area.

To date, the greatest impacts on fish habitats have occurred where streams are next to human population centers, roads, and other human developments. Native fish species populations have declined from their historic levels in all national forests in the project area, even those farther from large population centers, in part due to water developments, such as dams, and road crossings restricting movements (RMES, Inc. and PENDO Solutions, Inc. 2012a, 2012c, 2012d, 2013b-2013e). Non-native fish species such as rainbow, brook, and brown trout have affected native trout populations in Colorado (Behnke 2002), and portions of Nebraska and Utah through habitat and food competition.

The existing road systems in the project area currently deliver minor amounts of fine sediment to perennial streams and other ephemeral streams through overland flow, road crossings, and more concentrated roadside ditches that discharge into wetlands and surface waters (RMES, Inc. and PENDO Solutions, Inc. 2012a, 2012c, 2012d, 2013b-2013e).

Another threat to fish species in the project area is the potential to contract whirling disease, a parasitic infection by the nonnative parasite, *Myxobolus cerebralis*, which creates physical and neurological damage in young fish and causes affected fish to swim in a corkscrew pattern. This disease can result in feeding problems for affected fish and increase susceptibility to predators. Primary fish affected by this disease include juvenile fish in the salmon and trout families. Individuals with this disease have been found in the national forests associated with the project.

In cooperation with the USFWS, the Forest Service provided a list of federally listed threatened or endangered fish species that could be present in the project area. WAPA identified species for evaluation based on the information in Section 3.9.4 and the potential for direct and indirect impacts on fish species and their habitats next to or downstream of the project area.

Threatened and Endangered Fish Species

At present, there are six ESA listed threatened and endangered fish species which may be affected by proposed project activities, including – bonytail chub (*Gila elegans*), Colorado pikeminnow (*Ptychocheilus lucius*), greenback cutthroat trout (*Oncorhynchus clarki stomias*), humpback chub (*Gila cypha*), pallid sturgeon (*Scaphirhynchus albus*), and razorback sucker (*Xyrauchen texanus*) (Table 3-49). There are no fish species identified as candidate or proposed under the ESA and there is no designated critical habitat for threatened or endangered fish species in the proposed project area. Appendix D provides brief species descriptions.

Sensitive Fish Species

The Forest Service may designate as sensitive populations of fish those that are in decline or that are considered likely to become threatened or endangered if current trends continue. Table 3-49 identifies the 15 fish species currently designated as sensitive that could be present in the project area. Based on a review of available information, no known sensitive fish species were identified in Ashley National Forest in Utah. The Regional Forester identifies sensitive species for which population viability is a concern, as evidenced by substantial current or predicted downward trends in population numbers or density, or in habitat capability that would reduce a species' distribution (Forest Service Manual 2670.5). The Forest Service policy for sensitive species is to conserve sensitive species so that they do not become threatened or endangered and their habitats remain well distributed throughout their geographic range on NFS lands (Forest Service Manual 2670.22). Appendix D provides brief species descriptions.

Fish MIS and Species of Local Concern

The National Forest Management Act of 1976 requires that national forest planning "provide for diversity of plant and animal communities based on the suitability and capability of the specific land area in order to meet overall multiple-use objectives." To implement this mandate, in 1982 the Forest

Service developed and implemented regulations requiring the identification of MIS to be used as planning and analysis tools to set goals, objectives, and minimum management requirements in Forest Plans; to focus the analysis of impacts of plan alternatives; and to monitor the impacts of plan implementation at the project level. The MIS designation does not provide special protective status or serve as biological diversity benchmarks, rather, MIS species are monitored and used to evaluate the impacts of management practices on fisheries and wildlife resources and habitats.

Species of local concern is a voluntarily created list of fish species produced by individual national forests, and is not a requirement of agency policy or direction. The Forest Service observes and manages individual species on these lists and their habitats in an effort to minimize or eliminate threats affecting the status of each species.

At present, there are no records regarding fish MIS or fish species of local concern for the Nebraska and Utah national forests in the project area. There are eight MIS fish species and one fish species of local concern in the Colorado national forests associated with the project area. Also, aquatic macroinvertebrates are included on the MIS list because they are prey species for a variety of fish and are present in the project area. Management and uses of these species lists are forest specific. Table 3-49 identifies the eight MIS and one species of local concern present in the project area. Appendix D provides brief species descriptions.

The following subsections briefly describe the existing condition of fisheries resources on each of the national forests within the proposed project area as identified in the BE/MIS reports and BAs (RMES, Inc. and PENDO Solutions, Inc. 2012a-2012d, 2013b-2013e; RMES, Inc. and PENDO Solutions, Inc. 2014a-2014g). For more detailed information on surface waters and waterbody segments potentially affected by the project, refer to the Surface Water section of the EIS.

Table 3-49. Special Status Fish Species Potentially Occurring in the Project Area

Common Name	Scientific Name	Status	Forest Occurrence or Potential Habitat								Habitat	Species Excluded	Reason for Exclusion
			ARNF	ANF	GMUG	MBRNF	NNF	PSINF	SJNF	WRNF			
Federally Listed Fish Species													
Bonytail chub	*Gila elegans*	Endangered	X	X	X	X	-	-	X	X	Lower Colorado River Basin	Yes	Project area outside of species range
Colorado pikeminnow	*Ptychocheilus lucius*	Endangered	X	X	X	X	-	-	X	X	Lower Colorado River Basin	Yes	Project area outside of species range
Greenback cutthroat trout	*Oncorhynchus clarkii stomias*	Threatened; MIS	X	-	X	X	-	X	X	X	Montane streams	No	
Humpback chub	*Gila cypha*	Endangered	X	X	X	X	-	-	X	X	Lower Colorado River Basin	Yes	Project area outside of species range
Pallid sturgeon	*Scaphirhynchus albus*	Endangered	X	-	-	X	-	X	-	-	South Platte River Basin	Yes	Project area outside of species range
Razorback sucker	*Xyrauchen texanus*	Endangered	X	X	X	X	-	-	-	X	Lower Colorado River Basin	Yes	Project area outside of species range
Sensitive Fish Species													
Bluehead sucker	*Catostomus discobolus*	Sensitive	-	-	X	X	-	-	X	X	Montane streams	No	
Colorado River cutthroat trout	*Oncorhynchus clarkii pleuriticus*	Sensitive; MIS	X	X	X	X	-	-	X	X	Montane streams	No	
Finescale dace	*Phoxinus neogaeus*	Sensitive	-	-	-	X	-	-	-	-	Springs and headwaters of small streams on the plains	Yes	Project areas do not support habitat and is outside of known range
Flannelmouth sucker	*Catostomus latippinis*	Sensitive	X	-	X	X	-	-	X	X	Montane and larger lower elevation streams	No	
Flathead chub	*Platygobio gracilis*	Sensitive	-	-	-	X	-	X	-	-	Swift moving streams in Great Plains	Yes	Project areas do not support habitat and is outside of known range
Hornyhead chub	*Nocomis biguttatus*	Sensitive	-	-	-	X	-	-	-	-	Smaller streams of Great Plains and eastern U.S.	Yes	Project area does not support habitat and is outside of known range
Lake chub	*Couesius plumbeus*	Sensitive	X	-	-	X	-	-	-	-	Streams in plains and into foothills	Yes	Project area outside of known range
Mountain sucker	*Catostomus platyrhynchus*	Sensitive	X	-	X	X	-	-	X	X	Montane streams	No	
Northern redbelly dace	*Phoxinus eos*	Sensitive	X	-		-	X	X	-	-	Springs and headwaters of small streams on the plains	Yes	Project area does not support habitat and is outside of known range
Pearl dace	*Margariscus margarita*	Sensitive	-	-	-	-	X	-	-	-	Small headwater streams, beaver ponds, and small spring-fed lakes	Yes	Project area does not support habitat and is outside of known range
Plains minnow	*Hybognathus placitus*	Sensitive	-	-	-	X	X	-	-	-	Larger streams in Great Plains	Yes	Project area does not support habitat and is outside of known range
Roundtail chub	*Gila robusta*	Sensitive	-	-	X	X	-	-	X	X	Larger lower elevation and montane streams	No	
Southern redbelly dace	*Phoxinus erythrogaster*	Sensitive	-	-	-	-	X	X	-	-	Small creeks in Great Plains	Yes	Project area outside of species range, no water depletions as part of project
Sturgeon chub	*Macrhybopsis gelida*	Sensitive	-	-	-	X	X	-	-	-	Large rivers in central Great Plains	Yes	Project area does not support habitat and is outside of known range
Yellowstone cutthroat trout	*Oncorhynchus clarkia bouveri*	Sensitive				X	-				Montane Streams	Yes	Project area outside of known range

Table 3-49. Special Status Fish Species Potentially Occurring in the Project Area

Common Name	Scientific Name	Status	Forest Occurrence or Potential Habitat								Habitat	Species Excluded	Reason for Exclusion
			ARNF	ANF	GMUG	MBRNF	NNF	PSINF	SJNF	WRNF			
Management Indicator Species and Species of Local Concern													
Aquatic macroinvertebrates	*N/A*	MIS	-	-	-	-	-	-	-	X	Aquatic and stream health	No	
Brook trout	*Salvelinus fontinalis*	MIS	X	-	X	X	-	X	X	X	Montane aquatic habitats	No	
Brown trout	*Salmo trutta*	MIS; SOLC	X	-	X	X	-	-		X	Montane aquatic habitats	No	
Plains killifish	*Fundulus zebrinus*	MIS	X	-	-	-	-	-	-	-	Prairie aquatic habitats	Yes	No habitat in project area
Plains topminnow	*Fundulus sciadicus*	MIS	X	-	-	-	-	-	-	-	Prairie aquatic habitats	Yes	No habitat in project area
Rainbow trout	*Oncorhynchus mykiss*	MIS		-	X	X	-	-	X	X	Aquatic and stream health	No	

Sources: RMES, Inc. and PENDO Solutions, Inc. 2012a-2012d, 2013b-2013e; RMES, Inc. and PENDO Solutions, Inc. 2014a-2014g

ARNF Arapaho-Roosevelt National Forest
ANF Ashley National Forest
GMUG Grand Mesa, Uncompahgre, and Gunnison National Forest
MBRNF Medicine Bow-Routt National Forest
MIS management indicator species
NNF Nebraska National Forest
PSINF Pike and San Isabel National Forest
SJNF San Juan National Forest
SOLC species of local concern
WRNF White River National Forest

3.9.4.1 Arapaho-Roosevelt National Forest

On the Arapaho-Roosevelt National Forest, the Roach project area is located within the Laramie River watershed. Major tributaries in the project area include Pole Creek and Fish Creek. On the east side, the project area drains into North Park through Pinkham Creek and Government Creek, which flows west into the Canadian River, which flows into the North Platte River.

The transmission lines in this project area are integral to WAPA's hydroelectric facilities in the area; therefore, they occur close to the hydroelectric power plants and pumping stations around the reservoirs and their aquatic habitats. Lake Granby is stocked with kokanee salmon (*Oncorhynchus nerka*), but rainbow trout, brown trout, and lake trout (*Salvelinus namaycush*) also occur within the lake, which is managed as a sport fishery.

There are no fish-bearing streams crossed by the Blue River-Gore Pass or Green Mountain-Blue River transmission lines. The lands under the Green Mountain-Blue River transmission line drain almost entirely to the west, towards Green Mountain Reservoir. The northern 1.5 miles of the Blue River-Gore Pass line also is within drainages tributary to the Blue River, while the southernmost four miles is within the Williams Fork drainage. As the transmission line occurs near the headwaters of a number of drainages, there is the potential for sediment delivery to the shallow draws and ephemeral drainages; however, there are two miles between the project areas and the nearest fish-bearing reaches. Creeks draining to the west (towards Green Mountain Reservoir) are non-fish bearing (RMES, Inc. and PENDO Solutions, Inc. 2013b).

The area also experiences cattle grazing, which can have ongoing impacts to riparian systems. Near the southern end of the Williams Fork drainage is the Henderson Mill site, which processes molybdenum ore; the tailings from this processing are deposited in an impoundment located very near to the Williams Fork River.

3.9.4.2 Ashley National Forest

On the Ashley National Forest, there are seven named creeks in the project area, as well as many ephemeral drainages and unnamed tributaries. Some of these creeks flow northwards to the Green River, and many flow southwards, but still drain to the Green River.

One documented threat to fish and their habitat on the Ashley National Forest is that lodgepole pine trees have been sprayed with broad spectrum insecticides including Carbaryl and Permethrin to reduce the spread of mountain pine beetle. Both of these insecticides have been appearing in streams where intense mountain pine beetle activity and control has occurred due to widespread application and subsequent delivery into water systems. Carbaryl has been documented as having significant adverse impacts on aquatic macroinvertebrates and fish, and could have cumulative impacts on amphibian prey species populations, or direct effects to amphibian breeding, metamorphosis, and foraging (Hastings *et al.* 2001).

3.9.4.3 Grand Mesa, Uncompahgre, and Gunnison National Forest

On the Grand Mesa, Uncompahgre, and Gunnison National Forest, the North Fork-Rifle transmission line occurs at the headwaters of a number of first and second order streams. The majority of the streams crossed are ephemeral given the location towards the top of the watersheds. The line spans all of these streams; no infrastructure occurs within streams or associated wetlands. WAPA has an existing road to access infrastructure across the majority of the ROW, which has potential for increased sediment delivery to nearby streams. This access road is closed to public vehicle access; therefore, recreational use and the potential for additional disturbances to headwaters are very low. Widespread cattle grazing and intermittent sheep grazing occur throughout the area, which has ongoing impacts to riparian areas.

Data for Quacker Creek and Long Gulch indicate that these creeks do not support the presence of fish species, nor do they have highly suitable habitat; however, these creeks do drain to the Gunnison River and Crystal Reservoir. Data for the Gunnison River and Morrow Point Reservoir indicate that these water bodies support brook trout, kokanee salmon, long-nose sucker, brown trout, rainbow trout, lake trout, and possibly other fish species (RMES, Inc. and PENDO Solutions, Inc. 2013c).

The Curecanti-Poncha and North Gunnison-Salida transmission lines span a number of ephemeral drainages and span a number of fish-bearing creeks. These lines do not have any structures located within creeks or wetland features on NFS lands. Because of existing perturbances (e.g., road runoff, historic logging, road construction and mining impacts, high road traffic, erosive native soils), fine sediment delivery to area creeks is considered to be high in some areas, and stream health conditions are considered to be diminished due to elevated levels of fine sediment delivery, water diversions, and reduced instream flows.

3.9.4.4 Medicine Bow-Routt National Forest

On the Medicine Bow-Routt National Forest, the Cowdrey project area drains into North Park through Pinkham Creek and Government Creek, which flows west into the Canadian River, which flows into the North Platte River. The streams in the area have experienced indirect impacts from the widespread railroad tie harvesting activities in the early 1900s and more recent timber management activities such as WAPA's ongoing danger tree mitigation efforts. Increased water delivery to local creeks and road runoff has likely impacted area streams. The Cowdrey project area also experiences cattle grazing and has seen extensive mortality of lodgepole pine trees from mountain pine beetle. The surrounding soils are very gravelly and have rapid infiltration, which can generate sand and gravels that wash into Pinkham Creek.

The Mohawk project area drains into two major watersheds on either side of the Continental Divide. To the east the ROWs are within the Little Grizzly Creek drainage (a tributary to Grizzly Creek and the North Platte). On the west side of the divide, the ROWs are within the North Fork Fish Creek and Spring Creek drainages, which are both tributary to the Yampa River.

In the Little Grizzly Creek area, the ROWs pass over a number of small ponds set in lodgepole pine forests recently killed by mountain pine beetle. Little Grizzly Creek drainage has seen various impacts from livestock grazing, widespread timber management, and associated road construction. At one point the ROWs span Little Grizzly Creek where it is approximately three feet wide and six inches deep, with a cobbly substrate and many drop-pools through a moderate gradient. The next major drainage spanned by the ROWs is the North Fork of Fish Creek. This is a fairly wide span over the creek, which is dominated by willows and has a moderate gradient. The ROWs then come very close to the headwaters of Spring Creek, but it is unlikely that it is fish-bearing given its location in the headwaters.

Little Muddy Creek is spanned by the ROW, and parallels the ROW for about 250 feet. State Highway 40 and Forest Service Road 254.1 (which crosses Little Muddy Creek on its way to Lake Agnes) are also within the water influence zone. Because of these nearby road features, Little Muddy Creek likely receives increased sedimentation from the roads, thereby reducing stream health. There is no fish sampling data available for Little Muddy Creek. Hirsch (*et al.* 2006) indicated that native cutthroat trout occurred in unnamed tributaries to Little Muddy Creek to the west of the project area and in Little Green Creek. There are no recent confirmations of native cutthroats occurring in Little Muddy Creek.

3.9.4.5 Nebraska National Forest

On the Nebraska National Forest, the project area occurs near a ridgeline that separates two moderately sized drainages. To the east of the ROW is the Big Bordeaux Creek watershed, and to the west of the project area is the Chadron Creek watershed. As the ROW generally occurs along the upper elevations and along ridgetops in the area, it is does not span larger creeks or streams. The ROW does cross a number of smaller ephemeral drainages nearer the headwaters. The ROW does not cross any perennial creeks. The Chadron and Big Bordeaux Creeks both drain to the White River, which flows to the northeast and is tributary to the Missouri River.

3.9.4.6 Pike and San Isabel National Forest

On the Pike and San Isabel National Forest, there are no perennial or ephemeral streams in the vicinity of the Malta-Mount Elbert transmission line on NFS lands. The areas around the ROW drain to the Arkansas River to the east, but the drainages are intercepted by expansive wetland complexes and irrigated meadow/wetlands in the Arkansas River valley floor. The Arkansas River is approximately 1.67 miles from the project area, and the nearest wetland areas are on private lands approximately 0.8 mile from the ROW.

The nearest fish bearing stream is the Arkansas River. This area is managed as a sport fishery by CPW. The vast majority of fish stocked in this stretch of the Arkansas over the past 40 years are rainbow trout (*Oncorhynchus mykiss*), but there are records of a few stockings of other fish (including brown trout [*Salmo trutta*], Tasmanian rainbow trout, and Snake River cutthroat).

The Curecanti-Poncha and North Gunnison-Salida transmission lines cross a number of ephemeral drainages and span a number of fish-bearing creeks. Near the top of Monarch Pass, the Curecanti-Poncha transmission line spans the South Arkansas River, and the North Gunnison-Salida transmission line spans the headwaters of North Fooses Creek. The South Arkansas River is also spanned near the confluence of Fooses Creek and the South Arkansas River; however, the North Gunnison-Salida ROW and its associated access roads come very close to Fooses Creek in a number of locations. East of State Highway 50, the Curecanti-Poncha and North Gunnison-Salida transmission lines span Cree Creek, Lost Creek, the North Fork South Arkansas River, and a number of ephemeral drainages. The access road for the ROWs (Forest Service Road 219) crosses all of the drainages and creeks.

On Fooses Creek is Fooses Reservoir (which is also sometimes referred to Fooses Lake). Waters from the South Arkansas River are diverted to this reservoir. These waters are diverted out of Fooses Reservoir through a penstock (pipeline) to the Salida Hydropower Plant #1 located approximately 2.5 miles downstream and then flow through another penstock to Salida Hydropower Plant #2, located near the Town of Maysville. While these facilities are not part of WAPA's operations, they are part of the existing conditions of the project area and affect aquatic habitats. In 2009, trout habitat improvement projects were jointly completed by Xcel Energy, CPW, and Trout Unlimited to improve instream flows and habitats for trout in South Arkansas River.

Fine sediment delivery to area creeks is considered to be very high in some areas, and stream health conditions are considered to be diminished due to high levels of fine sediment delivery, water diversions, and reduced instream flows. The potential for fish productivity in South Arkansas River is described as "Average," and Fooses Creek as "Above Average" (RMES, Inc. and PENDO Solutions, Inc. 2013e).

3.9.4.7 San Juan National Forest

On the San Juan National Forest, the Hesperus-Montrose and Curecanti-Lost Canyon transmission lines occur at the headwaters of a number of first and second order streams. The Hesperus-Montrose transmission line spans the Dolores River on private lands. Most of the creeks and streams crossed by the Hesperus-Montrose transmission line are tributary to this river. The majority of the streams crossed are ephemeral given the location of the ROWs towards the top of the watersheds. The two transmission lines span all of these streams; no infrastructure occurs within streams or associated wetlands on NFS lands. WAPA has existing roads to access infrastructure across the majority of the ROWs, which has likely resulted in some fine-sediment delivery to ephemeral gulches and area wetlands during intense thunderstorm or snowmelt events in the past. The access roads along the ROWs are generally closed to public vehicle access; therefore, recreational vehicle use and the potential for additional disturbances to area headwaters are very low. Area streams also experience other ongoing impacts associated with cattle grazing.

Most of the creeks in the Norwood project area are too small and ephemeral to support a sustainable fishery given their position high in the basin. There has been extensive stocking of larger creeks in the project area. There are no records of native cutthroat trout occurring within the project area (RMES, Inc. and PENDO Solutions, Inc. 2012c).

Data for the McPhee project area indicates that the McPhee Reservoir supports a relatively robust warm and cool water fishery, but the area creeks do not support fisheries. The native flannelmouth sucker does occur in Narraguinnep Canyon (RMES, Inc. and PENDO Solutions, Inc. 2012c).

3.9.4.8 White River National Forest

On the White River National Forest, the Blue River-Gore Pass transmission line occurs at the headwaters of a number of first and second order streams. The majority of the streams crossed are very ephemeral given the location towards the top of the watershed. The line spans all of these streams; no infrastructure occurs within streams or associated wetlands. WAPA has an existing road to access infrastructure across the northern half of this line. All of the streams in this East project area drain to the west into the Blue River and Green Mountain Reservoir. Some fine sediments may have been delivered to ephemeral gulches and during intense thunderstorm events in the past. This access road is also closed to the public; therefore, the potential for additional disturbances to headwaters is very low. Streams draining down the Williams Fork Mountains towards Green Mountain Reservoir pass through very steep and broken country. Area streams have experienced the widespread mountain pine beetle epidemic, which resulted in 90 percent mortality of the widespread lodgepole pine forests in the Williams Fork drainage.

Where streams cross Highway 9, they pass through large culverts. At the down-gradient side of the culverts, the years of deposition of materials washed from the gulches has created large alluvial fans in Green Mountain Reservoir, and there is a lack of well-defined or stable channels for these creeks. During the winter months, when the reservoir is drained-down, there is a lack of connectivity to these creeks. Large sections of the creek appear uninhabitable for overwintering fish (RMES, Inc. and PENDO Solutions, Inc. 2012d). It is unknown if fish can spawn in these creeks, but year-round use of creeks does not occur for larger fish. The only creek the project area drains into which could support more significant fish use is Pasture Creek, at the southernmost end of the project area; however, the habitat effectiveness of this creek on NFS lands is likely compromised due to a lack of good connectivity to Blue River. CPW has no records of fish occurring in Pasture Creek, but there have been no recent survey efforts. Fish shocking in Mumford Gulch in 2011 revealed the presence of cutthroat trout (species unknown) and rainbow trout. Follow-up visits to Mumford Gulch revealed that the creek was totally dry, and no viable fishery remained (RMES, Inc. and PENDO Solutions, Inc. 2012d).

Green Mountain Reservoir's fishery is managed as a put-and-take recreational fishery by CPW. The vast majority of fish stocked in Green Mountain Reservoir are rainbow trout, but there are records of stocking other fish (brown trout and kokanee salmon) (RMES, Inc. and PENDO Solutions, Inc. 2012d).

The nearest fish-bearing creek to the Curecanti-Rifle transmission line is Alkali Creek; its tributary, West Prong Alkali Creek, is also in close proximity to the project area. East Road Gulch is spanned by the transmission line, but this creek is not fish-bearing. There is no infrastructure within the water influence zone associated with East Road Gulch, and existing vegetation is compatible within the ROW.

The project area is generally in the upper reaches of the Alkali Creek and Middleton Creek basins, and a number of existing activities occur in the area, including cattle grazing and trailing. The dirt road up East Road Gulch is very erosive, with deep ruts through the spring months and again in the fall. Fine sediment road runoff can be very significant from this road. There are also a number of natural gas pads and associated pipelines in the Alkali Creek and Middleton Creek drainages in the vicinity of the Curecanti-Rifle transmission line. Stormwater control and management from these pads and pipelines is relatively robust; however, increased road traffic to these sites can mobilize fine sediments which are then available to run off of roads. There are no significant (in spatial extent) vegetation management activities in the Alkali Creek or Middle Creek drainages.

Fine sediment delivery to Alkali Creek is considered to be very high, and stream health conditions are considered to be diminished due to high fine sediment delivery. The potential for fish productivity in Alkali Creek is poor. Only one species of fish has been documented in Alkali Creek; it was an unknown species of dace, which was likely a speckled dace (*Rhinichthys osculus*) (RMES, Inc. and PENDO Solutions, Inc. 2012d).

Alkali Creek is tributary to West Divide Creek, which is tributary to Divide Creek and the Colorado River. West Divide Creek is documented to at one time have native Colorado cutthroat trout (likely Colorado River lineage, RMES, Inc. and PENDO Solutions, Inc. 2012d). Hirsch *et al.* (2006) indicated that while Alkali Creek and Middleton Creek are considered to be historic habitat for native cutthroat, Alkali and Middleton Creeks (or West Divide Creek) no longer contains a conservation population of Colorado River lineage fish, and the nearest population is in the headwaters of East Divide Creek, above a fish barrier.

3.9.5 Environmental Consequences

This section describes impacts on fisheries resources in and next to project area ROWs under the No Action Alternative and the Proposed Action. Based on the impact criteria for this resource, impacts to fisheries would occur with a violation of statutes and regulations pertaining to fisheries or substantial interference with the movement of native fish species for more than two reproductive seasons that would adversely impact regionally important populations.

Vegetation management activities under the No Action Alternative and the Proposed Action could affect federally listed threatened and endangered fish species, as well as Forest Service sensitive species and MIS. A BA determining the potential impacts of the Proposed Action on federally listed and candidate species for each of the eight forests has been completed and is part of the project record. FSM 2672 (Section 2672.42, as supplemented) provides direction regarding the evaluation of impacts to the Regional Forester's list of sensitive species. A BE determining the potential impacts of the Proposed Action on threatened, endangered, candidate, sensitive species, MIS, and species of local concern for each of the eight forests has also been completed. The effects determinations of those reports are summarized in the table below and briefly discussed in the following text.

Under the No Action Alternative and the Proposed Action, management activities would clear incompatible vegetation in the water influence zones throughout the project area as needed; therefore, the likely impacts to fisheries resources would include potential changes to stream hydrology (i.e., timing and volume of water flows), alterations to riparian habitats from vegetation management, and fine sediment and pollutant delivery from roads, skid trails, and potential spills. Potential direct effects on fisheries resources can include loss or alteration of habitat from felled trees and fish mortality or injury. Indirect effects could include increased transportation of sediment into waterways from runoff and soil erosion, decreased water quality, reduced levels of available oxygen, herbicide drift, reductions in fish food sources, and warmer water temperatures if riparian vegetative cover is removed. Herbicide drift refers to fine clouds of herbicide blowing or vaporizing to untargeted areas.

3.9.5.1 No Action Alternative

Under the No Action Alternative, WAPA would continue its current transmission line maintenance practices throughout the project area. Current vegetation management and transmission line maintenance would not change; therefore, impacts to fisheries resources would remain approximately the same. The standard maintenance procedures in Table 2-15 would serve to minimize potential effects on fisheries from activities taken under the No Action Alternative. Potential impacts to fisheries resources under the No Action Alternative are discussed below.

Effects of the No Action Alternative to Fisheries Resources

Vegetation management in the project area ROWs would likely occur in small portions of each overall affected watershed. As a result, under the No Action Alternative, there are no anticipated changes to stream hydrology, volumes of water in existing streams, or timing of water delivery to aquatic habitats would result from ongoing vegetation treatments in ROWs. Additionally, no water depletions are anticipated under the No Action Alternative.

The ongoing use of existing roadways for haul operations and ROW access would continue to mobilize fine sediments into waterways, which may affect downstream fish habitats. Summertime use of roads by WAPA and their contractors would be common during vegetation treatment operations, or during more significant infrastructure maintenance operations which could mobilize fine sediments in some areas. Fine sediments would also be deposited into waterways from use of mechanized equipment; however, there are well-vegetated buffer zones between most ROWs with their potential activities and surface water areas. WAPA's standard maintenance procedures would minimize vegetation maintenance on wet soils to prevent excessive rutting and erosion, and the existing roadway system only delivers minor amounts of sediments to waterways, so annual sediment loads are not anticipated to increase under the No Action Alternative.

Under the No Action Alternative, removal of danger trees and vegetation within and adjacent to water influence zones could decrease shading in riparian areas. This maintenance activity would alter local aquatic conditions, which may affect fish habitat and their prey species (aquatic macroinvertebrates).

Use of herbicides for vegetation management within ROWs also poses a minor hazard fisheries habitat. WAPA does not typically use herbicides in these areas, and the use of standard maintenance procedures for EPA- and Forest Service-approved herbicides would minimize this risk.

There is a potential for accidental spills (e.g., equipment leaking hydraulic fluid), which would adversely affect fisheries habitats. However, per standard maintenance procedures, WAPA immediately cleans all spills. Additionally, WAPA would continue to adhere to standard state and federal BMPs, which reduce the potential for impacts from accidental spills.

Direct and indirect impacts to intermittent and ephemeral streams would be negligible due to the temporary annual occurrence of water in these locations and protections offered through BMPs associated with water, wetland, and riparian vegetation resources. Overall, direct and indirect impacts to fisheries resources would be minor compared to the total area of habitat present, and vegetation management activities would not substantially affect fish survival or population numbers.

Threatened, Endangered, and Sensitive Fish Species

A detailed evaluation of the direct, indirect, and cumulative effects to threatened, endangered, and sensitive fish species from the No Action Alternative is presented in the BA and BE reports prepared for each national forest. These detailed analyses address species known or expected to occur in or near the project area and those species having suitable habitat or documented ranges that lie on or near the ROWs. In reaching effects determinations, site-specific factors unique to each forest and ROW, as well as standard maintenance procedures that would serve to minimize potential effects on fish species are considered relative to the life history and habitat needs of each species addressed. The general types of impacts considered are described above in *Effects of the No Action Alternative to Fisheries Resources*.

Table 3-50 presents a summary of the effects determinations reached in the BAs and BEs for those fish species carried forward for analysis. One federally listed species, the greenback cutthroat trout, is "may affect, not likely to be adversely affected" by the No Action Alternative on each of the six Colorado forests in which this species occurs in the project area. These effects to the greenback cutthroat trout are described below in more detail. Bluehead sucker and Colorado River cutthroat trout, Forest Service sensitive species, could also be impacted on two and six national forests, respectively by the No Action Alternative, but it was determined that these effects would not be severe enough cause a trend to federal listing or a loss of species' viability. It was also determined that there would be no effect on the flannelmouth sucker, mountain sucker or roundtail chub from the No Action Alternative.

Greenback Cutthroat Trout Effects

The greenback cutthroat trout have documented occurrence in the project area for all the national forests in Colorado. Under the No Action Alternative, no direct impacts to the greenback cutthroat trout would occur as there are no planned activities in streams which may contain populations or habitat for this species. Additionally, continued vegetation clearing would not directly impact greenback cutthroat trout habitat or result in any water depletions.

Indirect impacts from the No Action Alternative to greenback cutthroat trout habitat could result from potential changes in the timing and amount of runoff from ROWs during the spring snowmelt period, potential fine sediment delivery, and crossing of streams during maintenance operations and removal of danger trees and other incompatible vegetation. Indirect impacts from deposition of fine sediments into suitable greenback cutthroat trout habitats downstream of project ROWs may include the covering of eggs or emerging fry in silt, potentially smothering eggs, and reduction of prey base (aquatic macroinvertebrates) due to loss of habitat and reduce oxygen level availability. These impacts are anticipated to be minimal. The No Action Alternative is "may affect, not likely to adversely affect" greenback cutthroat trout.

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Table 3-50. Effects Determinations Reached for Threatened, Endangered and Forest Service Sensitive Species (Fisheries Species) Analyzed in the Biological Assessments and Biological Evaluations

Common Name	Scientific Name	Status	ARNF		ANF		GMUG		MBRNF		NNF		PSINF		SJNF		WRNF	
			No Action	Proposed Action	No Action	Proposed Action	No Action	Proposed Action	No Action	Proposed Action	No Action	Proposed Action	No Action	Proposed Action	No Action	Proposed Action	No Action	Proposed Action
Federally Listed Species																		
Greenback cutthroat trout	*Oncorhynchus clarkii stomias*	Threatened; MIS	MANLAA	MANLAA	-	-	MANLAA	MANLAA	MANLAA	MANLAA	-	-	MANLAA	MANLAA	MANLAA	MANLAA	MANLAA	MANLAA
Forest Service Sensitive Species																		
Bluehead sucker	*Catostomus discobolus*	Sensitive	-	-	-	-	MIINLV	MIINLV	No Effect	No Effect	-	-	-	-	MIINLV	MIINLV	No Effect	No Effect
Colorado River cutthroat trout	*Oncorhynchus clarkii pleuriticus*	Sensitive; MIS	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV	MIINLV	-	-	-	-	MIINLV	MIINLV	MIINLV	MIINLV
Flannelmouth sucker	*Catostomus latippinis*	Sensitive	No Effect	No Effect	-	-	No Effect	No Effect	No Effect	No Effect	-	-	-	-	No Effect	No Effect	No Effect	No Effect
Mountain sucker	*Catostomus platyrhynchus*	Sensitive	No Effect	No Effect	-	-	No Effect	No Effect	No Effect	No Effect	-	-	-	-	-	-	-	-
Roundtail chub	*Gila robusta*	Sensitive	-	-	-	-	-	-	-	-	-	-	-	-	No Effect	No Effect	-	-

Sources: RMES, Inc. and PENDO Solutions, Inc. 2012a-2012d, 2013b-2013e; RMES, Inc. and PENDO Solutions, Inc. 2014a-2014g

ARNF Arapaho-Roosevelt National Forest
ANF Ashley National Forest
GMUG Grand Mesa, Uncompahgre, and Gunnison National Forest
MALAA May affect, and is likely to adversely affect
MANLAA May affect, but is not likely to adversely affect
MBRNF Medicine Bow-Routt National Forest
MIINLV May adversely impact individuals, but is not likely to result in a loss of viability on the project area, nor cause a trend to federal listing or a loss of species viability rangewide
MIS management indicator species
NNF Nebraska National Forest
PSINF Pike and San Isabel National Forest
SJNF San Juan National Forest
WRNF White River National Forest

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3.9.5.2 Proposed Action

This section describes direct and indirect effects of vegetation management in the project area under the Proposed Action. The primary difference between the two alternatives is the ability to quantify the amount and timing of vegetation management activities in specific locations under the Proposed Action. Additionally, Table 2-13 includes specific design features incorporated into the Proposed Action to protect environmental resources. Design features specific to fisheries resources are repeated below:

- Equipment will not be permitted within 100 feet of the edge of streams or the edge of riparian or wetlands/fens vegetation except as authorized by the Forest Service. Hand felling of hazardous trees is permitted within the 100-foot buffer.
- All maintenance vehicles and machinery will be properly cleaned and treated before beginning work over or next to waterways in an effort to reduce the potential spread of aquatic nuisances, including whirling disease.
- Equipment staging and refueling areas will be at least 250 feet away from streams and wetlands, and a Spill Prevention, Control, and Countermeasures Plan will be prepared.
- Job materials such as gasoline, chainsaws, garbage containers, etc., will not be stockpiled less than 250 feet from stream banks or other watercourse perimeters in an effort to prevent accidental spills of materials into fisheries habitat.

Effects of the Proposed Action on Fisheries Resources

Under the Proposed Action, the types of potential direct and indirect effects to fisheries resources would be similar to those described for the No Action Alternative, resulting from changes to stream hydrology (i.e., timing and volume of water flows), alterations to riparian habitats from vegetation management, and fine sediment and pollutant delivery from roads, skid trails, and potential spills. However, under the Proposed Action, the location and extent of the proposed vegetation management activities are more specifically known. As a result, the potential impacts are easier to quantify. As detailed in Table 2-4, WAPA anticipates initially treating up to 1,610 acres of incompatible vegetation within the ROWs (Vegetation Management Categories 2, 4, and 6) under the Proposed Action, which is approximately 40 percent of the project area. Another 1,720 acres (42 percent of the project area) is currently in acceptable condition, but over the long-term it will require monitoring and treatment for incompatible vegetation (Vegetation Management Categories 3 and 5). With implementation of the Proposed Action, approximately 2,617 acres of forested vegetation would be converted to a grass/forb community (RMES, Inc. and PENDO Solutions, Inc. 2012a-2012d, 2013b-2013e), and Table 3-48 identifies about 285 acres of clearing along ROWs within water influence zones.

Increased vegetation management under the Proposed Action would result in the conversion of forested vegetation to grass/forb and low growing vegetation during initial implementation, which may increase the potential for surface water runoff and sedimentation. Any increased water delivery generated from the implementation of the Proposed Action would most likely occur during the spring runoff period, with some higher low-flow levels during the summer months (RMES, Inc. and PENDO Solutions, Inc. 2012a-2012d, 2013c-2013e). However, the ROWs comprise small percentages of the national forests, and the Proposed Action is spread out across many different basins and sub-basins with minimal activity located directly adjacent to streams. Therefore, the amount and timing of water delivery to streams and fish habitats within each forest watershed are not expected to significantly change.

Surface disturbances located within a water influence zone can negatively influence fish habitat through erosion and fine sediment deposition (RMES, Inc. and PENDO Solutions, Inc. 2012a-2012d, 2013b-2013e). However, as detailed above, heavy equipment will not be permitted within 100 feet of streams or edge of riparian/wetlands, except as authorized by the Forest Service, which includes water influence zones, and WAPA would minimize vegetation maintenance on wet soils to prevent excessive rutting and erosion. These design features and standard maintenance procedures would reduce the potential for infiltration of fine sediment from project area ROWs into fish habitat. Additionally, trees in water influence zones would be hand cut; therefore, the potential for transfer of fine sediment from vegetation management activities into waterways would be minimal.

Continued and increased use of existing access roads during vegetation treatments under the Proposed Action would potentially increase the baseline mobilization of fine sediments and potential for delivery into streams in the project area. Primary locations for delivery of sediment may include existing roadway crossings over streams and wetlands. Since the project area is spread out across many water basins and sub-basins, sediment increases would not be localized and would not accumulate to create adverse impacts on fisheries habitat. Additionally, after treatment of incompatible vegetation is complete, traffic on access roads would decrease compared to No Action, which would reduce the potential for deposition of fine sediments into fish habitat.

Similar to the No Action Alternative, there is a potential for fish to be exposed to pollutants besides sediment under the Proposed Action; however, design features detailed in Table 2-13 and standard maintenance procedures detailed in Table 2-15 have been incorporated into the Proposed Action to reduce the potential for accidental spills (including herbicides and hydraulic fluid) in or adjacent to waterways. All refueling and maintenance activities would occur 250 feet away from streams to reduce the risk of spilled fluids reaching streams and impacting aquatic resources.

Threatened, Endangered, and Sensitive Fish Species

Similar to the No Action Alternative, only the greenback cutthroat trout, bluehead sucker, and the Colorado River cutthroat trout would potentially be impacted by implementation of the Proposed Action. Potential effects to the greenback cutthroat trout are anticipated for each forest where this species occurs in the project area and are described below. As with the No Action Alternative, it was determined that the effects to the bluehead sucker and Colorado River cutthroat trout would not be severe enough cause a trend to federal listing or a loss of species' viability. It was also determined that there would be no effect on the flannelmouth sucker, mountain sucker or roundtail chub.

Greenback Cutthroat Trout Effects

As identified above, greenback cutthroat trout have documented occurrences in the project area for all the national forests in Colorado. Direct and indirect impacts to this species would be similar to those described for the No Action Alternative, except with an increased potential for delivery of fine sediments into suitable habitats from roadways during the initial implementation of increased vegetation management activities. While no greenback cutthroat trout populations occur in the project area, the impacts from fine sediment delivery may affect downstream habitats and unknown areas of occupied habitat. There could also be decreased shading of riparian areas and modification of riparian vegetation from vegetation treatments in or near water influence zone areas. These indirect impacts would likely affect aquatic conditions and habitats for greenback cutthroat trout and their prey species (aquatic macroinvertebrates) (RMES, Inc. and PENDO Solutions, Inc. 2012b-2012d, 2013c-2013e). While the specific species and abundances of various species of aquatic macroinvertebrates may change with changes in shading of streams and temporary inputs of fine sediments, the densities and availability of aquatic macroinvertebrates is not expected to change enough so that decreases in greenback cutthroat trout occupancy or densities of affected reaches would occur (RMES, Inc. and PENDO Solutions, Inc. 2012b-2012d, 2013c-2013e). The Proposed Action is "may affect, not likely to adversely affect" greenback cutthroat trout (RMES, Inc. and PENDO Solutions, Inc. 2012b-2012d, 2013c-2013e).

3.9.5.3 Cumulative Effects

Under NEPA, cumulative impacts are the incremental impacts of the Proposed Action when added to other past, present, and reasonably foreseeable future federal, state, and private activities (40 CFR 1508.7).

The transmission line ROWs analyzed in the project area cross numerous habitats in Colorado, Nebraska, and Utah. Appendix A identifies approximately 20 past, present, and reasonably foreseeable programs, activities, or events adjacent to the project area ROWs that could affect threatened and endangered and sensitive fish. These primarily include wildland urban interface fire hazard reduction, wildfire landscape restoration and fuel reduction, salvage operations on forested areas afflicted with mountain pine beetle or spruce beetle, logging and danger-tree removal, ponderosa pine conservation and restoration, vegetation removal for wildlife conservation and habitat creation, management of noxious weeds and nonnative invasive vegetation, analysis and construction of motorized single-track recreation trails, and grazing management. The actions from these 20 identified projects could have a cumulative adverse effect on fisheries resources and could contribute to disruption in migration patterns. Some of the actions from these 20 identified projects could also cause beneficial effects, such as mimicking natural disturbances from woody debris and provision of habitat enhancement through increased sediment trapping or greater erosion control.

Because project ROWs are linear and spread over a large geographical area, WAPA's actions under the No Action Alternative or the Proposed Action would contribute relatively minor overall cumulative impacts when considered together with other actions in the region. Cumulative impacts on fisheries resources could include increased surface water runoff and water temperature, sedimentation of suitable habitats from upland ground disturbing projects, potential exposure to herbicides, habitat degradation, and decreased water quality. The presence and spread of nonnative trout and aquatic invasive species into area streams and lakes would continue to present a hybridization and competitive threat to existing fish populations. These cumulative effects are expected to continue into the foreseeable future. In considering the projects in Appendix A, there would be no changes to the effect determination for greenback cutthroat trout for the No Action Alternative or Proposed Action.

3.10 Fire and Fuels Management

3.10.1 Introduction

This section describes fire and fuels management activities in the project area that vegetation management activities could constrain or that vegetation management activities could adversely affect. Section 3.10.2 describes the regulatory and policy framework; Section 3.10.3 describes methods and assumptions for analysis; Section 3.10.4 describes the fire and fuels management affected environment; and Section 3.10.5 describes potential impacts to fire and fuels management, including cumulative impacts.

Historically, fire has been a part of the ecosystem dynamics in the West. Fire played an important role in forming vegetation conditions in the western United States. As humans have altered fire's role on the landscape, fuels have built up and many types of vegetation have grown more dense and prone to high-intensity wildfires. Western U.S. forests are burning with uncharacteristic severity and scale. A substantial contribution has been the paradox of successful fire exclusion – as we have become more efficient at suppressing wildfire, the wildfire problem has only become worse (Brown and Arno 1991).

When heat-generating, spark-producing facilities like electrical transmission lines are placed in a flammable environment, two things happen: (1) fires occasionally start when a portion of the system malfunctions or a tree falls across a line and (2) electrical facilities can be damaged or destroyed by a wildfire caused by some other ignition source.

3.10.2 Regulatory and Policy Framework

Authorizations for use of NFS lands can include a condition that requires state, county, or other federal agency licenses, permits, certificates, or other approval documents, such as a Federal Communications Commission license or a Federal Energy Regulatory Commission license (CFR 36, Chapter II, Part 251 Land Uses, Subpart B- Special Uses).

CFR 36, Chapter II, Part 261.5, Fire, states:

> The following are prohibited:
>
> (a) Carelessly or negligently throwing or placing any ignited substance or other substance that may cause a fire.
>
> (c) Causing timber, trees, slash, brush or grass to burn except as authorized by permit.
>
> (d) Leaving a fire without completely extinguishing it.
>
> (e) Causing and failing to maintain control of a fire that is not a prescribed fire that damages the National Forest System.
>
> (g) Negligently failing to maintain control of a prescribed fire on Non-National Forest System lands that damages the National Forest System.

NERC Standard FAC-003-02, “Transmission Vegetation Management”, requires transmission owners to competently execute a successful vegetation management program. The NERC Standard requires utilities to ensure that conditions conductive to reliable and secure energy delivery are maintained within their service areas. Fire risk is one of the many factors for consideration when developing and executing a vegetation management program. The purpose of the plan is to create conditions conducive to reliable energy delivery in their service areas. Standard R1.2.1 identifies fire risk as one of the many factors to be considered when developing a vegetation management program.

The 2012 International Wildland-Urban Interface Code, Appendix A, General Requirements, Section A102, Vegetation Control, outlines actions needed to prevent electrical facilities from starting fires. The requirements include standards for trimming clearances based on line voltage, and creation of a combustible-free space consisting of a clearing not less than 10 feet around poles or towers with equipment and hardware types that have a history of becoming an ignition source (International Code Council 2012).

3.10.3 Methods and Assumptions for Analysis

This analysis is based on existing conditions of WAPA ROWs in the project area. WAPA mapped vegetation types as described in the Forest Health and Vegetation section and correlated these vegetation types with fire behavior fuel models (Anderson 1982), a system for classifying different fuel loads. Different fuel loads lead to differences in fire behavior (Anderson 1982; Scott and Burgan 2005) and therefore lead to predictions of potential fire behavior. Using vegetation types as a guide, it is possible to develop a close approximation of fuel loads.

After WAPA correlated fuel models to vegetation types, WAPA obtained average severe weather conditions (high percentile or 90th percentile weather conditions) from the Colorado Wildfire Risk Assessment (WIZ) or analyses of data from the applicable fire weather stations in Nebraska and Ashley National Forests. Average severe fire weather conditions are defined in the context of the National Fire Danger Rating System. The terms "average severe fire weather conditions" and "90th percentile weather conditions" are interchangeable and represent the upper end of fire danger for any given area. At the 90th percentile weather conditions, more severe conditions only occur 10 percent of the time (Schlobohm and Brain 2002).

Fuel loading by various size classes, fuel moisture content, wind speeds, and slope drive fire behavior. Table 3-51 summarizes fuel moisture by fuel-size class and winds that make up the average severe wildfire conditions experienced in each national forest.

Table 3-51. Average Severe Wildfire Weather Conditions

National Forest(s)	WIZ/Weather Station[1]	1-hour TL[1, 2] % Moisture Content	10-hour TL1[3] % Moisture Content	100-hour TL1[4] % Moisture Content	Live herbaceous Fuels[5] % Moisture Content	Live Woody fuels[6] % Moisture Content	20-foot Wind Speed[7] Miles/Hour	Maximum Probable Wind Gust Miles/Hour
Arapaho-Roosevelt	East - WIZ 3 (Corral Creek)	4	6	10	31	80	12	29
	West - WIZ 2 (Dowd)	4	6	10	24	80	15	33
Ashley	Cart Creek (Zone 442)	2	3	5	30	60	8	23
	Diamond Rim (Zone 443)	3	3	5	30	60	17	36
Grand Mesa, Uncompahgre, and Gunnison	East - WIZ 5 (Taylor Park)	4	5	8	27	76	13	30
	West - WIZ 6 (Morefield)	4	4	7	37	71	12	29
Medicine Bow-Routt	West - WIZ 2 (Dowd)	4	6	10	24	80	15	33
Nebraska	Kings Canyon	3	4	9	31	87	7	21
Pike and San Isabel	WIZ 5 (Taylor Park)	4	5	8	27	76	13	30
San Juan	NW Dolores - WIZ 6 (Morefield)	4	4	7	37	71	12	29
	SE Dolores - WIZ 7 (Sandoval)	3	4	6	35	68	9	24
White River	WIZ 5 (Taylor Park)	4	5	8	27	76	13	30

[1]Timelag (TL) is the time necessary for a fuel size class to change 63 percent of the total expected change in moisture content (Anderson 1982).
[2]1-hour timelag fuels are less than 0.25 inch in diameter.
[3]10-hour timelag fuels are 0.25 inch to 1 inch in diameter.
[4]100-hour timelag fuels are 1 inch to 3 inches in diameter.
[5]Live herbaceous moisture content is the ratio of the amount of water to the amount of dry plant material in herbaceous plants (i.e., grasses and forbs).
[6]Live woody fuels percent moisture content is the ratio of the amount of water to the amount of dry plant material in shrubs (National Wildfire Coordination Group 2008).
[7]10-foot wind speed is the wind speed measured at 20 feet above the ground.

NW northwest
SE southeast
TL timelag
WIZ weather influence zone

Depending on the locations of the transmission lines, WAPA used a different set of weather conditions to predict fire behavior by vegetation type for each forest's weather zone using the associated fuel model for each vegetation type. WAPA identified a desired fuel profile for each ROW that supports surface fire behavior of less than 4-foot flame lengths. This equates to a maximum fireline intensity of 100 British Thermal Units/feet/second (BTUs/ft/s) under average severe weather conditions. A fuel model is a simulated fuel complex for which all fuel descriptors required for the solution of a mathematical rate-of-spread model have been specified (National Wildfire Coordinating Group 2008). In other words, a fuel model is a database of fuel properties (e.g., fuel load and depth) that are significant for rating fire danger and predicting fire behavior potential.

Flame length is the distance between the flame tip and the midpoint of the flame depth at the base of the flame (generally the ground surface), an indicator of fire intensity (National Wildfire Coordinating Group 2008).

Fireline intensity is the rate of heat release per unit length of fireline, usually expressed in kilowatts per meter or BTU/ft/s (Helms 1998).

Table 3-52 shows how WAPA associated fuel models with vegetation type. Fuel models are a basic building block for wildfire behavior calculations.

Table 3-52. Vegetation Type – Fuel Model Assignment

Vegetation Type[1,2]	Total Acres[1]	Fuel Model[3]
Grass-forb	667.8	1
Shrub (including true mountain mahogany)	103.8	2
Ponderosa pine	103.1	2
Gambel oak	485.1	4
Mountain big sagebrush	82.3	4
Bristlecone pine	1.4	8
Limber pine	0.9	8
Pinyon/juniper	25.5	8
Aspen	200.6	9
Cottonwood	3.0	9
Seral aspen/mixed conifer	2.2	9
Seral aspen/lodgepole pine	0.1	9
Seral aspen/ponderosa pine	0.4	9
Douglas fir	33.6	10
Lodgepole pine	235.8	10
Mixed coniferous forest	2	10
Spruce/fir	107.1	10
Subtotal for vegetation	2054.7	N/A
Cleared (unburnable)	1590.2	N/A
TOTAL	**3,644.9**	**N/A**

[1]Western Area Power Administration 2011

[2]Vegetation types in bold italic text have the potential to exceed conditions of less than 4-foot flame lengths and or fireline intensities less than 100 British Thermal Units/feet/second.

[3]Fuel models are based on descriptions in Aids to Determining Fuel Models for Estimating Fire Behavior (Anderson 1982).

Table 3-53 lists fuel model characteristics and predicted fire behavior. It describes the general vegetation, fuel loading, and fuel-bed depth that make up each of the fuel models. Table 3-54 lists total fuel model acres by fuel model in the project area.

Table 3-53. Fuel Model Characteristics

Fuel Group and Model	Descriptor and Associated Fire Behavior	Fuel Load Less than 3 Inches Dead and Live (tons/acre)	Fuel-bed Depth (feet)
Grasses FM 1	Short grass (1 foot) – Fires are surface fires that move rapidly, with general flame lengths of 4 feet under wind conditions of 5 miles per hour.	0.74	1
Grasses FM 2	Timber (grass and understory) – Fires are generally surface fires with potential for higher intensities due to clumps of heavy fuel. Flame lengths can be up to 6 feet under wind conditions of 5 miles per hour.	4.0	1
Shrubs FM 4	Shrub fields – Subject to high intensity and fast-moving fires due to a dense secondary overstory of live and dead fuels; deep litter accumulation may also hampers pre-suppression efforts. Flame lengths can be up to 19 feet under wind conditions of 5 miles per hour.	13.0	6
Shrubs FM 5	Brush (2 feet) – Fires are generally surface fires and not very intense due to light fuel loads, with little dead material, and the foliage contains little volatile material. Flame lengths are 4 feet under wind conditions of 5 miles per hour.	3.5	2
Timber FM 8	Closed timber litter – Commonly low-burning ground fires with low flame lengths, punctuated by possible concentrations of heavy fuel leading to flare-ups and longer flame lengths and intensities. Under severe weather conditions (hot dry, windy conditions), this fuel model can exhibit fire hazard. Flame lengths are modest (1 foot) under surface winds of 5 miles per hour.	5.0	0.2
Timber FM 9	Hardwood and long needled conifer – Fires can burn faster than FM 8 due to accumulations of leaves and surface debris, also leading to potential torching into the crowns and spotting. Flame lengths are 2.6 feet under surface winds of 5 miles per hour.	3.5	0.2
Timber FM 10	Timber (litter and understory) – Fires burn in surface and ground fuels with greater intensity than FM 8 or FM 9, and more frequent crowning out, spotting, and torching of trees. Flame lengths are 4.8 feet under surface winds of 5 miles per hour.	12.0	1

Source: Anderson 1982

Table 3-54. Fuel Model Acreage Summary

Fuel Model	Total Fuel Model Acres
1	667.8
2	206.9
4	567.4
8	27.8
9	206.3
10	378.5
Subtotal	2,054.7
Unburnable (no fuel model)	1,590.2
TOTAL	**3,644.9**

Source: Calculated from information in Table 3-52.

WAPA determined changes in the fuel models associated with vegetation types, acreages, and fuel loading in the project area to assess impacts. This section uses the fuel models to describe the predicted surface fire behavior (flame lengths and associated fire intensity). Changes in fuel models are discussed in relation to the change in risk of wildfire in the project area and infrastructure in the ROWs. The vegetation treatment methods described for the No Action Alternative and the Proposed Action are considered to be proven and standard treatment methods that are widely accepted as effective in modifying fuel levels to achieve specified fuels objectives. These methods would be appropriately applied to achieve the desired fuel models and associated flame lengths and intensities at the site-specific level, consistent with Design Feature 44.

Impact Criteria and Indicators

There would be an impact to fire and fuels management if there were a change in the fuel model that increases the risk of wildfire in the project area as a direct result of the proposed project.

3.10.4 Affected Environment

Transmission lines in areas with high fire risk and high occurrence of lightning strikes create risk to the electrical system. Dense smoke from wildfires can trip a circuit, causing it to go out of service, or outages can result from emergency line de-rating or shut-downs during a nearby fire to prevent thermal damage to the line, to prevent a smoke-caused trip, or to meet the safety needs of firefighters. When there is a wildfire very near a transmission line ROW, wood poles can burn. Lines carried by metal towers are also vulnerable to heat from wildfire. The conductors on both wood- and metal-structured transmission lines are susceptible to physical damage from the heat of a wildfire, and conductor damage is not repairable (conductors must be replaced). A fire can force the outage of a transmission circuit if it raises the ambient temperature of the air around the conductors above the line’s operating parameters. Smoke can cause an outage from a phase-to-phase or phase-to-ground fault because the ionized air in the smoke can become a conductor of electricity, resulting in arcing between lines on a circuit or between a line and the ground (Turley 2005).

WAPA’s transmission lines cross areas with flammable vegetation. Fire behavior is influenced by weather conditions, topography, and fuel. After a transmission line is constructed, active management of fuel loading along the ROW is the most effective and efficient way to mitigate the effects of wildfire on the transmission line.

A fuel profile that promotes surface fire behavior of less than 4-foot flame lengths (maximum fireline intensity of 100 BTUs/ft/s) under average severe fire weather conditions is desired to limit wildfire impacts to transmission infrastructure. To achieve the desired surface fire behavior, the resulting fuel characteristics should exhibit:

1. Low fuel loading such as that represented under Fuel Model 1 (grass group), Fuel Model 5 (shrub group), and Fuel Models 8 and 9 (timber group) (Anderson 1982).
2. A highly compacted fuel bed (crushed, chipped, masticated, or lopped and scattered).

Wood poles are thought to be more prone to wildfire than aluminum or steel. In fact, they are very fire tolerant as long as an area of at least 10 feet around their base has been cleared of combustible material. Deep cracks in a pole also compromise its resistance to wildfires. Sparks and embers can be blown into the cracks. The deep fissures provide the ideal environment for the embers to kindle full combustion of the pole (Cohen 2011).

Mr. Jack Cohen, Research Physical Scientist, at the Forest Service Missoula Fire Laboratory (Cohen 2011) yielded the following insights about wood power pole vulnerability to wildfires:

A. Radiant heat issues can be mitigated using the 20 kilowatt per square meter rule associated with wooden wall combustion research (Cohen and Butler 1998). Piloted wood ignition occurs at 20 kilowatts per square meter after more than 5.5 minutes of exposure. Reducing heat exposure to less than this threshold can prevent wood ignition. This can be accomplished by thinning stands within 40 meters (131 feet) of a structure to reduce crown fire potential.

B. Convective heat can best be dealt with by limiting direct flame impingement to poles.

C. Poles become more flammable or likely to catch fire as they age, shrink, and get deep cracks or fissures in them. The deeper the crack the more vulnerable the pole. Even flames from light fuels such as dry grass can ignite a pole if the poles have deep cracks or fissures.

D. Windblown embers can lodge in crevasses and cause smoldering and eventual pole deterioration. Mr. Cohen specifically noted situations where crossarms, high above the flaming front, have caught fire and burned completely through and are hanging suspended from the conductor.

E. Clearing light fuels at least 10 feet away from older poles is recommended.

Another wildfire concern is crown fires. Crown fires burn with much more intensity than surface fires and have flame lengths of 40 to 90 feet, which produces fireline intensities of 3,148 to 10,829 BTUs/ft/s.

3.10.4.1 Arapaho-Roosevelt National Forest

Table 3-55 lists the vegetation types along WAPA transmission lines in the Arapaho-Roosevelt National Forest and identifies their associated fuel model, anticipated flame length, and fireline intensity during a wildfire under 90th percentile weather conditions.

Table 3-55. Fire Conditions by Vegetation Type for Arapaho-Roosevelt National Forest

Vegetation Type[1,2]	Acres[1]	Fuel Model[3]	East WIZ 3 Flame Length (feet)	East WIZ 3 FLI (BTU/ft/s)	West WIZ 2 Flame Length (feet)	West WIZ 2 FLI (BTU/ft/s)
Grass-forb	105.9	1	5	187	6.1	284
Limber pine	0.9	8	1.3	9	1.4	12
Aspen	11.6	9	3.4	81	4	112
Douglas fir	6.9	10	6	284	6.9	374
Lodgepole pine	78.8	10	6	284	6.9	374
Spruce/fir	18.8	10	6	284	6.9	374
TOTAL	**222.4**	-	-	-	-	-

[1]Source: Western Area Power Administration 2011
[2]Vegetation types in bold italic text have the potential to exceed desired conditions of less than 4-foot flame lengths, fireline intensities less than 100 BTUs/ft/s, or both.
[3]Source: Anderson 1982

BTU/ft/s British thermal unit per foot per second
FLI fireline intensity
WIZ Weather Influence Zone

3.10.4.2 Ashley National Forest

Table 3-56 lists the vegetation types along WAPA's transmission line in the Ashley National Forest and identifies their associated fuel model, anticipated flame length, and fireline intensity during a wildfire under 90th percentile weather conditions.

Table 3-56. Fire Conditions by Vegetation Type for Ashley National Forest

Vegetation Type[1,2]	Acres[1]	Fuel Model[3]	Zone 442 Flame Length[3] (feet)	Zone 442 FLI (BTU/ft/s)	Zone 443 Flame Length (feet)	Zone 443 FLI (BTU/ft/s)
Grass-forb	12.8	1	4.5	148	7.4	434
Ponderosa pine	20.1	2	7	389	11	1,043
Shrub	24.5	2	7	389	11	1,043
Mountain big sagebrush	82.3	4	23	5,173	33.5	11,727
Pinyon-juniper	2.4	8	1.2	9	1.7	18
Aspen	1.4	9	3.2	69	4.7	165
Seral aspen/lodgepole pine	0.1	9	3.2	69	4.7	165
Seral aspen/mixed conifer	2.2	9	3.2	69	4.7	165
Seral aspen/ponderosa pine	0.4	9	3.2	69	4.7	165
Douglas fir	1.7	10	6	278	8.6	606
Lodgepole pine	1.4	10	6	278	8.6	606
Mixed coniferous forest	2.0	10	6	278	8.6	606
TOTAL	**151.3**	-	-	-	-	-

[1]Source: Western Area Power Administration 2011
[2]Vegetation types in bold italic text have the potential to exceed desired conditions of less than 4-foot flame lengths, fireline intensities less than 100 BTUs/ft/s, or both.
[3]Source: Anderson 1982

BTU/ft/s British thermal unit per foot per second
FLI fireline intensity
WIZ Weather Influence Zone

3.10.4.3 Grand Mesa, Uncompahgre, and Gunnison National Forest

Table 3-57 lists the vegetation types along WAPA transmission lines in the Grand Mesa, Uncompahgre, and Gunnison National Forest and identifies their associated fuel model, anticipated flame length, and fireline intensity during a wildfire under 90th percentile weather conditions.

Table 3-57. Fire Conditions by Vegetation Type for Grand Mesa, Uncompahgre, and Gunnison National Forests

Vegetation Type[1,2]	Acres[1]	Fuel Model[3]	East WIZ 5 Flame Length[3] (feet)	East WIZ 5 FLI (BTU/ft/s)	West WIZ 6 Flame Length (feet)	West WIZ 6 FLI (BTU/ft/s)
Grass-forb	77.4	1	5.3	217	5	187
Shrub	8.4	2	8.3	571	7.8	487
Ponderosa pine	29.6	2	8.3	571	7.8	487
Gambel oak	237.7	4	24.7	6,047	24.3	5,833
Pinyon-juniper	0.1	8	1.3	10	1.3	10
Aspen	90.3	9	3.6	91	3.4	81
Cottonwood	1.1	9	3.6	91	3.4	81
Douglas fir	0.1	10	6.5	328	6.3	314
Lodgepole pine	27.1	10	6.5	328	6.3	314
Spruce/fir	9.1	10	6.5	328	6.3	314
TOTAL	**480.9**	-	-	-	-	-

[1]Source: Western Area Power Administration 2011
[2]Vegetation types in bold italic text have the potential to exceed desired conditions of less than 4-foot flame lengths, fireline intensities less than 100 BTUs/ft/s, or both.
[3]Source: Anderson 1982

BTU/ft/s British thermal unit per foot per second
FLI fireline intensity
WIZ Weather Influence Zone

3.10.4.4 Medicine Bow-Routt National Forests

Table 3-58 lists the vegetation types along WAPA transmission lines in the Medicine Bow-Routt National Forest and identifies their associated fuel model, anticipated flame length, and fireline intensity during a wildfire under 90th percentile weather conditions.

Table 3-58. Fire Conditions by Vegetation Type for Medicine Bow-Routt National Forests

Vegetation Type[1,2]	Acres[1]	Fuel Model[3]	West WIZ 2 Flame Length (feet)	West WIZ 2 FLI (BTU/ft/s)
Grass-forb	256.8	1	6.1	284
Shrub	21.4	2	9.3	721
Aspen	22.6	9	4	112
Lodgepole pine	95.7	10	6.9	374
Spruce/fir	56.6	10	6.9	374
TOTAL	**453.1**	-	-	-

[1]Source: Western Area Power Administration 2011
[2]Vegetation types in bold italic text have the potential to exceed desired conditions of less than 4-foot flame lengths, fireline intensities less than 100 BTUs/ft/s, or both.
[3]Source: Anderson 1982

BTU/ft/s British thermal unit per foot per second
FLI fireline intensity
WIZ Weather Influence Zone

3.10.4.5 Nebraska National Forest

Table 3-59 lists the vegetation types along WAPA's transmission line in Nebraska National Forest and identifies their associated fuel model, anticipated flame length, and fireline intensity during a wildfire under 90th percentile weather conditions.

Table 3-59. Fire Conditions by Vegetation Type for Nebraska National Forest

Vegetation Type[1,2]	Acres[1]	Fuel Model[3]	Kings Canyon RAWS Flame Length (feet)	Kings Canyon RAWS FLI (BTU/ft/s)
Grass-forb	79.7	1	3.6	91
Ponderosa pine	3.8	2	5.8	263
TOTAL	**83.5**	-	-	-

[1]Source: Western Area Power Administration 2011
[2]Vegetation types in bold italic text have the potential to exceed desired conditions of less than 4-foot flame lengths, fireline intensities less than 100 BTUs/ft/s, or both.
[3]Source: Anderson 1982

BTU/ft/s British thermal unit per foot per second
FLI fireline intensity
RAWS Remote Automated Weather Station
WIZ Weather Influence Zone

3.10.4.6 Pike and San Isabel National Forest

Table 3-60 lists the vegetation types along WAPA's transmission lines in the Pike and San Isabel National Forest and identifies their associated fuel model, anticipated flame length, and fireline intensity during a wildfire under 90th percentile weather conditions.

Table 3-60. Fire Conditions by Vegetation Type for Pike and San Isabel National Forest

Vegetation Type[1,2]	Acres[1]	Fuel Model[3]	WIZ 5 Flame Length (feet)	WIZ 5 FLI (BTU/ft/s)
Grass-forb	23.4	1	5.3	217
Shrub	40.7	2	8.3	571
Ponderosa pine	2.7	2	8.3	571
Bristlecone pine	1.4	8	1.3	10
Pinyon-juniper	7.9	8	1.3	10
Aspen	4.6	9	3.6	91
Douglas fir	6.0	10	6.5	328
Lodgepole pine	9.7	10	6.5	328
Spruce/fir	12.1	10	6.5	328
TOTAL	**108.5**	**-**	**-**	**-**

[1]Source: Western Area Power Administration 2011
[2]Vegetation types in bold italic text have the potential to exceed desired conditions of less than 4-foot flame lengths, fireline intensities less than 100 BTUs/ft/s, or both.
[3]Source: Anderson 1982

BTU/ft/s British thermal unit per foot per second
FLI fireline intensity
WIZ Weather Influence Zone

3.10.4.7 San Juan National Forest

Table 3-61 lists the vegetation types along WAPA's transmission lines in the San Juan National Forest and identifies their associated fuel model, anticipated flame length, and fireline intensity during a wildfire under 90th percentile weather conditions.

Table 3-61. Fire Conditions by Vegetation Type for San Juan National Forest

Vegetation Type[1,2]	Acres[1]	Fuel Model[3]	WIZ 6 Flame Length (feet)	Wiz 6 FLI (BTU/ft/s)	WIZ 7 Flame Length (feet)	WIZ 7 FLI (BTU/ft/s)
Grass-forb	63.0	1	5	187	4.3	136
Shrub	0.2	2	7.8	487	6.8	367
Ponderosa pine	42.8	2	7.8	487	6.8	367
Gambel oak	218.6	4	24.3	5833	22	4,721
Pinyon-Juniper	5.3	8	1.3	10	1.2	8
Aspen	57.1	9	3.4	81	3.1	65
Cottonwood	1.9	9	3.4	81	3.1	65
Douglas fir	9.8	10	6.3	314	5.8	257
TOTAL	**398.7**	-	-	-	-	-

[1]Source: Western Area Power Administration 2011
[2]Vegetation types in bold italic text have the potential to exceed desired conditions of less than 4-foot flame lengths, fireline intensities less than 100 BTUs/ft/s, or both.
[3]Source: Anderson 1982

BTU/ft/s British thermal unit per foot per second
FLI fireline intensity
WIZ Weather Influence Zone

3.10.4.8 White River National Forest

Table 3-62 lists the vegetation types along WAPA's transmission lines in the White River National Forest and identifies their associated fuel model, anticipated flame length, and fireline intensity during a wildfire under 90th percentile weather conditions.

Table 3-62. Fire Conditions by Vegetation Type for White River National Forest

Vegetation Type[1,2]	Acres[1]	Fuel Model[3]	WIZ 5 Flame Length (feet)	WIZ 5 FLI (BTU/ft/s)
Grass-forb	48.9	1	5.3	217
Shrub	1.5	2	8.3	571
Ponderosa pine	4.1	2	8.3	571
Gambel oak	28.9	4	24.7	6,047
Pinyon-juniper	9.8	8	1.3	10
Aspen	13.0	9	3.6	91
Douglas fir	9.1	10	6.5	328
Lodgepole pine	23.6	10	6.5	328
Spruce/fir	10.6	10	6.5	328
TOTAL	**149.5**	-	-	-

[1]Source: Western Area Power Administration 2011
[2]Vegetation types in bold italic text have the potential to exceed desired conditions of less than 4-foot flame lengths, fireline intensities less than 100 BTUs/ft/s, or both.
[3]Source: Anderson 1982

BTU/ft/s British thermal unit per foot per second
FLI fireline intensity
WIZ Weather Influence Zone

3.10.5 Environmental Consequences

This section describes direct, indirect, and cumulative effects of WAPA's vegetation management activities on fire and fuels management under the No Action Alternative and the Proposed Action. The short-term effects are those expected to occur from treatments within the first five years after authorization. The long-term effects are those expected to occur beyond five years after authorization. This section provides an overview of the effects of the treatments on the different vegetation types and the expected change in fire behavior under 90th percentile (severe) weather conditions, as reflected by the changes in fuel models after treatment. The overview of effects applies to each forest-specific discussion.

3.10.5.1 No Action Alternative

Under this alternative, WAPA would continue reactive management of vegetation, and would continue monitoring along ROWs to identify imminent or existing threats to the power lines, and remove the threatening vegetation by manual, mechanical, or chemical treatments. The approach addresses immediate threats to the transmission lines. Of the 2,054.7 acres of vegetation in the ROWs, approximately 1,152.8 (56 percent) already exhibit predicted fire behavior (flame lengths under 90th percentile weather conditions) that exceed desired conditions (less than four-foot flame lengths and low intensity).

Direct and Indirect Effects

Under the No Action Alternative, debris would continue to accumulate and add to the existing fuel loads. This would increase the potential for wildfire damage on the 1,152.8 acres that do not meet desired fuel condition. It would also move almost all of the remaining vegetation toward undesirably high fuel loads, which would increase the risk from wildfire to the entire project area. This alternative would continue to control the risk of dead or tall trees from affecting the ROWs.

Arapaho-Roosevelt National Forest

Approximately 53 percent of the vegetation in WAPA's ROWs in these forests meet desired fuel models (FM 1, 8, or 9) and associated predicted flame lengths of four feet or less (Table 3-63). However, over time these areas would trend toward not meeting desired conditions because surface fuels would continue to accumulate. It is difficult to determine the estimated rate of accumulation, because current treatments under the No Action Alternative are based on monitoring and are done as needed. Approximately 47 percent of the vegetation in these forests does not meet desired fuel models and predicted flame lengths of four feet or less. These areas would continue to accumulate fuels and would continue to have the potential under severe weather conditions to present a high risk to ROWs due to excessive flame lengths and intensity.

Table 3-63. Existing and Predicted Fuel Models and Predicted Flame Lengths for Arapaho-Roosevelt National Forest under the No Action Alternative

Vegetation Type[1]	Total Acres	Existing Fuel Model	Post-treatment Fuel Model	Estimated Flame Lengths (feet)
Grass-forb	105.9	1	1	4.0
Limber pine	0.9	8	8	1.0
Aspen	11.6	9	9	2.6
Douglas fir	6.9	10	10	4.8
Lodgepole pine	78.8	10	10	4.8
Spruce/fir	18.8	10	10	4.8
TOTAL	**222.4**	-	-	-

[1]Vegetation types in bold italic text have the potential to exceed desired conditions of less than 4-foot flame lengths.

Ashley National Forest

Approximately 13 percent of the vegetation in WAPA's ROWs in this forest meet desired fuel models (FM 1, 8, or 9) and associated predicted flame lengths of four feet or less (Table 3-64). However, over time these areas would trend toward not meeting desired conditions because surface fuels would continue to accumulate. It is difficult to determine the estimated rate of accumulation, because current treatments under the No Action Alternative are based on monitoring and are done as needed. Approximately 87 percent of the vegetation in WAPA's ROWs in this forest does not meet desired fuel models and predicted flame lengths of four feet or less. These areas would continue to accumulate fuels and would continue to have the potential under severe weather conditions to present a high risk to the ROWs due to excessive flame lengths and intensity. Of particular concern is the fuel condition of the mountain big sagebrush vegetation type. This type represents 54 percent of the total vegetation in the ROWs and current predicted flame lengths are 19 feet, which far exceeds desired flame lengths of four feet, and under severe fire weather could cause an immediate threat to the ROWs. This fuel condition would continue to worsen over time.

Table 3-64. Existing and Predicted Fuel Models and Predicted Flame Lengths for Ashley National Forest under the No Action Alternative

Vegetation Type[1]	Acres	Existing Fuel Model	Post-treatment Fuel Model	Estimated Flame Lengths (feet)
Grass-forb	12.80	1	1	4.0
Ponderosa pine	20.1	2	2	6.0
Shrub	24.5	2	2	6.0
Mountain big sagebrush	82.3	4	4	19.0
Pinyon-Juniper	2.4	8	8	1.0
Aspen	1.4	9	9	1.0
Seral aspen/lodgepole pine	0.1	9	9	1.0
Seral aspen/mixed conifer	2.2	9	9	1.0
Seral aspen/ponderosa pine	0.4	9	9	1.0
Douglas fir	1.7	10	10	4.8
Lodgepole pine	1.4	10	10	4.8
Mixed coniferous forest	2.0	10	10	4.8
TOTAL	**151.30**	-	-	-

[1]Vegetation types in bold italic text have the potential to exceed desired conditions of less than 4-foot flame lengths.

Grand Mesa, Uncompahgre, and Gunnison National Forest

Approximately 35 percent (168 acres) of the vegetation in WAPA's ROWs in these forests meets desired fuel models (FM 1, 8, or 9) and associated predicted flame lengths of four feet or less (Table 3-65). However, over time these areas would trend toward not meeting desired conditions because surface fuels would continue to accumulate. It is difficult to determine the estimated rate of accumulation because current treatments under the No Action Alternative are based on monitoring and are done as needed. Approximately 65 percent of the vegetation (313 acres) does not meet desired fuel models and predicted flame lengths of four feet or less. These areas would continue to accumulate fuels and continue to have the potential under severe weather conditions to present a high risk to ROWs due to excessive flame lengths and intensity. Of particular concern is the fuel condition of the Gambel oak vegetation type. This type represents 49 percent of the total vegetation in the WAPA ROWs in these forests and current predicted flame lengths are 19 feet, which under severe fire weather could cause an immediate threat to the ROWs. This fuel condition and associated risk would continue to worsen over time.

Table 3-65. Existing and Predicted Fuel Models and Predicted Flame Lengths for the Grand Mesa, Uncompahgre, and Gunnison National Forest under the No Action Alternative

Vegetation Type[1]	Acres	Existing Fuel Model	Post-treatment Fuel Model	Estimated Flame Lengths (feet)
Grass-forb	77.4	1	1	4.0
Shrub	8.4	2	2	6.0
Ponderosa pine	29.6	2	2	6.0
Gambel oak	237.7	4	4	19.0
Pinyon-juniper	0.1	8	8	1.0
Aspen	90.3	9	9	2.6
Cottonwood	1.1	9	9	2.6
Douglas fir	0.1	10	10	4.8
Lodgepole pine	27.1	10	10	4.8
Spruce/fir	9.1	10	10	4.8
TOTAL	**480.9**	-	-	-

[1]Vegetation types in bold italic text have the potential to exceed desired conditions of less than 4-foot flame lengths.

Medicine Bow-Routt National Forest

Approximately 62 percent of the vegetation in WAPA's ROWs in these national forests currently meet desired fuel models (FM 1, 8, or 9) and associated predicted flame lengths of four feet or less (Table 3-66). Most of this vegetation is grass and forbs. However, over time these areas would trend toward not meeting desired conditions because surface fuels would continue to accumulate. There are 23 acres of aspen, which is less likely to move away from desired conditions than the grass-forb vegetation. It is difficult to determine the estimated rate of accumulation, because current treatments under the No Action Alternative are based on monitoring and are done as needed. Approximately 38 percent of the vegetation does not meet desired fuel models and predicted flame lengths of four feet or less. These areas would continue to accumulate fuels and would continue to have the potential under severe weather conditions to present a high risk to ROWs due to excessive flame lengths and intensity. The vegetation types characterized by fuel model 10 (lodgepole pine and spruce/fir) are not of particular concern over the short term, because these types are typically found at higher elevations, on cooler sites, or both, where wildfires have less potential to threaten the ROWs than wildfires in shrub vegetation. However, fuels would continue to accumulate and the risk from wildfire would continue to grow.

Table 3-66. Existing and Predicted Fuel Models and Predicted Flame Lengths for Medicine Bow-Routt National Forest under the No Action Alternative

Vegetation Type[1]	Acres	Existing Fuel Model	Post-treatment Fuel Model	Estimated Flame Lengths (feet)
Grass-forb	256.8	1	1	4.0
Shrub	21.4	2	2	6.0
Aspen	22.6	9	9	2.6
Lodgepole pine	95.7	10	10	4.8
Spruce/fir	56.6	10	10	4.8
TOTAL	**453.1**	-	-	-

[1]Vegetation types in bold italic text have the potential to exceed desired conditions of less than 4-foot flame lengths.

Nebraska National Forest

Almost all (95 percent) of the vegetation in WAPA's ROW in this forest meets desired fuel models (FM 1) and associated predicted flame lengths of four feet or less (Table 3-67). However, over time this grassy vegetation type would trend toward not meeting desired conditions because surface fuels would continue to accumulate. It is difficult to determine the estimated rate of accumulation, because current treatments under the No Action Alternative are based on monitoring and are done as needed. There are only four acres of the ponderosa pine vegetation type, which does not meet desired conditions; however, this small acreage is not expected to have an adverse effect on the ROW in the event of a wildfire.

Table 3-67. Existing and Predicted Fuel Models and Predicted Flame Lengths for Nebraska National Forest under the No Action Alternative

Vegetation Type[1]	Acres	Existing Fuel Model	Post-treatment Fuel Model	Estimated Flame Lengths (feet)
Grass-forb	79.7	1	1	4.0
Ponderosa pine	3.8	2	2	6.0
TOTAL	**83.5**	-	-	-

[1]Vegetation types in bold italic text have the potential to exceed desired conditions of less than 4-foot flame lengths.

Pike and San Isabel National Forest

Approximately 34 percent of the vegetation in WAPA's ROWs in these national forests meets desired fuel models (FM 1, 8, or 9) and associated predicted flame lengths of four feet or less (Table 3-68). However, over time, these areas would trend toward not meeting desired conditions because surface fuels would continue to accumulate. It is difficult to determine the estimated rate of accumulation, because current treatments under the No Action Alternative are based on monitoring and are done as needed. Approximately 66 percent of the vegetation does not meet desired fuel models and predicted flame lengths of four feet or less. These areas would continue to accumulate fuels and would continue to have the potential under severe weather conditions to present a high risk to ROWs due to excessive flame lengths and intensity. The vegetation types characterized by fuel model 10 are not of particular concern, because these types are typically found at higher elevations, on cooler sites, or both, where wildfires have less potential to threaten the ROWs than wildfires in shrub vegetation.

Table 3-68. Existing and Predicted Fuel Models and Predicted Flame Lengths for Pike and San Isabel National Forest under the No Action Alternative

Vegetation Type[1]	Acres	Existing Fuel Model	Post-treatment Fuel Model	Estimated Flame Lengths (feet)
Grass-forb	23.4	1	1	4.0
Shrub	40.7	2	2	6.0
Ponderosa pine	2.7	2	2	6.0
Bristlecone pine	1.4	8	8	1.0
Pinyon-juniper	7.9	8	8	1.0
Aspen	4.6	9	9	2.6
Douglas fir	6.0	10	10	4.8
Lodgepole pine	9.7	10	10	4.8
Spruce/fir	12.1	10	10	4.8
TOTAL	**108.5**	-	-	-

[1]Vegetation types in bold italic text have the potential to exceed desired conditions of less than 4-foot flame lengths.

San Juan National Forest

Approximately 32 percent of the vegetation in WAPA's ROWs in this forest meets desired fuel models (FM 1, 8, or 9) and associated predicted flame lengths of four feet or less (Table 3-69). However, over time these areas would trend toward not meeting desired conditions because surface fuels would continue to accumulate. It is difficult to determine the estimated rate of accumulation, because current treatments under the No Action Alternative are based on monitoring and are done as needed. Approximately 68 percent of the vegetation currently does not meet desired fuel models and predicted flame lengths of four feet or less. These areas would continue to accumulate fuels and would continue to have the potential under severe weather conditions to present a high risk to ROWs due to excessive flame lengths and intensity. Of particular concern is the fuel condition of the Gambel oak vegetation. This vegetation represents 55 percent of the total vegetation in the ROWs and current predicted flame lengths are 19 feet, which under severe fire weather could present an immediate threat to the ROWs. This fuel condition and associated risk would continue to worsen over time.

Table 3-69. Existing and Predicted Fuel Models and Predicted Flame Lengths for San Juan National Forest Under the No Action Alternative

Vegetation Type[1]	Acres	Existing Fuel Model	Post-treatment Fuel Model	Estimated Flame Lengths (feet)
Grass-forb	63.0	1	1	4.0
Shrub	0.2	2	2	6.0
Ponderosa pine	42.8	2	2	6.0
Gambel oak	218.6	4	4	19.0
Pinyon-juniper	5.3	8	8	1.0
Aspen	57.1	9	9	2.6
Cottonwood	1.9	9	9	2.6
Douglas fir	9.8	10	10	4.8
TOTAL	**398.7**	-	-	-

[1]Vegetation types in bold italic text have the potential to exceed desired conditions of less than 4-foot flame lengths.

White River National Forest

Approximately 48 percent of the vegetation (predominately gross-forb vegetation) in WAPA's ROWs in this forest meets desired fuel models (FM 1, 8, or 9) and associated predicted flame lengths of four feet or less (Table 3-70). However, over time these areas would trend toward not meeting desired conditions because surface fuels would continue to accumulate. It is difficult to determine the estimated rate of accumulation, because current treatments under the No Action Alternative are based on monitoring and are done as needed. Approximately 52 percent of the vegetation does not meet desired fuel models and predicted flame lengths of four feet or less. Of particular concern is the fuel condition of the Gambel oak vegetation. This type represents 19 percent of the total vegetation in the ROWs and current predicted flame lengths are 19 feet, which under severe fire weather could pose an immediate threat to the ROWs. These areas would continue to accumulate fuels, and would continue to have the potential under severe weather conditions to present a high risk to ROWs due to excessive flame lengths and intensity.

Table 3-70. Existing and Predicted Fuel Models and Predicted Flame Lengths for White River National Forest under the No Action Alternative

Vegetation Type[1]	Acres	Existing Fuel Model	Post-treatment Fuel Model	Estimated Flame Lengths (feet)
Grass-forb	48.9	1	1	4.0
Shrub	1.5	2	2	6.0
Ponderosa pine	4.1	2	2	6.0
Gambel oak	28.9	4	4	19.0
Pinyon/juniper	9.8	8	8	1.0
Aspen	13.0	9	9	2.6
Douglas fir	9.1	10	10	4.8
Lodgepole pine	23.6	10	10	4.8
Spruce/fir	10.6	10	10	4.8
TOTAL	**149.5**	-	-	-

[1]Vegetation types in bold italic text have the potential to exceed desired conditions of less than four 4-flame lengths.

3.10.5.2 Proposed Action

This section provides an overview of impacts to fire and fuels management under the Proposed Action by treatments and by vegetation groups. Following this section are national forest-specific sections that describe the expected changes in fuel models and associated fire behavior under severe weather conditions for the existing vegetation types described in Section 3.10.4.

The proposed range of treatments (see Chapter 2) are the ones WAPA applied regularly in the past in national forests and are regarded and accepted as effective practices for the purpose of managing vegetation and controlling fuel accumulations. These treatments include (1) manual control methods (primarily the use of chainsaws), (2) mechanical control methods (including mowing, chipping, grinding, and crushing of grass and understory vegetation, and the use of feller-bunchers and skidders), (3) herbicide and growth regulators (typically to treat undesirable herbaceous vegetation, such as invasive weeds or vegetation that re-sprouts), (4) slash pile burning, and (5) controlled grazing. The direct effects of these treatments include reducing the amount of fuel on the ground (reduced surface fuel loading), thinning the trees to a wider spacing, controlling re-growth, and pruning the lower branches of the trees to create a gap between surface and ladder and canopy fuels if there is an overstory of larger trees or shrubs.

Under the Proposed Action, WAPA would implement Design Feature 44 (see Table 2-13) to reflect site-specific vegetation and fuel characteristics, and would ensure that treated vegetation resulted in a fuel profile consistent with desired fuel models (surface fire flame lengths of four feet or less). The primary indirect effect would be that fire behavior would be affected because there is less fuel on the ground to burn, which decreases the amount of heat produced and lowers flame lengths. There would be only slight changes in the rate of fire spread because thinning trees opens the canopy to allow more sunlight to reach the surface, which reduces moisture in fine fuels. Fine fuels respond rapidly to changes in temperatures. The ability to mix a variety of treatments to address site-specific conditions and fuels objectives has been demonstrated to be effective. According to Stephens *et al.* (2009), "results indicate(d) that mechanical plus fire, fire-only, and mechanical-only treatments using whole-tree harvest systems were all effective at reducing potential fire severity under severe fire weather conditions." In addition, research has shown that during fuel-reduction treatments, it is important to address (among other factors) reducing surface fuels, increasing the height to live crown, decreasing crown density, and retaining large trees of fire-resistant species. Thinning and prescribed fire can be useful tools to achieve these objectives. Low thinning (thinning of understory vegetation) would be more effective than crown or selection thinning, and management of surface fuels would increase the likelihood that the stand would survive a wildfire (Agee and Skinner 2005).

The following paragraphs describe the effects by the three main vegetation groups.

Grass and shrub vegetation – These include the following vegetation types: grass-forb, shrub, and ponderosa pine. The treatments, both initial and maintenance, would create and maintain the vegetation in fuel model 1 or 5, with predicted flame lengths of approximately four feet. These would be direct effects associated with vegetation treatments. Indirect effects include the reduced risk of damage to power lines from wildfire in the ROWs, and reduced risk of wildfires that start in or move into ROWs and threaten adjacent NFS lands. This predicted fire behavior is consistent with desired conditions. Although ponderosa pine is coniferous, fuel model 1 is a common desired fuel model, because ponderosa pine in the project area typically has a grassy understory, which primarily dictates current and desired flame lengths and intensity.

Shrub vegetation – WAPA would treat shrub vegetation primarily with mechanical and hand methods that would greatly reduce the fuel-bed depth from approximately 2.5 feet to less than 1 foot. The fuel model 4 conditions would transition to fuel model 5 conditions because the depth of the fuel bed would be substantially reduced and the density and height of the remaining vegetation would be decreased. This would lead to a predicted flame length of four feet and reduced fire intensity.

Conifer vegetation – The combination of mechanical and hand treatments, followed by the strategic treatment of fuels (removal, hand-piling, and burning) would reduce the amount of surface fuel on the ground, thin the trees to a wider spacing, and prune the lower branches of the trees to remove ladder fuels that would allow surface fires to flare up into the crowns of trees. Fire behavior would be affected because there would be less fuel on the ground to burn, which would decrease the amount of heat produced and lower flame lengths. There would be only slight changes in the rate of fire spread because thinning trees opens the canopy to allow more sunlight to reach the surface, which reduces moisture in fine fuels. Fine fuels respond rapidly to changes in temperatures, relative humidity, and solar radiation, and are a key component in fire ignition. The treatments would also remove ladder fuels, thereby reducing the risk of surface fire to move from the forest floor into the crowns of the trees, torching out individual or groups of trees and threatening power lines and other infrastructure in the

ROWs. These effects would also reduce the potential risk of danger trees that threaten power lines because vegetation would be managed proactively along the entire length of the ROWs.

Existing fuel models 8 and 9 in the coniferous vegetation types would remain as fuel models 8 and 9. Vegetation types represented by fuel model 10 would transition to fuel model 8 or fuel model 9 conditions due to the reduction in the height and continuity of surface fuels. In addition, the potential for flare-ups and isolated torching into the upper crowns would be reduced due to the reduction in ladder fuels from the treatment of the understory shrub and dead fuels, and pruning of the lower limbs of trees and reductions in conifer density from thinning.

Arapaho-Roosevelt National Forest

Upon completion of treatments in Categories 2 through 5, vegetation types are expected to meet desired fuel models and predicted flame lengths and fire intensity (Table 3-71). Of particular note is the achievement of fuel models 1 and 9 in the grass/forb and lodgepole pine vegetation types, respectively. These vegetation types represent most of all the treated vegetation, and there would be a substantial reduction in risk to the ROWs from wildfire, and from danger trees.

Table 3-71. Existing and Predicted Fuel Models and Predicted Flame Lengths for Arapaho-Roosevelt National Forest under the Proposed Action

Vegetation Type[1]	Total Acres	Existing Fuel Model	Post-treatment Fuel Model	Estimated Flame Lengths (feet)
Grass-forb	105.9	1	1	4.0
Limber pine	0.9	8	8	1.0
Aspen	11.6	9	9	2.6
Douglas fir	6.9	10	9	2.6
Lodgepole pine	78.8	10	9	2.6
Spruce/fir	18.8	10	9	2.6
TOTAL	**222.4**	-	-	-

[1]Vegetation types in bold italic text have the potential to exceed desired conditions of less than 4-foot flame lengths.

Ashley National Forest

Upon completion of treatments in Categories 2 through 5, vegetation types are expected to meet desired fuel models and predicted flame lengths and fire intensity (Table 3-72). Of particular note is the achievement of fuel models 1 and 9 in the grass-forb and lodgepole pine vegetation types, respectively. These vegetation types represent most of the vegetation WAPA would treat, and there would be a substantial reduction in risk to the ROW from wildfire and from danger trees.

Table 3-72. Existing and Predicted Fuel Models and Predicted Flame Lengths for Ashley National Forest under the Proposed Action

Vegetation Type[1]	Acres	Existing Fuel Model	Post-treatment Fuel Model	Estimated Flame Lengths (feet)
Grass-forb	12.8	1	1	4.0
Ponderosa pine	20.1	2	1	4.0
Shrub	24.5	2	1	4.0
Mountain big sagebrush	82.3	4	5	4.0
Pinyon-juniper	2.4	8	8	1.0
Aspen	1.4	9	9	2.6
Seral aspen/lodgepole pine	0.1	9	9	2.6
Seral aspen/mixed Conifer	2.2	9	9	2.6
Seral aspen/ponderosa pine	0.4	9	9	2.6
Douglas fir	1.7	10	9	2.6
Lodgepole pine	1.4	10	9	2.6
Mixed coniferous forest	2.0	10	9	2.6
TOTAL	**151.3**	-	-	-

[1]Vegetation types in bold italic text have the potential to exceed desired conditions of less than 4-foot flame lengths.

Grand Mesa, Uncompahgre, and Gunnison National Forest

Upon completion of treatments in Categories 2 through 5, vegetation types are expected to meet desired fuel models and predicted flame lengths and fire intensity (Table 3-73). Of particular note is the achievement of fuel models 1 and 9 in the grass-forb and lodgepole pine vegetation types, respectively. These vegetation types represent most of the vegetation WAPA would treat, and there would be a substantial reduction in risk to the ROWs from wildfire and from danger trees.

Table 3-73. Existing and Predicted Fuel Models and Predicted Flame Lengths for Grand Mesa, Uncompahgre, and Gunnison National Forest under the Proposed Action

Vegetation Type[1]	Acres	Existing Fuel Model	Post-treatment Fuel Model	Estimated Flame Lengths (feet)
Grass-forb	77.4	1	1	4.0
Shrub	8.4	2	1	4.0
Ponderosa pine	29.6	2	1	4.0
Gambel oak	237.7	4	5	4.0
Pinyon-juniper	0.1	8	8	1.0
Aspen	90.3	9	9	2.6
Cottonwood	1.1	9	9	2.6
Douglas fir	0.1	10	9	2.6
Lodgepole pine	27.1	10	9	2.6
Spruce/fir	9.1	10	9	2.6
TOTAL	**480.9**	-	-	-

[1]Vegetation types in bold italic text have the potential to exceed desired conditions of less than 4-foot flame lengths.

Medicine Bow-Routt National Forest

Upon completion of treatments in Categories 2 through 5, vegetation types are expected to meet desired fuel models and predicted flame lengths and fire intensity (Table 3-74). Of particular note is the achievement of fuel models 1 and 9 in the grass-forb and lodgepole pine vegetation types, respectively. These vegetation types represent most of the vegetation WAPA would treat, and there would be a substantial reduction in risk to the ROWs from wildfire and from danger trees.

Table 3-74. Existing and Predicted Fuel Models and Predicted Flame Lengths for Medicine Bow-Routt National Forest under the Proposed Action

Vegetation Type[1]	Acres	Existing Fuel Model	Post-treatment Fuel Model	Estimated Flame Lengths (feet)
Grass-forb	256.8	1	1	4.0
Shrub	21.4	2	1	4.0
Aspen	22.6	9	9	2.6
Lodgepole pine	95.7	10	9	2.6
Spruce/fir	56.6	10	9	2.6
TOTAL	**453.1**	-	-	-

[1]Vegetation types in bold italic text have the potential to exceed desired conditions of less than 4-foot flame lengths.

Nebraska National Forest

Upon completion of treatments in Categories 2 through 5, vegetation types are expected to meet desired fuel models and predicted flame lengths and fire intensity (Table 3-75). Of particular note is the achievement of fuel models 1 and 2 in the grass-forb and Ponderosa pine vegetation types, respectively. These vegetation types represent most of the vegetation WAPA would treat, and there would be a substantial reduction in risk to the ROW from wildfire and from danger trees.

Table 3-75. Existing and Predicted Fuel Models and Predicted Flame Lengths for Nebraska National Forest under the Proposed Action

Vegetation Type[1]	Acres	Existing Fuel Model	Post-treatment Fuel Model	Estimated Flame Lengths (feet)
Grass-forb	79.7	1	1	4.0
Ponderosa pine	3.8	2	2	4.0
TOTAL	**83.5**	-	-	-

[1]Vegetation types in bold italic text have the potential to exceed desired conditions of less than 4-foot flame lengths.

Pike and San Isabel National Forest

Upon completion of treatments in Categories 2 through 5, vegetation types are expected to meet desired fuel models and predicted flame lengths and fire intensity (Table 3-76). Of particular note is the achievement of fuel models 1 and 9 in the grass-forb and lodgepole pine vegetation types, respectively. These vegetation types represent most of the vegetation WAPA would treat, and there would be a substantial reduction in risk to the ROWs from wildfire and from danger trees.

Table 3-76. Existing and Predicted Fuel Models and Predicted Flame Lengths for Pike and San Isabel National Forest under the Proposed Action

Vegetation Type[1]	Acres	Existing Fuel Model	Post-treatment Fuel Model	Estimated Flame Lengths (feet)
Grass-forb	23.4	1	1	4.0
Shrub	40.7	2	1	4.0
Ponderosa pine	2.7	2	1	4.0
Bristlecone pine	1.4	8	8	1.0
Pinyon-juniper	7.9	8	8	1.0
Aspen	4.6	9	9	2.6
Douglas fir	6.0	10	9	2.6
Lodgepole pine	9.7	10	9	2.6
Spruce/fir	12.1	10	9	2.6
TOTAL	**108.5**	-	-	-

[1]Vegetation types in bold italic text have the potential to exceed desired conditions of less than 4-foot flame lengths.

San Juan National Forest

Upon completion of treatments in Categories 2 through 5, vegetation types are expected to meet desired fuel models and predicted flame lengths and fire intensity (Table 3-77). Of particular note is the achievement of fuel models 1 and 9 in the grass-forb and lodgepole pine vegetation types, respectively. These vegetation types represent most the vegetation WAPA would treat, and there would be a substantial reduction in risk to the ROWs from wildfire and from danger trees.

Table 3-77. Existing and Predicted Fuel Models and Predicted Flame Lengths for San Juan National Forest under the Proposed Action

Vegetation Type[1]	Acres	Existing Fuel Model	Post-treatment Fuel Model	Estimated Flame Lengths (feet)
Grass-Forb	63.0	1	1	4.0
Shrub	0.2	2	1	4.0
Ponderosa Pine	42.8	2	1	4.0
Gambel Oak	218.6	4	5	4.0
Pinyon/Juniper	5.3	8	8	1.0
Aspen	57.1	9	9	26
Cottonwood	1.9	9	9	2.6
Douglas Fir	9.8	10	9	2.6
TOTAL	**398.7**	-	-	-

[1]Vegetation types in bold italic text have the potential to exceed desired conditions of less than four 4-flame lengths.

White River National Forest

Upon completion of treatments in Categories 2 through 5, vegetation types are expected to meet desired fuel models and predicted flame lengths and fire intensity (Table 3-78). Of particular note is the achievement of fuel models 1 and 9 in the grass-forb and lodgepole pine vegetation types, respectively. These vegetation types represent most of the vegetation WAPA would treat, and there would be a substantial reduction in risk to the ROWs from wildfire and from danger trees.

Table 3-78. Existing and Predicted Fuel Models and Predicted Flame Lengths for White River National Forest under the Proposed Action

Vegetation Type[1]	Acres	Existing Fuel Model	Post-treatment Fuel Model	Estimated Flame Lengths (feet)
Grass-forb	48.9	1	1	4.0
Shrub	1.5	2	1	4.0
Ponderosa pine	4.1	2	1	4.0
Gambel oak	28.9	4	5	4.0
Pinyon-juniper	9.8	8	8	1.0
Aspen	13.0	9	9	2.6
Douglas fir	9.1	10	9	2.6
Lodgepole pine	23.6	10	9	2.6
Spruce/fir	10.6	10	9	2.6
TOTAL	**149.5**	-	-	-

[1]Vegetation types in bold italic text have the potential to exceed desired conditions of less than 4-foot flame lengths.

3.10.5.3 Cumulative Effects

WAPA reviewed the list of projects (see Appendix A) that could contribute to cumulative effects to identify any possible effects on fire and fuels management.

The projects identified in Appendix A that address fuel loads on NFS lands, in conjunction with the No Action Alternative, would reduce the potential for severe wildfire behavior that could threaten the project area because they would reduce existing fuel loads. This would result in beneficial cumulative impacts by reducing the potential for fire intensity that could threaten the transmission lines; however, the degree of beneficial impacts would be modest because some of the projects are a considerable distance from the WAPA project area. This beneficial cumulative effect would be less than that from the Proposed Action, because the fuels in the project area would continue to accumulate over time, leading to an increased risk from wildfire.

Appendix A identifies projects that would have the potential for beneficial cumulative effects for fire and fuels management by reducing fuel loading. These projects in conjunction with the Proposed Action would reduce the potential for severe wildfire behavior that could threaten the project area because they would reduce existing fuel loads. The degree of beneficial effects would be modest because some of the projects are a considerable distance from the project area analyzed in this EIS. Because the Proposed Action specifically addresses fuel loading on the ROWs, the beneficial cumulative impacts are anticipated to be greater than the No Action Alternative.

3.11 Cultural Resources

3.11.1 Introduction

Cultural resources are non-renewable resources that include post-contact and pre-contact artifacts, structures, sites, districts, and archival materials important for their scientific, educational, economic, and social values. Dozens of Native American Tribes and Pueblos claim cultural affiliation with heritage and cultural resources in WAPA's transmission line ROWs in the project area. The Forest Service identifies, evaluates, and protects heritage and cultural resources on the public lands it manages.

Cultural resources also include traditional cultural properties (TCPs), and Places of Traditional Religious and Cultural Importance (PTRCI) and are specific to American Indian tribes. Federal regulations require that federal agencies consider potential effects of their actions on historic properties. Statutes and regulations define historic properties as those cultural resources eligible for listing on the *National Register of Historic Places* (NRHP). The criteria for NRHP listing, given in Section 3.11.3, are the measure of a cultural resource's historical significance.

Federal agencies also are required to consider the effects of their actions on sites, locations, and other resources, such as plants, that are of cultural or religious significance to Native Americans, as established under the American Indian Religious Freedom Act (42 U.S.C. 1996, 1996a) and the National Historic Preservation Act (16 U.S.C. 470 *et seq*.). The Native American Graves Protection and Repatriation Act (25 U.S.C. 3001 *et seq*.) protects Native American graves, associated funerary objects, and objects of cultural patrimony.

Section 3.11.2 describes the regulatory and policy framework, Section 3.11.3 describes analysis methods and assumptions, Section 3.11.4 describes the affected environment (existing conditions), and Section 3.11.5 describes potential impacts to cultural resources from proposed vegetation management activities, including cumulative impacts.

3.11.2 Regulatory and Policy Framework

This section describes the major federal laws and regulations; USDA orders and policies; and other requirements that could apply to the No Action Alternative and the Proposed Action.

Laws

Antiquities Act of 1906, as amended (16 U.S.C. 431–433). This act was the first federal involvement in the protection and management of cultural resources on public lands, and allows the President to set aside federally owned land as historic landmarks. It also establishes that objects of antiquity on federal lands had to be preserved, restored, and maintained; could only be disturbed under permit from a federal agency; and could only be disturbed for scientific and educational purposes by qualified personnel. It requires that artifacts and associated documents be cared for in public museums; a system be created to establish national historic monuments; and criminal penalties be assessed for violations by any person who excavates, injures, obtains objects from, or destroys any historical ruin or monument on federally owned or controlled land without the permission of the appropriate federal department.

Archaeological and Historic Preservation Act of 1960, as amended (16 U.S.C. 469–469c-2). The purpose of this act is to provide for the preservation of historical and archaeological data (including relics and specimens) that might otherwise be irreparably lost or destroyed by federal actions.

Archaeological Resources Protection Act of 1979, as amended (16 U.S.C. 470aa *et seq*.). This act protects all cultural resources more than 100 years old on federal lands and prohibits looting, vandalism, and unauthorized excavation. Significant civil and criminal penalties may be levied against individuals who knowingly damage such resources or who sell, buy, or trade items from a cultural resource on federal land. The penalties for violations includeforfeiture of equipment and vehicles used in any violations. The act also establishes permitting procedures for scientific excavation and removal of cultural resources on federal lands by qualified persons for the appropriate federal agency. Such work must further archaeological knowledge for the benefit of the public. The federal land manager must contact Native American tribes or organizations with an interest in the cultural resource to be excavated. Recovered items remain the property of the United States and are to be preserved by a qualified institution. Federal agencies cannot reveal the location of a cultural resource if by so doing the cultural resource would be at risk of being altered or destroyed. Agencies are also to develop plans for surveying lands other than those scheduled for undertakings and record and report violations of the act.

National Historic Preservation Act (NHPA) of 1966, as amended (16 U.S.C. 470 *et seq*.). This act establishes a leadership role for the Federal Government in the preservation of cultural resources, and promotes a policy of cooperation between federal agencies, states, tribes, and local governments. The act also created the Advisory Council on Historic Preservation to serve as an independent counsel on historic preservation issues to the President, Congress, and federal and state agencies. Most importantly, the act explains the responsibilities of federal agencies and outlines a process by which significant cultural resources are recognized and protected from undertakings and potential effects. Section 106 is a key NHPA section that pertains to this EIS.

Section 106 requires federal agencies to consider the effects of their undertakings on significant cultural resources, termed “historic properties,” and to give the Advisory Council on Historic Preservation the opportunity to comment on these effects. Where both NEPA and the NHPA apply, draft Environmental Assessments and EISs must integrate NHPA considerations along with other environmental impact analyses and studies (40 CFR 1502.25). Section 106 implementing regulations (36 CFR Part 800, Subpart B) include additional requirements regarding consultations with external parties and other aspects of integrating NEPA and NHPA.

American Indian Religious Freedom Act of 1978, as amended (42 U.S.C. 1996 and 1996a). This act reaffirms Native American religious freedom rights under the First Amendment and establishes U.S. policy to protect and preserve the inherent and constitutional right of Native Americans to believe, express, and exercise their traditional religions. It includes access to sites on federal properties integral to religious ceremonies and traditional rites. It also directs agencies to consult with interested Native American groups and leaders to develop and implement policies and procedures to protect and preserve cultural and spiritual traditions and sites.

Native American Graves Protection and Repatriation Act (NAGPRA) of 1990 (25 U.S.C. 3001 *et seq*.). This act requires federal agencies to consult with Native American tribes regarding human remains and materials in their collections. The act acknowledges tribal rights to Native American human remains, funerary objects, sacred objects, and objects of cultural patrimony. Persons who knowingly sell or purchase, use for profit, or transport for sale or profit Native American human remains or objects covered by this act can be prosecuted. In the case of unexpected discoveries of Native American graves or grave goods during activities on federal lands, the tribes or organizations are to be notified and procedures are to be agreed upon to establish affiliation and for disposition of the remains or objects. The act provides for the repatriation of these cultural items from federal archaeological collections and collections held by museums receiving federal funding to federally recognized tribes when cultural affiliations can be established.

Executive Orders

Executive Order 11593, *Protection and Enhancement of the Cultural Environment* (May 13, 1971). This EO formally designates the Federal Government as the leader in preserving, restoring, and maintaining the historic and cultural environment of the Nation. It gives federal agencies the responsibility for locating, inventorying, and nominating cultural resources to the National Register.

Executive Order 13007, *Indian Sacred Sites* (May 24, 1996). This EO directs federal agencies to accommodate the access and ceremonial use of Native American sacred sites on their lands by Native American religious practitioners. The confidentiality of these sites is to be maintained by the federal agency, and their physical integrity is not to be adversely affected.

Executive Order 13084, *Consultation and Coordination with Tribal Governments* (May 14, 1998). This EO establishes policy regarding consultation and coordination with Native American tribal governments.

Executive Order 13195, *Trails for America in the 21st Century* (January 18, 2001). This EO establishes policy to further the purposes of certain federal acts to achieve the common goal of better establishing and operating America's national system of trails.

Executive Order 13287*, Preserve America* (May 3, 2003). This EO establishes federal policy designed to provide leadership in preserving America's heritage by actively advancing the protection, enhancement, and contemporary use of the historic properties owned by the Federal Government.

Regulations and Policies

Title 43 CFR Part 3 establishes policy regarding the preservation of American antiquities, and implementing regulations for the Antiquities Act.

Title 36 CFR Part 7 establishes policy for the protection of archaeological resources.

Title 43 CFR Part 10 Establishes policy in line with the Native American Graves Protection and Repatriation Act Regulations; Final Rule.

Title 36 CFR 79 provides for the curation of federally owned and administered archaeological collections.

Title 36 CFR Part 60 establishes policy in line with the *National Register of Historic Places*.

Title 36 CFR Part 800 provides for the protection of historic properties.

Uniform Rules and Regulations (16 U.S.C.G. 432–433) coincides with the Antiquities Act of 1906. They give the Secretary of Agriculture "jurisdiction over ruins, archaeological sites, historic and prehistoric monuments and structures, objects of antiquity, historic landmarks, and other objects of historic or scientific interests" on NFS lands.

FSM 2360 establishes policy for Heritage Program Management.

3.11.3 Methods and Assumptions for Analysis

The project area is defined as the area that includes a 200-foot wide corridor along transmission lines and associated access roads.

WAPA gathered information about cultural resources in the project area from Forest Service and WAPA planning and management documents. WAPA obtained data on cultural resources in the project area ROWs from Forest Service and WAPA Rocky Mountain Regional Offices. WAPA gathered additional cultural resource-specific data using the Colorado Office of Archaeology and Historic Preservation

(OAHP) Compass database, the OAHP GIS database, the WAPA GIS system, and data provided by the Forest Service.

Cultural resources inventories have been completed in WAPA ROWs in Ashley and Nebraska National Forests in response to the Proposed Action, and NHPA Section 106 consultation has been completed for the identification and evaluation of cultural resources and the treatment of significant cultural resources. If WAPA implements the Proposed Action, the Rocky Mountain Region's Routine Maintenance Programmatic Agreement (PA) for Archaeological Resources Protection (Routine Maintenance PA) will still be in effect and will continue to be used to conduct NHPA Section 106 compliance ahead of site-specific project implementation, where necessary. Implementation of Standard Maintenance Procedure G-11 would also ensure compliance with federal, state, and local cultural resources laws, regulations, and orders.

For WAPA ROWs in national forests in Colorado, WAPA has consulted with the Forest Service, the Colorado State Historic Preservation Office (SHPO), and Native American tribes in compliance with NHPA Section 106. Compliance with the Routine Maintenance PA and implementation of the Proposed Action design features and Standard Maintenance Procedure G-11 would also ensure compliance with federal, state, and local cultural resources laws, regulations, and orders.

A pre-contact or prehistoric site is any locality representing the activities of peoples or groups existing before contact with Euro-Americans, exhibiting at least one structure or feature (e.g., a stone circle or hearth), or having several artifacts in association with one another and occurring within a restricted area. Pre-contact isolated finds are nonstructural remains and consist of one or a few artifacts. A post-contact or historic site represents any activity after Euro-American contact and includes any structure or structural remnant (e.g., house, outbuilding, or root cellar), any trash concentration or scatter suggesting residential or industrial use of the area, or any linear feature suggesting sustained or long-term use (e.g., transportation corridors such as old roads or railroad lines, or irrigation canals). Post-contact isolates are individual post-contact artifacts or small clusters of artifacts that do not represent established refuse dumps. The minimum age criterion for NRHP elibibility for all post-contact sites and isolates is 50 years; however, something less than 50 years can be eligible for National Register listing if it is of exceptional national significance. Furthermore, isolates are generally considered ineligible for NRHP listing and, therefore, not considered historic properties.

Cultural resources are regarded as significant if they are listed on or meet the eligibility criteria for listing in the National Register. National Register eligibility criteria are as follows (36 CFR 60):

> The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:
>
> A. that are associated with events that have made a significant contribution to the broad patterns of our history; or,
>
> B. that are associated with the lives of persons significant in our past; or,
>
> C. that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or,
>
> D. that have yielded, or may be likely to yield, information important in prehistory or history.

In addition to meeting these basic criteria, to be eligible for listing in the National Register, a cultural resource must alsoexhibit integrity in some or all the areas mentioned above. A site need not be of national historic significance to be eligible; sites of local, state, and regional importance may also be listed. A site does not have to be included in the National Register to receive protection under the law, but must meet the requirements of eligibility. Finally, in keeping with existing recommended best practices, this EIS treats all currently NRHP unevaluated sites in the project area as eligible and have historic property status until such time as they can be properly investigated.

Federal agencies must consider the effects of their undertakings onhistoric properties. Potential adverse effects on historic properties from a federal undertaking must be resolved in consultation with the appropriate State or Tribal Historic Preservation Officer and all other parties with an interest in the property.

Impact Criteria

There could be an impact on cultural resources if the proposed project caused any of the following:

- Damage or destruction of a site that is listed, or eligible for listing, in the NRHP
- Loss or degradation of a traditional cultural property or places of traditional religious and cultural importance, or they become inaccessible for future use
- Disturbance of human remains

3.11.4 Affected Environment

The project area is in a region with a long and rich prehistoric and historic record. Native American occupation of the region may have begun as long as 12,000 years ago. Portions of the project area variously contain archaeological materials representing some of the earliest agricultural societies in the region. The post-contact period brought Spanish and Euro-American explorers, trappers, miners, and settlers into the region. This long record of human occupation has left significant prehistoric and historic heritage and cultural resources, and many of these sites have national, international, and Native American tribal significance. The chronological periods described below are defined primarily by major changes in patterns of artifact assemblage composition, subsistence, settlement, and land use characterizing each period.

Pre-contact sites generally include artifacts or features representing one or more activities and periods. Artifacts most often consist of flaked or ground stone, ceramics, bone, and wood. Common features include the remains of fire pits, storage pits, and habitations such as stone circles wood-pole structures, and in some places, subterranean dugouts or aboveground adobe architecture Other localities my contain extensive trash deposits or hold the remains significant numbers of prey animals such as extinct bison or mammoths and the evidence of their processing for human consumption. Pre-contact rock art is also present in the region.

Post-contact sites include a wide array of site and feature types. Pertinent to this region are railroads and railroad-related sites, logging and logging-related sites, roads, utility lines, mining sites, ranching sites, remains of individual dwellings, and envgavings on aspen trees. Artifacts most often include construction materials, tools and machinery, and domestic items such as cans and bottle fragments.

Table 3-79 lists the number of cultural resources recorded in the project area. It further distinguishes between isolated finds and pre-contact and post-contact sites and their National Register eligibility.

Table 3-79. Summary of Cultural Resources in the Project Area

National Forest(s)	Total Studies	Isolates-Not Eligible		National Register of Historic Places-Not Eligible		National Register of Historic Places-Eligible[1]		Total National Register-Eligible Sites	Total Sites[2]
		Pre-Contact[3]	Post-Contact[3]	Pre-Contact[3]	Post-Contact[3]	Pre-Contact[3]	Post-Contact[3]		
Arapaho-Roosevelt	41	2	3	10	10	2	3	5	30
Ashley	24	1	3	1	4	6	0	6	15
Grand Mesa, Uncompahgre, and Gunnison	79	8	2	22	9	14	7	21	62
Medicine Bow-Routt	53	1	1	19	11	5	7	8	44
Nebraska	1	0	0	1	0	0	0	0	1
Pike and San Isabel	14	0	0	1	12	0	3	3	16
San Juan	104	23	0	36	9	29[4]	24	53	121
White River	10	0	0	0	5	0	1	1	6
TOTALS	**326**	**35**	**9**	**90**	**60**	**56**	**45**	**97**	**295**

[1]Includes unevaluated sites and sites recommended eligible for listing, determined eligible for listing, and listed in the National Register, and a listed National Register Historic District.
[2]Isolates, both the full linear site and its segments, and all components from multicomponent sites are included in total.
[3] For multicomponent sites, each component is included giving those sites two (or more for sites with multiple pre-contact components) entries in this table.
[4]Includes one National Register Archaeological District.

3.11.4.1 Arapaho-Roosevelt National Forests

Six WAPA transmission lines ROWs cross Arapaho-Roosevelt National Forests. Segments of the Archer-North Park, Ault-Craig, Estes-Lyons Tap, Estes-Pole Hill, and Flatiron-Polehill transmission lines cross the Canyon Lakes Ranger District (however, only the Archer-North Park and Ault-Craig lines are analyzed in this EIS). The Blue River-Gore Pass and Green Mountain-Blue Ridge Repeater transmission lines cross the Sulphur Ranger District. WAPA derived information in this section from the *Forest-wide Hazard Tree Removal and Fuels Reduction Project for the Arapaho and Roosevelt National Forests Environmental Assessment* (Forest Service 2010).

Culture History

Pre-contact Background

Archaeological findings indicate that pre-contact occupation of these forests was essentially continuous for the last 12,000 years, spanning the Paleoindian period, Archaic period, and Late Prehistoric Period, until historic contact between Euro-Americans and the Ute and Arapaho tribes in the mid-1800s. Within the forests, pre-contact groups were adept at overcoming the challenging environmental conditions of higher elevations. Pre-contact base camps were typically located along river valleys and basins near a reliable water source. Specialized activity sites like hunting camps, ceremonial/religious sites, and stone quarries were generally located at higher elevations and farther from water sources.

<u>*Post-contact Background*</u>

Euro-Americans explorers and fur trappers first ventured into the areas of today's National Forests during the early to mid-1800s. Later, Euro-Americans entered the forests to pursue economic activities focused around precious metal mining, farming and ranching, water control, timber harvesting and, later, federal conservation activities. Mining in particular played a large part in settlement of the region, supported in large part by the logging industry.

Cultural Resources in the Project Area

A total of 41 cultural resources studies have been completed for the portion of Arapaho-Roosevelt National Forests in the project area. For the study area, these studies recorded 30 cultural resources – two pre-contact isolates, three post-contact isolates, 12 pre-contact sites (open lithic sites, open camp, quarry, and hunting feature), and 13 post-contact sites (logging-related sites and features, refuse deposits, road/trail segments, and structural features). Of these, two prehistoric sites and three post-contact sites are eligible (or unevaluated and treated as eligible for the purpose of this EIS) for listing in the National Register (see Table 3-79).

3.11.4.2 Ashley National Forest

Segments of the Flaming Gorge-Vernal #1 and #3 transmission lines extend across Ashley National Forest Flaming Gorge and Vernal Ranger Districts. Unless otherwise noted, the information in this section is derived from *Cultural Resource Inventory of the Flaming Gorge-Vernal No. 1 and No. 3 Transmission Lines in Ashley National Forest, Daggett and Uinta Counties, Utah* (Alpine Archaeological Consultants 2010).

This part of the project area is along the crest and flanks of the Uinta Mountains, part of the Middle Rocky Mountains physiographic region. Soils in the area are variable, but generally thin, and are underlain by Uinta quartzite bedrock. The project area crosses drainages flowing to the north and south. Generally, vegetation communities vary and include the Upper Sonoran Zone in lower elevations to Canadian zone communities in the upper elevations.

Culture History

<u>*Pre-contact Background*</u>

The general pre-contact cultural sequence in the eastern Uinta area includes the Paleoindian Period, the Early and Late Archaic Period, and the Late Prehistoric Period. The Paleoindian period (14,000 to 8,440 years before present) is known by only a few diagnostic projectile points found near Green River; these represent small, wide-ranging groups of hunter-gatherers occupying the region during the Pleistocene-Holocene transition. The subsequent Early (6,550 to 3,050 years before present) and Late Archaic (3,050 years before present to AD 50) periods represent groups who were adapting to changing Holocene conditions. These peoples are thought to have been less wide-ranging than Paleoindian populations, taking advantage of a variety of upland and lowland resources in a more circumscribed range. The Late Prehistoric period (AD 50 to AD 1775) begins with the appearance of the Uinta variant of the Fremont culture, whose cultural characteristics include the use of bow and arrow, plant cultivation, and ceramics. The Fremont were mobile but more sedentary that previous populations, and had a mixed horticultural and hunter-gatherer lifeway. Evidence of Fremont cultures disappear from the archaeological record around AD 1550, after which Numic peoples appear. Numic populations were highly mobile hunter-gatherers who made and used stylistically different projectile points and ceramics than those of the

Fremont. The Numic populations are likely the ancestors of the Eastern Shoshonean groups that came to be known in the historic period as the Ute, Shoshone, and Comanche tribes.

Post-contact Background

The first European explorers to enter what is now Utah were those of the Spanish Dominguez-Escalante expedition in 1776. Although they did not reach the Uintah Mountains, over the next 50 years tribal territories shifted and the Ute and Shoshone tribes were greatly affected by the European presence in the southwest, particularly by their access to horses acquired directly or indirectly from the Spanish. In the early nineteenth century, European and American fur trappers began to penetrate the Uinta Mountains in search of beaver pelts, but left little material evidence behind of their presence. A trading post was established in what is now Brown's Park and operated as a regional trapping and trading center until the 1850s.

In 1869 and 1871, Major John Wesley Powell led two expeditions down the Green River, where his party documented the flora, fauna, and native cultural groups of the region. During the 1870s, cattle ranching became established near Brown's Park, and by 1900, commercial ranching operations and smaller family ranches had become established throughout the Uinta Mountains.

The establishment of Ashley National Forest in 1908 resulted in increased federal involvement in the region. Federal, state, and Forest Service roads were established across the Uinta Mountains by the 1950s. The Flaming Gorge hydroelectric dam was constructed at Dutch John between 1957 and 1964 to assist in the development of regional irrigation. Concurrent with this was the construction of transmission lines connecting the generating station to Vernal, Utah.

Cultural Resources in the Project Area

A total of 24 cultural resources studies have been completed for the portion of Ashley National Forest in the project area. These studies recorded 15 cultural resources – one pre-contact, three post-contact isolates, six pre-contact sites (five lithic scatters and one rock shelter), four post-contact sites (three transmission lines and one ranching feature), and one multicomponent site (a pre-contact artifact scatter and post-contact ranching features). Of these, six pre-contact sites are eligible for listing in the National Register (see Table 3-79).

3.11.4.3 Grand Mesa, Uncompahgre, and Gunnison National Forests

Six transmission line segments cross Grand Mesa, Uncompahgre, and Gunnison National Forests. The Curecanti-Lost Canyon and Hesperus-Montrose transmission lines cross Ouray and Norwood Ranger Districts; the Curecanti-North Fork crosses Paonia Ranger District; the Curecanti-Poncha and North Gunnison-Salida transmission lines cross Gunnison Ranger District; and the North Fork-Rifle Transmission line crosses Paonia and Grand Valley Ranger Districts.

Culture History

Grand Mesa, Uncompahgre, and Gunnison National Forests have a wide array of heritage resource sites resulting from past human habitation. Pre-contact sites resulting from exploitation of high-altitude environments are found in the forests that are not found at lower elevations. These sites are presumed to be related to big-game hunting and for ceremonies such as vision quests. In historical times, following Euro-American settlement, the forests provided resources not abundant elsewhere, such as timber and precious metals and minerals, that were of critical importance to American settlement and western development (Forest Service 2006b).

Cultural Resources in the Project Area

A total of 79 cultural resources studies have been completed for the portion of Grand Mesa, Uncompahgre, and Gunnison National Forests in the project area. The studies recorded 62 cultural resources – eight pre-contact isolates, two post-contact isolates, pre-contact components (open lithic scatters, culturally modified trees, and open camps), 16 post-contact cpmponents (trail/road segments, culturally modified trees, water-control features, transmission lines, a logging site, trash scatters, a natural gas pipeline, and abandoned historic machinery), and seven multicomponent sites containing both pre- and post-contact deposits. Of these, 21 sites (14 pre-contact and seven post-contact) are eligible (or unevaluated and treated as eligible for the purpose of this EIS) for listing in the National Register (see Table 3-79).

3.11.4.4 Medicine Bow-Routt National Forests

Segments of the Terry Ranch Road-North Park, Ault-Craig, Gore Pass-Hayden, Gore Pass-Muddy Pass, Hayden-Gore Pass, and Hayden-North Park transmission lines pass through the Medicine Bow-Routt National Forests Parks, Hahns Peak/Bears Ears, and Yampa Ranger Districts. WAPA derived information in this section from *Final Environmental Impact Statement and Revised Land and Resource management Plan for the Medicine Bow-Routt National Forests* (Forest Service 1998b).

Culture History

Pre-contact Background

The earliest evidence of human activity in Medicine Bow-Routt National Forests comes from the Paleoindian period, which lasted from approximately 11,000 to 6,000 years before present. Paleoindian people are thought to have been largely dependent on big game-hunting, especially during the end of the ice age when large mammals, such as mammoth, wild horses, and ancient bison, were still living. Cultural remains from the Paleoindian period can include open lithic scatters, quarries where the raw materials for stone tools were gathered, kill/butcher sites, and campsites.

The Archaic period spans from approximately 6,000 years before present to AD 1500. The first evidence of structures in northwest Colorado date to this period. Archaeological evidence from the Archaic period includes camps, open lithic scatters, stone quarries, and game-drive lines.

Archaeological evidence from the Late Prehistoric period (AD 1500 to 1810) represents Ute occupation of the area. During this period, use of the bow and arrow began, along with the limited use of ceramic vessels. While the Ute were the post-contact inhabitants of the area, the Arapaho, Shoshone, Cheyenne, and possibly Kiowa used the mountains to some degree until the 1700s. After 1810, the Ute and Arapaho competed over hunting territory. In 1879, the White River and Uncompahgre Ute bands were forcibly removed from their traditional lands onto the Uintah/Ouray Reservation in Utah.

Post-contact Background

Euro-Americans entered the forest to pursue economic activities focused around farming and ranching, mining, timber harvesting and, later, federal conservation activities. Mining in particular played a large part in the settlement of the region, supported in large part by the logging industry.

Cultural Resources in the Project Area

A total of 53 cultural resources studies have been completed for the portion of Medicine Bow-Routt National Forests in the project area. In the project's study area, the inventories recorded 44 cultural resources – one pre-contact isolate, one post-contact isolate, 24 pre-contact occupations (lithic scatters, open camps, and one tool stone quarry), 14 post-contact occupations(transmission lines, a telephone line, road/trail segments, logging complexes, refuse deposits, one log cabin, and one log bridge, one government building, one dugout, and water control structures). The single multicomponent site accounts for the open camp and one of the logging complex occupations. Of these, a total of 12 sites (five pre-contact and seven post-contact) are eligible (or unevaluated and treated as eligible for the purpose of this EIS) for listing in the National Register (see Table 3-79).

3.11.4.5 Nebraska National Forest

A segment of the Box Butte-Chadron transmission line passes through the Nebraska National Forest Pine Ridge Ranger District. The topography of the area is dominated by Pine Ridge, an escarpment of sandstone bluffs that extends just to the border in Wyoming, through northwestern Nebraska, and into southwestern South Dakota. The ridge is lightly forested with native ponderosa pine. WAPA derived background information for this section from the Nebraska State Historical Society publication *High Plains Archaeology* (Nebraska State Historical Society 2000).

Culture History

Pre-contact Background

Paleoindian populations were present on the plains from approximately 11,000 to 9,000 years before present. These groups were very mobile and focused on big-game hunting. Only a few Paleoindian sites are known in the region. The Plains Archaic period (9,000 to 2,050 years before present) is characterized by nomadic, broad-spectrum hunting and gathering. Numerous sites from this period have been recorded in western Nebraska. Archaic-period sites are often found along butte tops, lakeshores, and streams. Archaeological materials associated with the Archaic period include spear points and stone circles, thought to represent teepee rings. The Late Historic period (2,050 years before present to AD 1850) is marked by the Woodland cultural tradition, the hallmarks of which are the production of pottery, use of bow and arrow, ceremonial elaboration, and horticultural practices. Around first contact with Euro-Americans, Native American tribes in the region included the Arapaho, Sioux, Cheyenne, Crow, and Kiowa.

Post-contact Background

The presence of Euro-Americans in the area likely began in the early nineteenth century. These people were involved in the regional fur trade based in Fort Laramie, Wyoming. James Bordeaux established a small permanent post along what is now Bordeaux Creek. Between the 1840s and the 1860s, thousands of emigrants traveling to the west passed through western Nebraska on their way to California and Oregon via the California-Oregon Trail or the Overland Trail. Other significant historic themes in northwestern Nebraska other than fur trapping and emigration are the Pony Express, railroad development, removal by the Federal Government of Native American populations to reservation lands in 1877, and subsequent settlement and agriculture by Euro-Americans.

Cultural Resources in the Project Area

One cultural resource study has been completed for the portion of Nebraska National Forest in the project area. This study identified one pre-contact site, which has been determined not eligible for listing in the National Register, in the APE.

3.11.4.6 Pike and San Isabel National Forest

Segments of the North Gunnison-Salida and Curecanti-Poncha transmission lines extend across the Pike and San Isabel National Forest Salida Ranger District; the Mount Elbert-Malta transmission line passes through Leadville Ranger District. This part of the project area is in central Colorado on the eastern slopes of the southern Rocky Mountains. WAPA derived Information in this section from the *Salida-Leadville Range Environmental Assessment* (Forest Service 2008).

Culture History

Pre-contact Background

The Paleoindian (12,000 to 5,800 years before present) sites in the mountains of Colorado are still poorly understood because of the scarcity of identified sites. During the Paleoindian stage, the cultures of the mountains appear to have subsisted on large game (based on associated lithic tools), and supplemented their diets with a variety of small game and vegetal materials. It appears that Paleoindian populations were living in relatively small groups, and seem to have been mostly nomadic.

Much more cultural material dating to the Archaic stage in the mountains (5,800 years before present to AD 100) has been found. Archaic-stage stone tools suggest there was a gradual shift in subsistence focus from large game to a more broad-spectrum strategy, and it appears that Archaic groups were becoming more sedentary than their Paleoindian predecessors. Evidence of the Late Prehistoric period (AD 100 to 1725) occupation is sparse in the mountain region, due largely to the lack of intensive inventory in the area. Nonethless, there is good indication that there was a substantial Late Prehistoric presence in the mountains.

Native American populations during the Protohistoric period (AD 1450 to 1725) underwent significant changes due to the influence and encroachment of Euro-American culture. The Ute occupied the mountains, but other Plains tribes were also present in the mountains. The Comanche, Apache, Kiowa, Cheyenne, Arapaho, and Sioux used the area to varying degrees. Likely because of small populations, and the relatively nomadic lifestyle of the Plains tribes, there are very few sites attributed to the Protohistoric. Sites with identifiable Ute features (e.g., wikiups and distinctive Ute pottery) are rare east of the Continental Divide.

Post-contact Background

Regional exploration by the Spanish began in the early 1700s, but in the Pike and San Isabel National Forest area, the historic period generally begins in AD 1860. Euro-American activity in the mountain region was dominated by fur trapping and mining during most of the historic period. Fur trapping was at its height from 1812 through the 1840s. The Colorado Gold Rush occurred in 1859 and with it, increasing prospecting and mining. Construction of towns, roads, and railroads followed and greatly facilitated access into the mountains. By World War I, other minerals were in demand, and gold and silver mining greatly declined.

Cultural Resources in the Project Area

A total of 14 cultural resources studies have been completed for the portion of Pike and San Isabel National Forest in the project area. The studies recorded 16 cultural resources – no pre-contact or post-contact isolates. There are remains of one pre-contact and 15 post-contact occupations (road/trail segments, transmission line segment, railroad segments, water-control features, a hydropower site, a ski area, and three trash deposits). Of these, one site- segment pair and associated features of the Denver & Rio Grande Railroad, is listed in the National Register and two others, including the hydropower site, are eligible for such listing (see Table 3-79)

3.11.4.6 San Juan National Forest

Segments of the Hesperus-Montrose and Curecanti-Lost Canyon transmission lines extend across the San Juan National Forest Mancos/Dolores Ranger District. This portion of the project area is along the boundary of the Colorado Plateau and the Rocky Mountains. WAPA derived information in this section from San Juan Public Lands Draft Land Management Plan and Draft Environmental Impact Statement (Forest Service 2011e).

Culture History

Native Americans have been present in the region for at least the last 10,000 years, and some of the earliest agricultural societies lived here. During the historic period, Euro-Americans brought explorers, trappers, miners, ranchers and farmers, and settlers to the region. San Juan National Forest has some of the highest densities of pre-contact and historic period archaeological sites in the Nation representing this span of human occupation.

Pre-contact Background

The pre-contact cultural sequence in southwestern Colorado is complex and reflects the diversity of groups in the region. The general sequence includes the Paleoindian, Archaic, and Formative stages. This extended period of Native American cultural development in the forest is terminated with the abandonment of the area by Ancestral Puebloan poplulations and a significant cultural change. This poorly documented Transition period isfollowed by the Protohistoric and the Historic periods.

The Paleoindian Stage (13,500 to 7,550 years before present) represents the entry of humans into the region who focused on hunting for subsistence. The subsequent Archaic Stage (8,400 to 2,400 years before present) represents groups who became increasingly reliant on hunting smaller game, collecting plant resources, and occupying locations for longer periods. The Formative Stage (3,000 years before present to AD 1300) marks the beginning of early agriculture in the region and a more sedentary life, as represented in the establishment of permanent villages. Bow-and-arrow and ceramic technology is developed during this stage. This stage is further divided onto the Basketmaker and Pueblo periods, which represent increasing population numbers, sedentism, and centralization of social organization. Toward the end if this period, there was a large population decline and dispersal of the population to the southwest and the southeast. The Transition Period (AD 1300 to 1541) marks a period during which the likely ancestors of the Ute established themselves in the former Ancestral Puebloan realm. The Navajo and Apache peoples also became established in parts of the region at least by the mid-15th century. These groups exhibited lifeways similar to Archaic Stage populations, living a more mobile lifestyle focused on hunting and gathering rather than agriculture. The Protohistoric (AD 1541to 1640) sees the establishement of a European colony and increasing Hispanic populations. Interactions with the Ute were marked by, among other things, the introduction of Spanish horses and the move of the colonists into the San Luis Valley.

<u>*Post-contact Background*</u>

The Historic period (AD 1640 to 1950) begins with the establishment of the fully functioning Spanish colony and covers the history of both Native American and Euro-American populations. The period is marked by a 12 year span, 1680 CE to 1692 CE when the Pueblos were able to unite and expell the colonists. The post-contact period has been a time of considerable change to the region as the industrial state of the Euro-Americans exploited the regions natural resources and expanded its population. More recently, trends in the region has been the scene of significantly increased federal activity and recreation and tourism.

Cultural Resources in the Project Area

A total of 104 cultural resources studies have been completed for the part of San Juan National Forest in the project area. The studies recorded 121 cultural resource (isolates and site components or segments) – 23 pre-contact isolates, 65 pre-contact sites (open lithic sites, open camps, open and sheltered architectural sites, and culturally modified trees), 33 post-contact sites (logging-related, refuse deposits, structural features, mining, and post-contact graffiti). Four of the sites have multiple occupation components. Of these, 29 pre-contact sites and 24 post-contact sites are eligible (or unevaluated and treated as eligible for the purpose of this EIS) for listing in the National Register (see Table 3-79). The Anasazi Archaeological District is also in the project area and is listed in the National Register; 35 pre-contact sites and one post-contact site in this study are located in the district.

3.11.4.7 White River National Forest

Segments of the Blue River-Gore Pass, Green Mountain-Kremmling, and Green Mountain-Blue Ridge Repeater transmission lines extend across the White River National Forest Dillon Ranger District. A segment of the Curecanti-Rifle transmission line crosses the White River West Zone/Rifle Ranger District. WAPA derived information in this section from Final Environmental Impact Statement for the White River National Forest and Resource Management Plan 2002 Revision (Forest Service 2002).

Culture History

<u>*Pre-contact Background*</u>

Evidence of the earliest human activity in the region is in the form of mostly isolated occurrences from the Paleo-Indian Period, approximately 9,000 to 6,000 years before present. Most archaeological resources here are lithic scatters, campsites, or lithic procurement (quarries) or processing locations. Later populations who occupied the region are the ancestors of the Utes, parts of whose traditional territory are in White River National Forest.

<u>*Post-contact Background*</u>

Generally, the Historic period started sometime in the early 1600s when the Ute became one of the first Native American tribes to acquire horses from the Spanish. Historic period resources might date from the first European contact in the area, which occurred in 1776 when the Spanish priests and explorers Dominguez and Escalante possibly traveled through the southwestern edge of the forest. Most Historic period Ute sites in the forest are camps, wickiup villages, rock shelters, rock art panels, lithic procurement sites or quarries, special use areas, cairns, trails, and ceremonial sites.

Historic Euro-American sites generally date from the settlement period beginning in 1825 when trappers, explorers, miners, and homesteaders began entering the forest. Major John Wesley Powell's 1868-69 expedition to northern Colorado wintered on the White River near the present dat location of

Meeker, CO. Archaeological evidence of early Euro-Americans typically consists of cairns, camps, wooden and rock structures, fields, water-control features, mining sites, towns, trails, railroads, roads, and bridges.

Cultural Resources in the Project Area

A total of 10 cultural resources studies have been completed for the part of White River National Forest in the project area. A total of six sites or site segments have been reported for the project APE in the White River National Forest only one of which is an historic property. All are post-contact linear sites (road and transmission line segments (see Table 3-79).

3.11.5 Environmental Consequences

This section addresses potential impacts on cultural resources under the No Action Alternative and the Proposed Action. The following paragraphs describe impacts common to both the No Action Alternative and the Proposed Action. Sections 3.11.5.1 and 3.11.5.2 describe impacts specific to each alternative.

Impacts of Vegetation Management Methods

<u>General Impacts</u>

Vegetation management activities could damage or expose pre-contact or historic archaeological sites, could harm plants with traditional cultural values, or could visibly alter places of traditional cultural values. Vegetation management methods that disturb soil could damage cultural resources or could cause erosion, and have a relatively greater potential to disturb surface and subsurface cultural resources. Similarly, herbicide applications could affect resource areas with traditional cultural values.

<u>Method-Specific Impacts</u>

Mechanical vegetation control includes selective methods (feller bunchers, forwarders, walking brush controllers) and non-selective methods (mowing, blading and grubbing, skidders, roller choppers) to remove or control vegetation. WAPA could also pile vegetation debris outside the ROW as part of the project for later pile burning by the Forest Service. Mechanical vegetation control methods, particularly non-selective methods, could disturb cultural resources on the ground surface. Mechanical methods could also erode soils and disturb buried cultural resources. Some kinds of heavy machinery might also compact soils and affect buried archaeological resources. However, selective methods allow more control over the operation and placement of machinery and cause less ground disturbance than non-selective methods.

Manual vegetation control methods include hand pulling and hoeing, mowing, blading, and grubbing. These methods pull vegetation from the soil, scrape vegetation and surface soil, and dig into the soil. These methods could damage or destroy surface and buried cultural resources. These methods could also lead to erosion that could disturb buried artifacts. Cutting, girdling, trimming, and the use of geotextile barriers would have less potential to disturb archaeological resources. More labor-intensive methods of manual vegetation management would have greater potential for vandalism or inadvertent damage by workers.

Herbicides could harm traditional-use plants, or threaten the health of people gathering, handling, or ingesting recently treated plants. Less selective broadcast application methods would have greater potential to inadvertently affect non-target traditional-use plants.

Lopping and scattering or chipping cut vegetation might visually intrude on traditional-use places. The process of spreading chipped material could damage cultural resources on the ground surface.

Impacts of ROW Maintenance

Periodic access to transmission line ROWs is required to maintain operating functions. Therefore, access roads would be kept open, at least at a two-track level, which increases the potential for vandalism and illicit collection. There could be some impacts on cultural resources during the continuing maintenance of ROW access routes, particularly when activities require using graders, backhoes, and support vehicles to maintain culverts, ditches, and water bars, repair and prevent erosion, maintain graded access roads, and install fences and gates. The ROW access routes avoid known significant cultural resources, so maintenance of the routes should not affect known cultural resources. However, ROW maintenance activities mentioned above have the potential to adversely affect buried archaeological sites that could not be identified using standard archaeological survey methods. Inadvertent damage to or destruction of buried archaeological sites would be a significant impact.

ROW maintenance and other ground-disturbing activities (e.g., manual, mechanical, and herbicidal methods of vegetation treatment and management; ground patrols; excavation; and use, improvement, or repair of access roads) have the potential to result in direct impacts where they damage, disturb, or otherwise diminish the integrity of properties eligible for National Register listing. These ground-disturbing activities could also result in indirect effects to resources eligible for listing in the National Register, due to increased erosion, looting, and vandalism. As shown in Table 3-79, there are 187 resources eligible for listing in the National Register ("historic properties" as defined by 36 CFR 800.16(1)), and resources unevaluated and treated as eligible for purposes of this EIS, in WAPA ROWs in the eight national forests in the project area.

ROW maintenance and other ground-disturbing activities could expose or damage human remains. Pre-contact human remains and associated sacred features could be inadvertently exposed, unearthed, and damaged during ground-disturbing activities associated with vegetation management activities, transmission line maintenance, and ROW maintenance. Unanticipated exposure of and damage to human remains and associated sacred features could result in an adverse and unavoidable impact to the remains.

Impacts of Transmission Line Maintenance

Periodic inspection and repair of transmission lines is required to maintain their operating function. Air patrols are not expected to impact cultural resources. Because the ROW access routes avoid known significant cultural resources, annual ground patrols are not expected to impact cultural resources. There could be some impacts on cultural resources during major repairs of transmission towers, which could include the use of backhoes, bulldozers, bucket trucks, or other heavy machinery. Ground disturbances associated with the use of heavy machinery have the potential to adversely affect buried archaeological sites that could not be identified using standard archaeological survey methods. Inadvertent damage to or destruction of buried archaeological sites would be a significant impact.

Mitigation of Impacts for Cultural Resources

As documented in Table 2-15, WAPA shall comply with federal, state, and local environmental laws, orders, and regulations. Before beginning project activities, supervisory contractor personnel would be instructed on the protection of cultural and environmental resources. To help with this effort, the contract would address (1) federal and state laws regarding antiquities, including disturbance, collection, and removal, and (2) the importance of these resources and the purpose and need to protect them. Under the No Action Alternative and the Proposed Action, WAPA will perform NHPA Section 106 review and consultation in Colorado after specific treatments and actions have been identified, but prior to implementation. WAPA will follow stipulations of the existing Routine Maintenance PA for (Appendix E) under both alternatives.

3.11.5.1 No Action Alternative

Under the No Action Alternative, WAPA would continue to manage its ROWs in accordance with existing authorizations and other agreements with the Forest Service. Specifically, WAPA's Section 106 compliance for routine maintenance of its facilities in Colorado, Nebraska, and Utah national forests are governed by a Programmatic Agreement, executed in 2015, and referred to as the Routine Maintenance PA (Appendix E).

As discussed under General Impacts, impacts could result from ground-disturbing activities that have the potential to damage or disturb known cultural resources. At present, WAPA manages vegetation as needed, which primarily consists of removing danger trees. While the current vegetation management practice has less potential to impact cultural resources compared to the Proposed Action, the increased frequency of accessing ROWs to eliminate danger trees raises the potential for impacts on cultural resources along access routes. Impacts could also result from inadvertent trespass outside designated work areas, access roads, or the WAPA ROWs. Potential impacts on significant cultural resources or historic properties will be identified during NHPA review using the existing Routine Maintenance PA once precise locations of vegetation management activities are determined. Any identified adverse impact will be resolved using stipulations outlined in the Routine Maintenance PA and Standard Maintenance Procedure G-11 (see Table 2-15).

As discussed under General Impacts, ground disturbance associated with vegetation management methods, access route maintenance, and transmission line and ROW maintenance could inadvertently expose or damage undiscovered archaeological resources. Activities under the No Action Alternative could result in direct and permanent adverse impacts on individual archaeological resources, depending on the extent of the site and the amount of damage to the site. If vegetation management activities disturbed a previously undiscovered resource, the characteristics of the site could be adversely affected such that cultural information could be lost or damaged. Indirect impacts that could result from exposure of and damage to an archaeological site include vandalism and looting of the site. Inadvertent damage to or destruction of undiscovered archaeological sites would be a significant impact. Compliance with the existing Routine Maintenance PA and implementation of Standard Maintenance Procedure G-11 would reduce the severity of the impacts to the extent possible.

Arapaho-Roosevelt National Forests

There are five cultural resources in WAPA ROWs in Arapaho-Roosevelt National Forests that are eligible or unevaluated for listing in the National Register. Ground-disturbing activities associated with vegetation management methods, transmission line maintenance, and ROW maintenance have the potential to affect these resources. Before it implements specific projects, WAPA is required to complete NHPA Section 106 review and consultation following stipulations of the Routine Maintenance PA (see Design Feature 47 and Appendix E), which will result in the avoidance, minimization, or mitigation of adverse effects on resources and reduce impacts. A total of 30 cultural resources in WAPA ROWs in these forests have been determined ineligible for listing in the National Register. Based on the impact criteria listed in Section 3.11.4, the No Action Alternative would have no impact on these resources.

Ashley National Forest

There are six cultural resources in the WAPA ROWs in Ashley National Forest that have been recommended eligible (and therefore treated as eligible for purposes of this EIS) for listing in the National Register. Ground-disturbing activities associated with vegetation management methods, transmission line maintenance, and ROW maintenance could affect these sites. WAPA would comply with Stipulations I and II.D of the Routine Maintenance PA to ensure compliance with NHPA Section 106. Project ground-disturbing activities could uncover or damage undiscovered cultural resources. If this happened, WAPA would comply with Stipulation IV of the Routine Maintenance PA, which describes the appropriate procedures to follow in the event of an unanticipated discovery of a cultural resource during maintenance activities. A total of nine cultural resources in the WAPA ROWs in Ashley National Forest have been determined ineligible for listing in the National Register. By definition, the No Action Alternative would have no effect on these resources.

Grand Mesa, Uncompahgre, and Gunnison National Forests

There are 21 cultural resources in WAPA ROWs in these national forests that are eligible or unevaluated for listing in the National Register. Ground-disturbing activities associated with vegetation management methods, transmission line maintenance, and ROW maintenance could affect these resources. WAPA would comply with the Routine Maintenance PA to ensure compliance with NHPA Section 106. Project ground-disturbing activities could uncover or damage undiscovered cultural resources. If this happened, WAPA would comply with Stipulation IV of the Routine Maintenance PA, which describes the appropriate procedures to follow in the event of an unanticipated discovery of a cultural resource during maintenance activities. A total of 41 cultural resources in WAPA ROWs in these national forests have been determined ineligible for listing in the National Register. By definition, the No Action Alternative would have no effect on these resources.

Medicine Bow-Routt National Forests

There are 12 cultural resources in WAPA ROWs in Medicine Bow-Routt National Forests that are eligible or unevaluated for listing in the National Register. One of these had, at the time of recording, standing teepee pole structures and has been fenced by the Forest Service for protection. The site has not been fully evaluated and is treated as eligible pending full consultation. Ground-disturbing activities associated with vegetation management methods, transmission line maintenance, and ROW maintenance could affect these resources. WAPA would comply with the Routine Maintenance PA to ensure compliance with NHPA Section 106. Project ground-disturbing activities could uncover or damage undiscovered cultural resources. If this happened, WAPA would comply with Stipulation IV of the Routine Maintenance PA, which describes the appropriate procedures to follow in the event of an unanticipated discovery of a cultural resource during maintenance activities. A total of 32 cultural resources in WAPA ROWs in Medicine Bow-Routt National Forests have been determined ineligible for listing in the National Register. By definition, the No Action Alternative would have no effect on these resources.

Nebraska National Forest

There is one identified cultural resource in the WAPA ROW in Nebraska National Forest. This resource has been determined not eligible for listing in the National Register. By definition, the No Action Alternative would have no effect on this resource. Project ground-disturbing activities could uncover or damage undiscovered cultural resources. If this happened, WAPA would comply with Stipulation IV of the Routine Maintenance PA, which describes the appropriate procedures to follow in the event of an unanticipated discovery of a cultural resource during maintenance activities.

Pike and San Isabel National Forest

There are three cultural resources in WAPA ROWs in these national forests that are eligible or unevaluated for listing in the National Register. Ground-disturbing activities associated with vegetation management methods, transmission line maintenance, and ROW maintenance could affect this resource. WAPA would comply with the Routine Maintenance PA to ensure compliance with NHPA Section 106. Project ground-disturbing activities could uncover or damage undiscovered cultural resources. If this happened, WAPA would comply with Stipulation IV of the Routine Maintenance PA, which describes the appropriate procedures to follow in the event of an unanticipated discovery of a cultural resource during maintenance activities. Thirteen cultural resources in WAPA ROWs in these national forests have been determined ineligible for listing in the National Register. By definition, the No Action Alternative would have no effect on these resources.

San Juan National Forest

There are 53 cultural resources in WAPA ROWs in San Juan National Forest that are eligible or unevaluated for listing in the National Register. Ground-disturbing activities associated with vegetation management methods, transmission line maintenance, and ROW maintenance could affect these resources. WAPA would comply with the Routine Maintenance PA to ensure compliance with NHPA Section 106. Project ground-disturbing activities could uncover or damage undiscovered cultural resources. If this happened, WAPA would comply with Stipulation IV of the Routine Maintenance PA, which describes the appropriate procedures to follow in the event of an unanticipated discovery of a cultural resource during maintenance activities. A total of 68 cultural resources in WAPA ROWs in this national forest have been determined ineligible for listing in the National Register. By definition, the No Action Alternative would have no effect on these resources.

White River National Forest

There is one cultural resource in WAPA ROWs in this national forest that is eligible or unevaluated for listing in the National Register. Ground-disturbing activities associated with vegetation management methods, transmission line maintenance, and ROW maintenance could affect these resources. WAPA would comply with the Routine Maintenance PA to ensure compliance with NHPA Section 106. Project ground-disturbing activities could uncover or damage undiscovered cultural resources. If this happened, WAPA would comply with Stipulation IV of the Routine Maintenance PA, which describes the appropriate procedures to follow in the event of an unanticipated discovery of a cultural resource during maintenance activities. A total of five cultural resources in WAPA ROWs in White River National Forest have been determined ineligible for listing in the National Register. By definition, the No Action Alternative would have no effect on these resources. However, there is the potential for ground-disturbing activities to uncover undiscovered buried cultural resources.

3.11.5.2 Proposed Action

Under the Proposed Action, there are six categories of ROW conditions requiring vegetation management in various combinations of treatment methods and frequencies of treatment, as listed in Table 2-3. Generally, Categories 1, 3, and 5 would require less-intensive treatment, less-frequent use of these methods, or simply ROW monitoring. Categories 2, 4, and 6 would require more intensive and more frequent treatments. For purposes of this analysis, treatments in Category 1 are assumed to have the least potential to impact cultural resources, treatments in Categories 3 and 5 have a higher potential to impact cultural resources, and treatments in Categories 2, 4, and 6 have the highest potential to impact cultural resources. Sections below describe the general potential for vegetation management activities to impact cultural resources in each national forest. Effects on significant cultural resources or historic properties will be identified during NHPA review using the existing Routine Maintenance PA once precise locations of vegetation management activities are determined. Any identified adverse effect will be resolved using stipulations outlined in the Routine Maintenance PA and Standard Maintenance Procedure G-11 (see Table 2-15).

Under the Proposed Action, WAPA developed Design Features 46 through 49 (see Table 2-13) to protect cultural resources eligible or unevaluated for listing in the National Register. The design features list the following steps to be completed before Proposed Action Activities: cultural resources inventories, SHPO consultation, determining avoidance or other measures, project review, discovery procedures, and Native American consultation.

Direct and indirect impacts to significant cultural resources, undiscovered archaeological sites, and Native American human remains resulting from the IVM approach associated with the Proposed Action are the same as those described for the No Action Alternative. However, the potential for specific impacts would vary because cultural resources in an area designated for initial treatment or for frequent maintenance (and therefore a higher level of ground disturbance during the authorization) would have more chance of being directly or indirectly affected than cultural resources in an area designated for no initial treatment, less-frequent maintenance, or simply periodic monitoring (and therefore a lower level of ground disturbance during the authorization). However, direct and indirect impacts associated with transmission line and access route maintenance are expected to be comparable to those under the No Action Alternative.

Implementing the Proposed Action could cause an adverse effect on significant cultural resources. However, WAPA developed design features to protect cultural resources from potential impacts (see Table 2-13). Compliance with the Routine Maintenance PA (see Appendix E), Standard Maintenance Procedure G-11, and design features would reduce potential impacts to less than significant. WAPA considers these design features and PA a commitment and they are part of the Proposed Action.

Arapaho-Roosevelt National Forests

Under the Proposed Action, vegetation management activities could occur across approximately 288 acres of WAPA ROWs that have 3 significant cultural resources. Of this area, WAPA would manage 71 percent using less-intensive and less-frequent Category 1, 3, and 5 methods, and 29 percent would be subject to more-intensive and more-frequent Category 2, 4, and 6 methods. There would be an increase in ground-disturbing activities and the potential to impact cultural resources compared to the No Action Alternative. This increase would result in potential direct effects from ground-disturbing initial vegetation treatments, more-frequent maintenance treatments, and fuel-load reduction. There would be a potential for indirect effects from increased personnel access to previously undisturbed areas, which could result in vandalism and looting. Compliance with the Routine Maintenance PA (see

Appendix E), Standard Maintenance Procedure G-11, and design features would reduce potential impacts to less than significant.

Ashley National Forest

There are six cultural resources in the WAPA ROWs in Ashley National Forest that have been recommended eligible for listing in the National Register (Alpine Archaeological Consultants 2010). Ground-disturbing activities associated with vegetation management methods, transmission line maintenance, and ROW maintenance could affect these resources. Efforts to avoid or treat these historic properties would continue to follow procedures defined in the existing Routine Maintenance PA (see Appendix E). Implementation of the design features and Standard Maintenance Procedure G-11 would also ensure compliance with federal, state, and local cultural resources laws, regulations, and orders.

Under the Proposed Action, vegetation management activities could occur across approximately 253 acres of the WAPA ROWs in Ashley National Forest. Of this area, WAPA would manage 44 percent using less-intensive or less-frequent Category 1, 3, and 5 methods, and 56 percent would be subject to more-intensive and more-frequent Category 2, 4, and 6 methods. There would be an increase in ground-disturbing activities and the potential to impact cultural resources compared to the No Action Alternative. This increase would result in potential direct effects from ground-disturbing initial vegetation treatments, more-frequent maintenance treatments, and fuel-load reduction. There could be indirect effects from increased personnel access to previously undisturbed areas, which could result in vandalism and looting. Ground-disturbing activities associated with the proposed project could uncover or damage undiscovered cultural resources. If this happened, WAPA would comply with Stipulation IV of the Routine Maintenance PA (see Appendix E), which describes the appropriate procedures to follow in the event of an unanticipated discovery of a cultural resource during maintenance activities.

Grand Mesa, Uncompahgre, and Gunnison National Forests

Under the Proposed Action, vegetation management activities could occur across approximately 1,202 acres of WAPA ROWs in these national forests, which have 21 historic properties. Of this area, WAPA would manage 49 percent using less-intensive or less-frequent Category 1, 3, and 5 methods, and 51 percent would be subject to more-intensive and more-frequent Category 2, 4 and 6 methods. There would be an increase in ground-disturbing activity and the potential to impact cultural resources compared to the No Action Alternative. This increase would result in potential direct effects from ground-disturbing initial vegetation treatments, more-frequent maintenance treatments, and fuel-load reduction. There could be indirect effects from increased personnel access to previously undisturbed areas, which could result in vandalism and looting. Compliance with the Routine Maintenance PA (see Appendix E), Standard Maintenance Procedure G-11, and design features would reduce potential impacts to less than significant.

Medicine Bow-Routt National Forests

Under the Proposed Action, vegetation management activities could occur across approximately 936 acres of WAPA ROWs in Medicine Bow-Routt National Forests. This area has eight historic properties. Of this area, WAPA would manage 80 percent using less-intensive or less-frequent Category 1, 3, and 5 methods, and 20 percent would be subject to more-intensive and more-frequent Category 2, 4, and 6 methods. There would be an increase in ground-disturbing activities and the potential to impact cultural resources compared to the No Action Alternative. This increase would result in potential direct effects from ground-disturbing initial vegetation treatments, more-frequent maintenance treatments, and fuel-load reduction. There would be an increase in the potential for indirect effects from increased personnel access to previously undisturbed areas, which could result in vandalism and looting. Compliance with the Routine Maintenance PA (see Appendix E), Standard Maintenance Procedure G-11, and design features would reduce potential impacts to less than significant.

Nebraska National Forest

Under the Proposed Action, vegetation management activities could occur across all 83.5 acres in the WAPA ROW in Nebraska National Forest, which have no significant cultural resources. Of this area, the vegetation in 95 percent of the ROW is compatible with the existing transmission line and Category 1 treatment, consisting of monitoring with no vegetation treatment. This condition is expected for the duration of the authorization. Five percent of the ROW would be subject to more-intensive and more-frequent Category 4 treatment methods. There would be a slight increase in ground-disturbing activities and the potential to impact undiscovered cultural resources compared to the No Action Alternative. This increase would result in potential direct effects from ground-disturbing initial vegetation treatments and less-frequent maintenance treatments. There would be a slight increase in the potential for indirect effects resulting from increased personnel access to previously undisturbed areas, which could result in vandalism and looting. Undiscovered cultural resources could be uncovered or damaged during ground-disturbing activities associated with the proposed project. If this happened, WAPA would comply with Stipulation IV of the Routine Maintenance PA (see Appendix E), which describes the appropriate procedures to follow in the event of an unanticipated discovery of a cultural resource during maintenance activities. Implementation of the Proposed Action design features and Standard Maintenance Procedure G-11 would also ensure compliance with federal, state, and local cultural resources laws, regulations, and orders.

Pike and San Isabel National Forest

Under the Proposed Action, vegetation management activities could occur across approximately 212 acres of WAPA ROWs in Pike and San Isabel National Forest. This area has three historic properties. Of this area, WAPA would manage 63 percent using less-intensive or less-frequent Category 1, 3, and 5 methods, and 37 percent would be subject to more-intensive and more-frequent Category 2, 4, and 6 methods. There would be an increase in ground-disturbing activities and the potential to impact cultural resources compared to the No Action Alternative. This increase would result in direct effects from ground-disturbing initial vegetation treatments, more-frequent maintenance treatments, and fuel-load reduction. There would be an increase in the potential for indirect effects from increased personnel access to previously undisturbed areas, which could result in vandalism and looting. Compliance with the Routine Maintenance PA (see Appendix E), Standard Maintenance Procedure G-11, and design features would reduce potential impacts to less than significant.

San Juan National Forest

Under the Proposed Action, vegetation management activities could occur across approximately 898 acres of WAPA ROWs in San Juan National Forest. This area has 53 historic properties. Of this area, WAPA would manage 59 percent using less-intensive or less-frequent Category 1, 3, and 5 methods, and 41 percent would be subject to more-intensive and more-frequent Category 2, 4, and 6 methods. There would be an increase in ground-disturbing activities and the potential to impact cultural resources compared to the No Action Alternative. This increase would result in potential direct effects from ground-disturbing initial vegetation treatments, more-frequent maintenance treatments, and fuel-load reduction. There would be an increase in the potential for indirect effects from increased personnel access to previously undisturbed areas, which could result in vandalism and looting. Compliance with the Routine Maintenance PA (see Appendix E), Standard Maintenance Procedure G-11, and design features would reduce potential impacts to less than significant.

White River National Forest

Under the Proposed Action, vegetation management activities could occur across approximately 183 acres of WAPA ROWs in White River National Forest. One historic property has been recorded in the ROWs. Of this area, WAPA would manage 31 percent using less-intensive or less-frequent Category 1, 3, and 5 methods, and 69 percent would be subject to more-intensive and more-frequent Category 2, 4, and 6 methods. There would be a significant increase in ground-disturbing activity and the potential to impact cultural resources compared to the No Action Alternative. This increase would result in potential direct effects from ground-disturbing initial vegetation treatments, more-frequent maintenance treatments, and fuel-load reduction. There would be an increase in the potential for indirect effects from increased personnel access to previously undisturbed areas, which could result in vandalism and looting. Compliance with the Routine Maintenance PA (see Appendix E), Standard Maintenance Procedure G-11, and design features would reduce potential impacts to less than significant.

3.11.5.3 Cumulative Effects

The area for cumulative impacts analysis for effects on cultural resources includes the identified historic and pre-contact archaeological sites in WAPA ROWs in each national forest, as described in this EIS, and the geographic extent of each national forest within which similar projects are planned. Cumulative impacts on cultural resources can occur when development of an area results in the removal of a substantial number of historic structures, archaeological sites, TCPs, or PTRCIs that, when considered together, could degrade the physical historical record of an area.

Under the No Action Alternative and the Proposed Action, impacts would be minimized through implementation of Standard Maintenance Procedure G-11 to protect historic resources, pre-contact resources, and sites important to Native American heritage. Under the No Action Alternative, WAPA would continue to follow the existing Routine Maintenance PA. By complying with Standard Maintenance Procedure G-11, the existing Routine Maintenance PA, and the design features, WAPA will ensure that cultural resources that are eligible or unevaluated for listing in the National Register, sites important to Native American heritage, and inadvertent discoveries would be treated appropriately in compliance with federal, state, and local regulations and requirements. Present and future related projects must also comply with federal, state, and local laws, orders, and regulations, and would likely also include similar mitigation measures and agreements before projects are approved. Therefore, WAPA expects no or minimal cumulative impacts to cultural resources from the proposed project.

3.12 Transportation

3.12.1 Introduction

This section describes the transportation systems in the project area and potential impacts to those systems under the No Action Alternative and the Proposed Action. Section 3.12.2 describes the regulatory and policy framework; Section 3.12.3 describes analysis methods and assumptions; Section 3.12.4 describes the affected environment (existing conditions); and Section 3.12.5 describes potential impacts to transportation systems, including cumulative impacts.

Section 3.14 addresses scenic byways and motorized and nonmotorized trails.

3.12.2 Regulatory and Policy Framework

The National Forest Transportation System is made up of roads and trails that are on or provide access to NFS lands (36 CFR 212). As directed in the Highway Safety Act of 1966 (23 U.S.C. 402), the Forest Service maintains the safety of its roads and trails. The Highway Safety Act authorizes state and local governments and participating federal agencies to identify and survey accident locations; design, construct, and maintain roads following safety standards; and promote pedestrian safety (FSM 7701.2a.2). Forest Service Manual 7730 and Forest Service Handbook 7709.59 Chapter 60 apply to maintenance of NFS roads and trails. Forest Service Manual 7730.2 states, “Operate and maintain NFS roads in a manner that meets road management objectives (RMOs) and that provides for:

1. Safe and efficient travel;
2. Access for the administration, use, and protection of NFS lands; and
3. Protection of the environment, adjacent resources, and public investment.”

National Forest Plans and the travel analysis process provide direction for areas, roads, and trails where motorized vehicle use is allowed. Motor Vehicle Use Maps (MVUMs) display designated NFS roads and trails open to public travel.

3.12.3 Methods and Assumptions for Analysis

WAPA used GIS information (from WAPA and the Forest Service) and reviewed information on national forest websites to analyze potential impacts to transportation systems in the project area. Travel on NFS roads WAPA uses to access its ROWs could be affected by temporary traffic delays or short-term road closures due to access route maintenance and vegetation management activities. Most roads in transmission line ROWs are access routes; however, there are NFS roads in ROWs that might not be used for access, and the same effects could occur on those roads if they are in or near areas that need vegetation management. Hauling heavy equipment and vegetation debris could generate dust or damage roads, creating hazardous situations for motorists on NFS roads.

Assumptions

The following are important assumptions for the identification and analysis of potential impacts on transportation systems in the project area:

- WAPA does not propose to construct new or temporary access roads.
- Access route maintenance would occur only on permitted NFS roads and trails.
- WAPA's personnel and equipment traveling to and from work areas would not increase traffic on NFS roads because WAPA typically uses one to two trucks to transport crews of two to four and carry equipment.

Impact Criteria

There could be an impact on transportation systems if project activities caused either of the following:

- Changes in traffic patterns that create hazardous situations for motorists or pedestrians.
- Creation of road dust, excessive road damage, or both at levels that create hazardous situations on NFS roads open to public travel.

3.12.4 Affected Environment

The affected environment for transportation includes the following:

- NFS roads open to public travel that WAPA uses to access its ROWs, and NFS roads WAPA's transmission line ROWs cross
- Access routes WAPA needs authorization from the Forest Service to use. These routes are not open to public travel.

Access routes include NFS roads and trails open to public travel designated on forest MVUMs, two-track routes that might or might not be designated on MVUMs, and overland access not open to public travel. Most NFS routes in transmission line ROWs are access routes, but other NFS roads or trails not needed for access might be in the ROWs. The primary focus is NFS roads used for access because they could require maintenance, including vegetation treatment, grading, surfacing, or erosion control.

Table 2-2 lists the miles of access routes open to public travel in the project area as designated on MVUMs, and miles of access routes not open to public travel and for which WAPA needs authorization from the Forest Service to use. Map Access-1 through Map Access-8 show the access routes WAPA uses in each forest.

3.12.5 Environmental Consequences

Direct and Indirect Effects on Transportation

Vegetation management and access route maintenance would have direct short-term impacts on transportation by delaying traffic or closing NFS roads open to public travel. Indirect effects include temporary increases in public traffic on other NFS roads, or use of unauthorized routes. The following paragraphs describe these impacts.

Vegetation management includes manual and mechanized methods (as described in Chapter 2). Access route maintenance methods are the same under both alternatives and include managing vegetation along the road, and grading, surfacing, and installing or maintaining erosion control structures as needed.

Approximately 579.9 miles of access routes in the project area are NFS routes open to public travel. WAPA needs authorization to use an additional 173.3 miles of access routes outside the ROW that are not designated on forest MVUMs as open to public travel.

NFS roads WAPA uses to access its ROWs need vegetation management to maintain safe and reliable travel to transmission lines and work sites. Some but not all vegetation management activities need a safety zone around the area being treated to protect the public and workers. Techniques expected to need safety zones are primarily mechanized methods and tree felling, but some manual methods might also need safety zones around the work area. Depending on the vegetation treatment needed and how close the area is to NFS roads, safety zones could extend into road ROWs, limiting travel to one side of the road or closing the road, directly affecting travel on the road by changing traffic patterns. Motorists would experience short-term delays as they travel through the limited area or if the road is closed intermittently for short periods. These effects would be short term while work is underway on short sections of road. Travel over the full width of a road ROW would be restored as work is finished or moves away from the road and the safety zone is no longer needed. Indirect effects of road closures and traffic delays include temporary increases in public traffic on other NFS roads or use of unauthorized routes.

Access route maintenance is also needed to ensure travel to WAPA's ROWs is safe and reliable. Maintenance of culverts, fords, ditches, or water bars could temporarily limit travel to one side of the road, causing short-term delays. Installing new or replacing culverts or water bars could require temporary road closures. In addition, grading to improve road conditions could temporarily limit travel in the road ROW or close the road. Some access routes might need reconstruction to improve the road standard to allow for transport or use of special equipment needed for vegetation management or transmission line maintenance. Maintenance activities would ensure routes are open for the level of motorized use designated on the forest MVUMs. Direct and indirect effects of access route maintenance would be temporary delays or road closures, similar to those from vegetation management. A long-term beneficial effect of WAPA's access route maintenance would be improved conditions for public travel on NFS roads.

Hauling equipment to and from the work site or hauling vegetation debris could damage NFS roads and create holes, washboards, and ruts. Equipment hauled to the work area would include mowers, self-propelled machine platforms, chippers, crawler tractors, snowmobiles, snowcats, backhoes, graders, and bulldozers. Equipment usually would be hauled using lowboy trailers, but larger trucks or trailers might be required to transport bulldozers or debris. The potential for road damage would increase during and after periods of precipitation. Direct and indirect effects of repairing road damage caused by hauling would be temporary delays or road closures similar to those for access route maintenance.

Two-track routes are overland routes in the transmission line ROWs or spurs off graded access routes; they need maintenance only when they become impassable. Maintenance consists of removing large rocks and fallen trees, filling washouts, or cutting dense vegetation that blocks travel on the track. Additional maintenance could be necessary if access for multiple vehicles or special equipment is needed. Maintaining two-track routes designated on the MVUM would not affect overall transportation in the forests except for recreational off-highway vehicle (OHV) users. OHV users could be temporarily delayed or, in some cases, the two-track could be temporarily closed. Effects would be similar to those described for motorists, except effects would occur less often and for shorter periods, and would affect fewer individuals. Unauthorized public use on two-track routes not designated for motorized use could increase, because clearing the track and cutting vegetation would make the track more visible to the public.

Overland access needs maintenance only when vegetation makes the route impassable. Overland access in transmission line ROWs is not authorized for public travel and would not delay motorists or close NFS roads. Unauthorized public travel in transmission line ROWs could increase because cutting vegetation would make the overland route more visible to the public.

WAPA's maintenance activities, such as grading and hauling, have the potential to generate road dust along or next to NFS roads. However, these effects would be short term and localized. The air quality section (3.1) addresses the effects of dust.

Direct and indirect effects would be similar under the No Action Alternative and the Proposed Action. Sections 3.11.5.1 and 3.11.5.2 describe the differences.

3.12.5.1 No Action Alternative

Current practices for treating vegetation and maintaining transmission line ROWs and access routes would not change under the No Action Alternative. Motorists traveling on the 579.9 miles of access routes designated open to public use (Table 2-2 and Maps Access-1 to Access-8) could experience direct and indirect effects (described above) of temporary traffic delays and road closures in areas where immediate risks to transmission lines are found or when access routes need work. These effects occur intermittently across the project area, and are temporary and short-term.

WAPA notifies the Forest Service before work begins and complies with applicable specifications, guidelines, and standard maintenance procedures (Table 2-15). WAPA would get authorization from the Forest Service to use approximately 173.3 miles of access routes outside the ROW not currently permitted for public use (Table 2-2) if open NFS routes do not provide access to the transmission line ROW. Using existing routes, whether closed or open to the public, is preferred to avoid the need to create new access routes. Depending on conditions in transmission line ROWs, WAPA might need authorization to use some or all of the access routes not currently permitted for public use (Maps Access-1 to Access-8).

Because WAPA manages vegetation risks to the transmission lines primarily by treating danger trees, indirect effects under the No Action Alternative include road closures from fires if danger trees are not identified and removed before they fall on transmission lines. WAPA would need authorization from the Forest Service before accessing its transmission line ROW in the Copper Mountain Roadless Area in the Arapaho-Roosevelt National Forests. WAPA would continue to use existing access routes (less than five miles) across roadless area in the Ashley to access its transmission line which is not in a roadless area.

3.12.5.2 Proposed Action

Project activities that affect transportation under the Proposed Action are the same as those described for the No Action Alternative. The direct and indirect effects from these activities would be similar to those under the No Action Alternative, except for the differences described below.

WAPA would use the same access routes (Table 2-2 and Maps Access-1 to Access-8) discussed under the No Action Alternative.

Under the Proposed Action, WAPA would proactively manage vegetation in its ROWs before the vegetation becomes a threat, and continue routine maintenance of the transmission lines and access routes. Before beginning work, WAPA would consider and prioritize treatment areas based on the current risk to transmission line reliability and the threat of fire, public and worker safety, and availability of funding and personnel. The potential for direct and indirect effects on transportation are primarily related to the frequency and location of initial vegetation treatments and maintenance treatments needed thereafter.

Management of vegetation in Categories 1 and 5 areas has the least potential to affect transportation because these areas do not require initial treatments. Vegetation in Category 1 areas is not likely to need treatment during the authorization, and Category 5 areas might not need treatments for five or more years. In these areas, potential effects on transportation from vegetation treatments next to or near NFS roads would be intermittent over the long term, or might never happen. However, access routes would be inspected to identify if work is needed, and there still could be temporary traffic delays or road closures. WAPA would monitor transmission line ROWs and access routes and treat them as needed.

Vegetation in Category 2 and 4 areas needs initial or maintenance treatments within five years of authorization. Category 3 areas are currently compatible, but need maintenance treatments in 2 to 6 years because of the fast-growing vegetation in these areas. Category 2 areas also require maintenance treatments at 2- to 6-year intervals for similar reasons. Category 6 areas need initial treatment to reduce fuel loads and would be treated as funding becomes available. There could be effects on transportation from vegetation treatments only where and when these activities are underway. Initial treatments would not occur all at once; WAPA would consider other factors when determining where and when treatments are needed. WAPA would prioritize initial treatments throughout the eight forests within five years of authorization.

Access route maintenance occurs as needed and there could be temporary, short-term traffic delays or closed roads, depending on the work required. However, under the Proposed Action, maintenance activities could also be identified and addressed more proactively. Access route issues could be corrected when weather favors road work instead of during periods of poor weather conditions such as spring runoff, or periods of rain or snow. In this case, access routes would be in better condition to handle public and project travel during periods of precipitation, and less likely to be damaged by hauling equipment or debris. WAPA would maintain or install gates or other methods of closing access routes not open to public travel as necessary to minimize unauthorized use. Table 2-13 lists design features specific to access route maintenance (see Design Features 50 to 53) and Table 2-15 lists the standard maintenance procedures.

WAPA would use appropriate traffic control measures (signs and flaggers) necessary to maintain the safety and flow of public travel in the project area. WAPA would perform project activities in a way that minimizes inconvenience and disruption to public traffic from temporary traffic delays or road closures. Specific traffic control measures would be included in traffic control plans submitted to and approved by the Forest Service as part of WAPA's annual Operation and Maintenance Plan.

Heavy equipment traveling on access roads or hauling debris or heavy equipment such as bulldozers to the work site would increase the potential for road damage and temporary traffic delays or road closures while the damage is repaired. WAPA would stop hauling during precipitation periods and wait until road conditions could support these activities (Design Feature 51). WAPA would repair road damage as soon as possible.

Livestock or wildlife grazing to control vegetation in WAPA's ROWs is not anticipated to directly or indirectly affect transportation.

Direct and indirect effects on transportation would be intermittent, temporary, and short term. No long-term adverse effects are anticipated. Access route maintenance would benefit public travel in the forests over the short and long terms.

Arapaho-Roosevelt National Forests

Categories 2 (16 percent), 3 (57 percent), and 4 (seven percent) make up 80 percent of the four transmission line ROWs in these national forests, followed by Categories 1 (eight percent), 6 (six percent), and 5 (six percent). More than half (80 percent, or 231.3 acres) of the area in the ROWs would need treatment in the first six years of authorization, and Categories 2 and 3 areas need maintenance treatments at 2- to 6-year intervals thereafter. During this time, the potential for direct and indirect effects on access routes open to public travel (30 miles) from vegetation management would be moderate because of the size of the area needing treatment in the first six years. This potential would decrease after five years because of the maintenance treatment intervals of 2 to 6 years. The potential for road damage and associated effects could increase during the first six years because of the size of area needing treatment, but would decrease thereafter. Design features and standard maintenance procedures would minimize these effects.

WAPA would get Forest Service authorization to access its ROW in the Copper Mountain Roadless Area. All-terrain or off-road vehicles would be used for overland travel to and in the ROW. WAPA does not propose to build new roads in this area. Access is from NFS road 200 or other NFS roads as authorized by the Forest Service. WAPA would incorporate design features in the annual Operation and Maintenance Plan and comply with applicable requirements.

Ashley National Forest

The two transmission line ROWs in this forest are primarily in Categories 6 (45 percent) and 5 (24 percent), while Categories 2 (one percent), 3 (12 percent), and 4 (10 percent) combined make up 23 percent, and Category 1 is eight percent. In the first six years of authorization, 23 percent (59.2 acres) of the area in the ROWs would need treatment and 45 percent (114.5 acres) might be treated to reduce fuel loads if funding becomes available; there could be effects on transportation in these areas during those years, but the potential would decrease thereafter. Twenty-four percent (59.3 acres) of the area in the ROWs might not need treatment for five or more years and eight percent (19.6 acres) might not need treatment during the authorization, with low to no potential for direct or indirect effects on transportation from vegetation management. Given the area needing initial, recurring, or both maintenance treatments, the potential effects of vegetation management or access route maintenance on routes open to public travel (29.4 miles) would be moderate to low, with increased potential during fuel reduction activities. The potential to affect transportation would decrease after initial treatments. Design features and standard maintenance procedures would minimize these effects.

WAPA would get Forest Service authorization to access its ROW across several Roadless Areas (e.g., 0401002, 0401003, 0401006, and 040132 on Flaming Gorge Ranger District), predominately on unmaintained spurs form NFS Road 610 and the 0401006 Roadless Area on the Vernal Ranger District. All-terrain or off-road vehicles would be used for overland travel to and in the ROW. WAPA does not propose to build new roads in this area. WAPA would incorporate design features in the annual Operation and Maintenance Plan and comply with applicable requirements.

Grand Mesa, Uncompahgre, and Gunnison National Forests

The six transmission line ROWs in this forest are primarily in Category 6 (39 percent), followed by Category 3 (30 percent), Category 2 (nine percent), Category 5 (10 percent), Category 1 (nine percent), and Category 4 (three percent). Forty-two percent (502.6 acres) would need treatment within six years; 39 percent (473.3 acres) would need treatment to reduce fuel loads. The potential for direct and indirect effects from vegetation management on transportation would be moderate, with increased potential in areas where fuel reduction activities could occur. Nine percent (102.1 acres) of the area in the ROWs might not need treatment during authorization, and 10 percent (123.7 acres) might not need treatment for five or more years, with no or low potential for direct or indirect effects on transportation from vegetation management. The potential for effects from access route maintenance could increase because of the 171.7 miles of access routes open to public travel and the sizes of areas where fuel reduction would occur. However, following design features and standard maintenance procedures would reduce these potential effects on transportation.

Medicine Bow-Routt National Forests

In these forests, there are six transmission line ROWs that are primarily in Categories 3 (39 percent) and 1 (33 percent), followed by Category 2 (12 percent), Category 5 (seven percent), Category 4 (six percent), and Category 6 (two percent). Over half (57 percent, or 533.2 acres) of the ROWs would need treatment in the first six years and two percent (21.4 acres) would need fuel reduction treatments. Thirty-three percent (311.4 acres) might not need treatment during the authorization and seven percent (69.4 acres) might not be treated for five or more years, with no to little potential to affect transportation. The potential for direct and indirect effects from vegetation management on routes open to public travel (137.1 miles) would be moderate to low. The potential for effects from access route maintenance could increase because of the miles of access routes open to public travel and size of the area needing treatment and would decrease after initial treatements. However, following design features and standard maintenance procedures would reduce these overall effects on transportation.

Nebraska National Forest

Ninety-five percent of the transmission line ROW in Nebraska National Forest is Category 1 and not anticipated to need treatment during the authorization. Only five percent is in Category 4, with 3.8 acres that might need initial treatment in 2 to 5 years. The potential for direct or indirect effects from vegetation management is low to nonexistent because of the small area needing treatment. In addition, given the relatively few miles (13) of access routes open to public travel that could need maintenance, potential effects from access route maintenance would be low.

Pike and San Isabel National Forest

The three transmission lines in this forest have similar percentages of areas in Category 3 (26 percent), Category 6 (23 percent), and Category 5 (22 percent), with smaller percentages of Category 1 (15 percent), Category 2 (five percent), and Category 4 (nine percent). Forty percent (84.8 acres) of the ROWs would need treatment within six years and 23 percent (48.6 acres) would need treatment to reduce fuel loads as funding becomes available. Fifteen percent (31.4 acres) of the area in the ROWs might not need treatment during the authorization and 22 percent (47 acres) might not be treated for five or more years. The potential for direct and indirect effects from vegetation management on access routes open to public travel (16.7 miles) would be moderate, with increased potential in areas where there were fuel reduction activities. The potential for effects from access route maintenance would be low because of the relatively few miles open to public travel. However, following design features and standard maintenance procedures would reduce overall potential effects on transportation.

San Juan National Forest

In this forest, there are four transmission line ROWs that are primarily in Categories 5 (40 percent) and 6 (31 percent), followed by Category 1 (12 percent), Category 3 (eight percent), Category 4 (five percent), and Category 2 (five percent). Only 17 percent (155.9 acres) of the ROWs would require treatment in the first six years and 31 percent (282.4 acres) would need treatment to reduce fuel loads as funding becomes available. Twelve percent (103.3 acres) of the ROWs might not require treatment during the authorization, and 40 percent (356.6 acres) might not need treatment for five or more years. The potential for direct and indirect effects from vegetation management on routes open to public travel (169.4 miles) would be moderate to low. The potential for effects from access route maintenance could increase because of the miles of access routes open to public travel and size of the area needing treatment and would decrease after initial treatements. However, following design features and standard maintenance procedures would reduce these overall effects on transportation.

White River National Forest

In this forest, there are four transmission line ROWs that are primarily in Categories 6 (37 percent) and 1 (30 percent), followed by Category 2 (19 percent), Category 4 (13 percent), Category 3 (one percent); there is no ROW in Category 5. Thirty-three percent (60.8 acres) of ROWs need treatment within six years of authorization and 37 percent (68.5 acres) would need treatment to reduce fuel loads, with moderate potential to affect transportation. The potential to affect access routes open to public travel (12.5 miles) would increase in areas where fuel reduction could occur, but would decrease after initial treatment. More than half (69 percent, or 122.6 acres) of the ROWs might not need treatment within 10 years after authorization, with low to no potential to affect transportation from vegetation management. Given the few miles of access routes open to public travel, potential effects from road maintenance would be low. Following design features and standard maintenance procedures would further reduce the overall potential effects on transportation.

3.12.5.3 Cumulative Effects

The project area for cumulative effects analysis is the same as for the direct and indirect effects on transportation. Appendix A identifies approximately 20 past, present, and reasonably foreseeable projects near WAPA's ROWs in the eight forests in Colorado, Nebraska, and Utah. Only two projects are directly related to transportation or access: a travel management EIS for Nebraska National Forest and a motorized trails project in Grand Mesa, Uncompahgre, and Gunnison National Forests. The other projects are related to vegetation management, fire hazard reduction, salvage and fuels reduction, danger-tree cutting along transmission line ROWs, habitat improvement, invasive plant management, and transmission line reconstructions.

Cumulative effects on transportation would be similar under the No Action Alternative and the Proposed Action both require using the same roads, except that project effects would occur more frequently and larger areas would be treated under the Proposed Action. Cumulative effects are those that would affect the same roads at the same time as project-related activities. To the extent that the 20 projects affect traffic patterns or travel on NFS roads and occur at the same time as project activities, it is likely that the proposed project would contribute to cumulative effects of traffic delays or road closures. The potential for cumulative effects would increase under the Proposed Action because treatments would be more frequent and there would be a larger area affected. However, the contribution of the proposed project to these cumulative effects would be temporary and of short duration, lasting only as long as project activities in the immediate vicinity.

3.13 Visual Resources

3.13.1 Introduction

This section describes existing conditions for visual resources and direct, indirect, and cumulative environmental effects under the No Action Alternative and the Proposed Action. Section 3.13.2 describes the regulatory and policy framework, Section 3.13.3 describes analysis methods and assumptions, Section 3.13.4 describes the affected environment (existing conditions) for visual resources, and Section 3.13.5 describes potential impacts to visual resources under the No Action Alternative and the Proposed Action.

Visual resources are all objects (man-made and natural, moving and stationary) and features (e.g., landforms and waterbodies) visible on a landscape. These resources add to or detract from the scenic quality of the landscape (i.e., the visual appeal of the landscape). A visual impact is the creation of an intrusion or perceptible contrast that affects the scenic quality of a landscape. A visual impact can be perceived by an individual or group as either positive or negative, depending on a variety of factors or conditions (e.g., personal experience, time of day, and weather/seasonal conditions).

3.13.2 Regulatory and Policy Framework

There are several legal and policy frameworks that apply to the protection of visual resources on NFS lands. NEPA requires that measures be taken to “assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings” (42 U.S.C. 4331). As part of the planning process, the NFMA requires the Forest Service to inventory and evaluate visual resources and incorporate visual-quality objectives.

Forest Service Manual 2300, Recreation, Recreation, Wilderness, and Related Resource Management, Chapter 2380 – Landscape Management, requires the inventory, evaluation, management, and, where necessary, restoration of scenery as a fully integrated part of the ecosystems of NFS lands and of the land and resource management and planning process. This manual states, “Conduct and document a scenery assessment for all activities that may affect scenic resources and that require analysis under the National Environmental Policy Act. Ensure application of the principles of landscape aesthetics, scenery management, and environmental design in project-level planning (2380.43.4-5).” Individual forest land and resource management plans identify the visual scenic condition objectives or scenic integrity objectives specified for each management area.

3.13.3 Methods and Assumptions for Analysis

The forest plans for Arapaho-Roosevelt; Ashley; Grand Mesa, Uncompahgre, and Gunnison; Nebraska; Pike and San Isabel; Medicine Bow-Routt; San Juan; and White River National Forests were sources important to describing existing visual resource conditions, and providing key management guidance and direction for each resource and for special geographic areas in the project area. Forest Service manuals and handbooks (2300 sections) provided additional guidance and policy for the resources described in this EIS. Finally, analysts correlated GIS data with Google Earth™ and combined that information with professional experience to evaluate the impacts of WAPA's proposed project on NFS lands.

The effects indicators for visual resources focus on changes to the existing visual setting and the experiences provided by the attractions and requirements established through Forest Plan Visual Quality Objectives (VQOs) class designations defined in Agriculture Handbook 462, Visual Management System, and through evaluation of scenery sustainability concepts described in Agriculture Handbook 701, Landscape Aesthetics: A Handbook for Scenery Management (referred to herein as the Scenery Management System [SMS] Handbook) (Forest Service 1995). The project area includes both VQOs and Scenic Integrity Objectives (SIOs). Table 3-80 identifies and defines the VQOs and comparable SIOs. The visual indicators are (1) changes to the existing setting, VQOs/SIOs, and visibility and (2) compliance with the Standards and Guidelines for Management Areas. In addition, the experience of Forest Service personnel in evaluating similar projects with similar effects was useful in describing the effects of the proposed project on visual resources. Finally, professional judgment based on similar projects elsewhere on NFS lands contributed to the evaluation of potential effects. In Table 3-80, *ecological changes* would be naturally occurring changes to the visual environment. *Management activities* are defined as "an activity of man imposed on a landscape for the purpose of harvesting, traversing, transporting, or replenishing natural resources." (Forest Service 1974).

Using the concepts and terminology described for visual resources, and the criteria for determining impacts described below, analysis of visual effects under from the No Action Alternative and the Proposed Action are based on review of these alternatives regarding compliance with federal, state, and local ordinances and regulations pertaining to visual quality.

WAPA imported digital GIS data into Google Earth™ and then used the path measurement tool to estimate the lengths of the transmission line segments that pass through the various VQO and SIO designations to aid in defining the affected environment. WAPA also used this method to measure where management activities (i.e., category conditions) pass through VQO and SIO designations that would result in adverse effects, as described in the Environmental Consequences section. This method of measurement could result in small discrepancies between actual and estimated lengths, but is deemed a sufficient and reliable method for estimating the level of visual impacts given the measurements are accurate enough to capture the scale of impacts resulting from the proposed project.

Impact Criteria and Indicators

A project can be considered to have an adverse effect if it would conflict with state and local ordinances and regulations or if it would conflict with Forest Service visual quality and scenery management objectives. The following conditions would affect these objectives:

- Substantial degradation of the character or scenic quality of a visually important landscape. Landscape alterations that do not comply with VQOs or SIOs because alterations exceed the threshold of effects. The threshold of effects is exceeded when alterations visually dominate the characteristic landscape and variety of the visual resources in relation to the forest character type and forest character subtype as viewed from the key observation points (sensitivity levels) of viewsheds (e.g., uncharacteristic linear qualities in forest landscapes).
- Substantial dominant visual changes in the landscape that are seen at highly sensitive viewer locations such as community enhancement areas (community gateways, roadside parks, viewpoints, and historic markers) or locations with special scenic, historic, recreation, cultural,

archaeological, or natural qualities that have been recognized as such through legislation or some other official declaration.

- Predicted air pollutant emissions that would cause a change in visibility that would exceed Class I standards.
- Unresolved conflict with visual standards identified by a federal land management agency (e.g., Forest Service, Bureau of Land Management, National Park Service).
- Substantial increase in light and glare in the project area.
- Long-term (that is, persisting for two or more years) adverse visual changes or contrasts to the existing landscape as viewed from areas with high visual sensitivity.

Table 3-80. Visual Quality Objectives and Definitions and Corresponding Scenic Integrity Objectives

Visual Management System		Scenery Management System	
Visual Quality Objective	***Objective Definition***	***Scenic Integrity Objective***	***Objective Definition***
Preservation	• Only ecological changes are allowed. • Management activities are prohibited, except for recreation facilities with very low visual impact.	Very High	• Valued scenery "is" intact with only minute visual disturbances to the valued scenery are present. • The existing landscape character and sense of place is expressed at the highest possible level.
Retention	• Management activities are not visually evident. • Activities may only repeat form, line, color, and texture found in characteristic landscape, and changes in the size, amount, intensity, direction, and pattern of these visual elements should not be evident.	High	• Valued scenery "appears" Intact. • Deviations may be present but must repeat the form, line, color, texture, and pattern common to the landscape character so completely and at such scale that they are not evident.
Partial Retention	• Management activities are visually subordinate to characteristic landscape. • Activities may repeat form, line, color, and texture found in characteristic landscape, and changes in the size, amount, intensity, direction, and pattern of these visual elements should remain visually subordinate. • New or uncommon patterns of form, line, color, and texture may be added to the characteristic landscape through management activities as long as they are visually subordinate.	Moderate	• Valued scenery "appears slightly altered." • Noticeable disturbances are minor and visually subordinate to the valued scenery because they repeat its form, line, color, texture, pattern and scale.
Modification	• Management activities may visually dominate the characteristic landscape. • Activities resulting in changes in landform and vegetation cover must borrow from form, line, color, and texture found naturally in the landscape and at a scale that is also naturally occurring nearby. • Infrastructure features, such as buildings, roads, and signs, should mimic form, line, color, texture, and scale that is compatible with the surrounding landscape.	Low	• Valued scenery "appears moderately altered." • Deviations begin to dominate the valued landscape character being viewed but they borrow valued attributes such as size, shape, edge effect and pattern of natural openings, vegetative type changes or architectural styles outside the landscape being viewed. Scenery attributes borrowed from outside the viewed landscape appear compatible with or complimentary to those within.

Table 3-80. Visual Quality Objectives and Definitions and Corresponding Scenic Integrity Objectives

Visual Management System		Scenery Management System	
Visual Quality Objective	***Objective Definition***	***Scenic Integrity Objective***	***Objective Definition***
Maximum Modification	• Management activities may visually dominate the characteristic landscape. • Activities must appear as natural occurrences within surrounding area when viewed as background, but can appear out of keeping with naturally established form, line, color, texture, and scale when viewed in the foreground or middleground. • Infrastructure features, such as buildings, roads, and signs, should be visually subordinate when viewed as background.	Very Low	• Valued scenery "appears heavily altered." • Disturbances dominate the valued scenery being viewed; and they may only slightly borrow from, or reflect, valued scenery attributes within or beyond the viewed landscape (due to their size, shape, edge effect and pattern). However, disturbances must be shaped and blended with the natural terrain (primary landforms) so they do not dominate the overall composition.
Unacceptable Modification	• Management activities are excessive. • Activities and infrastructure appear to have an excessive contrast in form, line, color, texture, and scale and are visually unrelated to landform and vegetative patterns in characteristic landscape.	Unacceptably Low	• Valued scenery "appears extremely altered." • Disturbances are excessively dominant and they borrow little if any form, line, color, texture, pattern or scale from the valued scenery within or near the vicinity. • Scenery at this level needs rehabilitation. In addition, this level should only be used to inventory existing scenic integrity and not as a management objective.

Sources: Forest Service 1974; Forest Service 1995.

3.13.4 Affected Environment

For visual resources, *sense of place* is "the identity of a place created by people's social meanings and attachments, including valued scenery and recreation settings, cultural and spiritual values, economic, social and biophysical characteristics (Forest Service 2007)."

Visual resources can be described by scenic character, scenic integrity, and visibility. *Scenic character* includes natural and artificial landscape features that contribute to an area or view. Scenic character is influenced by geologic, hydrologic, botanical, wildlife, recreation, and urban features. Urban features include those associated with landscape settlements and development, including roads, utilities, structures, earthworks, and the results of other human activities. The perception of scenic character can vary substantially seasonally, even hourly, as weather, light, shadow, and elements that compose the viewshed change. The basic components used to describe visual character for most visual resources assessments are the elements of form, line, color, and texture of the landscape features (Forest Service 1995).

Scenic integrity is "the degree to which a landscape is free from visible disturbances that detract from the natural or socially valued appearance (Forest Service 2007)," measured by VQO and SIO levels.

Visibility includes key viewpoints from which an action would be seen, distance zone of available views, and prominence of available views.

The No Action Alternative and the Proposed Action would not affect the visual characteristics of wild and scenic rivers, because there are no designated wild and scenic rivers within view of the proposed project.

The No Action Alternative and the Proposed Action have the potential to affect scenic byways. National Scenic Byways and All-American Roads are designated under the Federal Highway Administration National Scenic Byways Program (America's Byways 2012). Although the Federal Highway Administration recognizes these routes for their scenic qualities, designated byways fall under local county, state, or Forest Service (if on NFS lands) jurisdiction and are therefore not protected under federal scenic byway policies (Steele 2003). The proposed project would be required to conform to policies established to protect these designated routes.

3.13.4.1 Arapaho-Roosevelt National Forests

Existing Scenic Character

The project area for Archer-North Park and Ault-Craig transmission lines is accessible by State Route 127 and smaller, graded forest routes that travel through the project area. These roadways wind through the spruce, fir, and lodgepole pine forest stands interspersed with big sagebrush openings that cover the numerous rising peaks and slopes of Medicine Bow Mountains. There are no major waterways in the foreground and middleground on NFS lands.

The project area for Blue River-Gore Pass and Green Mountain-Blue River Repeater transmission lines is accessible by State Route 9 and smaller, graded forest routes that travel through the project area. These roadways wind through the aspen, spruce, fir, and lodgepole pine forest stands interspersed with grasslands that cover the mountainous terrain of the Williams Fork Mountains. There are no major waterways in the foreground and middleground on NFS lands.

These dark green pine and fir forests are sprinkled with lighter green deciduous trees and understory shrubs that give way to hues of yellow, orange, and brown in fall. Fallen brown needles, pine cones, and dead branches litter the forest floor where canopies are dense, and small patches to larger meadows of grass and herbaceous vegetation are present in larger openings. Major scenery attributes of the project area are its steep, mountainous terrain; lakes; and pine and fir covered slopes. Minor scenery attributes are its smaller creeks; rock outcroppings; seasonal interest such as wildflowers in spring, deciduous fall colors, and snow-covered mountains; open canopy areas (e.g., meadows); and wildlife and plant viewing.

Visual Quality or Scenic Integrity Objective

The project area for Archer-North Park and Ault-Craig transmission lines is surrounded by a mixture of retention, partial retention, and modification VQO. Most of the five miles of Archer-North Park and Ault-Craig transmission lines pass through partial retention VQO, with approximately 1.2 miles going through retention VQO. The project area for Blue River-Gore Pass and Green Mountain-Blue River Repeater transmission lines is surrounded by a mixture of retention and partial retention VQO. Most of the almost seven miles of the Blue River-Gore Pass transmission line pass through partial retention VQO, with approximately 2.2 miles going through retention VQO. Green Mountain-Blue River Repeater is completely within retention VQO.

Visibility

Most of the project area for Archer-North Park, Blue River-Gore Pass, and Green Mountain-Blue Ridge Repeater transmission lines is visible from key viewpoints, such as from the roadways mentioned above. The project area is also visible from smaller, graded Forest Service routes that travel through the project area. Additional views of Blue River-Gore Pass transmission line are available from OHV and mountain-bike trails. Views in the project area vary from immediate foreground views comprised of many trees and the forest floor, to open views over shrub or grasslands with mountain peaks rising in the middleground or background, to panoramic middleground or background views over the forested slopes of mountains.

Scenic Byways

There are no scenic byways in the project area in Arapaho-Roosevelt National Forests.

3.13.4.2 Ashley National Forest

Existing Scenic Character

The project area for Flaming Gorge-Vernal #1 and #3 is accessible by Interstate 191 and smaller, graded forest routes that travel through the project area. All of these roadways wind through pinyon-juniper, lodgepole pine, Douglas fir, aspen, and alder-leaf mountain mahogany forests and black sagebrush, mountain big sagebrush, and grasslands that cover the numerous rising peaks and slopes of the Uinta Mountains, extending down to the banks of the rivers and creeks that flow into Flaming Gorge Reservoir. The transmission line ROWs are mostly cleared of vegetation.

These dark green pine and fir forests are sprinkled with lighter green deciduous trees and understory shrubs that give way to hues of yellow, orange, and brown in fall. Fallen brown needles, pine cones, and dead branches litter the forest floor where canopies are dense, and small patches to larger meadows of grass and herbaceous vegetation are present where there are larger openings. Greenish silver sagebrush shrublands provide visual contrast. Major scenery attributes of the project area are its steep, mountainous terrain; lakes; rivers; creeks; and forested and sagebrush covered slopes. Minor scenery attributes are its smaller creeks; rock outcroppings; seasonal interest such as wildflowers in spring, deciduous fall colors, and snow-covered mountains; open canopy areas (e.g., meadows); and wildlife and plant viewing.

Visual Quality or Scenic Integrity Objective

The project area for Flaming Gorge-Vernal #1 and #3 transmission lines is surrounded by a mixture of retention, partial retention, and modification VQO. Most of the 6.6 miles of Flaming Gorge-Vernal #1 transmission line pass through retention VQO, with approximately 0.5 mile going through modification VQO. Most of the almost 19.6 miles of Flaming Gorge-Vernal #3 transmission line pass through retention VQO, with approximately 5.5 miles going through modification VQO and four miles going through partial retention VQO.

Visibility

Most of the project area for Flaming Gorge-Vernal #1 and #3 transmission lines is visible from smaller, graded Forest Service routes that travel through the project area. There could be other key viewpoints of the transmission lines from campgrounds, picnic areas, and nearby trailheads. Views in the project area vary from immediate foreground views comprised of many trees and the forest floor, to open views over shrub or grasslands with mountain peaks rising in the middleground or background, to panoramic middleground or background views over the forested slopes of mountains.

Scenic Byways

Flaming Gorge-Uintas National Scenic Byway follows U.S. Route 191 in Ashley National Forest in the project area. Flaming Gorge-Vernal #3 would be visible because the transmission line parallels and crosses the byway in several locations, and the terrain and low-growing vegetation allows for views. In other locations, intervening terrain and vegetation prevents views of the transmission line crossing NFS lands. In addition, at some locations portions of the tops of the transmission line could be visible where topography and breaks in vegetation allow these views. However, these views would be minimal, and views of the ground plane and views associated with vegetation removal would not be noticeable in the landscape.

3.13.4.3 Grand Mesa, Uncompahgre, and Gunnison National Forests

Existing Scenic Character

The project area for Hesperus-Montrose and Curecanti-Lost Canyon transmission lines is accessible by State Route 145 and smaller, graded forest routes that travel through the project area. These roadways wind through the Gambel oak, ponderosa pine, cottonwood, and aspen forest stands interspersed with big sagebrush and grassland openings that cover the numerous rising peaks and slopes of the Uncompahgre Range. There are a number of creeks in the foreground and middleground on NFS lands.

The project area for Curecanti-North Fork transmission line is accessible by State Route 92, which is the West Elk Loop Colorado State Scenic Byway, and smaller, graded forest routes that travel through the project area. These roadways wind through the aspen, spruce/fir, and Gambel oak forest stands interspersed with grasslands that cover the mountainous terrain of Black Mesa. There are a number of creeks in the foreground and middleground on NFS lands flowing into Gunnison River. The transmission line ROW is mostly cleared of vegetation.

The project area for North Fork-Rifle transmission line is accessible by State Route 133 and smaller, graded forest routes that travel through the project area. These roadways wind through the aspen, spruce/fir, and Gambel oak forest stands interspersed with big sagebrush shrublands and grasslands that cover the mountainous terrain of Elk Mountain. There are a number of creeks in the foreground and middleground on NFS lands flowing into North Fork Gunnison River.

The project area for Curecanti-Poncha and North Gunnison-Salida transmission lines is accessible by U.S. Route 50 and smaller, graded forest routes that travel through the project area. These roadways wind through the aspen, spruce/fir, and lodgepole pine forest stands interspersed with true mountain mahogany, big sagebrush shrublands, mixed sagebrush, and grasslands that cover the mountainous terrain of the Sawatch Range. There are a number of creeks in the foreground and middleground on NFS lands.

These dark green pine and fir forests are sprinkled with lighter green deciduous trees and understory shrubs that give way to hues of yellow, orange, and brown in fall. Fallen brown needles, pine cones, and dead branches litter the forest floor where canopies are dense, and small patches to larger meadows of grass and herbaceous vegetation are present where there are larger openings. Greenish silver sagebrush shrublands provide visual contrast. Major scenery attributes of the project area are its steep, mountainous terrain; lakes; and pine and fir covered slopes. Minor scenery attributes are its smaller creeks; rock outcroppings; seasonal interest such as wildflowers in spring, deciduous fall colors, and snow-covered mountains; open canopy areas (e.g., meadows); and wildlife and plant viewing.

Visual Quality or Scenic Integrity Objective

The project area for Hesperus-Montrose, Curecanti-Lost Canyon, Curecanti-North Fork, North Fork-Rifle, Curecanti-Poncha, and North Gunnison-Salida transmission lines is surrounded by a mixture of low, moderate, moderately high, and high SIO. All of the Curecanti-North Fork, North Fork-Rifle, and North Gunnison-Salida transmission lines are completely within low SIO. Most of the 18.9 miles of the Hesperus-Montrose and 6 miles of the Curecanti-Lost Canyon lines are within low SIO, with 0.3 mile of each in moderate SIO. Most of the Curecanti-Poncha transmission line is within low SIO, with 0.3 mile in high SIO. Most of the nearby North Gunnison-Salida transmission line is within low SIO, with 1.8 miles in moderate.

Visibility

Most of the project area for Hesperus-Montrose and Curecanti-Lost Canyon, Curecanti-North Fork, North Fork-Rifle, and Curecanti-Poncha and North Gunnison-Salida transmission lines is visible from key viewpoints, such as from the roadways mentioned above. The project area is also visible from smaller, graded Forest Service routes that travel through the project area. Other key viewpoints of the transmission lines are available from OHV, pack and saddle, and motorcycle trails. Views in the project area vary from immediate foreground views comprised of many trees and the forest floor, to open views over shrub or grasslands with mountain peaks rising in the middleground or background, to panoramic middleground or background views over the forested slopes of mountains.

Scenic Byways

Curecanti-Lost Canyon transmission line parallels State Route 145, the Unaweep Tabeguache Colorado State Scenic Byway. However, the transmission line would not be visible because the roadway is in a canyon, and intervening terrain and vegetation prevents views of the portion of the transmission line crossing NFS lands. Curecanti-North Fork transmission line roughly parallels State Route 92, the West Elk Loop Colorado State Scenic Byway, to the east (Colorado Department of Transportation 2011). Portions of the tops of the transmission line could be visible where topography and breaks in vegetation allow these views. However, these views would be minimal and views of the ground plane and views associated with vegetation removal would not be noticeable in the landscape. Therefore, this section does not further address these scenic byways.

3.13.4.4 Medicine Bow-Routt National Forests

Existing Scenic Character

The project area for Ault-Craig, Hayden-North Park, and Gore Pass-Muddy Pass transmission lines is accessible by U.S. Route 40 and smaller, graded forest routes that travel through the project area. These roadways wind through the aspen, spruce/fir, and lodgepole pine forest stands interspersed with big sagebrush openings that cover the numerous rising peaks and slopes of the Park Range, part of the Continental Divide. There are no major waterways in the foreground and middleground on NFS lands.

The project area for Hayden-Gore Pass and Gore Pass-Hayden transmission lines is accessible by State Routes 131 and 134 and smaller, graded forest routes that travel through the project area. These roadways wind through the aspen, spruce/fir, lodgepole pine, and willow forest stands interspersed with grasslands that cover the mountainous terrain of the Gore Range. A number of creeks are visible in the foreground and middleground on NFS lands.

These dark green pine and fir forests are sprinkled with lighter green deciduous trees and understory shrubs that give way to hues of yellow, orange, and brown in fall. Fallen brown needles, pine cones, and dead branches litter the forest floor where canopies are dense, and small patches to larger meadows of grass and herbaceous vegetation are present where there are larger openings. Major scenery attributes of the project area are its steep, mountainous terrain; lakes; and pine and fir covered slopes. Minor scenery attributes are its smaller creeks; rock outcroppings; seasonal interest such as wildflowers in spring, deciduous fall colors, and snow-covered mountains; open canopy areas (e.g., meadows); and wildlife and plant viewing.

Visual Quality or Scenic Integrity Objective

The project area for Ault-Craig, Hayden-North Park, Gore Pass-Muddy Pass, Hayden-Gore Pass, and Gore Pass-Hayden transmission lines is surrounded by a mixture of retention, partial retention, and modification VQO, with an area of preservation VQO bordering the Ault-Craig and Hayden-North Park lines. Most of the 13.6 miles of the Ault-Craig and Hayden-North Park transmission lines pass through partial retention VQO, with approximately 1.8 miles going through retention and 2.9 miles going through modification VQOs. All 1.7 miles of the Gore Pass-Muddy Pass are within retention VQO. Most of the 22 miles of the Hayden-Gore Pass transmission line pass through partial retention VQO, with approximately 0.9 mile going through retention and 7.6 miles going through modification VQOs. Of the 11.1 miles of the Gore Pass-Hayden transmission line, approximately 6.6 miles pass through retention and 4.5 miles goes through partial retention VQO.

Visibility

Most of the project area for Ault-Craig, Hayden-North Park, Gore Pass-Muddy Pass, Hayden-Gore Pass, and Gore Pass-Hayden transmission lines is visible from key viewpoints, such as from the roadways mentioned above. The project area is also visible from smaller, graded Forest Service routes that travel through the project area. There are other key viewpoints of the transmission lines from trails that traverse the project area. Views in the project area vary from immediate foreground views comprised of many trees and the forest floor, to open views over shrub or grasslands with mountain peaks rising in the middleground or background, to panoramic middleground or background views over the forested slopes of mountains.

Scenic Byways

Hayden-Gore Pass transmission line passes to the east of the eastern terminus of County Road 17, the Flat Tops Trail Colorado State Scenic Byway (Colorado Department of Transportation 2011). Portions of the tops of the transmission line could be visible where topography and breaks in vegetation allow these views. However, these views would be minimal, and views of the ground plane and views associated with vegetation removal would not be noticeable in the landscape. Therefore, this section does not further address this scenic byway.

3.13.4.5 Nebraska National Forest

Existing Scenic Character

The project area for Box Butte-Chadron transmission line is accessible by U.S. Route 385 and U.S. Route 20, and smaller, graded forest routes that travel through the project area. All of these roadways wind through ponderosa pine forest and grasslands that cover the rolling terrain, extending down to the banks of the numerous creeks that flow through NFS lands. The transmission line ROW is mostly cleared of vegetation.

These dark green pine forests contrast against the surrounding grasslands. Fallen brown needles, pine cones, and dead branches litter the forest floor where canopies are dense. Grasslands change from green to brown seasonally and provide visual contrast. Major scenery attributes of the project area are its creeks; contrasting forest and grasslands; seasonal interest such as wildflowers in spring, changes to grass colors, and snow; and wildlife and plant viewing.

Visual Quality or Scenic Integrity Objective

The project area for Box Butte-Chadron transmission line is mostly surrounded by moderate SIO, with small portions of low and high SIO. All of transmission line is completely within moderate SIO.

Visibility

Most of the project area for Box Butte-Chadron transmission line is visible from smaller, graded Forest Service routes that travel through the project area. There are other key viewpoints of the transmission lines from mountain-bike and hiking trails in the area. Views in the project area vary from immediate foreground views comprised of trees and the forest floor, to wide expansive views over grasslands.

Scenic Byways

There are no scenic byways in the project area in Nebraska National Forest.

3.13.4.6 Pike and San Isabel National Forest

Existing Scenic Character

The project area for Malta-Mount Elbert transmission line is accessible by State Route 82, which is Top of the Rockies State and National Scenic Byway, and smaller, graded forest routes that travel through the project area. These roadways wind through lodgepole pine forest stands. Mount Elbert Forebay and Twin Lakes are visible in the foreground and middleground on NFS lands.

The project area for Curecanti-Poncha and North Gunnison-Salida transmission lines is accessible by U.S. Route 50 and smaller, graded forest routes that travel through the project area. These roadways wind through the aspen, spruce/fir, Douglas fir, bristlecone pine, and lodgepole pine forest stands interspersed with true mountain mahogany and grasslands that cover the mountainous terrain of the Sawatch Range. There are a number of creeks in the foreground and middleground on NFS lands.

These dark green pine and fir forests are sprinkled with lighter green deciduous trees and understory shrubs that give way to hues of yellow, orange, and brown in fall. Fallen brown needles, pine cones, and dead branches litter the forest floor where canopies are dense, and small patches to larger meadows of grass and herbaceous vegetation are present where there are larger openings. Greenish silver sagebrush shrublands provide visual contrast. Major scenery attributes of the project area are its steep, mountainous terrain; lakes; and pine and fir covered slopes. Minor scenery attributes are its smaller creeks; rock outcroppings; seasonal interest such as wildflowers in spring, deciduous fall colors, and snow-covered mountains; open canopy areas (e.g., meadows); and wildlife and plant viewing.

Visual Quality or Scenic Integrity Objective

The project area for Malta-Mount Elbert, Curecanti-Poncha, and North Gunnison-Salida transmission lines are surrounded by a mixture of retention, partial retention, modification, and modification/maximum modification VQOs. All 0.9 mile of the Malta-Mount Elbert transmission line passes through retention VQO. Most of the 8.4 miles of the Curecanti-Poncha transmission line passes through modification/maximum modification VQO, with approximately two miles going through retention and 0.5 mile going through partial retention VQOs. Most of the eight miles of the North Gunnison-Salida transmission line passes through modification/maximum modification VQO, with approximately 0.8 mile going through retention VQO. Note that digital data is not available for Pike and San Isabel National Forest; therefore, an image overlay of the hard copy mapping was imported into Google Earth™ for the purposes of estimating lengths. This could result in small discrepancies between actual and estimated lengths, but is deemed a sufficient and reliable method for estimating impacts given the availability of data.

Visibility

Most of the project area for Malta-Mount Elbert and Curecanti-Poncha and North Gunnison-Salida transmission lines is visible from key viewpoints, such as from the roadways mentioned above. The project area is also visible from smaller, graded Forest Service routes that travel through the project area. Other key viewpoints of the Hesperus-Montrose are available from Colorado Trail. In addition, there are views of the Curecanti-Poncha transmission line from the Monarch Mountain Ski Resort. Views in the project area vary from immediate foreground views comprised of many trees and the forest floor, to open views over shrub or grasslands with mountain peaks rising in the middleground or background, to panoramic middleground or background views over the forested slopes of mountains.

Scenic Byways

Malta-Mount Elbert transmission line roughly parallels State Route 82 to the north and Interstate 24 to the east, the Top of the Rockies State and National Scenic Byway (America's Byways 2012). Portions of the tops of the transmission line could be visible where topography and breaks in vegetation allow these views. However, these views would be minimal, and views of the ground plane and views associated with vegetation removal are not expected to be noticeable in the landscape. Therefore, this section does not further address these scenic byways in Pike and San Isabel National Forest.

3.13.4.7 San Juan National Forest

Existing Scenic Character

The project area for Great Cut-McPhee, Hesperus-Montrose, and Curecanti-Lost Canyon transmission lines is accessible by State Route 145 and smaller, graded forest routes that travel through the project area. These roadways wind through the Gambel oak, ponderosa pine, cottonwood, and aspen forest stands interspersed with big sagebrush and grassland openings that cover the numerous rising peaks and slopes of the San Juan Mountains. McPhee Reservoir, Dolores River, and numerous creeks are in the foreground and middleground on NFS lands.

These dark green pine and fir forests are sprinkled with lighter green deciduous trees and understory shrubs that give way to hues of yellow, orange, and brown in fall. Fallen brown needles, pine cones, and dead branches litter the forest floor where canopies are dense, and small patches to larger meadows of grass and herbaceous vegetation are present where there are larger openings. Greenish silver sagebrush shrublands provide visual contrast. Major scenery attributes of the project area are its steep, mountainous terrain; lakes; and pine and fir covered slopes. Minor scenery attributes are its smaller creeks; rock outcroppings; seasonal interest such as wildflowers in spring, deciduous fall colors, and snow-covered mountains; open canopy areas (e.g., meadows); and wildlife and plant viewing.

Visual Quality or Scenic Integrity Objective

The project area for Great Cut-McPhee, Hesperus-Montrose, and Curecanti-Lost Canyon transmission lines is surrounded by a mixture of very low, low, moderate, and high SIO. Most of the five miles of the Great Cut-McPhee transmission line is within moderate SIO, with 0.1 mile in very low and one mile in low SIO. The 31.2-mile Hesperus-Montrose transmission line crosses a somewhat equal mixture of low, moderate, and high SIO. Most of the Curecanti-Lost Canyon transmission line is within low SIO, with 0.7 mile in moderate and 0.9 mile in high SIO.

Visibility

Most of the project area for Great Cut-McPhee, Hesperus-Montrose, and Curecanti-Lost Canyon transmission lines is visible from key viewpoints, such as from the roadways mentioned above. The project area is also visible from smaller, graded Forest Service routes that travel through the project area. There are other key viewpoints of the transmission lines from OHV, pack and saddle, and motorcycle trails. Views in the project area vary from immediate foreground views comprised of many trees and the forest floor, to open views over shrub or grasslands with mountain peaks rising in the middleground or background, to panoramic middleground or background views over the forested slopes of mountains.

Scenic Byways

Hesperus-Montrose transmission line crosses State Route 160 and State Route 145, the San Juan Skyway Colorado State and Historic Byway, All-American Road, and National Forest Scenic Byway on NFS lands. Vegetation clearing in the ROW would be visible from these portions of the scenic byway (America's Byways 2012).

3.13.4.8 White River National Forest

Existing Scenic Character

The project area for Curecanti-Rifle transmission line is accessible by State Route 133 and smaller, graded forest routes that travel through the project area. These roadways wind through the aspen, pinyon-juniper, and Gambel oak forest stands interspersed with big sagebrush shrublands and grasslands that cover the mountainous terrain of Elk Mountain. There are a number of creeks in the foreground and middleground on NFS lands flowing into North Fork Gunnison River. The project area for Blue River-Gore Pass transmission line is accessible by State Route 9 and smaller, graded forest routes that travel through the project area. These roadways wind through the aspen, spruce, fir, and lodgepole pine forest stands interspersed with grasslands that cover the mountainous terrain of the Williams Fork Mountains. There are no major waterways in the foreground and middleground on NFS lands in this area.

These dark green pine and fir forests are sprinkled with lighter green deciduous trees and understory shrubs that give way to hues of yellow, orange, and brown in fall. Fallen brown needles, pine cones, and dead branches litter the forest floor where canopies are dense, and small patches to larger meadows of grass and herbaceous vegetation are present where there are larger openings. Greenish silver sagebrush shrublands provide visual contrast. Major scenery attributes of the project area are its steep, mountainous terrain; lakes; and pine and fir covered slopes. Minor scenery attributes are its smaller creeks; rock outcroppings; seasonal interest such as wildflowers in spring, deciduous fall colors, and snow-covered mountains; open canopy areas (e.g., meadows); and wildlife and plant viewing.

Visual Quality or Scenic Integrity Objective

The project area for Curecanti-Rifle and Blue River-Gore Pass transmission lines is surrounded by a mixture of low, moderate, high, and very high SIO. All 3.4 miles of the Curecanti-Rifle transmission line is completely within low SIO. All seven miles of the Blue River-Gore Pass transmission line pass through moderate SIO.

Visibility

Most of the project area for Curecanti-Rifle and Blue River-Gore Pass transmission lines is visible from key viewpoints, such as from the roadways mentioned above. The project area is also visible from smaller, graded Forest Service routes that travel through the project area. There are other key viewpoints of the transmission lines from OHV, pack and saddle, mountain bike, and motorcycle trails. Views in the project area vary from immediate foreground views comprised of many trees and the forest floor, to open views over shrub or grasslands with mountain peaks rising in the middleground or background, to panoramic middleground or background views over the forested slopes of mountains.

Scenic Byways

There are no scenic byways in the project area in White River National Forest.

3.13.5 Environmental Consequences

3.13.5.1 No Action Alternative

WAPA transmission line infrastructure, ROWs, and access routes, and current vegetation management activities are part of the existing visual landscape in the project area. Under the No Action Alternative, WAPA would continue its current infrastructure, ROW, and access road maintenance practices using manual, mechanical, and herbicide application methods to control vegetation. Management activities would continue to focus on danger trees. WAPA would inspect ROWs at least once a year using aerial, ground, and climbing methods, and remove new danger trees, and there would not be mass removals of danger trees in a selected removal event. Therefore, there would be no substantial degradation of the character or changes in scenic quality, and no impacts to existing VQOs or SIOs and sensitive viewing locations in the project area. Air pollutant emissions would be consistent with ongoing management activities and would not increase. There are currently no unresolved conflicts with visual standards identified by a federal land management agency. Ongoing management practices would continue to create a small amount of glare where trees that provide shade are removed, but this would not substantially increase light and glare in the project area. Because these activities are a part of the existing visual landscape, continuing them would not act to permanently reduce visually important features on NFS lands. Ongoing management activities are short term and act to maintain a visual landscape that is consistent within the ROWs; therefore, there would be no long-term adverse visual changes or contrasts to the existing landscape as viewed from areas with high visual sensitivity.

However, the No Action Alternative could indirectly affect the project area’s scenic character by increasing the chance for catastrophic fire where dense vegetation under the transmission line would aid in the spread of forest fires. This would negatively impact scenery attributes associated with vegetation communities by destroying vast areas of living vegetation. It would also eliminate the presence of wildflowers, deciduous fall colors, and meadows and would, in turn, negatively affect wildlife viewing through the destruction of habitat. These would be long-term effects until the forest could recover.

This No Action Alternative analysis applies to all affected forests because there are ongoing management activities in each forest, and these activities would continue. Only variations are described below.

Arapaho-Roosevelt National Forests

Under the No Action Alternative, there would be no substantial changes to the visual environment from vegetation management activities in the ROWs. Therefore, there would be no adverse direct, indirect, short-term, long-term, or cumulative impacts to visual resources, and no mitigation would be required.

Ashley National Forest

Under the No Action Alternative, vegetation management in areas of the Flaming Gorge-Vernal #3 ROW visible from the Flaming Gorge-Uintas National Scenic Byway (U.S. Route 191) remain the same, and there would be no substantial changes to the existing visual environment. Therefore, there would be no adverse direct, indirect, short-term, long-term, or cumulative impacts to visual resources, and no mitigation would be required.

Grand Mesa, Uncompahgre, and Gunnison National Forests

Under the No Action Alternative, there would be no substantial changes to the visual environment resulting from ongoing management activities in the ROWs in Grand Mesa, Uncompahgre, and Gunnison National Forests. Therefore, there would be no adverse direct, indirect, short-term, long-term, or cumulative impacts to visual resources, and no mitigation would be required.

Medicine Bow-Routt National Forests

Under the No Action Alternative, there would be no substantial changes to the visual environment resulting from ongoing management activities in the ROWs in Medicine Bow-Routt National Forests. Therefore, there would be no adverse direct, indirect, short-term, long-term, or cumulative impacts to visual resources, and no mitigation would be required.

Nebraska National Forest

Under the No Action Alternative, there would be no substantial changes to the visual environment resulting from ongoing management activities in the ROW in Nebraska National Forest. Therefore, there would be no adverse direct, indirect, short-term, long-term, or cumulative impacts to visual resources, and no mitigation would be required.

Pike and San Isabel National Forest

Under the No Action Alternative, management of areas of the Hesperus-Montrose ROW that can be seen from the Colorado Trail and areas of the Curecanti-Poncha ROW that can be seen from the Monarch Mountain Ski Resort would remain the same. Therefore, there would be no substantial changes to the visual environment resulting from ongoing management activities in the ROWs. There would be no adverse direct, indirect, short-term, long-term, or cumulative impacts to visual resources, and no mitigation would be required.

San Juan National Forest

Under the No Action Alternative, management of areas of the Hesperus-Montrose ROW that can be seen from State Route 160 and State Route 145, the San Juan Skyway Colorado State and Historic Byway, All-American Road, and National Forest Scenic Byway, on NFS lands would remain the same. There would be no substantial changes to the visual environment from ongoing management activities in the ROWs in San Juan National Forest. Therefore, there would be no adverse direct, indirect, short-term, long-term, or cumulative impacts to visual resources, and no mitigation would be required.

White River National Forest

Under the No Action Alternative, there would be no substantial changes to the visual environment resulting from ongoing management activities in the ROWs in White River National Forest. Therefore, there would be no adverse direct, indirect, short-term, long-term, or cumulative impacts to visual resources, and no mitigation would be required.

3.13.5.2 Proposed Action

Under the Proposed Action, WAPA vegetation management activities would involve the use of manual, mechanical, and chemical (herbicides) methods of vegetation control and aerial, ground, and climbing inspections that would continue to be visible because WAPA already uses these management and inspection methods. However, the Proposed Action adds the use of growth regulators, slash pile burning, and livestock or wildlife grazing – new management methods that would be visible to all viewer groups.

WAPA does not propose new access routes, but would continue to maintain access routes by inspecting and maintaining culverts, fords, and ditches; grading water bars across access roads; grading road surfaces to remove ruts and potholes; maintaining two-track access routes; and creating overland access routes, where necessary. However, WAPA is requesting overland access authorization to its structures in the Copper Mountain Roadless Area from the Forest Service. WAPA would continue to maintain and repair transmission lines using current practices, and would maintain existing transmission line ROW widths.

There are currently no unresolved conflicts with visual standards identified by a federal land management agency and the forests the Proposed Action would affect. Ongoing management activities involved with the physical act of vegetation removal are short term. However, removing vegetation could cause long-term adverse changes in the visual character of the existing landscape as viewed from areas with high visual sensitivity (discussed in more detail below). The Proposed Action could result in a beneficial direct impact to the project area's scenic character; removing dense vegetation under transmission lines would decrease the chance for catastrophic fires. Removing dense vegetation under transmission lines would create fire breaks, which would help stop the spread of forest fires, thereby protecting visual resources.

Table 2-13, lists design features for visual resources. The practices listed in the table would leave clumps or islands of trees where WAPA has removed danger trees. Those remaining trees would break sight distance and help maintain the natural landscape mosaic pattern where clearance is not a concern. Hand felling danger trees would also protect scenic byways, special interest areas, and research natural areas. Cutting vegetation by hand, leaving boles in place, and lopping and scattering slash over the forest floor would protect the visual quality of these areas.

The primary differences between the No Action Alternative and the Proposed Action would be the intensity with which WAPA manages and removes vegetation in ROWs, based on the six ROW category conditions listed in Table 2-3, and the use of growth regulators, slash pile burning, and livestock or wildlife grazing methods for controlling vegetation. Table 3-81 includes the total percentage of the various VQOs and SIOs across all forests that would be affected by the Proposed Action and a breakdown of the treatment category. Because the visual landscapes of the various VQOs and SIOs are comparable, as shown in Table 3-80, they are identified synonymously in Table 3-81 to provide a programmatic representation of how each would be affected by the Proposed Action. Note that digital data is not available for Pike and San Isabel National Forest; therefore, this data is not accounted for in the table. This results in small discrepancies between actual data and data provided, but is deemed a sufficient and reliable method for estimating impacts given the availability of data.

Table 3-81. Percentage of Visual Quality and Scenic Integrity Objectives Affected by Treatment Categories

			Total Percentage under each VQO/SIO by Treatment Category					
Treatment Category	Total Treatment Category Acres across all Forests being Treated	Total Treatment Category Percentage across all Forests being Treated	Preservation/ Very High	Retention/ High	Partial Retention/ Moderate	Modification/ Low	Maximum Modification/ Very Low	Unacceptable Modification/ Unacceptably Low
Category 1	690.7	18.01	0.0	20.4	49.4	30.1	0.1	0.0
Category 2	357.0	9.31	0.0	16.2	46.3	37.5	0.0	0.0
Category 3	990.4	25.82	0.0	6.4	44.4	49.1	0.0	0.0
Category 4	199.4	5.20	0.0	24.4	44.3	31.2	0.0	0.0
Category 5	626.2	16.32	0.0	18.5	21.4	60.1	0.0	0.0
Category 6	972.4	25.35	0.0	10.6	20.4	69.0	0.0	0.0
Total VQO/SIO Acres across all Forests being Treated			**0.0**	**529.9**	**1,367.1**	**1,938.5**	**0.4**	**0.0**
Total VQO/SIO Percentage across all Forests being Treated			**0.0**	**13.81**	**35.64**	**50.54**	**0.01**	**0.0**

SIO Scenic Integrity Objective
VQO Visual Quality Objective

As shown in Table 3-81, just over half of all the treatments are occurring on Modification VQO/Low SIO that supports management activities that are quite visible in the characteristic landscape. The remainder of the treatments are occurring on partial retention VQO/moderate SIO (approximately 36 percent), where management activities should be visually subordinate in the characteristic landscape; retention VQO/high SIO (approximately 14 percent), where management activities should not be noticeable in the characteristic landscape; and with very little to no treatments occurring on preservation VQO/very high SIO, maximum modification VQO/very low SIO, and unacceptable modification VQO/unacceptably low SIO. The following paragraphs describe impacts for each category condition.

Category 1

As seen in Table 3-81, Category 1 accounts for 18 percent of the total acreage in the project area. Vegetation management in Category 1 areas would not impact visual resources because there would be no vegetation treatments in these segments of ROWs; the transmission lines span canyons or stable, low-growing vegetation communities. See Photos 2-1 through 2-3 in Chapter 2. Therefore, there would be no change in the character or scenic quality of these areas, and VQOs or SIOs and sensitive viewing locations would not be affected. Air pollutant emissions would be consistent with ongoing management activities and would not increase at these locations. Glare would not increase because there would be no vegetation removal. Vegetation management in these segments of ROWs would not change the existing visual landscape. Therefore, there would be no long-term adverse visual changes or contrasts to the existing landscape as viewed from areas with high visual sensitivity. No mitigation would be required.

Category 2

As seen in Table 3-81, Category 2 accounts for approximately nine percent of the total acreage in the project area. Vegetation management in Category 2 areas would impact visual resources because these segments of ROW are not in an acceptable condition; vegetation treatments would be necessary because vegetation under the transmission lines is dense and grows fast. Treatments would start soon and continue frequently. The initial removal of dense vegetation would change the visual character of the areas, could alter the existing scenic quality and existing VQOs or SIOs, and could affect sensitive viewing locations. Areas of modification VQO/low SIO or lower, accounting for approximately 38 percent of VQOs/SIOs receiving Category 2 management, would not be affected because their designation lends itself to management activities and objectives. Areas of partial retention VQO/moderate SIO or higher, accounting for approximately 62 percent of VQOs/SIOs receiving Category 2 management, would be affected because their designation lends itself to limiting management activities and preserving the existing visual environment.

During initial management, removing many trees could cause visual impacts, including movements, sounds, and smells that would direct attention toward activities such as chainsaws cutting trees, trees being felled, tractors skidding logs, truck activities, smoke from slash pile burning, and soil disturbances. People would view these changes differently, depending upon each person's awareness and understanding of forest management activities. To the casual recreationist, activities associated with the proposed project could be viewed negatively as destruction of habitat or a part of the forest they might have enjoyed, or they could view the activities as interesting. Recreationists who understand forest management activities might still experience adverse effects from the short-term deterioration of sites during heavy-equipment use and site alterations, or they might appreciate the purpose for and need to manage ROWs and understand this management would enhance their visual experiences. However, once WAPA has treated vegetation in a ROW employing appropriate design features, the vegetation would begin to naturally rehabilitate within three years as herbaceous plants and grasses colonize the floor of canopy openings. This would reduce the visual appearance of disturbance, but might not meet long-term VQO and SIO designations.

As shown in Photos 2-4 through 2-6 in Chapter 2, ROWs are visible because they have been cleared, but dense growth fills entire ROWs and visually connects the ROWs to the forest on either side; this creates a fairly uniform forest canopy. After initial management measures, removing many trees could create clear-cut ROWs, remove most of the dense tree growth, and create a distinct line in the landscape that follows the transmission line ROW and segments the continuous canopy of the forest. The forest on either side of the ROW would appear to wall in the ROW and accentuate the line. The treated ROW would also create a break in color and texture because herbaceous vegetation and exposed earth tends to appear lighter and smoother than a forested canopy with shadowed spaces and a rougher texture, as seen in Photos 2-7 through 2-9 in Chapter 2 for Category 3 conditions. ROW lines would also be accentuated during winter when a continuous sheet of snow covers the ground and makes the ROWs more visible in contrast to the colors and textures of the snow-dappled canopies of the evergreen lodgepole pine or the snow-lined gray branches of aspen. These changes would make the ROW appear much more linear in foreground, middleground, and background views compared to existing conditions. Management measures could also leave behind tall, remnant stumps where trees once stood and obvious evidence of heavy machinery being used on the landscape through the presence of deep tire ruts and mounds (turn piles) in areas that once appeared to be natural and largely absent of these modifications.

To be effective, herbicides would be applied when trees are in leaf. Herbicide applications would create large areas of dead vegetation that would be brown. This would create a contrast in color with the surrounding live vegetation, which would be dark or light green, depending on whether the area is predominantly coniferous or deciduous forest. This change would be most visible and noticeable in middleground views where distance allows the viewer to see the whole treated area. The whole area might also be visible in the background, but distance from the treated area would decrease the appearance of its size. Distance also acts to decrease the vibrancy of colors, reduces the color contrast, and allows for larger patterns of light and shadow to be seen across terrain and forested areas. Light and shade patterns are visually more dominant in drawing viewers' attention. Also, atmospheric conditions such as haze act to mute colors in the distance. Therefore, it would require a very large area of dead vegetation to have enough color contrast to stand out in the background. Herbicide treatments would be visible in the foreground, but the entire treated area would not be visible unless the viewer has an elevated and direct view out, over, and toward the treated area, such as from a scenic overlook.

Slash pile burning would be used in a very limited way. Slash pile burning would create temporary changes to the visual environment by introducing smoke during the burn and then leaving behind a charred ground surface. This visual change would be more visible up close, in the foreground, and not as visible in the middleground and background because the vegetation outside the ROW is more likely to limit views of the ground surface where the slash pile burns would occur. In addition, within several months, herbaceous plants would begin to regrow and tree litter would start to reverse visible signs of this management method, and sites would naturally rehabilitate within 2 to 3 years. This would reduce the visual appearance of disturbance and meet long-term VQO and SIO designations.

WAPA would potentially use livestock or wildlife grazing to manage taller grasses, herbaceous vegetation, and saplings. The presence of grazing animals would be visually noninvasive and could actually provide visual interest for sensitive viewers that might enjoy watching the animals graze.

Air pollutant emissions from treatment methods would be localized and temporary and would result in negligible changes to visibility in Category 2 areas, as analyzed in the Air Quality *Impacts Common to Both Alternatives* and *Proposed Action* sections. Therefore, air pollutant emissions would not result in changes in visibility that would exceed Class I standards that would cause adverse visual impacts.

Glare would increase because management measures would remove trees that absorb the sun's rays and cast shadows over the ground surface. Lodgepole pine is coniferous and dark green, and provides dense, year-round cover and shading. Aspen is deciduous and would provide more shade during spring and summer, but would only provide shade from their trunks and branches in late fall through early spring. Removing coniferous and deciduous trees would remove sources of shade and expose the ground surface to increased glare through the creation of wider, open areas with little or no vegetation cover. This would create situations in which sensitive viewers, such as hikers on trails, would exit the denser forest on either side of the ROW and enter the ROW in bright and glaring conditions compared to the surrounding forest, altering the visual character of the trail and the trail experience.

Once the ROWs are treated, WAPA would continue to manage them in this way, which would result in long-term visual changes and contrasts to the existing landscape as viewed from areas with high visual sensitivity. Design Feature 58 would decrease these impacts because WAPA would:

- Treat unnatural-appearing soil disturbances by smoothing piles of soil created by machinery or any other soil disturbance from machine piling within 100 feet of areas requiring partial retention VQO/moderate SIO or higher, scenic byways, hiking or multi-use trails, camping areas, other areas of moderate- to high-use recreation, or other areas of visual significance.
- Implement BMPs for tractor skidding design, erosion control, and protection of meadows, streamcourses, and aquatic resources that apply to biological, soil, or other resource areas and

would also apply to visual resources because they indirectly protect aesthetics and prevent impacts that would dominate the visual landscape during and after project implementation.

- Limit the use of foliar application of herbicides to reduce the creation of large areas of browned vegetation.
- At road crossings and highway or visual overlooks, leave enough vegetation, where possible to screen views of the ROWs.
- If the area is visually very sensitive consider (1) softening the straight line of the corridor edge by cutting some additional trees outside the ROW, (2) if possible, leaving some low-growing trees in the ROW, or (3) implementing a less-aggressive treatment of the ROW and ensuring a higher frequency of monitoring vegetation conditions and scheduling re-treatments when needed.

Category 3

As seen in Table 3-81, Category 3 accounts for approximately 26 percent of the total acreage in the project area. WAPA would manage vegetation in Category 3 areas in a way very similar to existing management measures because the ROWs are in an acceptable condition. However, vegetation in Category 3 areas is incompatible and fast-growing, and would need more frequent maintenance treatment. This can be seen in Photos 2-7 through 2-9 in Chapter 2. Therefore, there would not be a substantial degradation of the visual character or changes in scenic quality or existing VQOs and SIOs; sensitive viewing locations would not be affected because removing vegetation would maintain current acceptable conditions. Air pollutant emissions would be consistent with ongoing management activities and would not increase. Ongoing management practices would continue to create a small amount of glare where WAPA removes trees that provide shade, but this would not substantially increase light and glare in the project area because these areas are already fairly free of large stands of shade-producing trees. Because these activities are a part of the existing visual landscape, continuing them would not permanently reduce visually important features on NFS lands. Ongoing management activities would be short-term and act to maintain a consistent visual landscape consistent in the ROWS. Therefore, there would be no long-term adverse visual changes or contrasts to the existing landscape as viewed from areas with high visual sensitivity. Design features would ensure that management measures would not result in adverse impacts.

Category 4

As seen in Table 3-81, Category 4 accounts for approximately five percent of the total acreage in the project area. WAPA vegetation management activities in Category 4 areas would impact visual resources because these segments of ROWs are not in an acceptable condition. WAPA would treat vegetation under the transmission lines, because, although it grows slowly, is dense. This can be seen in Photos 2-10 through 2-12 in Chapter 2. Treatments would start soon and continue frequently. The initial removal of dense vegetation would result in a change in existing visual character, could alter existing scenic quality and existing VQOs or SIOs, and could affect sensitive viewing locations. Areas of modification VQO/low SIO or lower, accounting for approximately 31 percent of VQOs/SIOs receiving Category 4 management, would not be affected because their designation lends itself to management activities and objectives. Areas of partial retention VQO/moderate SIO or higher, accounting for approximately 69 percent of VQOs/SIOs receiving Category 4 management, would be affected because their designation lends itself to limiting management activities and preserving the existing visual environment. The visual impacts and design features associated with Category 4 would be the same as those described for Category 2.

Category 5

As seen in Table 3-81, Category 5 accounts for approximately 16 percent of the total acreage in the project area. WAPA would manage vegetation in Category 5 areas very similar to existing management measures because the ROW is in an acceptable condition. However, vegetation in Category 5 areas is incompatible and slow-growing, and would require less frequent and more selective maintenance treatment. This can be seen in Photos 2-13 through 2-15 in Chapter 2. Therefore, there would be no substantial degradation of the visual character or changes in scenic quality and existing VQOs or SIOs, and there would be no impacts to and sensitive viewing locations. Air pollutant emissions would be consistent with ongoing management activities and would not increase. Ongoing management practices would continue to create a small amount of glare where trees that provide shade are removed, but this would not substantially increase light and glare in the project area, because WAPA would selectively remove the trees once they become a danger. Because these activities are a part of the existing visual landscape, continuing them would not permanently reduce visually important features on NFS lands. Ongoing management activities would be short term and act to maintain a visual landscape consistent within the ROWS. Therefore, there would be no long-term adverse visual changes or contrasts to the existing landscape as viewed from areas with high visual sensitivity. Design Feature 58 would ensure that management measures would not result in adverse impacts.

Category 6

As seen in Table 3-81, Category 6 accounts for approximately 25 percent of the total acreage in the project area. WAPA vegetation management activities in Category 6 areas would impact visual resources because these segments of ROWs are not in an acceptable condition, and WAPA would treat vegetation because there is a high fuel load of low-growing dense and woody vegetation under the transmission line. Treatments would start soon and continue frequently. The initial removal of dense vegetation would result in a change in the existing visual character, could alter the existing scenic quality and existing VQOs or SIOs, and affect sensitive viewing locations. Areas of modification VQO/low SIO or lower, accounting for approximately 69 percent of VQOs/SIOs receiving Category 6 management, would not be affected because their designation lends itself to management activities and objectives. Areas of partial retention VQO/moderate SIO or higher, accounting for approximately 31 percent of VQOs/SIOs receiving Category 6 management, would be affected because their designation lends itself to limiting management activities and preserving the existing visual environment.

During initial management, removing many trees could cause visual impacts, including movements, sounds, and smells that would direct attention toward activities such as chainsaws cutting trees, trees being felled, tractors skidding logs, truck activities, smoke from slash pile burning, and soil disturbances. People would view these changes differently, depending upon each person’s awareness and understanding of forest management activities. To the casual recreationist, activities associated with the proposed project could be viewed negatively as destruction of habitat or a part of the forest they might have enjoyed, or they could view the activities as interesting. Recreationists who understand forest management activities might still experience adverse effects from the short-term deterioration of sites during heavy-equipment use and site alterations, or they might appreciate the purpose for and need to manage ROWs and understand this management would enhance their visual experiences. However, once WAPA has treated vegetation in a ROW employing appropriate design features, the vegetation would begin to naturally rehabilitate within three years as herbaceous plants and grasses colonize the floor of canopy openings. This would reduce the visual appearance of disturbance, but might not meet long-term VQO and SIO designations.

As shown in Photos 2-16 and 2-17 in Chapter 2, the ROWs are not as visible because of the low-growing vegetation (unlike Category 2). After initial management measures, removing many trees could create clear-cut ROWs, remove most of the dense tree growth, and create a distinct line in the landscape that follows the transmission ROW and segments the continuous canopy of the forest. The forest on either side of the ROW would appear to wall in the ROW and accentuate the line. The treated ROW would create a break in color and texture because herbaceous vegetation and exposed earth tends to appear lighter and smoother than a forested canopy with shadowed spaces and a rougher texture, as seen in the photographs of Category 3 conditions. ROW lines would also be accentuated during winter when a continuous sheet of snow covers the ground and makes the ROWs more visible in contrast to the colors and textures of the snow-dappled canopies of the evergreen lodgepole pine, pinyon-juniper, snow-mounded evergreen sagebrush, or the snow-lined branches of the Gambel oaks. These changes would make the ROW appear much more linear in foreground, middleground, and background views compared to existing conditions. Management measures could also leave behind tall, remnant stumps where trees once stood and obvious evidence of heavy machinery being used on the landscape through the presence of deep tire ruts and mounds (turn piles) in areas that once appeared to be natural and largely absent of these modifications.

To be effective, herbicides would be applied when trees are in leaf. Herbicide applications would create large areas of dead vegetation that would be brown. This would create a contrast in color with the surrounding live vegetation, which would be dark or light green, depending on whether the area is predominantly coniferous or deciduous forest. This change would be most visible and noticeable in middleground views where distance allows the viewer to see the whole treated area. The whole area might also be visible in the background, but distance from the treated area would decrease the appearance of its size. Distance also acts to decrease the vibrancy of colors, reduces the color contrast, and allows for larger patterns of light and shadow to be seen across terrain and forested areas. Light and shade patterns are visually more dominant in drawing viewers' attention. Also, atmospheric conditions such as haze act to mute colors in the distance. Therefore, it would require a very large area of dead vegetation to have enough color contrast to stand out in the background. Herbicide treatments would be visible in the foreground, but the entire treated area would not be visible unless the viewer has an elevated and direct view out, over, and toward the treated area, such as from a scenic overlook.

Slash pile burning would create temporary changes to the visual environment by introducing smoke during the burn and then leaving behind a charred ground surface. This visual change would be more visible up close, in the foreground, and not as visible in the middleground and background because the vegetation outside the ROW is more likely to limit views of the ground surface where the slash pile burns would occur. In addition, within several months, herbaceous plants would begin to regrow and tree litter would start to reverse visible signs of this management method, and sites would naturally rehabilitate within 2 to 3 years. This would reduce the visual appearance of disturbance and meet long-term VQO and SIO designations.

WAPA would potentially use livestock or wildlife grazing to manage taller grasses, herbaceous vegetation, and saplings. The presence of grazing animals would be visually noninvasive and could actually provide visual interest for sensitive viewers that might enjoy watching the animals graze.

Air pollutant emissions from treatment methods would be localized and temporary in nature and would result in negligible changes to visibility under Category 6, as analyzed in the Air Quality *Impacts Common to Both Alternatives* and *Proposed Action* sections. Therefore, air pollutant emissions would not result in changes in visibility that would exceed Class I standards that would cause adverse visual impacts.

Glare would increase in areas of pine and oak forests because management measures would remove trees that absorb the sun's rays and cast shadows over the ground surface. Pines are coniferous, often dark green, and provide year-round cover and shading. Gambel oaks are deciduous and would provide more shading through spring and summer, but would only provide shading from their trunks and branches in late fall through early spring. Removing coniferous and deciduous trees would remove sources of shade and expose the ground surface to increased glare through the creation of wider, open areas with little or no vegetation cover. This would create situations where sensitive viewers, such as hikers on trails, would exit the denser forest on either side of the ROW and enter the ROW in bright and glaring conditions compared to the surrounding forest, altering the visual character of the trail and the trail experience. This impact would not occur in areas that are mostly sagebrush, because sagebrush is low-growing and does not produce enough shade that their removal would act to increase glare for sensitive viewers.

Once the ROW is treated, WAPA would continue to manage it in this way, which would result in long-term visual changes and contrasts to the existing landscape as viewed from areas with high visual sensitivity. Design Feature 58 would decrease these impacts.

Summary

Under the Proposed Action, WAPA vegetation management activities in Category 1, 3, and 5 areas would not impact visual resources. WAPA would manage vegetation very similar to existing management because vegetation in the ROWs in these categories is in an acceptable condition. Therefore, there would be no substantial alteration of the existing visual character; rather, WAPA would maintain the visual character in Category 1, 3, and 5 areas. Existing VQOs or SIOs and sensitive viewing locations would not be affected, air pollutant emissions would not increase, glare would not increase, and there would be no long-term adverse visual changes or contrasts to the existing landscape as viewed from areas with high visual sensitivity. Design features would ensure that management measures would not result in adverse impacts. Therefore, this section does not further address impacts in Category 1, 3, and 5 areas.

WAPA vegetation management activities in Category 2, 4, and 6 areas could directly impact visual resources, depending on the VQO/SIO within which they fall. Areas of modification VQO/low SIO or lower would not be affected because their designation lends itself to management activities and objectives. However, areas of partial retention VQO/moderate SIO or higher would be affected because their designation lends itself to limiting management activities and preserving the existing visual environment. The sections below discuss this in more detail for each forest. Note that for purposes of estimating miles of impacts, WAPA measured Category 2, 4, and 6 areas if management activities would affect approximately half of the ROW.

Arapaho-Roosevelt National Forests

WAPA would acquire overland access authorization from the Forest Service to its structures in the Copper Mountain Roadless Area in the Arapaho-Roosevelt National Forest. Overland access would originate at Forest Road 200 or other forest roads and proceed as directly as possible to each structure location. No new access roads would be built in the Copper Mountain Roadless Area. WAPA would incorporate design features into the Operations and Maintenance Plan, and those features would comply with applicable requirements in roadless areas. Therefore, overland access would not impact the existing VQOs.

Most of the five miles of Archer-North Park and Ault-Craig transmission lines pass through partial retention VQO, with approximately 1.2 miles going through retention VQO. Approximately 1.3 miles are in Category 2, 4, and 6 areas. However, most of this ROW is already in a treated, Category 3 condition.

Most of the almost seven miles of the Blue River-Gore Pass transmission line pass through partial retention VQO, with approximately 2.2 miles going through retention VQO. Approximately three miles are in Category 2, 4, and 6 areas. The remainder of the ROW is already acceptable and in a Category 1, 3, or 5 condition. The nearby Green Mountain-Blue River Repeater is completely within retention VQO. Approximately 0.5 mile is in Category 2, 4, and 6 areas. The remainder of the ROW is already acceptable and in a Category 1 or 3 condition.

Management activities in Category 2, 4, and 6 areas would adversely impact visual resources at these locations because all of the activities would be in partial retention and retention VQOs. Under the Proposed Action, there would be substantial changes to the existing visual environment at these locations from vegetation removal in the ROW. These changes would mostly be seen from access routes being used by recreationists. Therefore, direct, indirect, short-term, and long-term impacts to visual resources would be adverse. Design features could decrease these impacts.

Ashley National Forest

WAPA would continue to use existing access routes (less than five miles within roadless area) with authorization from the Forest Service to service its ROW. In the roadless area, less than five miles of existing access originates at Forest Road 610 or other unmtained spurs off U.S. Highway 191. These access routes proceed as directly as possible to each structure location. No new access routes would be built in the roadless areas. WAPA would incorporate design features into the Operations and Maintenance Plan, and those features would comply with applicable requirements in roadless areas. Therefore, using existing access routes would not impact the existing VQOs.

Most of the 6.6 miles of the Flaming Gorge-Vernal #1 transmission line pass through retention VQO, with approximately 0.5 mile going through modification VQO. Approximately three miles of retention VQO fall within Category 4 and 6 areas, with smaller areas of Category 4 and 6 conditions on the edges of the ROW. However, most of the ROW is already in a treated, Category 3 condition.

Most of the nearly 19.6 miles of the Flaming Gorge-Vernal #3 transmission line pass through retention VQO, with approximately 5.5 miles going through modification VQO and four miles going through partial retention VQO. Approximately 7.1 miles of partial retention and retention VQOs fall within Category 4 and 6 areas, with smaller areas of Category 2 conditions. There are also smaller areas of Category 2, 4, and 6 conditions on the edges of the ROW. Views from the Flaming Gorge-Uintas National Scenic Byway would be affected by Category 2 and 6 conditions east of U.S. Route 191. However, the remainder of the ROW is already in a treated, Category 1, 3, or 5 condition.

Management activities in Category 2, 4, and 6 areas would adversely impact visual resources at these locations because all of the activities would be in partial retention and retention VQOs. There would be substantial changes to the existing visual environment at these locations resulting from vegetation removal in the ROW. These changes would mostly be seen from access routes being used by recreationists. Therefore, direct, indirect, short-term, and long-term impacts to visual resources would be adverse. Design features could decrease these impacts.

Grand Mesa, Uncompahgre, and Gunnison National Forests

All of the Curecanti-North Fork, North Fork-Rifle, and North Gunnison-Salida transmission lines are completely within low SIO, and vegetation treatments in Category 2, 4, and 6 areas would not substantially impact visual resources at these locations.

All 18.9 miles of the Hesperus-Montrose and 11.6 miles of the Curecanti-Lost Canyon lines are within low SIO, with 0.3 mile of each in moderate SIO. The 0.3 mile moderate SIO segment of these lines would be adversely by Category 6 management measures, but the remainder would not.

Most of the Curecanti-Poncha transmission line is within low SIO, with 0.3 mile in high SIO. The high SIO area is affected by small areas of Category 2 conditions on the edges of the ROW. Most of the nearby North Gunnison-Salida transmission line is within low SIO, with 1.8 miles in moderate. The moderate SIO area is affected by approximately 0.4 mile of Category 6 conditions. These small portions of the line in moderate and high SIO would be adversely affected by Category 2 and 6 management measures, but the remainder would not.

Management activities in Category 2 and 6 areas would adversely impact visual resources at locations of moderate and high SIOs. Under the Proposed Action, there would be substantial changes to the existing visual environment at these locations from vegetation removal in the ROW. These changes would mostly be seen from access routes and trails being used by recreationists. Therefore, direct, indirect, short-term, and long-term impacts to visual resources would be adverse. Design features could decrease these impacts.

Medicine Bow-Routt National Forests

Approximately 8.1 miles of the Ault-Craig transmission line pass through retention and partial retention VQOs. Approximately 1.9 miles of this is affected by Category 2, 4, and 6 conditions, with smaller areas of Category 2, 4, and 6 conditions on the edges of the ROW.

Approximately 8.1 miles of the Hayden-North Park transmission line pass through retention and partial retention VQOs. Approximately 2.8 miles of this are affected by Category conditions 2, 4, and 6 conditions.

All 1.7 miles of the Gore Pass-Muddy Pass transmission line are within retention VQO. Approximately 138 feet of this are affected by Category 2 conditions, with two smaller areas of Category 2 conditions on the edges of the ROW.

Approximately 22 miles of the Hayden-Gore Pass transmission line pass through retention and partial retention VQOs. Approximately 3.2 miles of this are affected by Category 2 and 4 conditions, with smaller areas of Category 2 and 4 conditions on the edges of the ROW.

All 11.1 miles of the Gore Pass-Hayden transmission line pass through retention and partial retention VQOs. Approximately 1.8 miles of this is affected by Category 2 and 4 conditions.

Management activities in Category 2, 4, and 6 areas would adversely impact visual resources at locations of retention and partial retention VQOs. Under the Proposed Action, there would be substantial changes to the existing visual environment at these locations resulting from vegetation removal in the ROW. These changes would mostly be seen from access routes and trails being used by recreationists. Therefore, direct, indirect, short-term, and long-term impacts to visual resources would be adverse. Design features could decrease these impacts.

Nebraska National Forest

All 9.2 miles of the Box Butte-Chadron transmission line are within moderate SIO. Approximately 0.4 mile of this is affected by Category 4 conditions, with smaller areas of Category 4 conditions on the edges of the ROW. These small portions of the line would be adversely affected by Category 4 management measures, but the remainder would not. Under the Proposed Action, there would be substantial changes to the existing visual environment at these locations resulting from vegetation removal in the ROW. These changes would mostly be seen from access routes and trails being used by recreationists. Therefore, direct, indirect, short-term, and long-term impacts to visual resources would be adverse. Design features could decrease these impacts.

Pike and San Isabel National Forest

All 0.9 mile of the Malta-Mount Elbert transmission line passes through retention VQO, and a portion of the southern edge of the ROW would be affected by Category 2 conditions.

Approximately 2.5 miles of the Curecanti-Poncha transmission line passes through retention and partial retention VQOs. Approximately 1.6 miles of this is affected by Category 4 and 6 conditions, with smaller areas of Category 4 conditions on the edges of the ROW near Monarch Mountain Ski Resort. Category 4 management activities along the Curecanti-Poncha ROW could be seen from the Monarch Mountain Ski Resort and would add to the amount of cleared NFS lands in the area.

Approximately 0.8 mile of the North Gunnison-Salida transmission line passes through retention VQO and would be affected by Category 4 management activities. Category 6 management activities along the Curecanti-Poncha and North Gunnison-Salida ROWs would be seen from the Colorado Trail and would add to the amount of cleared NFS lands in the area.

Management activities in Category 2, 4, and 6 areas would adversely impact visual resources at locations of retention and partial retention VQOs. Under the Proposed Action, there would be substantial changes to the existing visual environment at these locations resulting from vegetation removal within the ROW. These changes would mostly be seen by recreationists from access routes, trails, and the ski area being. Therefore, direct, indirect, short-term, and long-term impacts to visual resources would be adverse. These impacts could be lessened by implementing design features.

San Juan National Forest

Most of the five miles of the Great Cut-McPhee transmission line are within moderate SIO, with 0.1 mile in very low and one mile in low SIO. Approximately two miles of moderate SIO are affected by Category 6 conditions, with a small area of Category 4 conditions.

The 31.2-mile Hesperus-Montrose transmission line crosses a somewhat equal mixture of low, moderate, and high SIO. Approximately 7.7 miles of moderate and high SIOs are affected by Category 2, 4, and 6 conditions, with smaller areas of Category 2, 4, and 6 conditions on the ROW edges.

Most of the Curecanti-Lost Canyon transmission line is within low SIO, with 0.7 mile in moderate and 0.9 mile in high SIO. Approximately 0.4 mile of moderate and high SIOs is affected by Category 6 conditions, with small areas of Category 2 and 4 conditions.

Management activities in Category 2, 4, and 6 areas would adversely impact visual resources at locations of moderate and high SIOs. Under the Proposed Action, there would be substantial changes to the existing visual environment at these locations resulting from vegetation removal in the ROW. These changes would mostly be seen from access routes and trails being used by recreationists. Therefore, direct, indirect, short-term, and long-term impacts to visual resources would be adverse. Design features could decrease these impacts.

White River National Forest

All 3.4 miles of the Curecanti-Rifle transmission line are within low SIO, and Category 2, 4, and 6 management activities would not substantially impact visual resources at these locations.

All seven miles of the Blue River-Gore Pass transmission line pass through moderate SIO. Approximately 3.8 miles of this are affected by Category 2 and 4 conditions, with smaller areas of Category 2 and 4 conditions on the edges of the ROW. There is a 0.18-acre portion of Category 6 condition on the edge of the southernmost extent of the ROW.

Management activities in Category 2, 4, and 6 areas would adversely impact visual resources at locations of moderate SIO. Under the Proposed Action, there would be substantial changes to the existing visual environment at these locations resulting from vegetation removal in the ROW. These changes would mostly be seen from access routes and trails being used by recreationists. Therefore, direct, indirect, short-term, and long-term impacts to visual resources would be adverse. Design features would decrease these impacts.

3.13.5.3 Cumulative Effects

Appendix A lists the projects WAPA included in the cumulative impacts analysis.

The No Action Alternative would not cause direct cumulative impacts to the existing scenic character or VQO/SIO designations in the forests, because vegetation as seen from sensitive viewpoints would remain largely intact. However, the No Action Alternative could result in indirect cumulative effects on scenic character by increasing the chance for catastrophic fires that could threaten not only the visual landscape and VQO/SIO designations on NFS lands, but those in the surrounding forested areas and local communities. Catastrophic fires would likely cross the boundary of the project area, contributing to altering scenery attributes associated with vegetation communities across many acres of NFS lands, adversely affecting the visual landscape. Catastrophic fires could destroy vast areas of living vegetation on NFS lands. These events would also eliminate the presence of wildflowers, deciduous fall colors, meadows, and other visual features and would, in turn, negatively affect wildlife viewing through the destruction of habitat. These would be long-term, cumulative effects until the forest could recover.

Projects considered in the cumulative analysis include one or combine several forest management measures, such as timber sanitation and salvage, fuel reduction, danger-tree removal, and noxious weed control projects in the transmission lines ROWs and outside transmission line ROWs on general forested lands. These projects cover large areas ranging in size from 730 to 175,300 acres, and are highly likely to occur near scenic byways, trails, recreation areas, and other sensitive viewing locations. While the entire area of these projects might not be treated, large portions would. Treatment methods would likely be very similar to Category 2 treatments and could include one, several, or all of the methods described. Also, more-intensive logging operations could be required based on, for example, terrain, harvest loads, and accessibility. These activities would likely span lands covered under all VQO/SIO designations and impact large areas of partial retention VQO/moderate SIO or higher. Removing dead vegetation would have indirect beneficial impacts by reducing the fuel load and potential fire hazard created by heavy loads of dead trees and vegetation. This would also allow canopy space for forest regeneration over time.

The Proposed Action would result in direct cumulative impacts to the existing scenic character or VQO/SIO designations in the forests, because areas of partial retention VQO/moderate SIO or higher would be affected. Indirect visual impacts could be more centrally located in geographical areas where a decline in visual quality of a large area affects visitor numbers to that area. However, the Proposed

Action could result in indirect beneficial cumulative effects on scenic character. The Proposed Action would decrease the chance for catastrophic fires by removing dense vegetation from under the transmission lines on NFS lands, which would protect visual resources by creating fire breaks that help stop the spread of forest fires, and would help protect scenic resources on the surrounding forested areas and in nearby local communities.

3.14 Recreation

3.14.1 Introduction

This section describes the Recreation Opportunity Spectrum (ROS) settings, NFS trails, scenic byways, and recreation sites in or next to WAPA's ROWs in the project area, and potential impacts to those settings. Section 3.14.2 describes the regulatory and policy framework, Section 3.14.3 describes analysis methods and assumptions, Section 3.14.4 describes the affected environment (existing conditions), and Section 3.14.5 describes potential impacts to recreation resources in the project area.

3.14.2 Regulatory and Policy Framework

National Forest Plans, Forest Service Manuals, and Forest Service Handbooks provide guidance for management of recreation on NFS lands. The travel analysis process provides guidance for use of motorized vehicles, including OHVs, ATVs, and motorcycles on designated NFS roads and trails. Forest Service Manual 2300 applies to recreation management. Forest Service Manual 7730 and Forest Service Handbook 7709.59, Chapter 60, apply to operation and maintenance of NFS roads and trails.

3.14.3 Methods and Assumptions for Analysis

WAPA reviewed Forest Service websites and GIS data provided by the Forest Service for ROS settings, NFS trails, scenic byways, and recreation sites. Trail detour or closure could affect trail users, and road closures could delay or prevent access to developed recreation sites, trails, or trailheads outside transmission line ROWs. Noise and visual changes from vegetation treatment activities, and views of equipment and vehicles, could temporarily affect the experience of recreationists on trails or in areas near the activities. Similarly, visual changes could temporarily affect the experience of motorists traveling along scenic byways. WAPA analyzed only the recreation sites, trails, and trailheads for which there was Forest Service GIS data.

Assumptions

The following are important assumptions for the identification and analysis of potential impacts to recreation resources:

- WAPA vegetation management activities could prevent or delay access to developed recreation sites, trails, or trailheads outside transmission line ROWs if NFS roads used to access those sites are temporarily closed or detoured.
- NFS trails WAPA uses to access its ROWs might need repair or vegetation management to maintain access to transmission line ROWs.
- NFS trails that transmission line ROWs cross could temporarily close or require a detour during vegetation management activities near the crossings.

Impact Criteria and Indicators

There could be an impact on recreation if there were conflicts with use of developed recreation sites, trails, and trailheads, next to or outside transmission line ROWs, such as increased noise near campgrounds or preventing access to the recreation site, trail, or trailhead. There also could be impacts if trails are closed for long periods for maintenance or vegetation treatment activities.

3.14.4 Affected Environment

Combined annual visitation estimates released by the National Visitor Use Monitoring program for the national forests in the project area totaled 30.8 million annual site visits. Table 3-82 summarizes the top five recreation activities visitors participated in by forest (Forest Service 2012a).

Table 3-82. Top Five Recreation Activities by National Forest

National Forest(s)	Recreation Activity				
	1	2	3	4	5
Arapaho-Roosevelt	Downhill Skiing	Hiking/Walking	Fishing	Hunting	Cross Country Skiing
Ashley	Viewing Natural Features	Fishing	Relaxing	Hunting	Developed Camping
Grand Mesa, Uncompahgre, and Gunnison	Downhill Skiing	Hiking/Walking	Cross Country Skiing	Snowmobiling	Viewing Natural Features
Medicine Bow-Routt	Downhill Skiing	Hiking/Walking	Bicycling	Viewing Natural Features	Fishing
Nebraska	Fishing	Hunting	Hiking/Walking	Some Other Activity	Viewing Natural Features
Pike and San	Viewing Natural Features	Hiking/Walking	Fishing	Driving for Pleasure	Hunting
San Juan	Hiking/Walking	Downhill Skiing	Viewing Natural Features	Driving for Pleasure	Fishing
White River	Downhill Skiing	Hiking/Walking	Cross Country Skiing	Viewing Natural Features	Some Other Activity

Source: Forest Service 2012a

The Forest Service uses the ROS system to determine the settings in which people choose to recreate and the types of recreation opportunities in those settings, and to establish user expectations for development levels and social interaction. The ROS is divided into six settings, as follows: Urban, Rural, Roaded Natural (RN), Semi-Primitive Non-Motorized (SPNM), Semi-Primitive Motorized (SPM), and Primitive (Forest Service 2011f). Roaded Modified (RM) is a sub-class of RN. Table 3-83 provides a description of the ROS settings.

Dispersed recreation includes activities that do not require developed facilities, except for trails. Dispersed recreation includes non-motorized activities such as hiking, biking, and backcountry skiing, and motorized and mechanized activities, including OHV use, snowmobiling, and mountain biking. Other winter activities include snowshoeing, cross country skiing, sledding, and dog sledding. Dispersed recreation also includes many other activities, such as camping outside developed campgrounds, backpacking, picnicking, viewing wildlife, fishing, and hunting. ROS settings SPNM, SPM, and Primitive are usually associated with dispersed recreation. There is no Primitive setting in transmission line ROWs in the project area. WAPA ROWs in the project area are in SPM (9 percent) and SPNM (7 percent) settings (Table 3-84). As shown in Table 3-82, many of the activities visitors chose to participate in are dispersed recreation activities.

Table 3-83. Description of Recreation Opportunity Spectrum Settings

Recreation Opportunity Spectrum Setting	Description
Rural	Opportunity to meet and enjoy others. Convenient sites and facilities are generally more important than the setting of the physical environment. Substantially modified natural environment. Level of interaction between users is moderate to high. Few opportunities for challenge and risk except for specific activities like downhill skiing. Vegetation alteration enhances specific recreation activities and maintains cover and soil. A considerable number of facilities designed for use by a large number of people and often provide for special activities. Facilities for motorized use and parking are available.
Roaded modified	Opportunity to get away from other users with easy access. Opportunity for interaction with the natural environment with little challenge or risk. Substantially modified natural environment (e.g., roads, timber harvest areas) but with little evidence of other users except on roads. Frequent and common encounters with others on roads. Little regulation except on roads; standard motorized use; vegetation alteration to enhance recreation setting.
Roaded natural	Equal opportunity to experience other users and solitude. Predominantly natural appearing environment. Level of interaction between users is low to moderate, but evidence of other users is prevalent. Opportunity for high degree of interaction with the natural environment. Challenge and risk are not very important. Opportunities for motorized and non-motorized recreation. Vegetation alteration is evident, but harmonizes with the natural environment. Conventional motorized use is provided for in construction standards and design of facilities.
Semi-primitive motorized	Moderate probability of solitude, independence, closeness to nature, tranquility and self-reliance in environment that offers challenge and risk. Opportunities for a high degree of interaction with the natural environment and to use motorized equipment. Predominantly natural appearing environment of moderate-to-large size. Often evidence of other users; subtle on-site controls and restrictions; and motorized use is permitted.
Semi-primitive non-motorized	High probability of solitude, independence, closeness to nature, tranquility, and self-reliance in environment that offers challenge and risk. Predominantly natural or natural-appearing environment of moderate-to-large size. Some evidence of others; subtle on-site controls and restrictions; and motorized use is not permitted.

Sources: Clark and Stankey 1979; Stankey *et al.* 1986

Developed recreation consists of activities at sites with developed facilities accessible by vehicle, including campgrounds, picnic or day-use sites, trailheads, scenic overlooks with parking areas, interpretive sites, ski areas, and visitor centers. ROS settings associated with developed recreation include Urban, Rural, RN, RM, and SPM. Downhill skiing and snowboarding are one of the primary activities for five of the forests in Colorado, while camping in developed campgrounds is included in the top five activities for Ashley National Forest. There is one ski area and one National Recreation Area (NRA) in the project area. The ski area offers skiing, snowboarding, and snowcat skiing. The NRA has developed recreation activities such as campgrounds, boat launches, picnic areas, a visitor center, and offers dispersed activities including hiking and fishing. Scenic byways offer opportunities for viewing natural features, photography, and driving for pleasure. The transmission line ROWs are primarily in the RM (42 percent) and RN (40 percent) settings (Table 3-84).

Table 3-84. Summary of Recreation Opportunity Spectrum Settings Crossed by WAPA's Rights-of-Way by National Forest (acres)

National Forest(s)	Recreation Opportunity Spectrum Setting				
	Rural (%)	RM (%)	RN (%)	SPM (%)	SPNM (%)
Arapaho-Roosevelt	-	166.7 (58)	44.4 (15)	71.4 (25)	7.1 (2)
Ashley	46.9 (19)	-	134.1 (53)	55.6 (22)	15.3 (6)
Grand Mesa, Uncompahgre, and Gunnison	2.0 (0.2)	1,200.6 (99.8)	-	-	-
Medicine Bow-Routt	1.8 (0.2)	347.6 (37)	283.7 (30)	114.5 (12)	189.1 (20)
Nebraska	-	-	84.3 (100)	-	-
Pike and San Isabel	4 (2)	-	208.6 (98)	-	-
San Juan	11.2 (1)	-	872.5 (97)	6.5 (0.7)	4.7 (0.5)
White River	-	-	-	120.0	63.2
TOTAL ACRES	**65.9**	**1,714.7**	**1,627.6**	**368**	**279.4**
PERCENT (All Forests)	**2**	**42**	**40**	**9**	**7**

Source: Forest Service 2011c

RM Roaded Modified
RN Roaded Natural
SPM Semi-Primitive Motorized
SPNM Semi-Primitive Non-Motorized

The affected environment for recreation includes (1) ROS settings (Table 3-84), (2) NFS trails (motorized and non-motorized), (3) scenic byways, and (4) developed recreation sites crossed by or next to WAPA's ROWs, as summarized in Table 3-85.

Table 3-85. Summary of National Forest System Trails, Scenic Byways, and Developed Recreation Sites Crossed by WAPA's Rights-of-Way by National Forest

National Forest(s)	National Forest System Trails[1]	Scenic Byways	Developed Recreation Sites
Arapaho-Roosevelt	0	0	0
Ashley	4	1	1
Grand Mesa, Uncompahgre, and Gunnison	12	0	0
Medicine Bow-Routt	10	0	0
Nebraska	2	0	0
Pike and San Isabel	2	0	1
San Juan	8	1	0
White River	2	0	0
TOTAL	**40**	**2**	**2**

Source: Forest Service 2011c

[1]Includes motorized, non-motorized, and snow trails.

The following sections describe ROS settings, trails (motorized and non-motorized), scenic byways, and developed recreation sites by forest.

3.14.4.1 Arapaho-Roosevelt National Forests

The RM setting is in the two ROWs (Ault-Craig and Archer-North Park) in the northern part of the forest, with a small area of RN. The SPM, RN, and SPNM setting occurs in the ROWs (Blue River-Gore Pass and Green Mountain-Blue Ridge Repeater) near the White River National Forest boundary. No WAPA ROWs cross motorized or non-motorized trails and there are no recreation sites next to or in the ROWs.

3.14.4.2 Ashley National Forest

WAPA ROWs cross two motorized trails (NFS Trails 160 and 013) and three non-motorized trails (NFS Trails 103, 026, and 170).

U.S. Highway 191 from Vernal north to the Utah-Wyoming border is a segment of Flaming Gorge-Uintas National Scenic Byway and is also designated as both Utah State and National Forest Scenic Byways (Forest Service 2011g; America's Byways 2012). The transmission line ROW roughly parallels U.S. 191 and crosses it multiple times in the project area.

Flaming Gorge NRA is in Ashley National Forest and managed by the Forest Service. Flaming Gorge NRA includes 91 miles of Flaming Gorge Reservoir on the Green River in northeast Utah and southwest Wyoming. There are 43 developed campgrounds and swimming beaches, boat launches and marinas, and hiking and skiing trails (Forest Service 2011h). Approximately 7.6 miles of the transmission line ROWs are in Flaming Gorge NRA, but there are no developed recreation sites in the ROW.

The RN setting is primarily along U.S. Highway 191 with multiple developed recreation sites along the highway including two NFS campgrounds (Red Springs and Lodgepole) within 300 feet of the ROW (Flaming Gorge-Vernal #3) as well as three trail crossings. As U.S. Highway 191 travels northeast through the NRA to the Flaming Gorge Dam, recreation development (private and public) is more concentrated and the ROS setting changes to Rural. Two NFS campgrounds (Firefighters Memorial and Green Dale East Group) are within 500 feet of the ROW (Flaming Gorge-Vernal #3). Trail 160 parallels the transmission line and is used for access. As noted, there are multiple opportunities for developed and dispersed recreation opportunities in the NRA.

The SPM and SPNM settings are found in more undeveloped areas accessed by NFS roads and trails. The Flaming Gorge-Vernal #1 ROW crosses one trail in this area. Dispersed camping and other dispersed recreation opportunities in this area include hiking, biking, motorized trail use, picnicking, viewing wildlife, sightseeing, and hunting.

3.14.4.3 Grand Mesa, Uncompahgre, and Gunnison National Forests

The RN setting surrounds the ROWs by approximately 500 feet on each side (total width of 1,000 feet), except where the ROW crosses U.S. Route 50 and the setting changes to Rural. There are no scenic byways or developed recreation sites crossed by or next to WAPA ROWs on this forest. Dispersed recreation opportunities include dispersed camping, hiking, biking, OHV use, backpacking, picnicking, viewing wildlife, fishing, and hunting.

The transmission line ROWs cross 12 trails – eight motorized and four non-motorized (Table 3-86). WAPA uses the Powerline, Hightower, and Boundary trails to access the North Fork-Rifle ROW.

Table 3-86. Trails Crossed by WAPA's Rights-of-Way in Grand Mesa, Uncompahgre, and Gunnison National Forests

Trail Type	Trail Name (National Forest System Trail Number)
Motorized	East Fork Dry Creek (114.1B), Spring Creek (116.1B), Boundary (525), Burn (522), Hightower (524), Power Line (520), Mule Park (808), Suttons Way (887), Monarch Crest (531), Sunlight to Powderhorn (740), Old Mesa Powerline (001), Oil Well Powerline (520), Old Mesa Snowmobile (716), SP Tie In (701), Hightower (524), Ruth Mountain (548), South Divide (402), and Depler Park (769)
Non-motorized	Terror (802), UT2100, UT8006, and Continental Divide National Scenic Trail[1]

Source: Forest Service 2011c

[1]Motorcycles are allowed on this trail (Forest Service 2012b).

Designated a national scenic trail in 1978 by Congress, the Continental Divide National Scenic Trail (CDNST) is planned to extend a distance of approximately 3,100 miles, from Canada to Mexico along the continental divide in Montana, Idaho, Wyoming, Colorado, and New Mexico (Continental Divide Trail Alliance 2012). The North Gunnison-Salida ROW crosses the CDNST once west of the Pike and San Isabel National Forest boundary.

3.14.4.4 Medicine Bow-Routt National Forests

The RM setting occurs only in the Hayden-Gore Pass ROW, while the SPM setting occurs in all ROWs, except Gore Pass-Hayden, where the setting is all RN. The SPNM setting is in the Ault-Craig and Hayden-North Park ROWs. The Rural setting is in the ROW near the intersection of U.S. Route 40 and State Road 14 south of Muddy Pass Lake. No scenic byways or developed recreation sites are crossed by or next to the transmission line ROWs in Medicine Bow-Routt National Forests. Winter sport activities include cross country skiing, snowshoeing, and snowmobiling. Dispersed recreation opportunities include dispersed camping, hiking, backpacking, biking, motorized trail use, picnicking, viewing wildlife, sightseeing, and hunting. Table 3-87 lists the 10 trails crossed by the transmission line ROWs in Medicine Bow-Routt National Forests. Parts of the Morrison Divide trail are used for access to the Hayden-Gore Pass ROW.

Table 3-87. Trails Crossed by WAPA's Rights-of-Way in Medicine Bow-Routt National Forests

Trail Type	Trail Name (National Forest System Trail Number)
Motorized	Wyoming (1101) and Morrison Divide (1174)
Non-motorized	Shawn's Cross Country Ski Trail and Tepee Creek (1173)
Snowmobile	Two groomed and four ungroomed trails

Sources: Forest Service 2011c; Forest Service 2012c

3.14.4.5 Nebraska National Forest

There are no scenic byways or developed recreation sites next to or crossed by the transmission line ROW in the project area (America's Byways 2012). WAPA's ROW crosses two non-motorized trails on this forest: Pine Ridge Mountain Bike Trails D (24-D) and F (24-F). Dispersed recreation opportunities include dispersed camping, hiking, biking, motorized trail use, picnicking, viewing wildlife, sightseeing, and hunting.

3.14.4.6 Pike and San Isabel National Forest

The ROS changes to Rural where the transmission line crosses the edge of Monarch Mountain Resort, the only ski area in the project area. No scenic byways or other developed recreation sites are crossed by or next to WAPA's ROWs. Monarch Mountain Resort offers skiing, snowboarding, snowcat skiing, and lessons (Monarch Mountain 2012). The resort operates under a special use permit issued by the Forest Service (Forest Service 2012d). Fooses Reservoir, a NFS fishing site, is approximately 300 feet southeast of the North Gunnison-Salida ROW near U.S. Route 50. The CDNST passes through the ski area. In addition to developed winter sports activities, there are many dispersed recreation opportunities available, including dispersed camping, hiking, backpacking, biking, motorized trail use, picnicking, viewing wildlife, sightseeing, and hunting.

The transmission line ROWs cross two non-motorized trails – the CDNST and the Colorado Trail (Forest Service 2011c). Motorcycles are allowed on the CDNST (Forest Service 2012b). The Colorado Trail is a state-designated trail that extends from Denver to Durango, a distance of approximately 500 miles. In 1976, the Forest Service and the Colorado Mountain Trails Foundation signed a Cooperative Agreement to build the trail (Colorado Trail Foundation 2012). The Curecanti-Poncha ROW crosses the CDNST once where the trail leaves the boundaries of Monarch Mountain Resort and descends to the Old Monarch Pass Road. The Curecanti-Poncha ROW also crosses the Colorado Trail near County Road 224. The North Gunnison-Salida ROW crosses the Colorado Trail six times, three times west of U.S. Route 50 and three times east of U.S. Route 50.

3.14.4.7 San Juan National Forest

The ROWs are primarily in the RN setting except where the setting changes to Rural west of McPhee Reservoir and in the Dolores River valley along State Highway 145. No developed recreation sites are in or next to the transmission line ROWs. Dispersed recreation opportunities include dispersed camping, hiking, backpacking, biking, motorized trail use, picnicking, viewing wildlife, sightseeing, snowmobiling, cross country skiing, and hunting.

The transmission line ROWs cross eight trails, two motorized and six non-motorized, as summarized in Table 3-88.

Table 3-88. Trails Crossed by WAPA's Rights-of-Way in San Juan National Forest

Trail Type	Trail Name (National Forest System Trail Number)
Motorized	Boggy Draw Off-highway Vehicle (194) and Coyote Park South (170)
Non-motorized	Boggy (199), Little Bean Canyon (198), Maverick (197), Chicken Creek (615), Boggy Lookout (193), and Narrow Gauge (373)

Source: Forest Service 2011c

The Boggy Draw OHV trail is in the Curecanti-Lost Canyon ROW, and WAPA uses this trail for access to this ROW.

Colorado State Highway 145 and U.S. Highway 160 are both segments of the San Juan Skyway, designated an All American Road, a Colorado State Scenic and Historic Byway, and a National Forest

Scenic Byway (America's Byways 2012). The Hesperus-Montrose transmission line ROW crosses the scenic byway twice, once at each roadway.

3.14.4.8 White River National Forest

The SPM setting is in the Curecanti-Rifle ROW and the Blue River-Gore Pass ROW west of the Arapaho-Roosevelt National Forests boundary. The SPNM setting is in the Green Mountain-Kremmling ROW west of Green Mountain Reservoir, and the Blue River-Gore Pass ROW west of the Arapaho-Roosevelt National Forests boundary. There are no scenic byways or developed recreation sites crossed by or next to the transmission line ROWs.

The Curecanti-Rifle transmission line ROW crosses two motorized trails – N262.1 and Boundary (525). WAPA uses parts of both trails to access the ROWs – N262.1 to Blue River-Gore Pass, and Boundary to the Curecanti-Rifle near the Grand Mesa, Uncompahgre, and Gunnison National Forests boundary.

3.14.5 Environmental Consequences

3.14.5.1 No Action Alternative

WAPA uses seven motorized trails to access its ROWs in the project area, and these trails could be closed if the trails need repair or vegetation prevents use of the trails. Because these trails are in or follow transmission line ROWs, maintenance of the line or vegetation treatments in ROWs could close the trails when work is underway. Trail closures would be temporary and short term, depending on the work needed. Trail maintenance would also benefit trail users by removing obstacles or repairing erosion, improving safety for recreational users and WAPA personnel.

WAPA transmission line ROWs cross 40 trails in the project area. Motorized and non-motorized trails the ROWs cross could temporarily close during vegetation management activities next to or in the trail. These effects would be temporary, short term, and over short sections of trail. ROW widths vary by transmission line voltage, and range from 25 to 175 feet. Trees that present risks to transmission lines could also fall across trails in the ROWs; removing these trees would improve safety for trail users in the ROWs.

NFS roads used to access transmission lines could be closed for maintenance or vegetation treatment, delaying or preventing recreationists traveling to recreation sites, trails, or trailheads outside transmission line ROWs. There could be similar effects on NFS roads transmission lines cross, but that WAPA does not use for access. Delays or closures would be temporary, on short sections of road, and short term, lasting only as long as the activity. Road maintenance would also improve recreational travel on NFS access roads.

Noise from vegetation treatment or maintenance activities and views of workers, equipment, vehicles or debris and cleared areas, could temporarily affect the experience of dispersed recreationists on trails or in areas near the activities. These indirect effects would be temporary and localized, as the recreationist moves past the work area. Recreationists in SPM setting (9 percent) and SPNM setting (7 percent) might notice noise and visual changes the most, while in the RN setting (40 percent) and RM setting (42 percent) evidence of vehicles and others is more expected.

Noise and visual changes would be more noticeable to recreationists in SPM and SPNM settings because these areas are less developed, with less opportunity to encounter the sights and sounds of other recreationists. Five forests include SPM and SPNM settings in transmission line ROWs. While motorized use is generally not allowed in SPNM settings, roads and motorized trails exist in these areas typically following the transmission line ROWs; therefore, these roads and trails are part of the existing settings and encountering others would be expected. Non-motorized trails do not occur in the SPM or SPNM settings in the project area. Recreationists in the SPM or SPNM setting would be hiking off trail, camping, hunting, or biking or OHV riding on the existing roads and motorized trails. Indirect effects on these recreationists would be similar to those identified above, and could temporarily affect the recreation experience in these areas. However, these effects would not permanently change the expected experience or character of the area to the degree that would change the SPM or SPNM settings. Vegetation treatment and maintenance activities would be less noticeable in the RN and RM settings and less likely to affect the experience of recreationists in these areas. Similarly, visual changes could temporarily affect the experience of motorists traveling along scenic byways in Ashley and San Juan National Forests if work is necessary in the ROWs and visible from the roadways.

Dispersed camping primarily occurs along designated roads and trails and can be in or near transmission line ROWs. Dispersed campsites in transmission line ROWs could be displaced by debris disposal, including slash piles; logs piled for future removal; or covered by chips, mulch, or cut branches and trunks. Campers in dispersed sites in or near ROWs while work is underway would experience indirect noise and visual effects similar to those already described.

One transmission line ROW in the project area crosses a developed recreation area – Flaming Gorge NRA in Ashley National Forest. The ROWs in Ashley National Forest only cross trails, and direct effects would be similar to those already described. Four campgrounds in the NRA are within 500 feet of the transmission line ROWs, and campers could experience increased noise levels if WAPA is treating vegetation close to the campgrounds. However, these activities would not occur at night for safety reasons, so there would be no nighttime disturbances. One WAPA ROW crosses near Monarch Mountain Resort in Pike and San Isabel National Forest, but it is not within the boundaries of the resort. If risks to WAPA's ROWs are identified during the ski season and access to the ROWs is needed from inside the resort boundary, WAPA would work with the Forest Service and Monarch Mountain Resort to limit any inconvenience to skiers or snowboarders.

Under the No Action Alternative, these effects are expected to occur at similar frequencies and intensities as today. However, because WAPA mainly removes existing vegetation threats to its transmission lines, there could be an increased risk of fire as dead and dying trees accumulate near ROWS and those trees fall on ROWs causing road, trail, and recreation-site closures. These same conditions could increase the frequency over time that WAPA is required to work on its ROWs and access routes.

3.14.5.2 Proposed Action

Proposed Action activities that could affect recreation are the same as those described for the No Action Alternative, except that WAPA proposes to proactively manage vegetation in its ROWs before it becomes a threat. Direct and indirect effects on recreation would be similar to those described for the No Action Alternative, but could occur more often in areas where ROWs need initial vegetation treatments and maintenance treatments at intervals thereafter. The differences in effects between the No Action Alternative and Proposed Action are described below. Before beginning work, WAPA would consider and prioritize treatment areas throughout the eight forests based on the current risk to transmission line reliability and fire threat, public and worker safety, and availability of funding and personnel.

Table 2-3 lists the six categories of ROW conditions and their treatment methods, and Section 2.2.2.6 identifies the ROW conditions in each of the six treatment categories for the eight affected forests. Management of vegetation in Category 1 and 5 areas has the least potential to affect recreation because these areas do not require initial treatments. In these areas, potential effects on recreation from vegetation treatments next to or near recreation sites would be intermittent over the long term, or the areas might never need treatment. However, WAPA would monitor ROWs and manage vegetation as needed.

Effects on recreationists would increase as areas need initial or maintenance treatment as described in Table 2-3 for vegetation Categories 2, 4 and 6. Potential effects of vegetation treatments on recreation occur when and where these activities are underway.

Recreationists traveling on NFS roads used for access to or crossed by ROWs could experience temporary delays or temporary road closures, preventing access to developed recreation sites, trails, or trailheads. Delays or closures would be temporary and short term, lasting only as long as the activity. WAPA would coordinate road closures or delays with the local Ranger District to maintain access to these sites and identify alternative routes to minimize potential effects on recreationists (Design Features 59 and 61, and Standard Maintenance Procedure R-1). WAPA's road maintenance would also improve recreational travel on NFS access roads.

Potential effects on motorized and nonmotorized trails would be similar to those described for the No Action Alternative. WAPA would coordinate trail closures with the local Ranger District, including identifying alternative routes and posting notices with details about the closures (including maps of alternative routes) at trailheads or nearby recreation sites (Design Feature 60 and Standard Maintenance Procedure R-1). Slash and debris would be kept out of trails (Design Feature 64). WAPA maintenance of motorized trails would improve travel on the trails for recreational users over the long term.

Noise and visual effects would also be similar to those under the No Action Alternative, except that views of altered vegetation in ROWs would be more noticeable to recreationists because larger areas in one location might need treatment.

The temporary effects of noise and visual changes would be more evident to recreationists in SPM and SPNM settings if vegetation treatment is needed in these areas. Similar to the No Action Alternative, these effects would not permanently change the expected experience or character of the area to the degree that would change the SPM or SPNM settings.

Effects on dispersed recreationists, including dispersed campers and motorists traveling along scenic byways, would be similar to those effects under the No Action Alternative.

Arapaho-Roosevelt National Forests

WAPA's ROWs in these forests do not cross trails, and there are no developed recreation sites or scenic byways in or next to the transmission lines. Therefore, there would be no direct effects. Approximately 80 percent of the ROWs could need treatment in the first six years of authorization, and six percent might need initial treatment for fuel reduction. The rest of the ROWs might need treatment after five years (six percent) or might not need treatment (eight percent). Temporary delays or road closures would primarily affect recreationists traveling through these areas to recreation sites, trails, or trailheads outside the transmission line ROWs. Dispersed recreationists in areas being treated would also be affected by the indirect effects of noise and visual changes or displaced campsites. Potential effects would happen less often after the first six years, but would still happen intermittently as maintenance treatments are needed, primarily in ROWs in Category 2 and 3 areas.

Sections of WAPA's transmission line ROWs are in SPM and SPNM settings (Table 3-84). Noise and visual changes could temporarily affect the experience of dispersed recreationists if vegetation treatment is needed in these areas. No trails (motorized or non-motorized) are in SPM or SPNM settings, but there are roads near or that follow the ROWs in these areas. Indirect effects would be temporary, localized, and short term, and would not change the ROS settings.

Ashley National Forest

The transmission line ROWs in this forest are primarily in Categories 6 (45 percent) and 5 (24 percent). Categories 2 (one percent), 3 (12 percent), and 4 (10 percent) combined account for 23 percent, and Category 1 accounts for eight percent. The ROWs cross the Flaming Gorge NRA, four trails, and the Flaming Gorge-Uintas National Scenic Byway. Trail 160 follows one segment of the ROW, and WAPA uses the trail to access the transmission line. There also are four campgrounds within approximately 500 feet of the ROWs.

Most of the ROWs (45 percent) might need treatment to reduce fuel loads if funding becomes available. Categories 2 and 3 (13 percent) occur in the Flaming Gorge-Vernal #3 segment of the ROW, the location of the developed recreation sites, byway, and four trails. Proposed vegetation management activities would cause temporary trail closures on short sections of trail, and indirect effects on recreationists from noise and visual changes near treatment areas or on motorists passing on the byway. Category 4 areas need initial treatment within 2 to 5 years; these areas are located primarily along the Flaming Gorge-Vernal #1 ROW where there are no developed recreation sites, but dispersed recreationists could be affected by noise and visual changes near treatment areas. See the Visual Resources section for more discussion about effects on scenic byways.

The WAPA ROWs cross the entrance road to the Green Dale East Campground east of the transmission line, and the campground could be closed if treatment is needed on or near the road. WAPA would coordinate with the local Ranger District to maintain access to the campground (Design Feature 59 and 61, and Standard Maintenance Procedure R-1).

The campground is within 500 feet of the transmission line ROWs, and campers could experience indirect effects from increased noise and views of crews working in the ROWs. These effects would be temporary and short term during the day, when campers are likely recreating outside the campground. The use of noise-generating equipment would be limited to day-time hours (Design Feature 63).

The temporary effects of noise and visual changes would be more evident to recreationists in the SPM and SPNM settings (Table 3-84) if vegetation treatment is needed in these areas. A road follows the length of the transmission line ROWs in both settings, and the ROWs cross one non-motorized trail in the SPM setting. The experience of dispersed recreationists could be affected as described for Arapaho-Roosevelt National Forests. The indirect effects would be temporary, localized, and short term, and would not change the ROS settings.

Grand Mesa, Uncompahgre, and Gunnison National Forests

Forty-three percent of the area in the ROWs in this forest need treatment during the first six years after authorization, and 39 percent might need treatment to reduce fuel loads. Ten percent might not need treatment for five or more years, and nine percent might not need treatment during the authorization.

WAPA ROWs in this forest do not cross developed recreation sites or scenic byways, so there would be no direct effects. Direct effects on recreationists traveling through treatment areas and indirect effects on dispersed recreationists would be similar to those described for Arapaho-Roosevelt National Forests.

ROWs in these forests cross 12 trails (eight motorized and four non-motorized) and the trails could temporarily close if WAPA needs to treat vegetation in those areas. Closures would be temporary over short sections of trail. Design Feature 60 would minimize potential effects.

The North Gunnison-Salida ROW crosses the CDNST once. The vegetation at this crossing is Category 3, which is currently compatible but needs treatment within 2 to 6 years of authorization. Three trails follow the North Fork-Rifle ROW, and WAPA uses the trails to access this transmission line segment. The Powerline, Hightower, and Boundary trails could temporarily close if the trails or structures need repair or vegetation management. Trail closure would be temporary and short term, depending on the work needed. WAPA would coordinate closures with the local Ranger District and use design features and standard maintenance procedures to minimize effects on trail users. Trail maintenance would also benefit trail users, as described for the No Action Alternative.

Medicine Bow-Routt National Forests

Over half (57 percent) of the ROWs in this forest would need treatment in the first six years after authorization, and two percent would be treated to reduce fuel loads if funding becomes available. Seven percent might need treatment within five or more years, and WAPA might not treat 33 percent of the ROWs during authorization; there would be little potential to directly affect recreationists near these areas. WAPA ROWs do not cross scenic byways, and there are no developed recreation sites next to or crossed by the transmission lines. Direct effects on recreationists traveling through treatment areas and indirect effects on dispersed recreationists would be similar to those described for Arapaho-Roosevelt National Forests.

WAPA ROWs cross 10 trails in this forest – two motorized trails, one non-motorized trail, and seven snow trails. The Wyoming and Tepee Creek trails could temporarily close if WAPA needs to treat vegetation in those areas. Closures would be temporary over short sections of trails. Of the seven snow trails, one is a cross-country ski trail and six are snowmobile trails. Vegetation management would occur primarily in spring, summer, and fall, with little to no potential to affect winter trail users, except possibly in emergency situations. Design Feature 60 would minimize potential effects. The Morrison Divide Trail (motorized) roughly parallels the Hayden-Gore Pass ROW, and WAPA uses sections of the trail to access the transmission line. Potential effects to trail users on the Morrison Divide Trail would be similar to effects described for access trails in Grand Mesa, Uncompahgre, and Gunnison National Forests.

Transmission line ROWs in this forest are in the SPNM and SPM (Table 3-84) settings. Roads follow the Ault-Craig and Hayden-North Park ROWs, and the Wyoming Trail is crossed in the SPM setting. As noted above, the Morrison Divide Trail follows the Hayden-Gore Pass ROW in the SPM setting. Indirect effects would be similar to those described for Ashley National Forest.

Nebraska National Forest

There are no developed recreation sites or scenic byways in or next to WAPA's ROW in this forest, so there would be no direct effects. Vegetation in this ROW is primarily grasses (95 percent) that are not expected to need treatment for the duration of authorization. The other five percent of the ROW is in Category 4 and needs treatment within 2 to 5 years of authorization. The ROW crosses two mountain-bike trails, but the trails are not in the Category 4 areas. There would be no direct or indirect effects on trails users. Effects on recreationists traveling to areas outside the ROW or participating in dispersed activities would be rare or nonexistent.

Pike and San Isabel National Forest

Forty percent of the ROWs in these forests need treatment within six years of authorization, and 23 percent would be treated to reduce fuel loads if funding becomes available. Twenty-two percent might not need treatment for five or more years, and 15 percent might not need treatment during the authorization. WAPA ROWs do not cross scenic byways. The ROWs do not cross developed recreation sites and there are no such sites next to the transmission lines. Direct effects on recreationists traveling through treatment areas and indirect effects on dispersed recreationists would be similar to those described for Arapaho-Roosevelt National Forests.

The Curecanti-Poncha ROW crosses the CDNST once where the trail leaves Monarch Mountain Resort and starts to descend to Old Monarch Pass Road. The ROW at this crossing spans the trail in the Category 1 area, so treatment might not be needed during the authorization. WAPA does not anticipate effects on recreation in this area. The Curecanti-Poncha ROW also crosses the Colorado Trail once east of U.S. Route 50. The ROW at this crossing is in Category 6 and might need treatment to reduce fuel loads as funding is available. In addition, the North Gunnison-Salida ROW crosses the Colorado Trail five times, twice west of U.S. Route 50 and three times east of U.S. Route 50. Crossings west of U.S. Route 50 are in Category 3 and need treatment in 2 to 6 years of authorization. The ROWs at trail crossings east of U.S. Route 50 are in Category 6 and might need treatment to reduce fuel loads as funding is available. Trail closures in either category area would be temporary. Hikers on the trails could experience short-term indirect effects from noise or visual changes as they travel through areas being treated. The Curecanti-Poncha ROW crosses just south of the Monarch Mountain Resort boundary but does not cross any trails within the resort's boundaries and is not in the snowcat skiing area. WAPA does not expect effects on resort operations.

Fooses Reservoir is within 300 feet of the North Gunnison-Salida ROW, but the ROW does not cross the access road to the reservoir off U.S. Route 50. Therefore, there would be no direct effects on Fooses Reservoir. The ROW is in Category 6 areas and could need treatment for fuel loading; recreationists or fishermen could experience short-term indirect effects of noise if WAPA needs to treat these areas.

San Juan National Forest

The San Juan National Forest does not have complete MVUMs. WAPA would need Forest Service authorization to use and maintain trails WAPA needs to use as access routes. Only 17 percent of the ROWs require treatment in the first six years, and 31 percent might be treated to reduce fuel loads. Twelve percent of ROWs in this forest might not require treatment during the authorization, and 40 percent might not be treated for five or more years. Direct effects on recreationists traveling through treatment areas and indirect effects on dispersed recreationists would be similar to those described for Arapaho-Roosevelt National Forests.

WAPA ROWs cross eight trails in this forest – two motorized trails and six non-motorized trails. Closures would be temporary over short sections of the trails, and the trails could temporarily close if WAPA needs to treat vegetation in those areas. Closures would be temporary over short sections of the trails. Design Feature 60 would minimize potential effects. The Boggy Draw OHV Trail follows the Curecanti-Lost Canyon ROW in multiple places, and WAPA uses the trail to access the transmission line. Potential effects to trail users on the Boggy Draw OHV Trail would be similar to effects described for access trails in Grand Mesa, Uncompahgre, and Gunnison National Forests.

The Hesperus-Montrose ROW crosses San Juan Skyway in two places on different highways. Motorists passing on the byway might see crews and equipment working on the ROW where it crosses the byway if work is needed near these crossings. See the Visual Resources section for more discussion about effects related to scenic byways.

Small segments of the Hesperus-Montrose ROW cross SPM and SPNM (Table 3-84) settings, which are mostly surrounded by the RN setting. Roads are present in both settings and potential effects on dispersed recreation would be similar to those described for Ashley National Forest.

White River National Forest

Thirty-three percent of the ROWs need treatment within six years of authorization, and 37 percent could require treatment to reduce fuel loads. Direct effects on recreationists traveling through treatment areas and indirect effects on dispersed recreationists would be similar to those described for the Arapaho-Roosevelt National Forest. Thirty percent of the ROWs in this forest might not need treatment during the authorization, and there would be little to no potential to affect recreationists in these areas. There are no scenic byways or developed recreation sites next to or crossed by the ROWs in this forest.

WAPA uses two motorized trails – N262.1 and Boundary – to access ROWs in White River National Forest. The N262.1 trail follows the Blue River-Gore Pass ROW, and the Boundary Trail follows the North Fork Rifle ROW near the forest boundary with the Grand Mesa, Uncompahgre, and Gunnison National Forest. Potential effects on trail users on both trails would be similar to effects described for access trails in the Grand Mesa, Uncompahgre, and Gunnison National Forest.

Transmission line ROWs are all in the SPM and SPNM (Table 3-84) settings. Roads and motorized trails follow the transmission lines in both settings, and dispersed recreationists in these areas could be affected if vegetation treatment is need. Potential effects would be similar to those already described.

3.14.5.3 Cumulative Effects

The project area for the cumulative effects analysis is the same as for the direct and indirect effects on recreation. Appendix A identifies more than 20 past, present, and reasonably foreseeable projects near WAPA's ROWs in the eight forests in Colorado, Nebraska, and Utah. Only one is directly related to recreation – a trails project in the Grand Mesa, Uncompahgre, and Gunnison National Forest south of Norwood, Colorado. The other projects are related to vegetation management, salvage and fuels reduction, danger-tree cutting along transmission line ROWs, habitat improvement, invasive plant management, and transmission line reconstructions.

Cumulative effects on recreation would be similar under the No Action Alternative and the Proposed Action because both have the potential to affect the same recreation activities and facilities, except that potential effects would occur more frequently over larger areas under the Proposed Action. Vegetation treatment and maintenance activities could temporarily close or detour trails and roads, displace recreationists, or delay travel to recreation sites or facilities outside transmission line ROWs. These temporary effects would be limited to the transmission line ROWs or immediate area near the ROWs. The present and reasonably foreseeable projects listed in Appendix A that treat vegetation, reduce fuel loads, or cut danger trees could have similar effects on recreation activities and facilities. If these projects occur at the same time and overlap with the same transmission line ROWs, there could be cumulative effects on recreation activities and facilities from temporary closures, delays, detours, or displacement of recreation activities. The potential for cumulative effects would be greater under the Proposed Action because of the increased frequency of project activities and larger area affected. However, potential cumulative effects would be temporary and of short duration, lasting only as long as the vegetation treatment activities in the immediate vicinity.

3.15 Public Health and Safety

3.15.1 Introduction

The primary public health and safety issues under the No Action Alternative and the Proposed Action are the potential for fire, the potential for chemical spills, public safety during maintenance activities, and electric and magnetic fields.

3.15.2 Affected Environment

The project area for public health and safety is the same under the No Action Alternative and the Proposed Action. For fire, the project area is the ROW, where the concern is the risk associated with transmission line-related fire starts, whether the cause is vegetation that encroaches too close to energized equipment, or the transmission line faults or experiences equipment failures that cause a fire. The project area for chemical spills includes areas in which chemicals are stored, transported, and used. The project area for public safety during maintenance activities, including vegetation management, is the ROW and access routes. The project area for electric and magnetic fields is the ROW.

Fire

The project area is generally arid; it includes significant beetle-killed timber and seasonally contains dry grasses and shrubs. The greatest risk of fire would be during the hot, dry summer season and into fall before snowfall. Existing electrical transmission lines create the potential for fire hazards in the immediate vicinity of the lines and the potential for personal injury, property damage, or fire in the event of transmission tie-line fault.

The following are the most likely causes of transmission line-related fires:

1. Vegetation can grow too close to energized lines or other energized equipment. When vegetation encroaches and causes an arc, the vegetation can catch fire. Vegetation encroachments occur if a tree, for example, grows too close to the conductor, causing the electricity to arc to the tree. Another possibility is that an energized conductor could sag, for example, because of high temperatures or ice loading, close enough to the vegetation so that the electricity arcs and sets the vegetation on fire.
2. Vegetation, especially trees, can fall into conductors and cause the line to arc and set the tree on fire. The fire could then spread from that tree, starting a wildfire.
3. Animals sometimes cause arcing, especially on smaller lines, but this could occur on high-voltage lines. An example is if a bird that builds large nests, such as an eagle, builds a nest too close to energized equipment. The nest could catch fire and blow to the ground, where it could start a ground fire.
4. Equipment failure such as crossarm failure could cause a conductor to drop toward the ground. These types of failures can start fires if the conditions are right for the vegetation to catch fire

before the line trips and turns off. Equipment can fail for a number of reasons, including ice loading beyond the design specifications; age and materials fatigue; and excessive wind loading or very strong winds.

Under any of these scenarios, transmission lines generally trip automatically and turn off at circuit breakers in substations. Regardless, the fire is started and its course depends on many variables that are site specific, such as proximity to other flammable materials, wind, availability of fuel, and terrain. Emergency response to control the fire would be initiated.

Chemical Spills

Chemical spills or incidents under the No Action Alternative and Proposed Action could involve the typical chemicals used in routine maintenance and vegetation management. These include gasoline, diesel fuel, engine and hydraulic oils, and herbicides. The environmental concerns are (1) spills and the potential impacts primarily to surface water quality and aquatic life, (2) exposure of humans, particularly to herbicides, and (3) inadvertent adverse effects on plant species of special concern from herbicides.

Public Safety during Maintenance Activities

The concern is for the safety of members of the public who might be on or near the ROWs while maintenance activities are underway. The concern is the same under the No Action Alternative and the Proposed Action. Routine maintenance activities, including vegetation management, employ a variety of activities and actions, as described in Chapter 2. Trucks, helicopters, all-terrain vehicles, cranes, and other equipment could be used, depending on the activity. Typically the presence of maintenance crews is obvious, and members of the public who use NFS lands for recreational or other proposes can easily avoid maintenance activity areas.

WAPA crews and contractors are aware of the potential to encounter members of the public, especially if the work is being performed next to public access such as open Forest Service roads. Depending on the situation, any of several safety notifications can be made to increase the awareness of maintenance activities on NFS lands and to keep unauthorized persons from activity areas. Use of signs, flaggers, safety cones, and marker tapes; temporary closure of sections of road during some maintenance activities; and verbal warnings are among the typical methods used to improve communication and provide additional warning to users of land near maintenance activities.

Electric and Magnetic Fields

There would be no change in the electric and magnetic field characteristics of the transmission lines between the No Action Alternative and Proposed Action. The public did not identify concerns about electric and magnetic fields during scoping. Because the transmission lines are on NFS lands and are generally in more remote, rural areas, WAPA did not expect to hear concerns about these fields.

WAPA recognizes that in some localities there is public concern over the possible health effects of electric and magnetic fields. While primary exposure to EMFs for most people is in the home and at work, WAPA realizes that some people have concerns about EMFs created by its transmission facilities.

In the past 30 years, scientists have studied the relationship, if any, of EMF to human, plant and animal health. Congress mandated in 1992 that federal agencies and the scientific community research and perform a comprehensive review of potential EMF effects on health. These studies concluded in 1997 that there is only "weak" evidence that magnetic fields increase the risk of cancer and other human diseases.

Scientific research continues on a wide range of questions related to EMF exposure, and some of this work has hinted at possible health risks. A comprehensive EMF health risk assessment by the World Health Organization is underway, and will likely influence decision making and further research. The research is expected to continue for several more years. Until conclusive or more specific research results are obtained, WAPA will continue to take prudent actions regarding EMFs.

Summary discussions can be found in these references, among others:

- Western Area Power Administration. 2005. Electric and Magnetic Fields Facts. 13 pp.
- National Institute of Environmental Health Sciences. 1999. NIEHS Report on Health Effects From Exposure to Power-Line Frequency Electric and Magnetic Fields. NIEHS/National Institute of Health. Publication 99-4493. 80 pp.
- National Institute of Health. June 2002. Electric and Magnetic Fields Associated with the Use of Electric Power; Questions and Answers. NIEHS/NIH. 65 pp.

3.15.3 Environmental Consequences

Fire

Fires can destroy the transmission line structures, which would require rebuilding the structure; this situation could result in the line being out of service for many days or even weeks. Fires can cause widespread destruction of public and private property, wildlife habitat, visually sensitive areas, water resources, air quality, recreational facilities, and other resources. Indirect socioeconomic effects from fires include loss of electrical service and potential disturbances to the larger electrical system, including generators and other transmission lines. In some cases, for example the northeastern U.S. and Canada blackout of August 2003, the blackouts can be widespread and affect many more persons far away from the initiating cause of the interaction between the transmission line and the vegetation (U.S.-Canada Power System Outage Task Force 2004).

Activities described under the No Action Alternative and Proposed Action are designed to maintain the transmission lines to minimize hardware failure and to reduce risks from potentially dangerous interactions with vegetation. Chapter 2 describes the routine maintenance activities and vegetation management activities. Chapters 1 and 2 describe the regulatory requirements, policies, and directives requiring these activities.

Chemical Spills

Incidents from chemical use are usually caused by improper storage and use, although hydraulic hose breaks and mechanical failures of machinery can cause spills.

The amounts of chemicals required for vegetation management are relatively small. For example, diesel fuel would be the main fuel used in trucks and machinery; gasoline would be used in chainsaws. Portable fuel tanks installed in the beds of pickup trucks are the typical mode of transport for activities related to routine maintenance and vegetation management. Herbicides would be applied as needed in local areas and using spot treatments, as previously described for the No Action Alternative and the Proposed Action.

Standard maintenance procedures that address issues related to potential spills of these substances are part of the No Action Alternative and Proposed Action (see Table 2-15). WAPA proposes to use only herbicides approved by the Forest Service, all of which are EPA-approved and on the state lists of approved herbicides. Herbicides would be applied by appropriately licensed applicators, and in accordance with label requirements. The design features and standard practices include storage and refueling away from surface water; prompt cleanup of spills; and removal of contaminated soils and other materials from the ROW for disposal at approved landfills.

The impacts to public health and safety are expected to be negligible because of the design features and standard work practices described in Chapter 2. For spills, the impacts are expected to be minor and short term. No cumulative impacts to environmental resources are expected from the use of these chemicals.

Public Safety during Maintenance Activities

Public safety problems are not expected to occur during maintenance activities under either the No Action Alternative or Proposed Action. Impacts to public use of NFS lands are expected to be short term and minor. No cumulative impacts on public safety were identified.

Electric and Magnetic Fields

No direct or indirect effects related to EMF are expected. No cumulative impacts were identified.

3.16 Roadless Area

No Action

Under the No Action alternative, on the Arapaho/Roosevelt National Forest, ongoing enhanced vegetation management was permitted by a Forest Service authorization in 2019. Treatments would continue along three miles of ROW abutting the Copper Mountain Roadless Area with less than one mile in the Roadless Area. These treatments were evaluated for impacts to the nine roadless area characteristics. The evaluation noted that there was potential to effect watershed conditions, wildlife and plant habitat, and scenic quality. Design criteria were determined to be sufficient to protect these roadless area characteristics. Less than two miles of existing access route crosses the Copper Mountain Roadless Area, predominately on unmaintained spurs from NFS Road 200.

Under the No Action alternative, on the Ashley National Forest, ongoing enhanced vegetation management would continue under the existing authorizations. Treatments would continue along WAPA's transmission line ROWs which are outside of roadless areas in Daggett and Uintah County, Utah using existing access routes and methods. Approximately 4 miles of existing access route crosses several Roadless Areas (e.g., 0401002, 0401003, 0401006, and 040132 on Flaming Gorge Ranger District), predominately on unmaintained spurs from NFS Road 610. Less than one mile of existing access route crosses the 0401006 Roadless Area, off various unmaintained spurs along the U.S. Highway 191 corridor on the Vernal Ranger District to access WAPA's Flaming Gorge-Vernal #3 transmission line.

Proposed Action

Under the Proposed Action, on the Arapaho Roosevelt National Forest, ongoing enhanced vegetation management was permitted by a Forest Service authorization in 2019. Treatments would continue along three miles of ROW abutting the Copper Mountain Roadless Area with less than one mile in the roadless area. These treatments were evaluated for impacts to the nine roadless area characteristics (Appendix I, Roadless Analyses). The evaluation noted that there was potential to effect watershed conditions, wildlife and plant habitat, and scenic quality. Design criteria were determined to be sufficient to protect these roadless area characteristics.

Under the Proposed Action, on the Ashley National Forest, treatments would continue along WAPA's transmission line ROWs which are outside of roadless areas in Daggett and Uintah County, Utah using existing access routes and methods. Approximately four miles of existing access route crosses several Roadless Areas (e.g., 0401002, 0401003, 0401006, and 040132 on Flaming Gorge Ranger District), predominately on unmaintained spurs form NFS Road 610. Less than one mile of existing access route crosses the 0401006 Roadless Area, off various unmaintained spurs along the U.S. Highway 191 corridor on the Vernal Ranger District to access WAPA's Flaming Gorge-Vernal #3 transmission line. These treatments were evaluated for impacts to the nine roadless area characteristics (Appendix I, Roadless Analyses). The evaluation noted that while there was potential to effect watershed conditions, wildlife and plant habitat, and scenic quality, design criteria were determined to be sufficient to protect these roadless area characteristics.

3.17 Environmental Justice

Environmental justice pertains to the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Under E.O. 12898 (published in the Federal Register February 11, 1994), federal agencies are required to identify and address disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations or low income populations. The Forest Service incorporates environmental justice into its planning process, both as a consideration in the environmental effects analysis and by ensuring a meaningful role in the decision-making process for minority and low-income populations.

According to the Council on Environmental Quality (CEQ) Environmental Justice Guidance Under the National Environmental Policy Act (CEQ 1997), "minority populations should be identified where either: (a) the minority population of the affected region exceeds 50 percent or (b) the minority population percentage of the affected region is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis." The same document advises the use of Census poverty thresholds to identify low-income populations.

Additionally, the CEQ (CEQ 1997) guidance advises that "In order to determine whether a proposed action is likely to have disproportionately high and adverse human health or environmental effects on low-income populations, minority populations, or Indian tribes, agencies should identify a geographic scale, obtain demographic information on the potential impact area, and determine if there is a disproportionately high and adverse effect to these populations. Agencies may use demographic data available from the Bureau of the Census to identify the composition of the potentially affected population. Geographic distribution by race, ethnicity, and income, as well as a delineation of tribal lands and resources, should be examined."

Minority Populations

Table 3-89 summarizes the total population and percentage of people in various racial and ethnic groups in each county of the project area and in the states of Colorado, Nebraska and Utah, as well as the United States as a whole.

Table 3-89. Racial and Ethnic Makeup of Populations, 2007-2011 Average

Geographic Area	Total Population	Percentage of Total Population								
		White	Black or African American	Alaska Native or American Indian	Asian	Native Hawaiian & Other Pacific Islander	Other Race	Two or More Races	Hispanic or Latino[1]	Total Minorities[2]
Chaffee (CO)	17,707	93.3	2.8	0.8	0.3	0.0	1.8	0.9	9.1	13.4
Delta (CO)	30,666	94.2	1.2	0.6	0.5	0.0	2.2	1.2	13.7	16.9
Dolores (CO)	2,043	95.5	0.0	2.2	0.3	0.0	0.0	1.9	3.1	7.0
Grand (CO)	14,634	94.8	0.2	0.3	1.1	0.1	1.9	1.5	7.2	10.1
Gunnison (CO)	15,274	93.4	0.6	2.7	0.6	0.0	1.0	1.6	7.8	11.0
Jackson (CO)	1,494	97.4	0.3	0.4	0.5	0.0	0.7	0.7	7.5	8.4
La Plata (CO)	50,820	87.1	0.6	6.3	0.7	0.1	3.1	2.2	11.7	19.6
Lake (CO)	7,010	74.1	0.7	2.2	0.7	0.3	20.1	1.8	38.9	42.9
Larimer (CO)	296,107	91.1	0.8	0.6	1.8	0.1	2.7	2.9	10.4	15.4
Mesa (CO)	144,766	89.7	0.7	1.1	0.7	0.1	4.9	2.8	13.0	16.6
Montezuma (CO)	25,372	83.2	0.0	11.7	0.4	0.0	1.5	3.1	10.9	24.6
Montrose (CO)	40,812	90.9	0.6	0.7	0.6	0.0	3.6	3.5	19.1	22.2
Ouray (CO)	4,371	95.4	0.0	0.4	1.0	1.4	0.0	1.8	3.8	7.0
Routt (CO)	23,201	96.3	0.1	0.7	1.5	0.0	0.3	1.0	6.3	8.9
Saguache (CO)	6,165	81.4	0.4	1.6	0.9	0.1	9.7	5.9	41.1	45.6
San Miguel (CO)	7,383	96.0	0.2	0.5	1.9	0.2	0.2	1.0	8.2	11.6
Summit (CO)	27,496	92.3	0.5	0.6	1.2	0.0	4.2	1.2	13.5	16.6
Dawes (NE)	9,180	90.9	2.1	4.4	1.3	0.0	0.2	1.0	3.3	11.9
Daggett (UT)	891	95.6	0.4	0.3	0.3	0.3	1.3	1.6	4.6	7.6
Uintah (UT)	31,892	85.3	0.1	6.7	0.6	1.4	2.7	3.2	6.8	17.0
State of Colorado	4,966,061	83.9	3.9	1.0	2.7	0.1	5.1	3.2	20.4	29.7
State of Nebraska	1,813,061	88.3	4.4	0.9	1.7	0.1	2.5	2.2	8.8	17.4
State of Utah	2,715,379	89.3	1.1	1.1	2.0	0.9	3.3	2.2	12.7	19.3
United States	306,603,772	74.1	12.5	0.8	4.7	0.2	5.1	2.5	16.1	35.8

Source: U.S. Census Bureau 2012a

[1]Individuals who identify themselves as Hispanic or Latino might be of any race; the sum of the other percentages under the "Percent of Total Population" columns plus the "Hispanic or Latino" column therefore does not equal 100 percent, and the sum of the percentages for each racial and ethnic category does not equal the percentage of "total minorities".

[2]The total minority population, for the purposes of this analysis, is the total population for the geographic unit analyzed minus the population that is White and not Latino /Hispanic.

CO Colorado
NE Nebraska

Table 3-89. Racial and Ethnic Makeup of Populations, 2007-2011 Average

Geographic Area	Total Population	Percentage of Total Population								
		White	Black or African American	Alaska Native or American Indian	Asian	Native Hawaiian & Other Pacific Islander	Other Race	Two or More Races	Hispanic or Latino[1]	Total Minorities[2]

UT Utah

With the exception of Lake and Saguache Counties in Colorado, all counties within the project area have a lower minority population by percentage than their respective state. The largest minority group in both counties is the Hispanic/Latino population, which makes up about 40 percent of the population in each of Lake and Saguache Counties.

Low-income Populations

Table 3-90 summarizes the percentage of the population below poverty level in each county of the project area, the respective states, and the U.S. as a whole. Following the Office of Management and Budget's Directive 14, the Census Bureau uses a set of money income thresholds that vary by family size and composition to detect what part of the population is considered to be in poverty (U.S. Census Bureau 2012b).

Table 3-90. Low-Income Populations, 2007-2011 Average

Geographic Area	Percent Population Below Poverty Level
Chaffee (Colorado)	9.7
Delta (Colorado)	14.1
Dolores (Colorado)	12.4
Grand (Colorado)	8.7
Gunnison (Colorado)	13.8
Jackson (Colorado)	15.1
La Plata (Colorado)	10.6
Lake (Colorado)	22.2
Larimer (Colorado)	13.4
Mesa (Colorado)	12.7
Montezuma (Colorado)	16.9
Montrose (Colorado)	12.6
Ouray (Colorado)	7.2
Routt (Colorado)	7.0
Saguache (Colorado)	25.3
San Miguel (Colorado)	7.2
Summit (Colorado)	10.1
Dawes (Nebraska)	24.7
Daggett (Utah)	10.8
Uintah (Utah)	11.0
State of Colorado	12.5

Table 3-90. Low-Income Populations, 2007-2011 Average

Geographic Area	Percent Population Below Poverty Level
State of Nebraska	12.0
State of Utah	11.4
United States	14.3

Source: U.S. Census Bureau 2012a

Several of the counties in Colorado as well as Dawes County, NE, have a greater percentage of residents below the poverty level than the overall statewide percentages. These include Saguache and Lake Counties, discussed previously in the context of minority populations, and several others.

Analysis of Potential Impacts

The existing lines are located on uninhabited NFS Lands and have been in place for many years. All of the lines are distant from settled populations. For instance, of the lines that pass through Lake County, the closest a line passes to settled areas is six miles (based on boundaries of U.S. Census urban areas). The closest settled area to a transmission line (over a mile from the line) is Steamboat Springs, Colorado, which has a lower minority population than the state and a comparable median household income.

Neither low income (poverty status) nor minority populations would be disproportionately impacted by the proposed project. The project is located in areas where no low income populations would be directly affected by changes in vegetation management on existing ROWs and continued maintenance of existing transmission lines. There is no proposal to take actions that would affect minority or other groups disproportionately. Under both the No Action and Proposed Action alternatives, the decisions and actions are related to the condition of vegetation on the rights-of-way and the need to ensure the continued maintenance and safe operation of the transmission lines.

3.18 Other Required Disclosures

NEPA states, "to the fullest extent possible, agencies shall prepare draft environmental impact statements concurrently with and integrated with …other environmental review laws and executive orders" (40 CFR 1502.25(a)). WAPA and the Forest Service considered the following federal requirements, but found they do not need analysis for the reasons described.

Farmlands

The Farmland Protection Policy Act of 1981 (7 U.S.C. 4201 *et seq*.) directs federal agencies to "minimize the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses." As defined in the act, "farmland" includes prime farmland, unique farmland, and farmland of state or local importance. WAPA and the Forest Service found there are no prime or unique farmlands or farmland of state or local importance on NFS lands in the project area. Therefore, WAPA did not analyze effects on farmlands.

Wilderness

The Wilderness Act of 1964, Public Law 88-577 (16 U.S.C. 1131-1136) established the National Wilderness Preservation System, which is made up of federal lands designated by Congress as wilderness areas. Section 2(a) of the act requires wilderness areas to be managed "for the use and enjoyment of the American people in such manner as would leave them unimpaired for future use as wilderness, and so as to provide for the protection of these areas, the preservation of their wilderness character, and for the gathering and dissemination of information regarding their use and enjoyment as wilderness." WAPA's ROWs do not cross designated wilderness areas on NFS lands in the project area. Therefore, WAPA did not analyze effects on wilderness areas.

3.19 Accidents and Intentional Acts of Destruction

The DOE Office of NEPA Policy and Compliance issued final and interim guidance on the need to consider accidents and intentional acts of destruction (e.g., vandalism) in NEPA documents (DOE 2006). Two possible scenarios are analyzed in this section – catastrophic wildfire and intentional acts of destruction.

Wildfire

The project area is naturally susceptible to wildfire because of the dominant vegetation types and climatic conditions. However, the recent mountain pine beetle epidemic caused widespread pine stand mortality through several parts of the project area. Widespread stand mortality has greatly increased short-term wildfire risk, and in the event of a fire start, would likely exacerbate fire intensities. The remaining dead trees equate to an enormous amount of dry hazardous fuel on the ground. In the event of a wildfire in these conditions, even the most robust fire suppression responses might have little or no effect on fire spread, intensities, or level of destruction. To the extent practical, given the situation, WAPA's Proposed Action includes reasonable measures to reduce fuel loading and the potential for transmission line and vegetation interactions that could start fires in the ROWs. WAPA has no control over the fuel situation adjacent to its ROWs or in other areas.

Intentional Acts of Destruction

Power transmission facilities are part of America's critical infrastructure and are considered to be possible targets of intentional acts of destruction. Potential aggressors include terrorists hoping to cause disruption, or activists targeting facilities for other reasons. A more likely occurrence is acts of opportunity, such as individuals thoughtlessly shooting at or vandalizing insulators or structures without regard to their own safety or public safety in general.

Uncertainty Regarding the Analysis

Both of these events would depend on many complex variables and are unpredictable. The degree of uncertainty in this analysis is therefore high. However, the following impacts overview provides a general statement of the types of impacts expected. A detailed impacts analysis is not provided due to the uncertainty.

Potential Impacts

The effects of intentional destructive acts and wildfire would likely be relatively localized, and would depend on the nature and location of the acts, the magnitude of the damage, and other variables. The effects would typically be similar to outages caused by other natural phenomena such as ice storms or tornadoes. There would likely be inconveniences to electrical end users, ranging from loss of heating, air conditioning, and refrigeration to effects on traffic signals and a numerous other systems that run on electricity. Police and fire services could be affected if communication systems are out of service. Services such as sewer and water systems could be affected by extended outages. Loss of electrical service at hospitals would be of special concern, but these effects can be mitigated at hospitals and other critical facilities through the use of backup generators. Environmental impacts would depend on the location of the incident, and a detailed analysis is beyond the scope of this EIS. WAPA and all electric utilities have in place a variety of protocols to control accidents on transmission systems, and limit the effects of transmission line outages.

3.20 Short-term Uses and Long-term Productivity

NEPA Section 102 requires consideration of "the relationship between short-term uses of man's environment and the maintenance and enhancement of long-term productivity (42 USC 4332; 40 CFR 1502.16)." As declared by the U.S. Congress, this includes using all practicable means and measures, including financial and technical assistance, in a manner calculated to foster and promote the general welfare, to create and maintain conditions under which man and nature can exist in productive harmony, and fulfill the social, economic, and other requirements of present and future generations of Americans (NEPA Section 101).

Short-term uses of the environment are one-time events or events that occur at intervals over short periods, such as installing a water bar on an access route or intermittently treating aspen patches. WAPA's vegetation management activities and maintenance of access routes or areas around structures are short-term uses of the environment. Long-term productivity relates to converting the natural productivity of the land to some developed use including transmission lines. The No Action Alternative and the Proposed Action would not substantially change the long-term productivity of the affected environment. Long-term productivity in WAPA's ROWs has already been affected by the existing transmission line ROWs on NFS lands. The No Action Alternative and the Proposed Action do not propose building new transmission lines or roads, and the width of WAPA's ROWs would not change. Long-term productivity in areas outside WAPA's ROWs would not be affected. Transmission line ROWs would not be available for timber production, but WAPA would remove salvageable timber in accessible areas during initial treatments under the Proposed Action.

3.21 Unavoidable Adverse Effects

Unavoidable adverse effects are environmental effects that cannot be effectively mitigated. WAPA and the Forest Service have identified and developed specific design features and standard maintenance procedures to eliminate or reduce potential adverse effects (Tables 2-13 and 2-15). Also, the application of forest plan standards and guidelines is intended to further reduce the extent and duration of these effects. Adverse effects on the environment that cannot be totally mitigated are described briefly below; see the individual resource sections for detailed discussions. In all cases, the effects would follow established legal limits, regulations, and policies.

Managing vegetation in WAPA's ROWs to be compatible with transmission lines could be considered an adverse effect. But it is a necessary activity needed to efficiently and safely operate and maintain the facilities, so it is unavoidable. The No Action Alternative would have less of an adverse effect because WAPA would only remove vegetation identified as an immediate threat to the transmission lines or as needed in emergency situations. Adverse effects of managing vegetation on WAPA's ROWs would be more substantial under the Proposed Action, particularly in areas that need initial treatments to be compatible with transmission lines. Vegetation in Category 1 areas would not likely be affected, while vegetation in Category 2 areas would be affected the most.

Vegetation management and maintenance activities in WAPA's ROWs could temporarily disturb wildlife and their habitats under either alternative. Wildlife would avoid areas where workers, vehicles, and equipment are working in the ROWs. These adverse effects would be temporary, short-term and localized, occurring only when these activities are underway.

The Proposed Action would result in adverse effects on visual resources that could be unavoidable. Vegetation management activities in Category 2, 4, and 6 areas would adversely affect locations that fall within areas of partial retention VQO/moderate SIO settings or higher. There would be substantial long-term changes to the existing visual environment at these locations from vegetation removal in the ROW.

3.22 Irreversible and Irretrievable Commitments of Resources

Irreversible commitments of resources are those that cannot be regained, such as the extinction of a species or the removal of mined ore. Under the No Action Alternative or the Proposed Action, WAPA's vegetation management and maintenance activities would require using financial resources and diesel fuel and gasoline for vehicles and equipment. Use of these non-renewable resources is an irreversible commitment.

Irretrievable commitments are those that are lost for a time, such as the temporary loss of timber productivity in forested areas that are kept clear for use as a transmission line ROW or road. Timber production in WAPA's transmission line ROWs was irretrievably committed at the time the transmission lines were built. The width of WAPA's ROWs would not change under the No Action Alternative or the Proposed Action; no more areas would be removed from timber production, so the commitment would not change. Under the Proposed Action, WAPA would remove salvageable timber from transmission line ROWs in accessible areas in vegetation Category 2, 3, and 4 areas, as described in Chapter 2 for each forest.

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CHAPTER 4 – CONSULTATION AND COORDINATION

Western and the Forest Service coordinated with the following individuals; federal, state, and local agencies; tribes; and other persons during the development of this Environmental Impact Statement (EIS).

4.1 Interdisciplinary Team Members and List of Preparers

Table 4-1 identifies persons who reviewed and contributed to the preparation of this EIS.

Table 4-1. Interdisciplinary Team Members and List of Preparers

Organization and Name	Resource/Role	Qualifications/ Years of Experience
Forest Service		
Matt Custer	Lands Special Uses Program Lead	BA, 15 years experience special uses
Ruth Esperance	Roadless Coordination	BS Forest Administration /30 years experience
Tyler Johnson	Botany	MS Forest Ecology, BS Botany/13 years experience
Paul Langowski	Fire and Fuels Management	B.S. Resource Management/36 years
Deb Ryon	Realty Specialist	B.S. Forest Management/28 years lands experience
Bart Lander	Rocky Mountain Regional Environmental Coordinator	BS, Forestry; MS Urban and Regional Planning; PhD, Forest Policy /19 years experience
David Loomis	Realty/Environmental Specialist	BA, Economics; MS Land Use Planning /41 years experience
Bill Janowsky	Fisheries	M.S. Degree/27 years
Peter McDonald	Threatened and Endangered Species / Wildlife	B.S. Wildlife Management, M.S. Wildlife Ecology/31 years experience
Hal Pearce	Invasive Species (Includes Aquatics)	B.S. Animal Science/15 years invasive species management
Shaina Shippen	Lands Special Uses Specialist	JD Environmental Law
Jeff Sorkin	Air Quality	M.S.E.S. Natural Resource Management, M.P.A., B.S. Conservation Biology, Zoology/19 years experience
Christopher Sporl	Recreation, Visual Resources	M.L.A./18 years with Forest Service
Jim Thinnes	Forest Vegetation (Includes Insects and Disease)	B.S. Natural Resources/34 years
Anne Marie Verde	Transportation	B.S. Forest Management/30 years
Karen Vyverberg	Hydrology and Watershed	PhD Geological Sciences /2 years experience
Molly Westby	Cultural Resources	B.A., M.A. Anthropology/17 years experience
Western Area Power Administration		
Matthew Blevins	NEPA Compliance Officer	B.S. Chemistry, M.S. Env. Engineering/24 years NEPA Project Coordination
Melissa Ardis	NEPA Document Manager	B.A., M.A., J.D./10 years NEPA Project Coordination

Table 4-1. Interdisciplinary Team Members and List of Preparers

Organization and Name	Resource/Role	Qualifications/ Years of Experience
Mark Wieringa	NEPA Specialist	B.S. Forestry, M.A. Geography/43 years NEPA experience
Cynthia Adornetto	NEPA Document Manager	B.S. Natural Resources Management; M.E.P.M./23 years NEPA experience
Jim Hartman	NEPA Document Manager	B.S., M.S. Biology/30 years NEPA Project Coordination
Daniel Borunda	Vegetation and Fleet Program Manager	B.S. Biology, M.S. Wildlife Science/22 years
Calvin H. Jennings	Archaeologist	B.A., M.A., Ph.D. Anthropology/40 years historic/heritage preservation
Tim Langer	Biologist	B.A. Biology, M.S. Fisheries and Wildlife Sciences, Ph.D. Zoology
Lisa Meyer	Archaeologist	B.A. and M.A. Cultural Anthropology/29 years cultural resources management and historic preservation experience
Stephen Tromly	Native American Liaison	M.A. Anthropology, Tribal Archaeologist/20 years Tribal experience
Ron Turley	Special Programs Manager, Vegetation Management Program Contact	B.A. Biology, M.S. Civil Engineering/31 years electric utility management
Neilie Goodwin	Vegetation Management Specialist	B.A., Biology, Natural Resources/25 years natural resource program implementation
Tri-State Generation and Transmission Association		
Diana Leiker	Senior Environmental Planner	M.S. Natural Resource Management/14 years environmental compliance and planning
Consultant – ICF International		
Madeline Terry	Project Manager	B.S. Wildlife Biology, B.B.A. Management/12 years
Lisa Sakata	Deputy Project Manager	B.A. Peace Studies/12 years
Joseph Walsh	GIS Specialist	B.A. Geography/17 years
Bill Baber	Wildlife	B.S., M.S. Biology, Ph.D. Wildlife Ecology/28 years
Joel Butterworth	Soils	B.A., M.S. Geography/26 years
Karen Crawford	Cultural Resources	B.A., M.A. Anthropology/17 years
Nicholas Dennis	Forest Health and Vegetation	B.S. Forest Science, M.S. Forest Economics, Ph.D. Wildland Resource Science/39 years
Rob Fetter	Environmental Justice	B.S., M.S. Resource Economics/13 years
Jay Haney	Air Quality	B.S., M.S. Meteorology/36 years
Tom Henry	Fire and Fuels Management	B.S. Natural Resource Management, M.S. Organizational Development and Career Counseling/39 years
Andy Herb	Wetlands/Riparian Areas/Floodplains	B.S. Earth Science, M.S. Environmental Science/13 years
David Holm	Surface Water	B.A. Biology, Masters of Public Health, Environmental Health-Water Quality/24 years

Table 4-1. Interdisciplinary Team Members and List of Preparers

Organization and Name	Resource/Role	Qualifications/ Years of Experience
Bill Knapp	Invasive Species, Rare Plants, Fisheries	B.S. Wildlife Management, M.S. Natural Resources Management/10 years
Kim Stevens	Transportation, Recreation	B.S. Geography/10 years
Jennifer Stock	Visual Resources	B.L.A. Landscape Architecture/14 years
Consultant – Elliott Environmental Consulting		
Brian Elliott	Botanist	M.S. Botany/14 years
Consultant – Rocky Mountain Ecological Services		
Eric Petterson	Ecologist	B.S. Wildlife Biology, M.S. Ecology/23 years
Consultant – PENDO Solutions		
Zach Perdue	GIS Analyst	15 years

B.B.A. Bachelor of Business Administration
B.A. Bachelor of Arts
B.L.A. Bachelor of Landscape Architecture
B.S. Bachelor of Science
M.E.P.M. Master of Environmental Policy and Management
M.L.A. Master of Landscape Architecture
M.P.A Master of Public Administration
M.S. Master of Science
M.S.E.S. Master of Science in Environmental Science
NEPA National Environmental Policy Act
Ph.D. Doctor of Philosophy

4.1.1 Contractor Disclosure Statement

Pursuant to 40 CFR 1506.5(c), ICF International, headquartered at 9300 Lee Highway, Fairfax, VA 22031, hereby certify that we have no financial or other interests in the execution or outcome of the proposed project identified in this EIS, nor any financial or other interests in other developments related to this vegetation management and transmission line maintenance project or to WAPA or the Forest Service; nor any financial or other interests in any requirements associated with the Proposed Action.

ICF prepared a draft Final EIS in 2014, however, that contract expired in 2014. Subsequently, this Final EIS was updated by USFS and WAPA personnel.

4.2 Federal, State, and Local Agencies Contacted

Table 4-2 lists the federal, state, and local agencies Western and the Forest Service consulted or contacted during the development of this EIS. Appendix F includes letters of consultation.

Table 4-2. Federal Agencies Contacted during Development of the Environmental Impact Statement

AGENCY/AFFILIATION • Name/Title, City, State
ANIMAL AND PLANT HEALTH INSPECTION SERVICE-WILDLIFE SERVICE • Michael Bodenchuk, Salt Lake City, Utah

Table 4-2. Federal Agencies Contacted during Development of the Environmental Impact Statement

AGENCY/AFFILIATION • Name/Title, City, State	
BUREAU OF INDIAN AFFAIRS	
• Superintendent, Towaoc, Colorado	• Superintendent, Fort Duchesne, Utah
BUREAU OF LAND MANAGEMENT	
• Field Manager, Montrose, Colorado • Field Manager, San Juan Field Office, Durango, Colorado, • Steve Bennett, Glenwood Springs Field Office, Glenwood Springs, Colorado • Thomas Fresques, Fisheries Biologist, Colorado River Valley Field Office, Silt, Colorado	• John Ruhs, Field Manager, Kremmling Field Office, Kremmling, Colorado • Mike Stiewig, Field Manager, Vernal Field Office, Vernal, Utah • Mark Mackiewicz, National Project Manager, Price, Utah
BUREAU OF RECLAMATION	
• Howard Bailey, Safety and Security Specialist, Eastern Colorado Office, Loveland, Colorado • Jerry Westbrook, Loveland, Colorado • Michael Francis, Durango, Colorado • Alan Christensen and David Krueger, Provo, Utah	• Beverly Heffernan, Environmental Protection, Provo, Utah • Reed Murray, Central Utah Project Completion Act Office, Provo, Utah • Dave Trueman, Director, Salt Lake City, Utah • Utah Reclamation Mitigation and Conservation Commission, Salt Lake City, Utah
ENVIRONMENTAL PROTECTION AGENCY	• Joe Cothern, National Environmental Policy Act Coordination Team Leader, Kansas City, Kansas
ENVIRONMENTAL PROTECTION AGENCY REGION 8, DENVER, COLORADO	
• Dana Allen, Department of Energy Reviewer • Cindy Cody, Chief, National Environmental Policy Act Team	• Larry Svoboda, National Environmental Policy Act Director • Wetland Coordinator
NATIONAL PARK SERVICE	
• Allan Loy, George San Miguel, and Marilyn Collier, Mesa Verde National Park, Mesa Verde, Colorado	• Mary Risser, Dinosaur National Monument, Dinosaur, Colorado
NATURAL RESOURCES CONSERVATION SERVICE	
• Natural Resources Conservation Service, Montrose, Colorado • Mike Rich, Cortez, Colorado • Sterling Moss, Durango, Colorado	• Robin Foulk, Chadron, Nebraska • Randall Julander, Snow Survey, Salt Lake City, Utah
REGION 10 LEAGUE FOR ECONOMIC ASSISTANCE AND PLANNING	• Leslie Jones, Montrose, Colorado
UNITED STATES AIR FORCE	
• Robert Heinrich, Contracting Officer, Schriever Air Force Base, Schriever, Colorado	• Tom Rokita, Contract Administrator, Air Force Academy, United States Air Force Academy, Colorado Springs, Colorado
UNITED STATES ARMY	
• Vince Guthrie, Utility Programs Manager, CEM, Director of Public Works, Fort Carson, Colorado Springs, Colorado	• Paul Helgar, Management Analyst, Pueblo Army Depot, Pueblo, Colorado
UNITED STATES ARMY CORPS OF ENGINEERS	
• Nathan Green and Nicholas Mezel, Colorado/Gunnison Basin Office, Grand Junction, Colorado	• Amy DeFreese and Jason Gipson, Utah Regulatory Office, Bountiful, Utah

Table 4-2. Federal Agencies Contacted during Development of the Environmental Impact Statement

AGENCY/AFFILIATION • Name/Title, City, State	
UNITED STATES DEPARTMENT OF THE INTERIOR	
• Robert Stewart, Regional Environmental Office, Denver, Colorado	• Mark Plank, Rural Utilities Service, Washington, D.C.
UNITED STATES FISH AND WILDLIFE SERVICE	
• Susan Linner, State Supervisor, Ecological Services, Denver, Colorado • Kurt Broderdorp and Al Pfister, Grand Junction, Colorado	• Ralph Swanson, Provo, Utah • Larry Crist, Utah Field Supervisor, West Valley City, Utah • Dave Irving, Vernal, Utah
UNITED STATES FOREST SERVICE	
• C. Lewellen, East Zone Fisheries Biologist, Dillon, Colorado • Jim Dunn, Delta, Colorado	• Jack Cohen, Research Physical Scientist, Missoula Fire Laboratory, Missoula, Montana
UNITED STATES GEOLOGICAL SURVEY	• Dave Grey, Conservation Division, Durango, Colorado

Table 4-3 lists the elected officials and state agencies that Western contacted during the development of this EIS.

Table 4-3. Elected Officials and State Agencies Contacted during Development of the Environmental Impact Statement

AGENCY/AFFILIATION • Name/Title, City, State	
Elected Officials	
UNITED STATES HOUSE OF REPRESENTATIVES	
• Congresswoman Diana DeGette, Colorado • Congressman Doug Lamborn, Colorado • Congressman Jared Polis, Colorado • Congressman Scott Tipton, Colorado	• Congressman Adrian Smith, Nebraska • Congressman Rob Bishop, Utah • Congressman Jason Chaffetz, Utah
UNITED STATES SENATE	
• Senator Mark Udall, Colorado • Senator Michael Bennet, Colorado • Senator Deb Fischer, Nebraska	• Senator Mike Johanns, Nebraska • Senator Orrin Hatch, Utah

Table 4-3. Elected Officials and State Agencies Contacted during Development of the Environmental Impact Statement

AGENCY/AFFILIATION • Name/Title, City, State	
STATE OF COLORADO HOUSE OF REPRESENTATIVES AGRICULTURE, NATURAL RESOURCES, AND ENERGY COMMITTEE, DENVER, COLORADO	
• Gail Schwartz, State Senator • Kevin Grantham, State Senator • Jeanne Nicholson, State Senator • Larry Crowder, State Senator • Rollie Heath, State Senator • Randy Baumgardner, State Senator • Ellen Roberts, State Senator • Steve King, State Senator • Perry Buck, State Representative • Diane Mitsch Bush, State Representative • Edward Vigil, State Representative	• Kevin Lundberg, State Representative Don Coram, State Representative • Leroy Garcia, State Representative • Claire Levy, State Representative • Jared Wright, State Representative • Mike McLachlan, State Representative • Millie Hamner, State Representative • Bob Rankin, State Representative • James Wilson, State Representative • Cheri Gerou, State Representative
STATE OF COLORADO HOUSE OF REPRESENTATIVES	
• Perry Buck, State Representative, Fort Collins, Colorado • Daniel Kagan, State Representative, Durango, Colorado	• Jeanne Labuda, State Representative, Denver, Colorado
STATE OF UTAH HOUSE OF REPRESENTATIVES	
• John G. Mathis, State Representative, Vernal, Utah • Rebecca D. Lockhart, State Representative, Provo, Utah	• Jeremy A. Peterson, State Representative, Ogden, Utah
STATE OF UTAH SENATE	• Jim Dabakis, State Senator, Salt Lake City, Utah
State Agencies	
COLORADO DEPARTMENT OF NATURAL RESOURCES	• Jim Martin, Denver, Colorado
COLORADO DEPARTMENT OF TRANSPORTATION	• Tony Cady, Durango, Colorado
COLORADO DIVISION OF WATER RESOURCES	• Cortez, Colorado
COLORADO NATURAL HERITAGE PROGRAM	• Peggy Lyon, Ridgway, Colorado
COLORADO NATURAL AREAS PROGRAM	• Brian Kurzel, Denver, Colorado
COLORADO PARKS AND WILDLIFE	
• Carry Carron, Bayfield, Colorado • Celia Greenman, Denver, Colorado • Chris Kloster, Durango, Colorado • Drayton Harrison, Durango, Colorado • Joe Lewandowski, Durango, Colorado • Lyle Sidener, Area Wildlife Manager, Hot Sulphur Springs, Colorado • Michael Warren, Land Use Specialist, Grand Junction, Colorado • Mike Reid, Pagosa Springs, Colorado	• Area Manager, Glenwood Springs, Colorado • Area Manager, Montrose, Colorado • Patt Dorsey, Area Manager, Durango, Colorado • Ron Velarde, North West Service Center, Grand Junction, Colorado • Scott Wait, Durango, Colorado • Tom Kroening, District Wildlife Manager, Silverthorne, Colorado • Tom Spezze, Regional Manager, SW Office, Durango, Colorado

Table 4-3. Elected Officials and State Agencies Contacted during Development of the Environmental Impact Statement

AGENCY/AFFILIATION • Name/Title, City, State	
COLORADO STATE FOREST SERVICE, DURANGO, COLORADO	• Dan Wand, Kent Grant, and Ron Cosineau, District Forester
COLORADO STATE UNIVERSITY, FRWS DEPARTMENT	• Dr. Bill Romme, Fort Collins, Colorado
CHADRON STATE PARK	• Dave Tinnamon, Superintendent, Chadron, Nebraska
DINOSAURLAND RESOURCE CONSERVATION AND DEVELOPMENT, ROOSEVELT, UTAH	
FORT ROBINSON STATE PARK, CRAWFORD, NEBRASKA	
NEBRASKA DEPARTMENT OF ENVIRONMENTAL QUALITY	
• Hugh Stirts, Small Business Public Assistant/NEPA Coordinator, Lincoln, Nebraska	• Nebraska Department of Environmental Quality, Chadron, Nebraska
NEBRASKA STATE FOREST SERVICE, CHADRON, NEBRASKA	
OFFICE OF ARCHITECTURE AND HISTORIC PRESERVATION, DENVER, COLORADO	• Shina duVall and Susan Collins, State Archaeologist • Dan Corson, Intergovernmental Services Director, Denver, Colorado
PUBLIC LANDS POLICY ANALYST	• Judy Edwards, Salt Lake City, Utah
STATE OF UTAH DIVISION OF WATER RIGHTS	• Bob Leake, Vernal, Utah
STATE OF UTAH TRUST LANDS ADMINISTRATION	• David Terry, Scott Robertson, and Tom Faddies, Salt Lake City, Utah
UPPER NIOBRARA WHITE NATURAL RESOURCES DISTRICT, CHADRON, NEBRASKA	
UTAH DEPARTMENT OF NATURAL RESOURCES	• Executive Director, Salt Lake City, Utah
UTAH DEPARTMENT OF TRANSPORTATION	• Tracy Conti, Orem, Utah
UTAH DIVISION OF DRINKING WATER	• Kate Johnson, Salt Lake City, Utah
UTAH DIVISION OF WATER QUALITY	• Shelly Quick, Salt Lake City, Utah
UTAH DIVISION OF WATER RESOURCES	• Todd Adams, Salt Lake City, Utah
UTAH DIVISION OF WILDLIFE RESOURCES	• Carolyn Wright, Salt Lake City, Utah
UTAH DIVISION OF WILDLIFE SERVICES	• Kevin Christopherson, Vernal, Utah
UTAH PUBLIC LANDS POLICY COORDINATOR	• Kelly Beck, Office of the Governor, Salt Lake City, Utah
UTAH STATE DEPARTMENT OF NATURAL RESOURCES	• Jerry Olds, Salt Lake City, Utah
UTAH STATE HISTORIC PRESERVATION OFFICE	• Jim Dykman, Salt Lake City, Utah
UTAH STATE PARKS AND RECREATION	• Charles VanGenderen, Salt Lake City, Utah
UTAH WILDLIFE FEDERATION	• Gerald Gordon, Salt Lake City, Utah

Tables 4-4 and 4-5 list the local agencies, including county and city agencies that were contacted during the development of this EIS.

Table 4-4. Counties Contacted during Development of the Environmental Impact Statement

COUNTY • Name/Title, City, State	
Colorado	
ARCHULETA COUNTY, PAGOSA SPRINGS, COLORADO	
• Administrator • Clifford Lucero, Commissioner	• Bob Moonmaw, Commissioner • John Ranson, Commissioner
BOULDER COUNTY, BOULDER, COLORADO	• Board of County Commissioners
CLEAR CREEK COUNTY, GEORGETOWN, COLORADO	• Board of County Commissioners
DOLORES COUNTY, DOVE CREEK, COLORADO	• Administrator
GARFIELD COUNTY, GLENWOOD SPRINGS, COLORADO	• Board of County Commissioners
GILPIN COUNTY, CENTRAL CITY, COLORADO	• Board of County Commissioners
GRAND COUNTY	
• Board of County Commissioners, Hot Sulphur Springs, Colorado	• Richard Bready, Department of Natural Resources, Granby, Colorado • Amy Sidner, Granby, Colorado
HINSDALE COUNTY, LAKE CITY, COLORADO	• Laurie Vierheller, Administrator
JACKSON COUNTY, WALDEN, COLORADO	• Board of County Commissioners
LA PLATA COUNTY, DURANGO, COLORADO	
• Kellie Hotter, Commissioner • Joelle Riddle, Commissioner • Planning Director	• Rod Cook, Weed Control • Wally White, Commissioner
LARIMER COUNTY, FORT COLLINS, COLORADO	
• Board of County Commissioners • Dale Miller, Director, Larimer County Road and Bridge Department	• Dennis Morton, Assistant Director, Larimer County Road and Bridge Department
MINERAL COUNTY, CREEDE, COLORADO	• Scott Lamb, Commissioner
MONTEZUMA COUNTY, CORTEZ, COLORADO	
• Administrator	• Ashton Harrison
MONTROSE COUNTY, MONTROSE, COLORADO	• Clair Baldwin, Noxious Weed Control
OURAY COUNTY, OURAY, COLORADO	• Ron Mabry, Noxious Weed Control
SAN JUAN COUNTY, SILVERTON, COLORADO	
• Bill Norman, Administrator	• Pete and Pat McKay, Commissioner
SAN MIGUEL COUNTY	
• Sheila Grother, Noxious Weed Control, Norwood, Colorado • Elaine Fischer, Commissioner, Telluride, Colorado • Joan May, Commissioner, Telluride, Colorado	• Dave Schneck, Environmental Health, Telluride, Colorado • Planning Department, Telluride, Colorado

Table 4-4. Counties Contacted during Development of the Environmental Impact Statement

COUNTY • Name/Title, City, State	
SUMMIT COUNTY	
• Steve Hill, Special Projects Manager, Breckenridge, Colorado • Dan Gibbs, County Commissioner, Breckenridge, Colorado	• Jim Curnutte, Planning Department, Frisco, Colorado
Nebraska	
DAWES COUNTY, CHADRON, NEBRASKA	
• Karl Dailey, Sheriff • Board of County Commissioners	• Becky Paulsen, Weed Superintendent
Utah	
DAGGETT COUNTY	
• Stewart Leith, County Commission Chair, Manila, Utah	• Brian Raymond, Daggett County Courthouse, Manila, Utah
DUCHESNE COUNTY	
• Board of County Commissioners, Duchesne, Utah • Ronald Johnson, Weed Control Department, Duchesne, Utah • Kirk Wood, Commissioner, Duchesne, Utah	• Ron Winterton, Commissioner, Duchesne, Utah • Irene Hansen, Economic Development, Roosevelt, Utah • Randy Crozier, Water Conservation District, Roosevelt, Utah
SALT LAKE COUNTY	• Harvey Shell, Fish and Game Association, Murray, Utah
SUMMIT COUNTY	• Chairperson, Board of County Commissioners, Coalville, Utah
UINTAH COUNTY, VERNAL, UTAH	
• Mark Raymond, Commissioner • Darlene Burns, Commissioner • Mike McKee, Commissioner • Mark Raymond, Commissioner	• Board of County Commissioners • Irvin Haws, Water Conservancy District • Scott Ruppe, Water Conservancy District • Drake Coltharp, Uintah County Public Lands
UTAH COUNTY, PROVO, UTAH	• Chairperson, Board of County Commissioners
WASATCH COUNTY	• Robert Riddle, Board of County Commissioners, Midway, Utah

Table 4-5. Cities Contacted during Development of the Environmental Impact Statement

CITY • Name/Title, City	
Colorado	
CITY OF ASPEN	• Phil Overeynder, Utility Director
CITY OF BURLINGTON	• Bob Hines, Public Works Director
CITY OF DELTA	• Fay Mathews, Utility Director
CITY OF FORT MORGAN	• Jeffrey Wells, City Administrator
CITY OF GLENWOOD SPRINGS	• Robin Millyard, Director of Public Works
CITY OF GUNNISON	• Ken Bradford, Director of Public Works
CITY OF HOLYOKE	• Mark Brown, City Superintendent
CITY OF MONTROSE	• Administrator
CITY OF RIFLE	• Administrator
CITY OF WRAY	• Stan Holmes, City Manager
CITY OF YUMA	• Doug Sanderson, City Manager
DURANGO FIRE AND RESCUE AUTHORITY	• Dan Noonan, Durango, Colorado
NORTHWEST COLORADO COUNCIL OF GOVERNMENTS	• Liz Mullen, Assistant Executive Director, Silverthorne, Colorado
RIDGEWAY-OURAY COMMUNITY COUNCIL	• Walter Rule
TOWN OF CENTER	• Jerry Atencio, Superintendent of Utilities
TOWN OF DOLORES	• Tommy Lux, Jr., Mayor
TOWN OF FLEMING	• Keith Beck, Town Superintendent
TOWN OF FREDERICK	• Nanette Fornos, Town Clerk
TOWN OF HAXTUN	• Lyle McBride, Town Superintendent
TOWN OF MOUNTAIN VILLAGE	• Administrator
TOWN OF OAK CREEK	• Melissa Sever, Public Works Director
TOWN OF OPHIR	• Administrator
TOWN OF OURAY	• Administrator
TOWN OF RICO	• Joe Croke, Mayor
TOWN OF SILT	• Administrator
TOWN OF SILVERTON	• Administrator
TOWN OF TELLURIDE	• Administrator
Nebraska	
CITY OF ALLIANCE	• Pam Caskie, City Manager
CITY OF BAYARD	• Michelle Fries, City Clerk/Treasurer
CITY OF CHADRON	
• Donny Grantham, Mayor	• Pat Gould, Chief, Chadron Volunteer Fire Department

Table 4-5. Cities Contacted during Development of the Environmental Impact Statement

CITY • Name/Title, City	
CITY OF CRAWFORD	• Fire Chief, Volunteer Fire Department
CITY OF SIDNEY	• John Hehnke, Public Service Director
VILLAGE OF LODGEPOLE	• Eianne Born, Mayor
VILLAGE OF MULLEN	• Leonard Phillips, Chairman of the Board
VILLAGE OF WAUNETA	• Bill Bischoff, Utilities Superintendent
Utah	
CITY OF VERNAL	• Ken Bassett
TOWN OF MANILA	
• Charles Dickison, Mayor	• Town Council
TOWN OF TABIONA	• Dennis Jones
UINTAH CITY - VERNAL ECONOMIC DEVELOPMENT	• Bill Johnson, Vernal

Table 4-6 lists other entities contacted during the development of this EIS.

Table 4-6. Other Entities Contacted during Development of the Environmental Impact Statement

AFFILIATION • Name/Title, City, State	
TSS CONSULTANTS	• Tad Mason, Chief Executive Officer, Rancho Cordova, California
VOLCANIC LEGACY INFORMATION CENTER	• Joanna Steele

4.3 Tribes

Western contacted the following forty-four Native American Tribes to initiate government-to-government consultation and invite the tribes to participate in project review and consultation under NHPA and NEPA.

- Apache Tribe of Oklahoma
- Cheyenne and Arapaho Tribes of Oklahoma
- Cheyenne River Sioux Tribe
- Comanche Nation of Oklahoma
- Crow Creek Sioux Tribe
- Eastern Shoshone
- Fort Peck Assiniboine Sioux Tribe
- Hopi Tribe
- Jicarilla Apache Nation
- Kiowa Tribe of Oklahoma
- Lower Brule Sioux Tribe
- Navajo Nation
- Northern Arapaho Tribe
- Northern Cheyenne Tribe
- Oglala Sioux Tribe
- Ohkay Owingeh (Pueblo of San Juan)

- Pawnee Nation of Oklahoma
- Pueblo de Cochiti
- Pueblo of Acoma
- Pueblo of Isleta
- Pueblo of Jemez
- Pueblo of Laguna
- Pueblo of Nambe
- Pueblo of Picuris
- Pueblo of Pojoaque
- Pueblo of San Felipe
- Pueblo of San Ildefonso
- Pueblo of Sandia
- Pueblo of Santa Ana
- Pueblo of Santa Clara
- Pueblo of Santo Domingo
- Pueblo of Taos
- Pueblo of Tesuque
- Pueblo of Zia
- Rosebud Sioux Tribe
- Santee Sioux Tribe of Nebraska
- Shoshone-Bannock Tribes
- Southern Ute Indian Tribe
- Standing Rock Sioux Tribe
- Ute Indian Tribe (Uintah & Ouray Reservation)
- Ute Mountain Ute Tribe
- Wichita & Affiliated Tribes
- Ysleta del Sur Pueblo
- Zuni Tribe of the Zuni Reservation

4.4 Draft EIS Distribution List

This section identifies those who were sent a copy or notification of the availability of the Draft EIS.

4.4.1 Federal, State, and Local Agencies and Officials, and Project Partners

Table 4-7 identifies the federal and state agencies and officials and project partners who were sent a notification of the Draft EIS. A public notice with a project overview and related information (contact information, where to review the document or request a CD, etc.) and a Web link to download the Draft EIS was mailed to federal, state, and local agencies and officials as identified in Appendix G.

Table 4-7. Federal, State, and Local Agencies and Officials, and Project Partners Mailed a Copy of the Draft Environmental Impact Statement

Name, Title	Affiliation
Federal Elected Officials	
Senator Michael Bennet	U.S. Senate, Colorado
Senator Mark Udall	U.S. Senate, Colorado
Senator Deb Fischer	U.S. Senate, Nebraska
Senator Mike Johanns	U.S. Senate, Nebraska
Senator Orrin Hatch	U.S. Senate, Utah
Representative Diana DeGette	U.S. House of Representatives, Colorado
Representative Jared Polis	U.S. House of Representatives, Colorado
Representative Scott Tipton	U.S. House of Representatives, Colorado
Representative Doug Lamborn	U.S. House of Representatives, Colorado

Table 4-7. Federal, State, and Local Agencies and Officials, and Project Partners Mailed a Copy of the Draft Environmental Impact Statement

Name, Title	Affiliation
Representative Adrian Smith	U.S. House of Representatives, Nebraska
Representative Rob Bishop	U.S. House of Representatives, Utah
Representative Jason Chaffetz	U.S. House of Representatives, Utah
State Elected Officials	
Governor John Hickenlooper	Governor of Colorado
Governor Dave Heineman	Governor of Nebraska
Governor Gary Herbert	Governor of Utah
Federal Agencies	
Ms. Carol Borgstrom, Director	U.S. Department of Energy, Office of NEPA Policy and Compliance
Dr. Willie R. Taylor, Director	U.S. Department of the Interior, Office of Environmental Policy and Compliance
Mr. Larry Shepard	U.S. Environmental Protection Agency Region 7, ENSV-NEPA Team
Ms. Suzanne Bohan, Program Director	U.S. Environmental Protection Agency Region 8, NEPA Compliance and Review Program
Mr. Doug Laye, Region 6 Section 7 Coordinator	U.S. Fish and Wildlife Service
Mr. Kurt Broderdorp	U.S. Fish and Wildlife Service
Mr. Larry Crist, Utah Field Supervisor	U.S. Fish and Wildlife Service
Mr. Dave Irving	U.S. Fish and Wildlife Service
Ms. Susan Linner, Colorado Field Supervisor	U.S. Fish and Wildlife Service
Ms. Patty Gelatt, Asst. Field Supervisor, Colorado	U.S. Fish and Wildlife Service
Mr. Michael George, Nebraska Field Supervisor	U.S. Fish and Wildlife Service
State Agencies	
Mr. Rick Cables, Director	Colorado Parks and Wildlife
Mr. Mark Spurgin, Commissioner	Nebraska Game and Parks
Northwest District Office	Nebraska Game and Parks
Northeastern Region, Vernal	Utah Division of Wildlife Resources
Project Partner	
Ms. Diana Leiker, Senior Environmental Planner	Tri-State Generation and Transmission Association

4.4.2 Individuals Sent Copies of the Draft Environmental Impact Statement

No individuals requested a copy of the Draft EIS. A hard copy of the Draft EIS was available for public review at the forest headquarters of the Arapaho-Roosevelt National Forests, Ashley National Forest, Grand Mesa, Uncompahgre, and Gunnison National Forests, Medicine Bow-Routt National Forests, Nebraska National Forest, Pike and San Isabel National Forests, San Juan National Forest, and White River National Forest. In addition, the Draft EIS was posted on the project website.

The public notice was mailed to over 800 individuals on the project mailing list. The mailing list includes tribal contacts, individuals on the Forest Service schedule of proposed actions (SOPA) list, individuals that provided scoping comments, and other stakeholders.

4.5 Final EIS Distribution List

This section identifies those who were sent a copy or notification of the availability of the Final EIS.

4.5.1 Federal, State, and Local Agencies and Officials, and Project Partners

No individuals requested a copy of the Final EIS. A hard copy of the Final EIS is available for public review at the forest headquarters of the Arapaho-Roosevelt National Forests, Ashley National Forest, Grand Mesa, Uncompahgre, and Gunnison National Forests, Medicine Bow-Routt National Forests, Nebraska National Forest, Pike and San Isabel National Forests, San Juan National Forest, and White River National Forest. In addition, the Final EIS is posted on the project website at: https://www.wapa.gov/transmission/EnvironmentalReviewNEPA/Pages/vegetation-management.aspx.

A public notice was mailed to over 700 individuals on the project mailing list. The mailing list includes tribal contacts, individuals on the Forest Service schedule of proposed actions (SOPA) list, individuals that provided scoping comments, and other stakeholders, as noted in Appendix G.

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