BLM

DRAFT ENVIRONMENTAL ASSESSMENT

Herbicide Use within Authorized Power Line Rights-of-Way on Bureau of Land Management Lands in Arizona

DOI-BLM-AZ-P000-2017-0001-EA

NATIONAL SYSTEM OF PUBLIC LANDS
U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SEPTEMBER 2017

Herbicide Use within Authorized Power Line Rights-of-Way on Bureau of Land Management Lands in Arizona

DRAFT
ENVIRONMENTAL ASSESSMENT

DOI-BLM-AZ-P000-2017-0001-EA

U.S. Department of the Interior
Bureau of Land Management
Phoenix District Office
21605 North 7th Avenue
Phoenix, Arizona 85027
623-580-5500

September 12, 2017

It is the mission of the Bureau of Land Management to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.

DOI-BLM-AZ-P000-2017-0001-EA

CONTENTS

APPENDICES

LIST OF TABLES

LIST OF FIGURES

LIST OF PHOTOGRAPHS

LIST OF ACRONYMS AND ABBREVIATIONS

ACEC	Area of Critical Environmental Concern
ADEQ	Arizona Department of Environmental Quality
ADOT	Arizona Department of Transportation
ADWR	Arizona Department of Water Resources
AGFD	Arizona Game and Fish Department
ANSI	American National Standards Institute
APE	area of potential effect
APS	Arizona Public Service Company
ARPA	Archaeological Resources Protection Act of 1979
ATV	all-terrain vehicle
AZPDES	Arizona Pollution Discharge Elimination System
BA	Biological Assessment
BGEPA	Bald and Golden Eagle Protection Act
BLM	Bureau of Land Management
BLS	Below Land Surface
BMP	best management practices
CESA	cumulative effects study area
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CWA	Clean Water Act
DFZ	District Fire Zone
DSAP	defensible space around poles
EA	environmental assessment
EPA	Environmental Protection Agency
ESA	Endangered Species Act of 1973
FERC	Federal Energy Regulatory Commission
FLPMA	Federal Land Policy and Management Act of 1976
GIS	Geographic Information System
HDMS	Heritage Data Management System
HUC	Hydrologic Unit Code
IBA	Important Bird Area
INA	Irrigation Non-Expansion Area
IVM	integrated vegetation management
kV	kilovolt
MBTA	Migratory Bird Treaty Act
MVCD	minimum vegetation clearance distance
NEPA	National Environmental Policy Act
NERC	North American Electric Reliability Corporation
NHD	National Hydrography Dataset
NHPA	National Historic Preservation Act of 1966
NHT	National Historic Trail

NLCS	National Landscape Conservation System
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRT	National Recreation Trail
NST	National Scenic Trail
NWI	National Wetlands Inventory
OHV	Off-Highway Vehicle
PA	Programmatic Agreement
PCE	Primary Constituent Element
PEIS	Programmatic Environmental Impact Statement
PER	Programmatic Environmental Report
PGP	Pesticide General Permit
PRC	Protection and Control
PUP	Pesticide Use Proposal
RMP	Resource Management Plan
ROD	Record of Decision
ROW	Right-of-Way
SDWA	Safe Drinking Water Act
SHPO	State Historic Preservation Office
SOP	Standard Operating Procedure
SRP	Salt River Project Agricultural Improvement and Power District
SSA	Sole Source Aquifer
THPO	Tribal Historic Preservation Officer
U.S.	United States
USC	United States Code
USDA	United States Department of Agriculture
USDI	U.S. Department of the Interior
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

PAGE INTENTIONALLY LEFT BLANK

CHAPTER 1
PURPOSE AND NEED

1.1 Introduction

The Arizona Public Service Company (APS) and Salt River Project Agricultural Improvement and Power District (SRP) are responsible for managing vegetation within their respective utility authorized rights-of-way (ROW)[1] in Arizona. In accordance with the following electrical system standards and regulations, APS and SRP must manage vegetation to protect electrical distribution[2] and transmission[3] lines, to provide reliable energy delivery, to maintain access to the lines, to ensure the safety of the public and electrical workers, and to protect environmental resources:

- 2012 National Electrical Safety Code (Institute of Electric and Electronics Engineers 2011)
- Federal Energy Regulatory Commission's (FERC's) Order 785 (FERC 2013)
- North American Electric Reliability Corporation's (NERC's) standards: Transmission Vegetation Management FAC-003-4 (2016) and Protection and Control (PRC) standard PRC-005-01 (2006)

The Bureau of Land Management (BLM) administers approximately 12.20 million surface acres in Arizona. Collectively, APS and SRP (Utilities) have approximately 1,029.23 miles of existing distribution and transmission lines crossing BLM-managed lands (approximately 11,534.99 acres[4] of ROW)[5] in three of the four BLM district offices. The ROW represents approximately 0.12 percent of the 9.4 million acres managed within the BLM Colorado River, Gila, and Phoenix district offices (Table 1-1; Figure 1-1 through Figure 1-8).

Currently, as part of the BLM ROW authorizations the terms and conditions allow the Utilities to use manual and mechanical vegetation treatment methods, such as masticators (mowers, chippers, or brushcutters) and chainsaws, on BLM-managed lands. The Utilities are proposing to use a targeted application of BLM-approved herbicides in addition to existing vegetation treatment methods within the ROWs. The introduction of herbicides to the Utilities' tools would assist with the reduction and control of incompatible vegetation[6] within ROWs to ensure the delivery of safe and reliable electricity to the public.

[1] The term ROW in this document refers to an area that is authorized and granted to the Utilities for the purpose of operating and maintaining electrical power line infrastructure.

[2] Distribution lines are lower in voltage and a generic term for a distribution voltage (2,400 volts to 35,000 volts) line that carries power from a substation to end users such as a residence or business. These lines may be overhead or underground and are part of a network that typically includes medium-voltage power lines, substations, pole-mounted transformers, low-voltage distribution wiring, and meters.

[3] Transmission lines are high-voltage lines that carry electricity over long distances, such as from a power plant to a city, or from a substation to a city. They are generally high voltage and are placed on physically tall structures. A transmission line is a bare uninsulated high-voltage (69,000 volts to 500,000 volts) overhead line, usually strung from steel towers or tall wood poles. The Utilities also use steel mono poles along with steel lattice towers and wood poles.

[4] The numerical values in this environmental assessment (EA), including those provided in tables, are shown to two decimal places. The data used to generate the values was maintained to six decimal places in order to capture small values in the analysis. In the EA tables, the resultant outputs are rounded to two decimal places to make the values readable; therefore, totals and subtotals found in the tables may not appear to sum precisely.

[5] The width of the ROW can vary from 10 feet to 230 feet depending on the voltage category, the type of structure, physical constraints, and whether or not parallel lines are present. Calculations for ROW and line miles on BLM-managed lands included areas that are jointly managed by BLM and Bureau of Reclamation and BLM and U.S. Fish and Wildlife Service (USFWS). These jointly-managed areas have been removed from the ROW and analysis but not from the mile and acre calculations found in this EA and associated tables. The jointly-managed land includes 7.94 miles and 192.49 acres of ROW in Yuma Field Office, and 1.89 miles and 45.88 acres of ROW in Tucson Field Office. The USFWS area is located in the Bill Williams Wildlife Refuge and contains 1.83 miles and 4.44 acres of ROW maintained by APS.

[6] Incompatable vegetation is defined in this EA as plants under, above, and near power lines that could disrupt the safe, reliable, and continuous delivery of electricity to the Utilities' customers.

This environmental assessment (EA) is a project-specific analysis of the potential impacts of the Proposed Action to use BLM-approved herbicides within the existing ROW on BLM-managed lands in Arizona. The project area for this EA is defined as the ROW and the two terms are used synonymously throughout the EA. This EA tiers to the Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement (2007 Herbicides Programmatic Environmental Impact Statement [PEIS]) (BLM 2007a) and the Final Programmatic Environmental Impact Statement for Vegetation Treatments Using Aminopyralid, Fluroxypyr, and Rimsulfuron on Bureau of Land Management Lands in 17 Western States (2016 Herbicides PEIS) (BLM 2016a), which are discussed in Sections 1.7.1 and 1.7.2, respectively.

Table 1-1. Miles of Electrical Lines and Acres of ROW

BLM Field Office	Total Acres within Field Office	Total Miles of Electrical Lines within ROW	Total Acres[a] of ROW	Percent of BLM-managed Acres[b]
Kingman	2,471,743.58	36.52	880.16	0.04
Lake Havasu	1,307,801.99	108.28	309.30	0.02
Yuma	1,236,393.05	223.26	2,302.89	0.19
Safford	1,398,001.01	31.16	341.23	0.02
Tucson	642,205.15	65.45	810.26	0.13
Hassayampa	971,580.00	201.60	2,212.00	0.23
Lower Sonoran	1,416,429.94	362.96	4,679.14	0.33
Total	9,444,154.72	1,029.23	11,534.99	0.12

Source: Public Land Ownership, Arizona Land Resource Information Service, October 2014.

[a] The acreage in this table represents a calculated total acreage for the Utilities (calculations provided in April 2016).

[b] The percentage of the acres of ROW is in reference to the total managed acres within each BLM field office. For example, the Kingman Field Office consists of 2,471,743.58 acres of land managed by BLM. There are 880.16 acres of ROW containing the Utilities' electrical lines within the Kingman Field Office. The 880.16 acres of ROW represents 0.04 percent of the total lands managed within this Field Office.

.

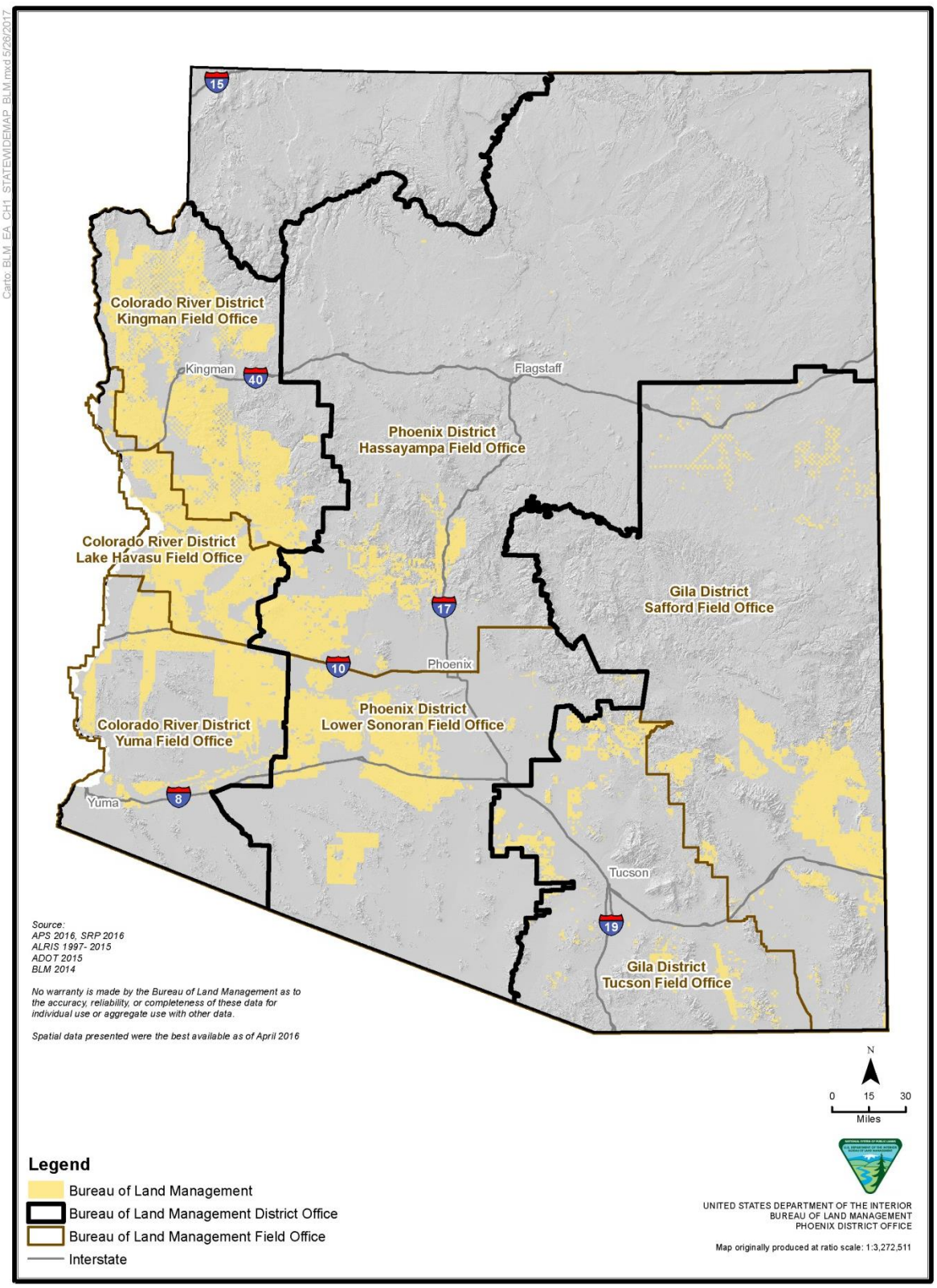


Figure 1-1. BLM Colorado River, Gila, and Phoenix District Offices and associated Field Offices

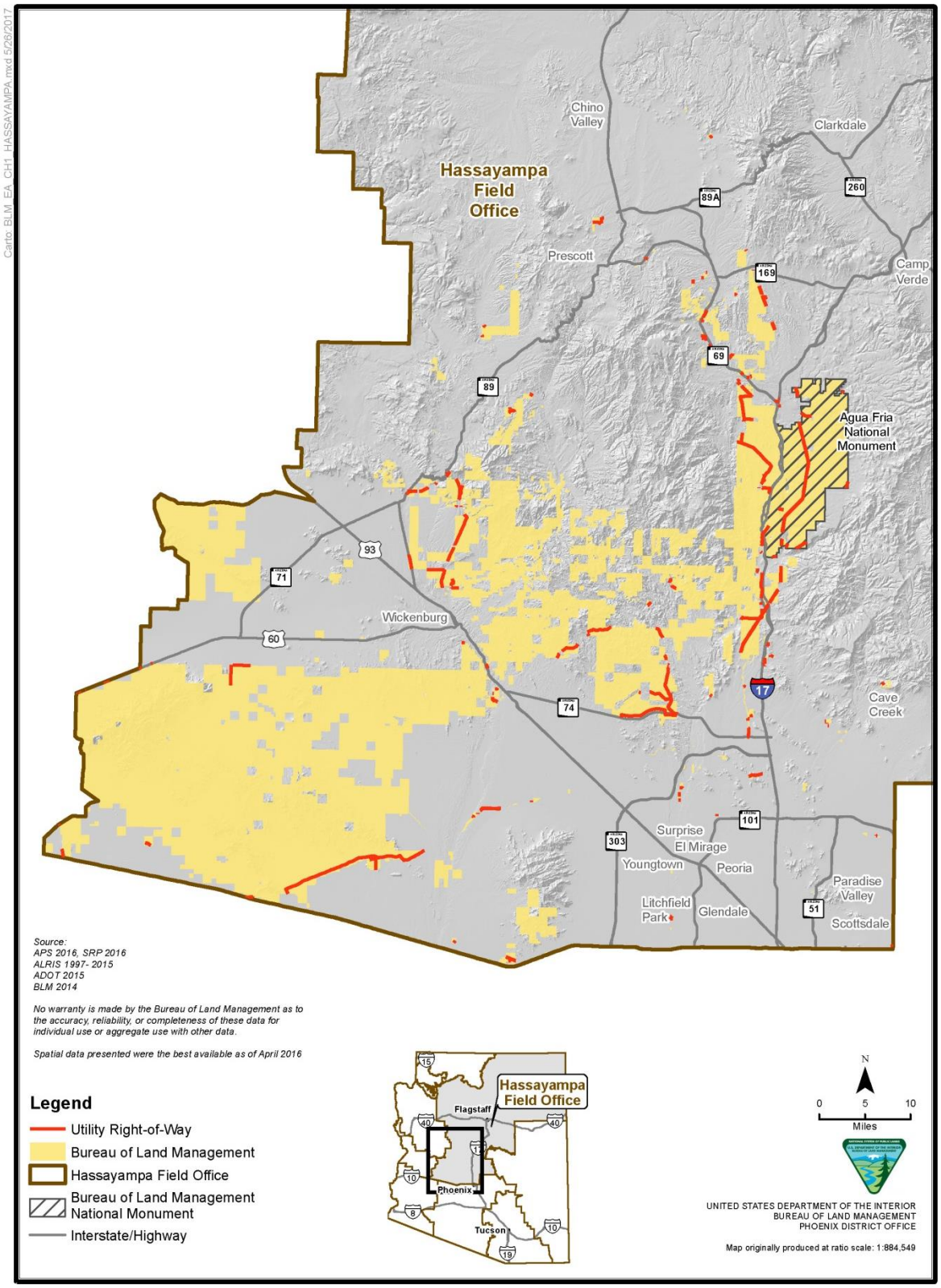


Figure 1-2. ROW within the Hassayampa Field Office

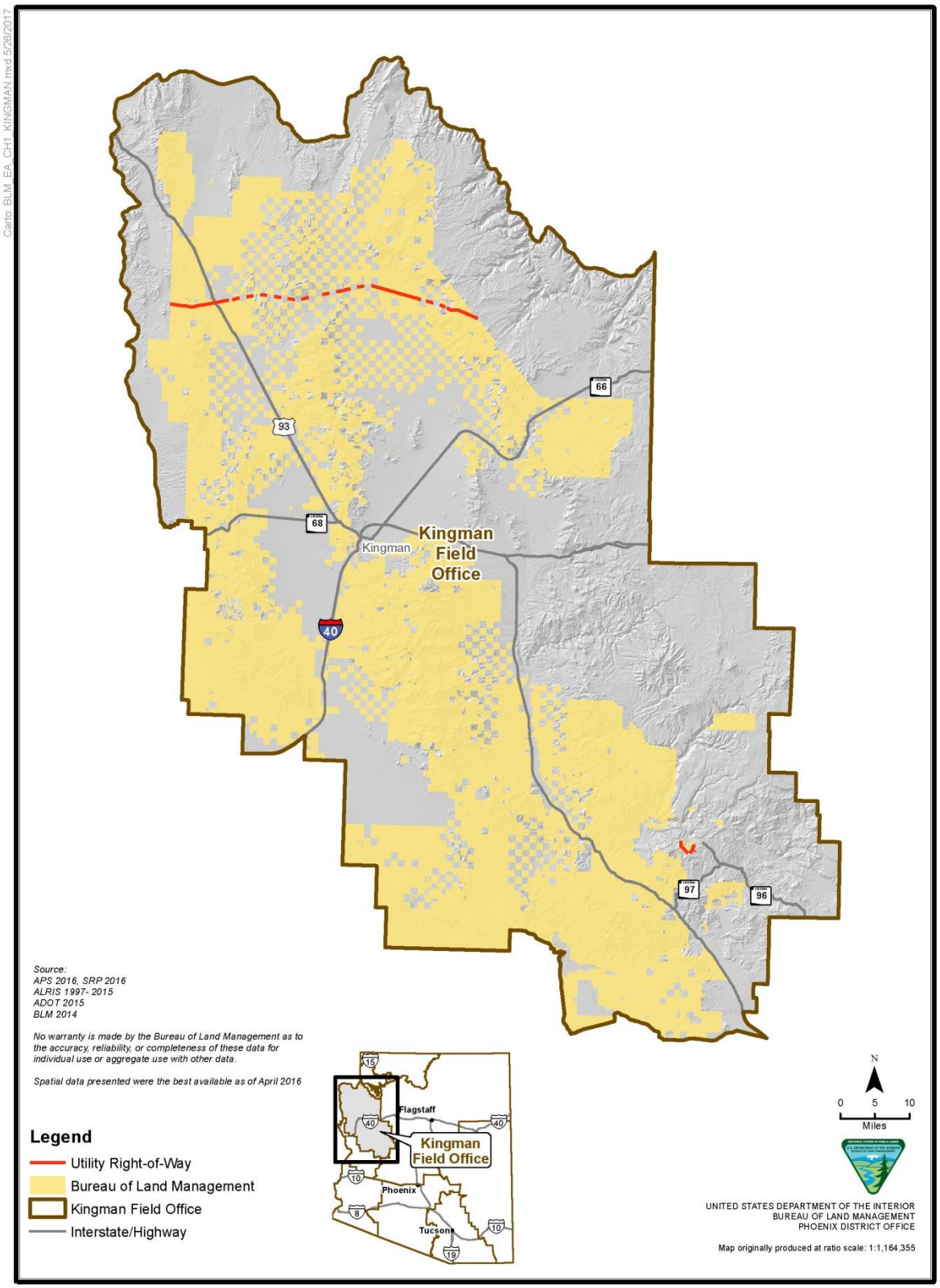


Figure 1-3. ROW within the BLM Kingman Field Office

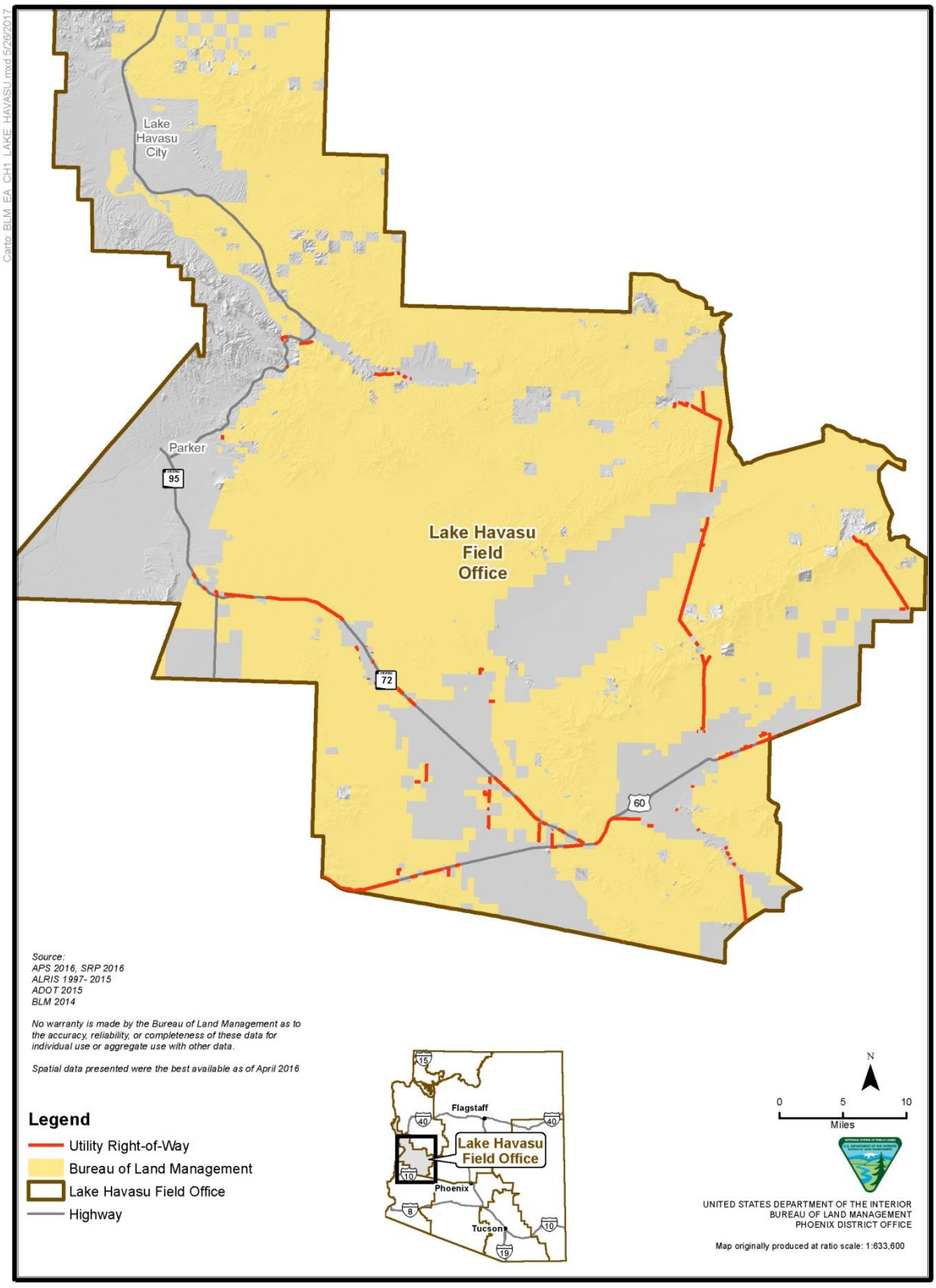


Figure 1-4. ROW within the BLM Lake Havasu Field Office

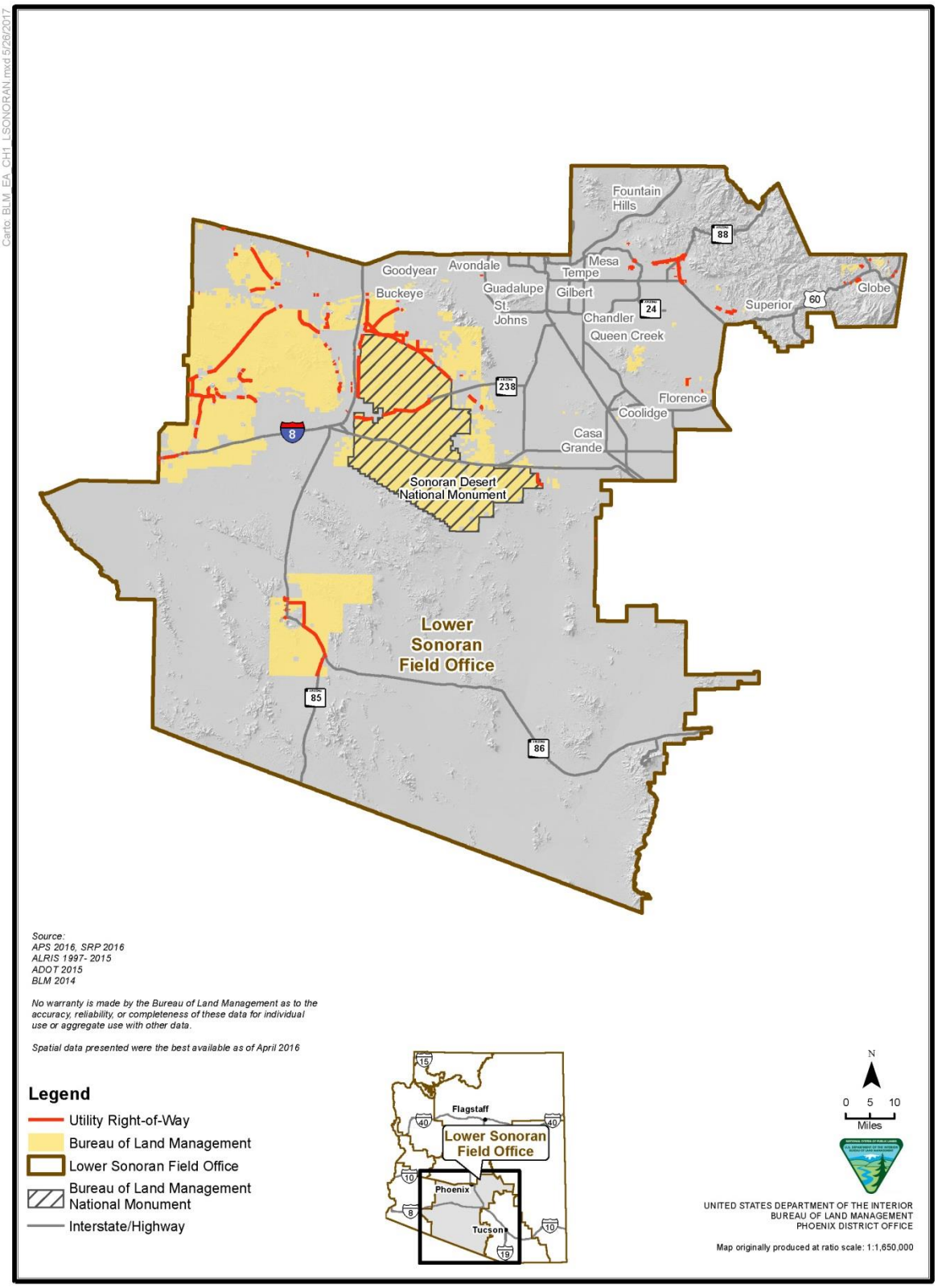


Figure 1-5. ROW within the BLM Lower Sonoran Field Office

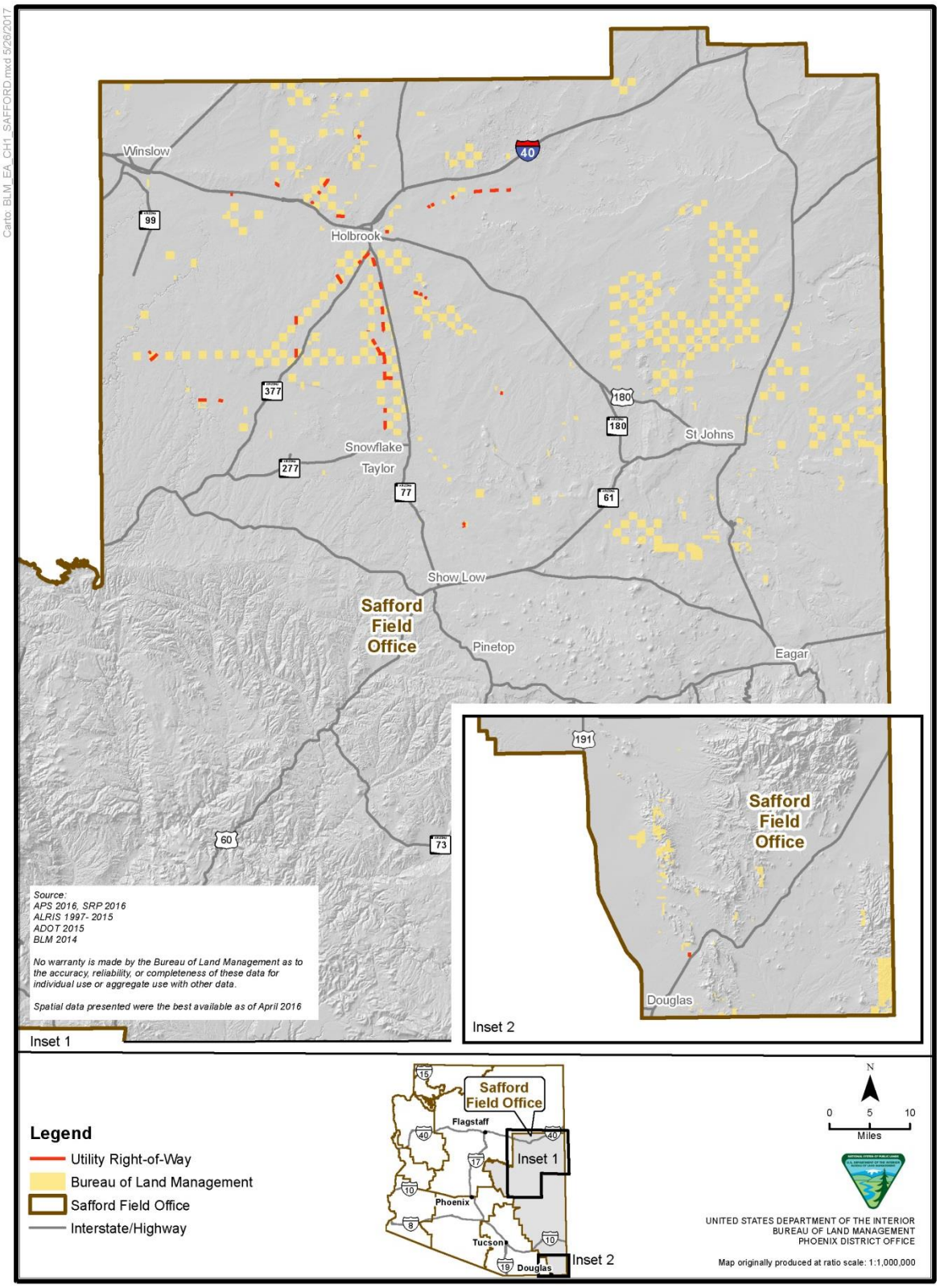


Figure 1-6. ROW within the BLM Safford Field Office

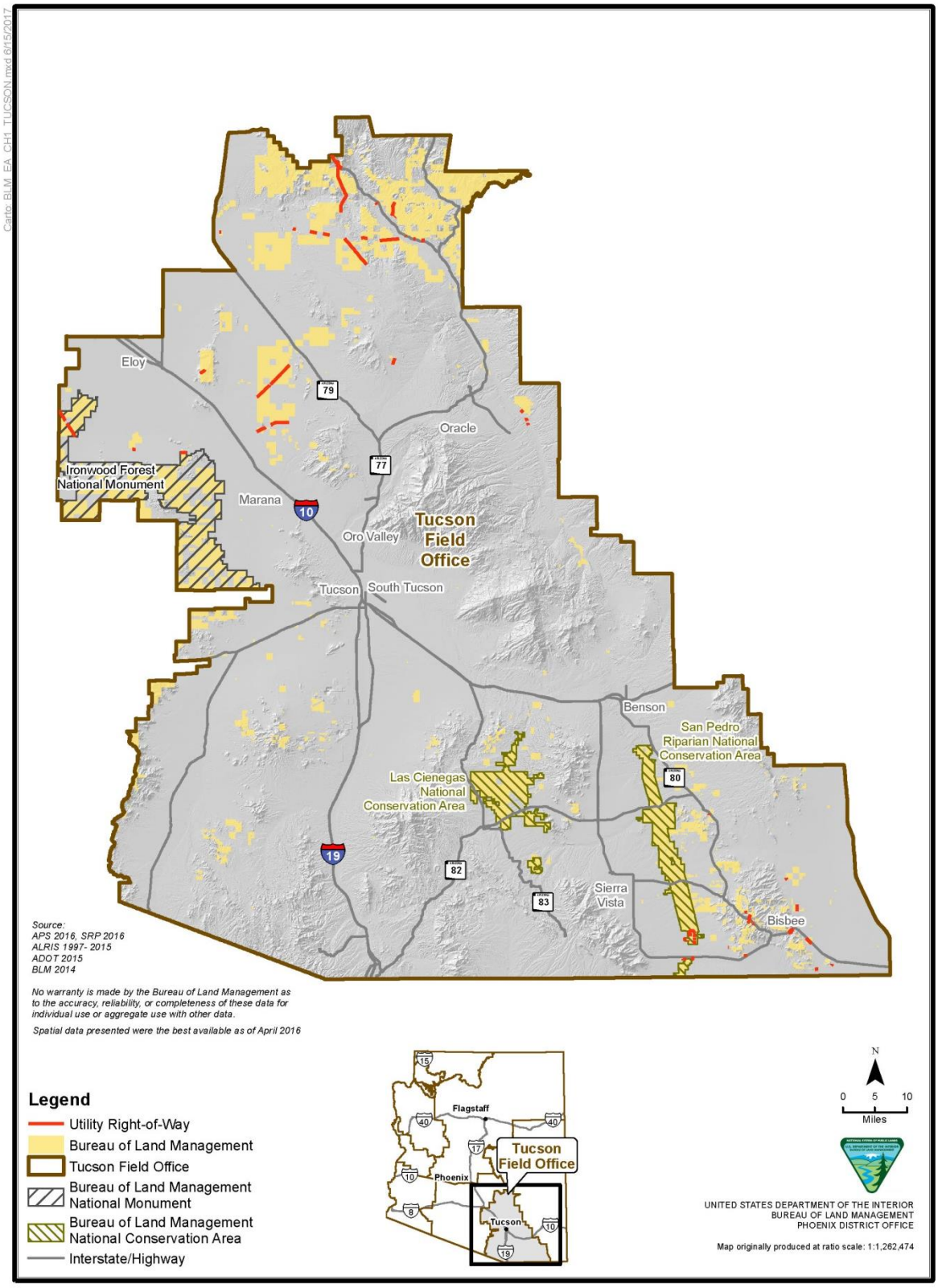


Figure 1-7. ROW within the BLM Tucson Field Office

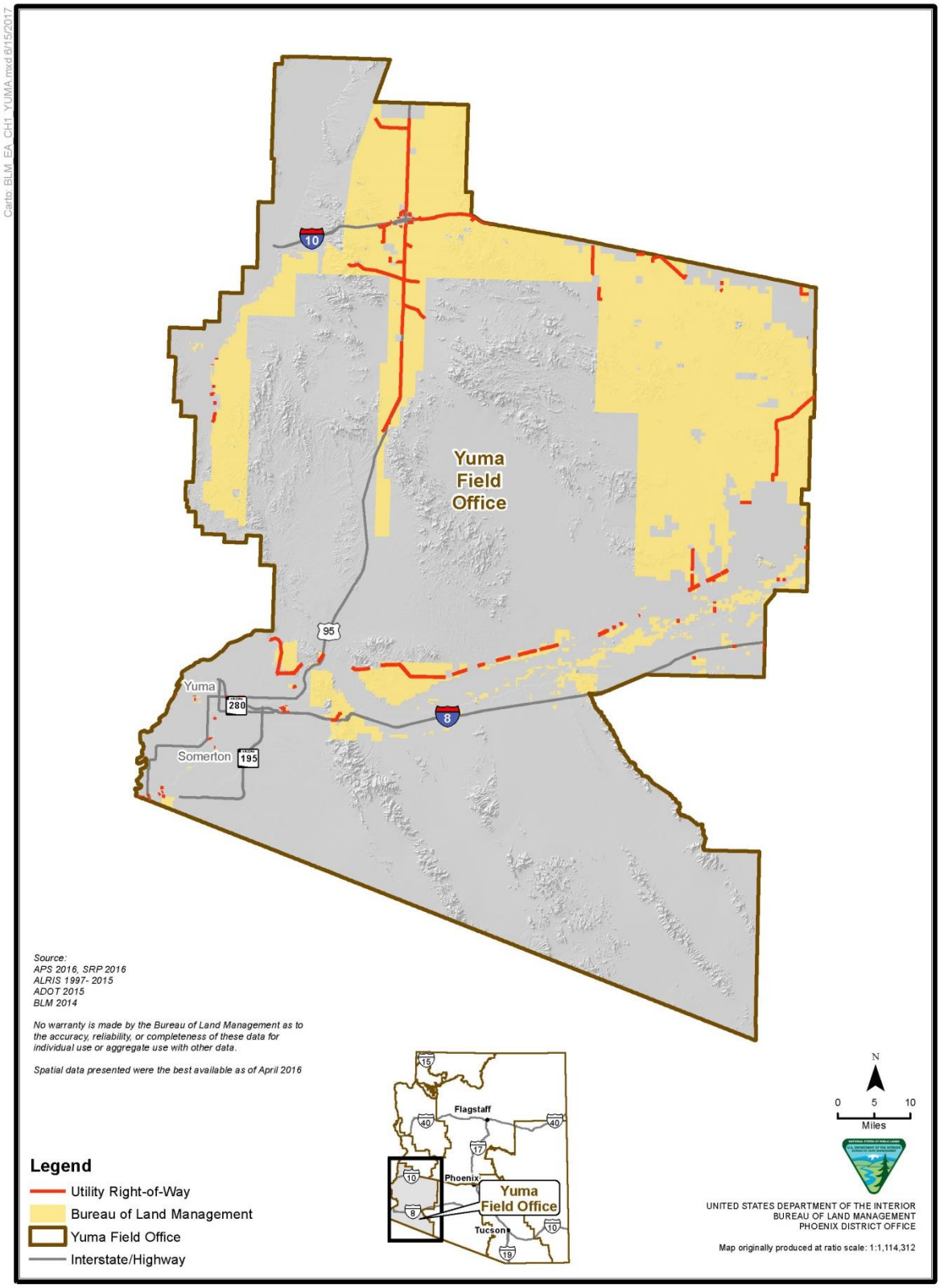


Figure 1-8. ROW within the BLM Yuma Field Office

1.2 Background

Vegetation interference with electrical distribution and transmission lines is one of the most common causes of electrical power outages throughout the United States (U.S.). Outages can occur when vegetation and overhead power lines become too close to each other as a result of vegetation growth; increased electrical loads, which can cause lines to sag and make contact with vegetation; and/or changes in ambient conditions such as increased air temperature or wind speed. Vegetation within power line ROWs has been implicated in large-scale electric grid failures in the U.S. and Canada, including a 2003 blackout that affected an estimated 50,000,000 people in eight states and two Canadian provinces (NERC 2004). Additionally, unmanaged vegetation within ROWs can be more susceptible to wildfire and crowd out native species. Herbicide use can be an important tool to help achieve multiple resource management goals, such as improving biological diversity and ecosystem functions in addition to fulfilling utility company responsibilities.

Recognizing the importance of reliable electric service, the U.S. Congress made provisions for electric system reliability standards, including vegetation management, in the Energy Policy Act of 2005 (Public Law 109-58, Section 1211, Electric Reliability Standards). Under this act, Congress specified that federal land management agencies responsible for approving ROWs for electrical transmission or distribution facilities on federal lands must expedite any approvals necessary to allow the owners or operators of such facilities to comply with reliability standards that pertain to vegetation management, electric service restoration, or resolution of situations that imminently endanger the reliability or safety of the facilities. The FERC, in accordance with the Energy Policy Act, has outlined legally enforceable electric energy reliability standards to protect the transmission grid and has established requirements for maintaining equipment and ROWs, including vegetation management (FERC 2007).

In addition to vegetation interference, wildfires fueled by vegetation within the ROW can be another cause of power outages. In recent years, the severity and intensity of wildfires have dramatically increased partly due to increases in incompatible vegetation identified as hazardous fuels. In response to increased wildfire risks, the President and Congress have directed the U.S. Department of the Interior (USDI) and BLM, through implementation of the 2000 National Fire Plan (USDI and U.S. Department of Agriculture 2000) and the Healthy Forests Restoration Act of 2003, to take more aggressive actions to reduce catastrophic wildfire risk on public lands. The actions are intended to protect life and property and to manage vegetation in a manner that provides for long-term economic sustainability of local communities and vegetation conditions for public land uses. Maintenance of ROW vegetation reduces risks of wildland fires and fulfills objectives of the 2000 National Fire Plan and the Healthy Forests Restoration Act.

The 2008 Integrated Vegetation Management Handbook (H-1740-2; BLM 2008b) states the BLM's approach to vegetation management is to improve biological diversity and ecosystem function, as well as to promote and maintain native plant communities that are resilient to disturbance and invasive species. Healthy, functioning plant communities enhance the ability to attain a sustainable level of social and economic benefits on public land. Ultimately, the ROW should include a diverse mixture of native grasses, low-growing shrubs, and other ground cover to promote a thriving wildlife habitat. Well-managed corridors can therefore provide food and cover for wildlife, in addition to their primary function of providing safe and reliable electric service.

The Utilities are committed to implementing integrated vegetation management (IVM) using industry best management practices (BMPs) (American National Standards Institute [ANSI] 2006; Miller 2013) while maintaining compliance with NERC Reliability Standard FAC-003-4. The IVM approach systematically selects, implements, and monitors different types of vegetation treatment methods[7] in order to manage plant

[7] Methods may include manual, mechanical, cultural, biological, and chemical methods, or a combination therof, to assists with the control of incompatible vegetation.

communities to achieve established objectives. This management approach uses a variety of methods to promote sustainable plant communities that are compatible with the intended use of the Utilities ROW and to discourage or prevent the establishment of incompatible vegetation that may pose increased fire or other safety hazards in the ROWs. "Incompatible vegetation" is defined in this EA as plants under, above, and near power lines that could disrupt the safe, reliable, and continuous delivery of electricity to the Utilities' customers.

According to a 2014 Presidential Memorandum issued by President Barack Obama, the Utilities' ROWs should provide the opportunity to establish healthy, effective pollinator populations that help native plants to reproduce, thereby creating sustainable plant communities as supported by IVM. Pollinators, which are considered ecological keystones, are defined here as insects (including honey bees), birds, and some mammals that transfer pollen from one flower to another (Peterson et al. 2015). President Obama issued the memorandum on June 20, 2014 to direct the creation of a federal strategy for protecting pollinators (June 24, 2014; 79 Federal Register 35901). The June 20, 2014, Presidential Memorandum directs federal land management agencies to evaluate permits and practices within ROWs and make any necessary changes to enhance pollinator habitat through the use of IVM practices.

The Utilities do not currently use herbicides to maintain vegetation in their ROWs on BLM-managed lands in Arizona. Instead the Utilities use a combination of mechanical and manual methods to remove incompatible vegetation. The Utilities conduct regularly scheduled inspections of the electrical distribution and transmission systems to monitor any ROW encroachments from incompatible vegetation. Depending on vegetation growth rates, each ROW is mechanically or manually treated approximately every one to five years.

The Utilities are proposing to use selected BLM-approved herbicides in combination with currently authorized mechanical and manual treatments. The use of herbicides would become part of the Utilities' IVM approach. Control of incompatible vegetation through the judicious use of herbicides following manual and mechanical vegetation treatment assists in the establishment of low-growing, compatible vegetation within the ROW, which has been shown to enhance wildlife and pollinator habitat. Once established, low-growing, compatible vegetation can extend maintenance periods, which substantially minimizes the time and cost required for subsequent vegetation management operations.

The BLM currently uses herbicides on a project-by-project basis to treat noxious weeds and incompatible vegetation within all Arizona field offices. The BLM completed a programmatic EA in 2015 to allow for the use of herbicides within Arizona Department of Transportation (ADOT)/Federal Highway Administration ROWs crossing BLM-managed lands (BLM 2015a). In addition, the Utilities have been using herbicides as part of their vegetation management programs on non-federal lands since the mid-1990s in an effort to eliminate regrowth of incompatible vegetation.

1.3 Purpose and Need for Action

The proposed project need is to encourage early successional plant communities[8], convert vegetation in the ROW to compatible low-growing plant species, optimize habitat for pollinators, and reduce hazardous fuels through the use of herbicides as part of vegetation management within the ROWs. The Proposed Action is to add BLM-approved herbicides to the Utilities' existing vegetation management tools for controlling incompatible vegetation in the ROW. The BLM's responsibility under Section 501 of the Federal Land Policy and Management Act of 1976 (FLPMA) and Title 43 Code of Federal Regulations (CFR) Part 2800 is to respond to the Utilities' application to use selected and BLM-approved herbicides within ROWs on BLM-managed public lands in Arizona.

[8] Successional plant communities refers to vigorously growing grasses, forbs, shrubs, and trees. Examples of early successional habitats include weedy areas, grasslands, old fields or pastures, shrub thickets, and young forest.

1.4 Decision To Be Made

Based on the analysis in this EA, the Authorized Officer would approve, approve with modifications, or deny the Utilities' request to use BLM-approved herbicides within the ROWs on BLM-managed lands and determine whether to add terms and conditions (stipulations) to the Proposed Action. The Phoenix District Manager is the authorized officer by virtue of Memoranda of Agreement between the Phoenix District Office and the other BLM Districts. No new authorization is needed for the on-going vegetation maintenance activities described in the No Action Alternative.

1.5 Conformance with BLM Land Use Plans

Each BLM field office manages public land through resource management plans (RMPs), as required by the FLPMA. These plans outline management direction, including desired future conditions, suitable uses, monitoring requirements, goals and objectives, and standards and guidelines. The Proposed Action is in conformance with the management decisions in the following land use plans and additional discussion is in Appendix A.

- *Approved Resource Management Plan Amendments/Record of Decision (ROD) for Designation of Energy Corridors on Bureau of Land Management-Administered Lands in the 11 Western States* (BLM 2009)
- *Bradshaw-Harquahala Record of Decision and Approved Resource Management Plan* (BLM 2010b)
- *Agua Fria National Monument Record of Decision and Approved Resource Management Plan* (BLM 2010c)
- *Ironwood Forest National Monument Record of Decision and Approved Resource Management Plan* (BLM 2013a)
- *Record of Decision for the Approval of the Kingman Resource Area Resource Management Plan* (BLM 1995)
- *Record of Decision and Lake Havasu Field Office Approved Resource Management Plan* (BLM 2007b)
- *Approved Las Cienegas Resource Management Plan and Record of Decision* (BLM 2003a)
- *Lower Sonoran Record of Decision and Approved Resource Management Plan* (BLM 2012a) and *Sonoran Desert National Monument Record of Decision and Approved Resource Management Plan* (BLM 2012b)
- *Partial Record of Decision for the Approval of the Safford District Resource Management Plan* (BLM 1992a, 1994)
- *Record of Decision for the San Pedro River Riparian Management Plan and Environmental Impact Statement* (BLM 1989a)
- *Proposed Arizona Statewide Land Use Amendment, Fire, Fuels and Air Quality Management Finding of No Significant Impact and Environmental Assessment* (BLM 2004)
- *Yuma Field Office Record of Decision and Approved Resource Management Plan* (BLM 2010g)
- *Proposed Phoenix Resource Management Plan and Final Environmental Impact Statement* (BLM 1988) and *Phoenix Resource Management Plan/Environmental Impact Statement Record of Decision* (BLM 1989)

1.6 Scoping and Issues Identified

Public and external agency scoping was held from January 13 to February 16, 2015. The BLM posted a scoping letter and related information on its website and also mailed over 1,300 scoping letters and postcards to individuals, public organizations, and agencies. Twenty-four comments were received via letters, emails, or telephone calls during the public scoping period. In addition to external scoping, the BLM conducted internal scoping with interdisciplinary teams of resource specialists.

According to the BLM's National Environmental Policy Act (NEPA) Handbook, H-1790-1 (BLM 2008c), "for the purposes of BLM NEPA analysis, an 'issue' is a point of disagreement, debate, or dispute with a Proposed Action, based on some anticipated environmental effect." The handbook also states that an issue:

- Has a cause and effect relationship with the Proposed Action or alternatives.
- Is within the scope of the analysis.
- Has not been decided by law, regulation, or previous decision.
- Is amenable to scientific analysis rather than conjecture.

While many issues were identified during the scoping process, not all identified issues warrant analysis in this EA. If an issue was determined to be nonsubstantive, then it was not carried forward in the NEPA analysis. Nonsubstantive comments were eliminated because they were out of the scope of analysis or did not state a cause-and-effect relationship with the Proposed Action or alternatives. All substantive comments have been categorized and listed by resource and addressed in the respective resource subsections in Chapter 3 of this EA.

Types of Substantive Comments Received

Supportive comments were largely focused on the use of herbicides as a management tool, as well as the beneficial effects of maintaining energy infrastructure and utility ROW. These comments stated potential beneficial effects such as the reduction of hazardous fuel loads, wildfires, and power blackouts. Additionally, comments discussed herbicide use and their effectiveness in eliminating nonnative plant species, restoring ecosystems, and maintaining travel corridors for wildlife and pollinators.

Additional comments were predominately focused on the potential adverse impacts of herbicide use relating to human health, wildlife, and ecosystems. Non-supportive comments were both broad in nature (i.e., concerns over long-term effects and general environmental impacts) as well as narrowly focused (i.e., overspray and drift, loss of wildlife corridors and pollinators, chemical exposure, and human health effects and diseases). Other comments questioned the purpose and need of the Proposed Action relative to traditional mechanical methods and expressed concerns pertaining to the potential impacts of vegetation reduction, increased erosion, and water contamination. Comments were also received expressing concerns about specific herbicides/carriers used, application methods, and monitoring of applications. Alternatives were suggested in some comments received, including goat and sheep grazing and natural clearing through fire management. Potential impacts identified included the chemical resistance in weeds, unintended vegetation impacts, and associated cumulative effects.

In addition to external scoping, the BLM conducted internal scoping with interdisciplinary teams of resource specialists. Their comments are included in the respective resource sections of Chapter 3.

1.7 Relationships to Statutes, Regulations, and Other Plans

The Proposed Action would meet BLM and USDI objectives set forth in the Healthy Forests Restoration Act of 2003 and BLM Handbook H-4180-1, *Rangeland Health Standards* (2001), to improve the health of the nation's forests and rangelands; previous BLM EA's including *ADOT/BLM Statewide Herbicide Treatment Program on Bureau of Land Management Lands in Arizona* (BLM 2015b) and *Phoenix District Integrated Weed Management* (BLM 2015c). The herbicides considered in the Proposed Action have been evaluated in the 2007 Herbicides PEIS and 2016 Herbicides PEIS. The Proposed Action in this EA considers a total of 17 herbicides for use, of which 15 herbicides have been analyzed in the 2007 Herbicides PEIS, and the remaining two herbicides have been analyzed in the 2016 Herbicide PEIS (additional description below).

1.7.1 Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States: Programmatic Environmental Impact Statement, Programmatic Environmental Report, and Record of Decision (2007)

BLM evaluated vegetation treatment using herbicides on BLM-managed public lands in 17 western states, including Arizona. This culminated in the issuance of a final 2007 Herbicides PEIS (BLM 2007a) and a record of decision (ROD) (BLM 2007c). The PEIS analyzed the effects of herbicide use on humans, plants, animals, and other environmental and social resources associated with public lands. A separate final programmatic environmental report (PER)—*Vegetation Treatments on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Report* (2007 Herbicides PER) (BLM 2007e)—was also prepared to disclose general environmental effects of using non-herbicide treatment methods (e.g., fire use and mechanical, manual, and biological control methods) to treat hazardous fuels, invasive species, and other unwanted or competing vegetation. Various conservation measures for avoiding or minimizing adverse impacts were documented and adopted. A list of authorized herbicides, as well as standard operating procedures (SOPs) for implementing them, was identified and approved in the ROD. The 2007 Herbicides PEIS and PER documents and the 2007 ROD document are available on BLM's website: http://www.blm.gov/wo/st/en/prog/more/veg_eis.html. This EA tiers to the 2007 Herbicides PEIS and provides the site-specific analysis necessary to evaluate use of approved herbicides within the Utilities' ROWs on BLM-managed land within Arizona. All applicable SOPs, BMPs, and mitigation measures listed in the 2007 Herbicides PEIS are carried forward in this Proposed Action and are used in this document to limit the analysis to relevant concerns for this project (refer to Section 2.3.10).

As stated in the BLM's 2007 Herbicides PEIS and PER, vegetation management on public land is a vital function of the BLM. These documents analyzed a potentially substantial increase in the amount of vegetation that could be treated to respond to presidential and congressional mandates to reduce the risk of wildfire, restore fire-adapted ecosystems, and repair land damaged by fire. The PEIS and PER provided the rationale for such an increase and disclosed the potential environmental effects of such a program. The ROD described the types of approved treatment methods, applicable SOPs, and mitigation measures for implementing such treatments.

The 2007 Herbicides PEIS, PER, and ROD provide comprehensive source information from which subsequent environmental analyses can be tiered (40 CFR 1502.20). Tiering allows BLM to prepare more specific environmental documents without duplicating relevant portions of the PEIS, PER, and ROD. This EA tiers from the 2007 Herbicides PEIS, specifically the analysis of direct, indirect, and cumulative impacts of the 18 approved herbicidal active ingredients[9] on humans and non-target plants and animals that is presented in Chapter 4. Environmental Consequences. The 2007 Herbicides PEIS, which is incorporated by reference in this EA, addresses the potential risks to humans and compatible plants and animals from these active ingredients in the proposed commercial herbicidal formulations. The Utilities are proposing to use 15 of the 18 approved herbicides. The 15 herbicidal active ingredients selected by the Utilities, approved under the 2007 PEIS and ROD include 2,4-D; bromacil; chlorsulfuron; clopyralid; dicamba; diuron; glyphosate; hexazinone; imazapic, imazapyr; metsulfuron methyl; picloram; sulfometuron methyl; tebuthiuron; and triclopyr. Since these have been analyzed in the 2007 Herbicides PEIS and ROD and are being proposed for use by the Utilities, the analysis will not be repeated in this EA.

[9] 18 herbicidal active ingredients analyzed in the 2007 PEIS and ROD include: 2,4-D; bromacil; chlorsulfuron; clopyralid; dicamba; diflufenzopyr (in formulation with dicamba); diuron; diquat; fluridone; glyphosate; hexazinone; imazapic, imazapyr; metsulfuron methyl; picloram; sulfometuron methyl; tebuthiuron; and triclopyr.

1.7.2 Programmatic Environmental Impact Statement for Vegetation Treatments Using Aminopyralid, Fluroxypyr, and Rimsulfuron on BLM Lands In 17 Western States (2016)

A subsequent PEIS analyzed the potential impacts associated with BLM's use of the herbicides aminopyralid, fluroxypyr, and rimsulfuron on the human and natural environment has recently been completed—2016 Herbicides PEIS (BLM 2016a). These three herbicides have been added to the BLM's list of approved active ingredients and integrated into the vegetation management program that was analyzed in the 2007 Herbicides PEIS. The 2016 Herbicides PEIS for the three additional herbicides was published for public review in January 2016 and the ROD was signed on August 15, 2016. This EA will tier from the 2016 Herbicides PEIS, specifically the analysis of direct, indirect, and cumulative impacts of only aminopyralid and fluroxypyr on humans and non-target plants and animals. Rimsulfuron is not anticipated for use in the Utilities ROW. The analysis of the potential impacts from the use of aminopyralid and fluroxypyr will not be repeated in this EA.

1.7.3 Other Applicable Federal Laws, Regulations, and Policies

The FLPMA and its implementing regulations provide the legal framework within which the BLM manages public lands and assesses the effects of its management actions. Review and possible authorization of the use of herbicides is also subject to requirements for consistency and conformance with a number of other applicable federal laws, regulations, and policies. Table 1-2 summarizes most of the other federal laws, regulations, and policies relevant to the Proposed Action.

Table 1-2. Summary of Other Applicable Federal Laws, Regulations, and Policies

Relevant Authority	Description
American Indian Religious Freedom Act of 1978 (42 United States Code [USC] 1996)	This act protects and preserves the Native American traditional religious rights, access to ethnic heritage sites, and the use of sacred objects.
Antiquities Act of 1906 (16 USC 431–433)	This act protects historic and prehistoric remains and sites of scientific value on federal lands; establishes criminal sanctions for unauthorized destruction or removal of antiquities; authorizes the President to establish national monuments by proclamation; and authorizes scientific investigation of antiquities on federal lands, subject to permit and regulations.
Archaeological Resources Protection Act of 1979 (16 USC 470aa to 470ee)	This act establishes civil and criminal penalties for the unauthorized excavation, removal, damage, alteration, or defacement, or the attempt to do so, to any archaeological resource more than 100 years old on public lands or Indian lands (not restricted to resources eligible for the National Register of Historic Places). It prohibits the sale, purchase, exchange, transportation, receipt, or offering of any archaeological resource obtained from public lands or Indian lands in violation of any provision, rule, regulation, ordinance, or permit under the act or under any federal, state or local law.
Bald and Golden Eagle Protection Act of 1940 (16 USC 668–668d)	This act prohibits anyone without a permit issued by the Secretary of the Interior from "taking" bald or golden eagles. Taking includes killing, molesting, or disturbing the birds, their nests, or their eggs.
Clean Air Act (42 USC 7401 et seq., as amended)	This act regulates air emissions and pollutants from area, stationary, and mobile sources to improve air quality. It authorizes the Environmental Protection Agency to establish National Ambient Air Quality Standards to protect public health and the environment.

Relevant Authority	Description
Clean Water Act (33 USC 1251 et seq.)	This act establishes structure for regulating quality standards for surface waters and requires states to set standards to protect water quality, including regulation of stormwater and wastewater discharges during construction and operation of a facility.
Clean Water Act Section 404(b)(1) Guidelines (40 CFR 230)	These guidelines are the substantive environmental standards by which all Section 404 permit applications are evaluated. The guidelines fundamentally stipulate that discharges of dredged and fill material into waters of the United States, including wetlands, should not occur unless it can be demonstrated that such discharges, either individually or cumulatively, will not result in unacceptable adverse effects on the aquatic ecosystem.
Endangered Species Act of 1973 (16 USC 1513 et seq.)	This act federally protects threatened and endangered plants, invertebrates, fish, and wildlife through listing; requires consultation with the U.S. Fish and Wildlife Service on federal projects (known as Section 7 consultation); prohibits the "taking" of listed species; and provides for permits to allow the "incidental taking" of listed species.
Energy Policy Act of 2005 (Public Law 109-58; 42 USC 13201 et seq.)	This act establishes a comprehensive, long-range national energy policy, including both traditional energy production and newer energy technologies and conservation.
Executive Order 11593, Protection and Enhancement of the Cultural Environment (May 6, 1971)	This order identifies several actions required of federal agencies to contribute to the protection and enhancement of the cultural environment.
Executive Order 11988, Floodplain Management (May 24, 1977, as amended)	This order requires each federal agency to avoid, to the extent possible, impacts associated with the occupancy and modification of floodplains and to avoid supporting floodplain development when there is a practicable alternative.
Executive Order 11990, Protection of Wetlands (May 24, 1977)	This order directs each federal agency to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands in carrying out its responsibilities.
Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (February 11, 1994)	This order directs each federal agency to identify and address any disproportionately high and adverse human health or environmental effects that its programs, policies, and activities may have on minority and low-income populations.
Executive Order 13007, Indian Sacred Sites (May 24, 1996)	This order directs federal land management agencies to the extent practicable to accommodate access to, and ceremonial use of, Indian sacred sites by Indian religious practitioners and avoid adversely affecting the physical integrity of such sacred sites.
Executive Order 13112, Invasive Species (February 3, 1999)	This order requires federal agencies to take actions to prevent the introduction and spread of invasive species; to provide for invasive-species control; and to minimize the economic, ecological, and human health impacts of invasive species.
Executive Order 13175, Consultation and Coordination with Indian Tribal Governments (November 9, 2000)	This order reiterates the requirement for regular and meaningful government-to-government consultation between the federal government and tribal officials.

Relevant Authority	Description
Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds (January 10, 2001)	This order outlines a collaborative approach to promote the conservation of migratory bird populations and directs agencies to take certain actions to further implement the migratory bird conventions, the Migratory Bird Treaty Act, the Bald and Golden Eagle Protection Act, and other pertinent statutes.
Executive Order 13211, Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution, or Use (May 18, 2010)	This order directs federal agencies to identify impacts that their actions may have on the supply, distribution, or use of energy in the United States.
Executive Order 13212, Actions to Expedite Energy-Related Projects (May 18, 2010)	This order directs federal agencies to expedite their reviews of permits or other actions for energy-related projects, to accelerate the completion of those projects.
Executive Order 13423, Strengthening Federal Environmental, Energy, and Transportation Management (January 24, 2007)	This order instructs federal agencies to conduct their environmental, transportation, and energy-related activities in a manner that is environmentally, economically, and fiscally sound; integrated; continuously improving; efficient; and sustainable. The order sets goals in the following areas: energy efficiency, acquisition, renewable energy, toxic chemical reduction, recycling, sustainable buildings, electronics stewardship, fleets, and water conservation.
Executive Order 13514, Federal Leadership in Environmental, Energy, and Economic Performance (October 5, 2009)	This order sets forth policies and goals to establish an integrated strategy toward sustainability in the federal government and to make reduction of greenhouse-gas emissions a priority for federal agencies.
Federal Noxious Weed Act of 1974, as amended	This act established a federal program to control the spread of noxious weeds. The Secretary of Agriculture is authorized to designate plants as noxious weeds. The movement of all such weeds in interstate or foreign commerce is prohibited, except under permit.
Hazardous Materials Transportation Guides (43 CFR 171–177 and 350–399)	This regulation governs the transportation of hazardous materials and related guidelines.
Manual 6100– National Landscape Conservation System (July 13, 2012); Manual 6220– National Monuments, National Conservation Areas, and Similar Designations (July 13, 2012); Manual 6280– Management of National Scenic and Historic Trails and Trails Under Study or Recommended as Suitable for Congressional Designation (September 14, 2012)	The purpose of these manuals is to provide general policies and guidance on managing public lands in Bureau of Land Management's National Landscape Conservation System (NLCS) that have been designated as national monuments, national conservation areas; wilderness; wilderness study areas; wild and scenic rivers; and national scenic and historic trails. The objectives for implementing these policies are to ensure consistency with designating acts of Congress and presidential proclamations by conserving, protecting, and restoring the values for which NLCS units were designated for the benefit of present and future generations.
Migratory Bird Treaty Act of 1918 (16 USC 703–711)	This act makes it unlawful to take or possess any migratory bird (or any part of such migratory bird, including active nests) as designated, unless permitted by regulation (for example, duck hunting).
National Historic Preservation Act of 1966 (54 USC 300101 et seq.)	This act established the National Register of Historic Places for listing historic properties that are significant in American history, architecture, archaeology, and culture. Section 106 requires federal agencies to take into account the effect of a proposed undertaking on resources listed or eligible for listing on the National Register of Historic Places.

Relevant Authority	Description
National Trails System Act (PL 90-543, as amended through PL 111-11, March 30, 2009)	This act created a series of National trails "to promote the preservation of, public access to, travel within, and enjoyment and appreciation of the open-air, outdoor areas and historic resources of the Nation." Specifically, this act authorized three types of trails: the National Scenic Trails (NST), National Recreation Trails (NRT) and connecting-and-side trails.
Native American Graves Protection and Repatriation Act of 1990 (25 USC 3001–3002)	This act established additional requirements for ownership and control of Native American cultural items, human remains, and associated funerary objects. It also establishes requirements for the treatment of Native American human remains and cultural objects found on federal land. This act further provides for the protection, inventory, and repatriation of Native American human remains, objects of cultural patrimony, sacred objects, unassociated funerary objects, and associated funerary objects.
Presidential Memorandum—Federal Leadership on Energy Management (December 2013)	This memorandum establishes new goals for renewable energy and energy-management practices.
Presidential Memorandum—Modernizing Federal Infrastructure Review and Permitting Regulations, Policies, and Procedures (May 2013)	This memorandum directs agencies to advance the goal of cutting timelines for major infrastructure projects in half while improving outcomes for communities and the environment.
Presidential Memorandum—Transforming Our Nation's Electric Grid Through Improved Siting, Permitting, and Review (June 2013)	This memorandum directs agencies to continue to identify and designate energy right-of-way corridors most suitable for siting transmission projects.
Public Rangelands Improvement Act of 1978 (43 USC 1901–1908)	This act establishes and reaffirms the national policy and commitment to inventory and identify current public rangeland conditions and trends; to manage, maintain, and improve the condition of public rangelands in accordance with management objectives and the land use planning process; and to continue to protect wild free-roaming horses and burros from capture, branding, harassment, or death while simultaneously facilitating the removal and disposal of excess wild free-roaming horses and burros that pose a threat to themselves, their habitat, and to other rangeland values.
Resource Conservation and Recovery Act of 1976 (42 USC 6901 et seq.)	This act authorizes the Environmental Protection Agency to control hazardous waste from "cradle-to-grave." This includes the generation, transportation, treatment, storage, and disposal of hazardous waste. This act sets forth a framework for managing nonhazardous solid wastes. The 1986 amendments enable the Environmental Protection Agency to address environmental problems that could result from underground tanks storing petroleum and other hazardous substances.
Safe Drinking Water Act Amendments of 1996 (42 USC 300f)	This act and its amendments emphasize preventing contamination through source water protection and enhanced water system management to better provide for the sustainable use of water by our nation's public water systems.

PAGE INTENTIONALLY LEFT BLANK

CHAPTER 2
ALTERNATIVES

2.1 Introduction

This chapter describes and compares the No Action Alternative and the Proposed Action as part of vegetation management within the Utilities' ROW crossing the BLM Hassayampa, Kingman, Lake Havasu, Safford, Tucson, Lower Sonoran, and Yuma Field Offices in Arizona (refer to Figure 1-2 through Figure 1-8).

2.2 No Action Alternative

The No Action Alternative is the Utilities' current approach to its IVM program. The Utilities' IVM program is a system of managing plant communities by identifying compatible and incompatible vegetation and evaluating, selecting, and implementing the most appropriate control methods to ensure the safe, reliable delivery of electricity to customers, meeting the Utilities' established objectives. The Utilities' IVM approach/methodology is consistent with the ANSI A300, Part 7 and includes:

Set Objectives – such as promoting safety, preventing sustained outages caused by vegetation growing into electric facilities, maintaining regulatory compliance, protecting structures and security;

Evaluate the Site – inspection of ROWs before, during and after vegetation management work to identify target incompatible vegetation that poses a risk or identify a situation that would not be consistent with the Utilities' set objectives;

Define Action Thresholds – level at which the method of control would be initiated;

Evaluate and Select Control Methods – selecting the most appropriate vegetation control methods including manual and mechanical techniques;

Implement IVM – removing and pruning incompatible vegetation under and around utility lines and infrastructure through careful and targeted manual and mechanical treatments; and

Monitor Treatment and Quality Assurance – post-work monitoring of treatment effectiveness and quality.

On BLM-managed lands, the Utilities' ROWs would continue to be inspected annually in order to plan, prioritize, and conduct utility vegetation management work, in compliance with NERC Reliability Standard (FAC-003-4). The No Action Alternative would not include the full range of vegetation management tools typically associated with IVM but the Utilities would implement the most appropriate control methods from the available tools. A description of the No Action Alternative is provided in Section 2.2.1 through Section 2.2.7 below.

2.2.1 Inspection

All ROWs would continue to be routinely inspected by the Utilities, typically on an annual basis, to check the condition of the ROWs and status of vegetation. These inspections would be performed in two ways: 1) aerial inspection or 2) ground inspection.

Aerial inspections completed by the Utilities would include the use of helicopters to annually perform aerial inspections on most overhead transmission lines. ROWs inspected by air include those with known problem areas, lines that are remote and difficult to access, and distribution lines adjacent to a transmission line would typically be included in the annual aerial inspections. Aerial inspections would include flying over the ROWs, checking and recording vegetation conditions, looking for potential problem areas, and assessing the effectiveness and quality of previous vegetation management projects. During inspection flights, the helicopter

crew may hover or circle over areas to get a closer look at the vegetation, and although rare, may even occasionally land to allow personnel to ground inspect a specific location or concern.

Ground inspections would typically be conducted during the scheduled maintenance cycle prior to any vegetation work to plan for the upcoming maintenance projects. Additional ground inspections may occur outside of this cycle where and when aerial patrols are not conducted, to check known problem areas, follow up with conditions identified during aerial inspection, or inspect areas of concern identified by the public or Utility personnel. During ground inspections, one to three inspectors would access the area driving a four-wheel drive pickup truck or sport utility vehicle, all-terrain vehicles (all-terrain vehicle [ATV], quad, or 6-wheeler), or by walking. These vehicles would be used by Utilities' staff where roads or trails are established. Many of the ROWs have existing roads and trails that meander in and out of the ROW. These roads and trails are often used to inspect the power line. Where no roads are present and where the terrain allows, vehicles may travel off-road within the ROW. Where access by pickup truck or sport utility vehicle is not feasible, ATVs would be used to access portions of the ROWs or areas where no established roads/trails are present, unless otherwise restricted by ROW grants or corridor management plans.

When a power line is scheduled for maintenance, the ROW would be inspected to identify areas where work is needed for manual and/or mechanical treatments. Generally, inspections encompass the entire length of the power line and in some circumstances, it may be determined that no treatment is needed. Ground inspections would also occur during and following cyclical vegetation management work to refine and audit the work. These inspections would generally involve a portion or multiple portions of the power line but may not include the entire line. During inspections, conditions of vegetation would be recorded and when work is required, the pertinent information would be provided to BLM in the form of a vegetation management work proposal.

2.2.2 Incompatible Vegetation Management

The Utilities' classify manual and mechanical incompatible vegetation management into three general categories: 1) hazard vegetation maintenance, 2) routine vegetation maintenance, and 3) defensible space around poles (DSAP). The majority of incompatible vegetation maintenance work on BLM lands falls under the routine vegetation maintenance category. Hazard vegetation along the Utilities' ROWs is very uncommon, with only three Utility recorded incidents of hazard vegetation in the last five years occurring on BLM-managed lands.

Hazard vegetation is defined as vegetation that could come into close proximity or contact with electrical lines, structures, or equipment and may cause an electrical fault (ANSI 2011). Vegetation can be considered hazardous if it exhibits characteristics[10] that could increase the chances of it contacting utility infrastructure. Hazard vegetation has the potential for public safety or reliability risk. This category of incompatible vegetation can be identified in several ways, including scheduled aerial and ground inspections, during regular line or facility maintenance, or through customer call-in. These situations would need to be resolved immediately with treatment occurring shortly after the hazard is identified. Hazard vegetation within the ROW is most often a fast-growing species (typically in riparian areas) that has grown since the last maintenance cycle to a height that poses a risk. As a result, hazard vegetation may be removed at any time of year, typically by manual treatment techniques described in Section 2.2.3.

[10] A feature, condition, or deformity of vegetation or vegetation parts that indicates a weak structure and contributes to the likelihood of failure (ANSI 2011).

Routine vegetation maintenance is the process of identifying and removing or pruning vegetation within a ROW that has undergone previous vegetation treatments. Typically this would involve employing manual and mechanical treatment methods (see Sections 2.2.3 and 0) on a set maintenance schedule, targeting new and/or regrowth since the last treatment. During routine vegetation maintenance, all woody vegetation (shrubs and trees) within a 10-foot radius around poles and 40-foot radius around transmission towers would also be removed. The removal, or selective spacing, of all woody vegetation would reduce fuels and would provide easier access to the poles or towers. The treatment schedule, ranging from every one to five years, would depend on the maintenance needs for each ROW based on the Utilities' routine inspections. On BLM-managed lands, vegetation within the ROWs has been and would be continually maintained.

(Source: Pacific Gas & Electric Company)

Photograph 2-1 Defensible Space around a Wooden Utility Pole

(Source: Wade Ward, APS Fire Mitigation Specialist)

Photograph 2-2. Defensible Space around a Wooden Utility Pole, Christopher Creek, AZ

DSAP maintenance is a part of the current vegetation management program to comply with the International Fire Code (International Code Council 2011a; Section A102.3.1). The objective is to remove vegetation from around the poles to reduce the risk of fire ignition from spark-emitting electrical equipment and to reduce fuel loads and create a fire break around these poles to help protect them in the event of a wildland fire. APS has an estimated total of 6,194 poles on BLM-managed lands, of which approximately 420 poles include electrical equipment that could spark[11], e.g., transformers, capacitor banks, and switches. These poles are generally located in the wildland-urban interface areas near residential development. Only about 8 percent of the poles on the Utilities' systems on BLM-managed lands have equipment where this type of treatment is required[12]. The total treatment area within the DSAP maintenance program would be approximately 3.03 acres, equivalent to 0.03 percent of the Utilities' ROWs on BLM lands.

The treatment of the vegetation within the DSAP would consist of manually removing vegetation using chainsaws, handsaws, and string trimmers within a 10-foot radius (20 feet [ft] in diameter) from the base of the pole up to a height of 10 feet. All combustible debris would be manually removed within the 10-foot radius using rakes or other hand held tools (Photographs 2-1 and 2-2). All treatments

[11] Numbers of poles with equipment that can spark are estimated. Geographic Information System (GIS) analysis was used to obtain these numbers using a dataset with all distribution equipment. Each type of equipment (e.g., transformers, fuses, switches, and capacitor banks) is recorded as a single point. This point data was used to estimate the number of poles with equipment. However, there may be multiple pieces of equipment on a single pole, so a single pole may be recorded multiple times using the equipment point data. Approximately 456 pieces of equipment on BLM lands could spark, which represents an overestimate of 7.4 percent of poles. When the numbers are recalculated using only transformers, which are the most prevalent piece of equipment that could spark, there are approximately 384 poles, which amount to 6.2 percent of the total poles on BLM lands. Likely, the actual percentage is between 6.2 and 7.4 percent.

[12] The percentage of poles that require vegetation removal to protect from the danger of fire ignition due to spark-emitting electrical equipment and to reduce fuels/provide a fuel break has been extrapolated from data about APS distribution poles, since SRP does not use a similar program.

(Source: Rich Fertilizer 2016)

Photograph 2-4. Example of Manual Treatment by Polesaw

(Source: Arb Access LTD 2015)

Photograph 2-3. Example of Manual Treatment by Handsaw

(Source: courtesy of Salt River Project)

Photograph 2-5. Example of Mechanical Treatment by Slashbuster

would remain within the ROW. Treatments would typically occur every three years with a minimum of two individuals per crew conducting the maintenance activities at a pole location.

2.2.3 Manual Vegetation Treatment Method

Manual vegetation treatment is the most common method of treatment performed on BLM-managed lands and generally consists of hand tools, such as chain, pole, and hand saws; climbing harnesses; and ropes. Manual work crews most often consist of two to five individuals per crew, though more may be deployed on the larger work areas and wider ROWs. These crews are trained in vegetation line clearance, arboriculture techniques, and safety procedures and perform work in accordance with ANSI A300 Standards and BMPs using hand-held tools (Photographs 2-3 and 2-4). The majority of the time, tall trees and other vegetation (such as saguaros) and smaller vegetation (such as shrubs and young trees) are cut from the ground by manual work crews. Crews may use a vehicle with an associated basket (bucket truck) to treat tall vegetation where access or vegetation maintenance agreements allow their use. Crews can also climb trees using standard safety equipment to prune or remove trees. Complex rigging arboriculture techniques may be used when tree felling could result in the vegetation striking the power line or infrastructure (e.g., wall, fence, power pole). Manual work crews operate during daylight hours at any time of year. Crews would not access the ROW during adverse weather conditions to avoid damage and rutting of roads and trails or where environmental restrictions apply, except during emergency situations. All vegetation cut would be left on-site in the ROW (see Section 2.2.5 Vegetation Disposal for more detail).

2.2.4 Mechanical Vegetation Treatment Method

This vegetation treatment method is used less than five percent of the time on BLM-managed lands and generally would consist of rotary- and drum-style cutting devices (mowers, chippers, and brushcutters) mounted on a vehicle such as a tractor, skid steer, or

(Source: Mike Wasgatt, Phillips and Jordan)

Photograph 2-6. Example of Mechanical Treatment by John Deere 200LC with Shinn Cutter Head

excavator with rubber tires or tracks. Mechanical methods would include equipment such as mowers, chippers, and brushcutters (Photographs 2-5 and 2-6). A mechanical work crew would minimally consist of an equipment operator and a grounds person to direct the driver. Other work crew members may follow the mechanical equipment to clean up, scatter debris, and prune or remove trees that the mechanical equipment could not access. All vegetation is cut into large mulch-like pieces and would be left on-site in the ROW. Mechanical vegetation treatment methods may be used at any time of year except during environmental restrictions or inclement weather conditions. Mechanical methods may not be feasilblen specific areas based on terrain, presence of environmentally sensitive sites, or access; vegetation treatments would then be conducted using manual clearance methods as discussed in Section 2.2.3.

2.2.5 Vegetation Disposal

Once vegetation is cut by either manual or mechanical means, various disposal methods could be employed. The overall objective of vegetation disposal is to distribute the cut/chipped material in a cost-effective and environmentally sensitive manner. The disposal would minimize potential impacts to sensitive environmental resources while mitigating fire risk within ROWs. The method of disposal would be determined through coordination between BLM and the Utilities prior to the commencement of vegetation maintenance work. During manual treatments, vegetation disposal would generally be by lop and scatter[13] or chipping[14], though other methods may be employed following coordination with BLM. When mechanical treatment is used, the vegetation is mulched by mechanical equipment and then broadcasted across the ROW to a depth of no more than 4 inches above the ground surface.

2.2.6 Incompatible Vegetation Maintenance Work Proposal

Prior to the completion of routine vegetation maintenance work on a ROW, the Utilities would prepare a work proposal. The work proposal, in letter form, identifies the location and description of the proposed work and provides information concerning known environmental or resource issues. Most vegetation maintenance occurring within the authorized ROW consists of minor trimming, pruning, and removal of vegetation and is authorized under the terms of the ROW grant and regulation (§ 2805.14). Upon reviewing the work proposal and finding no environmental issues of concern, the BLM then proceeds to acknowledge that there is no additional environmental analysis required and concurs with the proposal as submitted. If in the alternative there are issues that must be addressed, the BLM then proceeds with a conditional concurrence, which may also include regulatory consultation such as Section 7 of the Endangered Species Act of 1973 (ESA) or Section 106 of the National Historic Preservation Act of 1966 (NHPA).

[13] Limbs and logs of less than 9 inches in diameter would be lopped and scattered throughout the immediate area in a manner such that limbs and logs would be left no taller than 18-24 inches above the ground. Logs over 9 inches diameter would remain where felled and would be cut in sections to lay flush with the ground.

[14] Limbs and logs less than 9 inches in diameter would be chipped and broadcast on site with chips placed no deeper than 4 inches.

In the case of certain hazardous conditions, the Utilities first contact the BLM by phone or email if possible. Details of the hazard vegetation, along with a map, are provided and include the following: 1) power line number on which the hazard was found; 2) GPS location of the hazard; 3) plant species; 4) size of vegetation (diameter at breast height for trees or linear height for saguaros); 5) and condition of vegetation (e.g., dead, diseased, heavily leaning).

Once details of the hazard are received, BLM determines if onsite monitoring is needed. The work is then completed with follow-up correspondence documenting the situation.

2.2.7 No Action Alternative Standard Operating Procedures

Besides the general procedures and methods described above, the Utilities implement the following SOPs when performing vegetation management activities:

- Within the ROW, ATVs and vehicles may drive off-road if necessary with the implementation of relevant SOPs below.
  - ATVs and vehicles would be used only during dry conditions to avoid rutting, except under hazard vegetation maintenance situations.
  - ATVs and vehicles would avoid driving through rivers, standing water, and other water sources except on established roads.
  - ATVs and vehicles would be driven at low speeds (less than 10 miles per hour) when traveling off-road within the ROW.
  - ATVs and vehicles would only be operated during daylight hours, except under hazard vegetation maintenance situations.
  - ATVs and vehicles would avoid driving directly up slopes and other areas that may contain highly erodible soils.
  - ATVs and vehicles would not drive on slopes greater than 20 percent when traveling off established roads.
- Stumps from tree removal would be cut within 6 inches of the ground or if possible stumps would be cut flush with the ground.
- Small chips produced during vegetation treatments would be broadcast across the ROW at a thickness no greater than 4 inches.
- During manual vegetation treatment, the following methods of disposal would be used:
  - Lop and scatter: Limbs and logs of less than 9 inches in diameter would be lopped and scattered throughout the immediate area in a manner such that limbs and logs would be left no taller than 18-24 inches above the ground. Logs over 9 inches diameter would remain where felled and would be cut in sections to lay flush with the ground.
  - Chipping: Limbs and logs less than 9 inches in diameter would be chipped and broadcast on site with chips placed no deeper than 4 inches.
- Consider site characteristics, environmental conditions, and equipment in order to minimize damage to non-target vegetation.
- All areas with the potential for flowing water (e.g., culverts, ditches, and washes) would be kept free of slash, logs, and debris from vegetation removal operations.
- Do not operate a mechanical mower within riparian vegetation. Riparian vegetation shall be removed or pruned using manual methods.

- A qualified biologist or resource specialist would provide maintenance crew members with training on migratory bird nest reporting and nest avoidance: crews are to report active nests that occur on vegetation or on the ground internally per each Utilities' avian reporting procedures. Do not conduct routine vegetation maintenance and DSAP treatments on the vegetation containing the nest and vegetation adjacent to ground nesting birds until after nesting is complete.
- When working in riparian areas, wetlands, and near other aquatic habitats, access work site only on existing roads, and limit all travel on roads when damage to the road surface would result or is occurring.
- Manual vegetation maintenance activities would not be conducted within suitable habitat for southwester willow flycatcher during the nesting season from May 1 to August 31.
- ATVs would not be driven within 164 feet (50 meters) of southwestern willow flycatcher suitable habitat (riparian vegetation) during the nesting season (May 1 to August 31) except on existing roads that are open to the public.
- ATVs would not be driven within 164 feet (50 meters) of yellow-billed cuckoo habitat (riparian vegetation) during the nesting season (May 15 to September 30) except on existing roads that are open to the public.
- Manual vegetation maintenance activities would not be conducted within suitable habitat for Yuma clapper rail during the nesting season from February 1 to July 31.
- ATVs would not be driven within 164 feet (50 meters) of river channels and open water marsh habitat during the Yuma clapper rail nesting season of February 1 to July 31 except on existing roads that are open to the public.
- Driving over lesser long-nosed bat forage plants, including agave and young columnar cacti, would be avoided during manual and mechanical treatments.
- All field personnel would be trained on how to identify important lesser long-nosed bat forage plants, including agave and columnar cacti, and the importance of their protection. Important forage plants for lesser long-nosed bats would include saguaro cactus (*Carnegia gigantea*), organ pipe cactus (*Stenocereus thurberi*), and various species of agave.
- Mechanical mowers would not be used for routine vegetation maintenance within acuña cactus critical and suitable habitats.
- Prior to manual cutting of vegetation in acuña cactus critical and suitable habitats, pretreatment surveys would be conducted for acuña cactus. Biologists or other professionals experienced in the identification and survey of this cactus would survey the ROW area to be treated and would locate and flag all acuña cacti within or immediately adjacent to the area. In an effort to be conservative, all other similar looking cacti would be flagged and avoided.
- During manual cutting of vegetation within critical and suitable habitats for the acuña cactus, check for acuña cactus under incompatible plants to be treated prior to cutting to identify cacti that may have been missed during the pretreatment surveys. If an acuña cactus is found, appropriate conservation measures would be implemented to avoid the cactus.
- During manual vegetation maintenance work, if an acuña cactus occurs underneath and is shaded by the incompatible plant to be cut, either the targeted plant would be left untreated or the plant would be selectively trimmed to provide protection for the acuña cactus.
- Vehicles and ATVs would be driven only on existing roads to access the ROW and ATVs would not be driven off-road within the ROW in acuña cactus suitable and critical habitats.

- Mechanical mowers for routine vegetation maintenance would not be used within Arizona hedgehog cactus potentially suitable habitat.
- Prior to manual cutting of vegetation in Arizona hedgehog cactus potentially suitable habitat, pretreatment surveys would be conducted for Arizona hedgehog cactus. Biologists or other professionals experienced in the identification and survey of this cactus would survey the ROW area to be treated and would locate and flag all Arizona hedgehog cacti within or immediately adjacent to the area. In an effort to be conservative, all other similar looking cacti would be flagged and avoided.
- During manual cutting of vegetation within potentially suitable habitat for the Arizona hedgehog cactus, check for Arizona hedgehog cactus under incompatible plants to be treated prior to cutting to identify cacti that may have been missed during the pretreatment surveys. If an Arizona hedgehog cactus is found, appropriate conservation measures would be implemented to avoid the cactus.
- During manual vegetation maintenance work, if an Arizona hedgehog cactus occurs underneath and is shaded by the incompatible plant to be cut, either the targeted plant would be left untreated or the plant would be selectively trimmed to provide protection for the Arizona hedgehog cactus.
- Vehicles and ATVs would be driven only on existing roads to access the ROW and ATVs would not be driven off-road within the ROW in Arizona hedgehog cactus potentially suitable habitat.
- Pretreatment surveys for Huachuca water-umbel in species habitat would be conducted in accordance with United States Fish and Wildlife Service (USFWS) protocols or do not survey and assume all habitats are occupied. Conservation measures would be applied to occupied habitat or assumed occupied habitat where pretreatment surveys have not been conducted.
- Vehicles and ATVs would be driven only on existing roads to access the ROW and ATVs would not be driven off-road within the ROW in suitable and critical habitat for Huachuca water-umbel.
- Manual treatment work crews would be supplied with species identification information to minimize stepping on Huachuca water-umbel and to ensure special precaution is taken around this plant.
- Prior to manual treatment work in Tanner Wash Area of Critical Environmental Concern (ACEC), pretreatment surveys for Peebles Navajo cactus would be conducted. Biologists or other professionals experienced in the identification and survey of this cactus would survey the ROW area to be treated and would locate and flag all Peebles Navajo cacti within or immediately adjacent to the area. In an effort to be conservative, all other similar looking cacti would be flagged and avoided.
- Drive vehicles (including ATVs) only on existing roads to access the ROW and do not drive ATVs off-road within the ROW in Tanner Wash ACEC.
- Manual treatment workers would be educated on the avoidance of Peebles Navajo cactus prior to scheduled work in potential habitat. The training of applicators would involve one or more applicators, crew foreman, or utility employee overseeing work and include: education on appearance of Peebles Navajo cactus; reference materials to assist in avoidance in the field; field visit, if needed, for refinement of search image; and procedures on avoiding cacti not found during survey.
- During manual cutting of vegetation within suitable habitat for the Peebles Navajo cactus, check for Peebles Navajo cactus under incompatible plants to be treated prior to cutting to identify cacti that may have been missed during pre-treatment surveys. If a Peebles Navajo cactus is found, appropriate conservation measures would be implemented to avoid the cactus.
- Mechanical mowers would not be used within suitable riparian and upland habitat for northern Mexican gartersnake.

- Work crews would be provided materials in the identification of northern Mexican gartersnake prior to manual treatment of vegetation. If a northern Mexican gartersnake (or similar looking snake) is encountered, treatment would not occur until the snake has moved, or, if necessary, the snake would be moved to a safe, sheltered place away from work activities.
- Within northern Mexican gartersnake suitable habitat, vehicles would not be driven off established roads.
- The Utilities would provide cultural resource sensitivity training for herbicide applicators and instruction on how to avoid the relatively rare types of archaeological structural features that are most sensitive to disturbance by vehicle traffic (rock walls, rock alignments, etc.). The training would (1) educate their employees and contractors about antiquities laws, (2) inform them that violations of those laws are not tolerated and would be grounds for disciplinary actions or dismissal, and (3) oversee field activities to ensure that archaeological sites are not affected by unauthorized collection or inadvertent impact to artifacts.

2.3 Proposed Action

The Proposed Action consists of using selected, BLM-approved herbicides on incompatible vegetation within ROWs on BLM-managed lands as part of the Utilities' IVM program. The Utilities would continue using manual and mechanical methods, such as mowing or hand cutting, as described in the No Action Alternative in combination with herbicide treatments. Control of incompatible vegetation through the judicious use of herbicides following manual and mechanical vegetation treatment would assist in the establishment of low-growing, compatible vegetation within the ROW. The establishment of low-growing, compatible vegetation would eventually reduce the need for future vegetation treatments, thereby extending the time between the routine vegetation maintenance cycles (Miller 2013). An IVM program that includes a combination of manual, mechanical, and herbicide treatments can be up to three to four times less expensive than manual and mechanical treatments alone (Carroll Electric Cooperative 2010:8).

Herbicides proposed for use in the Proposed Action would include the list of BLM-approved herbicide active ingredients provided in Table 2-1. Details on the ingredients of the herbicides selected for use in the Proposed Action are provided in the BLM Herbicide 2007 PEIS (2-9 to 2-15) and BLM Herbicide 2016 PEIS (2-1 to 2-6). Various manufacturers offer multiple products under various trade names that include the active ingredients listed in Table 2-1. The risk assessments developed by BLM apply to these active ingredients. Other herbicide active ingredients may be used in the future, after they are evaluated and approved by BLM (refer to Section 2.3.9). Herbicide treatments would follow BLM procedures outlined in BLM Handbook H-9011-1, Chemical Pest Control (1988), and in BLM Manual Section 1112, Safety (2000); Section 9011, Chemical Pest Control (2013b); and Section 9015, Integrated Weed Management (1992b). Herbicides would be applied according to product label directions, which are reviewed and approved by the U.S. Environmental Protection Agency (EPA). The Utilities would comply with changes in label directions that may occur in the future, as well as with federal and state requirements. Generic herbicides with the same chemical properties under a different name could be used; therefore, the products or trade names listed in Table 2-1 are examples. Herbicides are categorized as selective or non-selective[15] where selective herbicides kill only a specific type of plant and non-selective herbicides kill all types of plants. The selectivity category of the herbicides in the Proposed Action is provided in the use descriptions in Table 2-1.

[15] For example, a selective herbicide for broadleaved plants can be used to manage such species while also maintaining compatible grass species in rangeland communities. Herbicides can be used selectively to control specific types of vegetation (e.g., killing invasive weeds), or non-selectively to clear all vegetation on a particular area. Some herbicides are post-emergent, which means they can be used to kill existing vegetation; others are pre-emergent, which stops vegetation before it grows (e.g., prohibiting seeds from germinating).

Table 2-1. BLM-Approved Herbicides List with Vegetation Treatment Application and Use Descriptions

Herbicide Active Ingredient/ Trade Name	Foliar application	Cut Stump application	Basal application	DSAP application	Anticipated Use Frequencya	Herbicide Use Description[b]
2,4-D	x	x	x	x	rare	Selective herbicide that controls woody brush and broadleaf weeds.
Aminopyralid/ Milestone	x	x	x	x	frequent	Selective herbicide used for control of broadleaf weeds.
Bromacil/ Hyvar				x	rare	Non-selective herbicide recommended for the control of incompatible woody plants; uptake is through the roots and requires rainfall to be incorporated into the soil.
Chlorsulfuron/ Telar	x			x	rare	Selective herbicide that controls select broadleaf weeds and incompatible grasses; pre- and post-emergent noxious and nuisance weed control.
Clopyralid/ Transline and Reclaim	x	x	x		rare	Selective herbicide used for control of broadleaf weeds, thistles, and clovers.
Dicamba/ Vanquish	x	x	x	x	rare	Selective herbicide that controls select broadleaf weeds.
Diuron/ Karmex				x	rare	Broad-spectrum (non-selective) pre-emergent herbicide used for weed, grass, and brush control.
Fluroxypyr/ Vista	x			x	rare	Selective herbicide that controls broadleaf weeds and woody brush.
Glyphosate/ Roundup, Rodeo	x	x	x	x	frequent	Provides broad spectrum (non-selective) control and has an aquatic label.
Hexazinone			x	x	rare	Selective herbicide used to control grasses and broadleaf and woody plants through root and foliar uptake; requires rain for incorporation into the soil for root uptake.
Imazapic	x			x	rare	Selective herbicide for weed control in natural areas. Not a broad spectrum herbicide.
Imazapyr	x	x	x	x	moderate	Broad spectrum (non-selective) herbicide for control of a range of weeds including annual and perennial grasses, broad-leaved, woody species, and riparian and emergent aquatic species. Often used for control of invasive species.
Metsulfuron methyl	x			x	frequent	Selective herbicide used to control noxious weeds, brush and problem broadleaves with excellent grass tolerance.
Picloram	x	x			rare	Selective herbicide used for general woody plant control; it also controls a wide range of broad-leaved and invasive weeds; most grasses are resistant.

Herbicide Active Ingredient/ Trade Name	Foliar application	Cut Stump application	Basal application	DSAP application	Anticipated Use Frequencya	Herbicide Use Description[b]
Sulfometuron methyl	x			x	rare	Non-selective herbicide used to control a wide range of annual and perennial grasses as well as broad-leafed weeds.
Tebuthiuron				x	rare	Non-selective herbicide used for control of broadleaf and woody weeds, grasses and brush; requires rainfall for incorporation into the soil for root uptake.
Triclopyr	x	x	x	x	frequent	Selective herbicide used to control broadleaf weeds and woody vegetation.

[a] Anticipated use frequency is based on current use and knowledge of herbicide products by APS.

[b] Herbicide Use Description was populated from the herbicide product label and use and knowledge of herbicide products by APS.

With the current manual/mechanical treatment techniques, the root system of each individual plant is relatively unaffected after the removal of the aboveground portion of the stem. The plant's natural survival response is to resprout stems to reestablish enough leaves to support the root system. The rapid resprouting and increase in stem count ultimately allows the plant to support a larger root mass. Root-suckering species, such as Mexican black locust (*Robinia neomexicana*); African sumac (*Rhus lancea*); Russian olive (*Elaeagnus angustifolia*); and saltcedar (*Tamarix ramosissima*), respond to cutting by producing "suckers" (vertical shoots) from both the stump and the extensive root system of the established plant. The density of incompatible vegetation can increase by up to 35 percent when manual and mechanical treatment methods are employed without a follow-up herbicide treatment (Carroll Electric Cooperative 2010:3). A continuous cutting regimen stimulates growth that requires more cutting, which, in turn, increases vegetation treatment costs over time (Johnstone 2008). As described in the No Action Alternative, the majority of the Utilities' vegetation maintenance efforts are attributed to the continual resprouting of incompatible vegetation following routine manual and mechanical treatments.

To prevent plant species from resprouting, the entire root system must be removed. Herbicides control plants by interfering with specific botanical biochemical pathways. Herbicides are chemicals that are derived from plants or manufactured synthetically and used to damage or kill plants. Herbicides are categorized by their mode of action, i.e., the sequence of events from absorption into the plant to plant death (Penn State College of Agricultural Sciences 2017). Herbicides may affect plants in multiple ways. Mode-of-action categories include growth regulators and root and shoot inhibitors, in addition to other mechanisms that interfere with plant metabolism (Bussan and Dyer 1999). A more detailed description of how herbicides work is presented in the 2007 PEIS (BLM 2007a: 2-13 to 2-14). Herbicides must be applied by someone with the appropriate license identified in state laws and BLM policy. The BLM-approved herbicides that would be used in the Proposed Action would be applied according to the current label directions. The Utilities would comply with changes in label directions that may occur in the future and would comply with state registration requirements.

Herbicides are currently being used to successfully achieve desired results on private, State Trust, and tribal lands and are a key component of Utilities' IVM program. By using herbicides in conjunction with manual and mechanical treatment as part of the Utilities' IVM program, the frequency, duration, and degree of vegetation management activities have declined over time where herbicides are used, and the ROWs are converted to low-growing, early successional plant communities.

Similar to the No Action Alternative, in the Proposed Action the Utilities' IVM program would include: 1) Set Objectives; 2) Evaluate the Site; 3) Define Action Thresholds; 4) Evaluate and Select Control Methods—selecting

the appropriate vegetation control methods including manual, mechanical, herbicide, and/or a combination of these application techniques; 5) Implement IVM—removing and pruning incompatible vegetation under and around utility lines and infrastructure through careful and targeted manual, mechanical, herbicide, and/or a combination of these application techniques; and 6) Monitor Treatment and Quality Assurance—post-work monitoring of treatment effectiveness and quality. A description of the Proposed Action is provided in Sections 2.3.1 through 2.3.10 below. Where the Proposed Action is different than the No Action Alternative, the difference is identified in the Proposed Action.

2.3.1 Inspection

As described in the No Action Alternative (refer to Section 2.2.1), the inspection methodology in the Proposed Action would be the same and conducted by air or on the ground prior to, during, and after vegetation management work. The objectives of the inspections would be as follows and include the consideration for herbicide treatments:

- Identify hazard vegetation.
- Identify and plan upcoming manual, mechanical, and herbicide maintenance work.
- Audit work during and after manual, mechanical, and herbicide treatments.
- Assess effectiveness and quality of vegetation management practices.
- Identify areas for vegetation management for future cycles of work.

2.3.2 Incompatible Vegetation Management

In the Proposed Action, the Utilities would continue to manage vegetation similar to the No Action Alternative. Vegetation management is still considered in three general categories: 1) hazard vegetation maintenance; 2) routine vegetation maintenance; and 3) DSAP. Under the Proposed Action, all three would include the use of herbicide treatments in conjunction with manual and mechanical treatment methods.

Hazard vegetation within the ROWs would be continually maintained as part of the Utilities' IVM program goals in the Proposed Action as it would be in the No Action Alternative.

Routine inspection results would assist in determining when the next maintenance cycle would be needed. The No Action Alternative's routine vegetation maintenance cycle may vary between three to five years. The Proposed Action is anticipated to extend the routine vegetation maintenance cycle to be every eight years or more after the initial cycle of manual/mechanical and herbicide treatments[16].

DSAP maintenance cycles in the Proposed Action would remain the same as the No Action Alternative and also include the use of pre-emergent herbicides to keep vegetation from growing inside the prescribed combustible-free area.

2.3.3 Manual Vegetation Treatment Methods

The manual vegetation treatment methods in the Proposed Action would be the same as described in the No Action Alternative (refer to Section 2.2.3). Under the Proposed Action the frequency and intensity of these treatment methods would be reduced as described in Section 2.2.3.

[16] The initial cycle of manual/mechanical and herbicide treatments would consist of manual and/or mechanical treatments during year one, followed by a spot herbicide treatment in year two, and a follow-up herbicide spot treatment in year three, if necessary. The next treatment cycle would be a targeted manual/mechanical or herbicide spot treatment, where necessary, in year eleven (eight years after the initial treatment cycle), followed by an herbicide retreat (treatments targeted to complement the initial treatment or capture any missed vegetation) in year twelve, if necessary.

2.3.4 Mechanical Vegetation Treatment Methods

The mechanical vegetation treatment methods in the Proposed Action would be the same as described in the No Action Alternative (refer to Section0). Under the Proposed Action the frequency and intensity of these treatment methods would be reduced as described in Section 0.

(Source: APS 2016)

Photograph 2-7. ATV with Mounted Tanks and Low-Volume Hand

(Source: Ron Romero, Southwest Ground Control)

Photograph 2-8. Low-Volume Backpack Sprayer

2.3.5 Herbicide Vegetation Treatment Methods

With the implementation of the Proposed Action, the incompatible vegetation would typically first be removed by manual and/or mechanical treatments, as outlined in the No Action Alternative. Herbicides would be used in conjunction with manual and mechanical treatments during the routine vegetation maintenance cycle and/or in subsequent years to treat regrowth and seedlings. Herbicide treatments, in some situations, would be used on vegetation that may not have had, or required, manual or mechanical treatments previously. The Proposed Action would also use a carrier as part of the herbicide application. Herbicides would be applied in selected locations using handheld sprayers from backpacks or spray units mounted on ATVs (Photographs 2-7 and 2-8) for accurate spot treatment.

The Utilities would use a low volume spot application method to apply the selected herbicide ingredients listed in Table 2-1. The adjuvant[17] Thinvert®, which is a paraffinic (waxy) oil carrier, would be used with the herbicides on BLM-managed lands[18]. Applications using Thinvert are considered low-volume applications. The ratio of Thinvert (carrier) to herbicide would vary, as determined by the Utilities and by the species of vegetation to be controlled, and would follow label requirements. Depending on the herbicides included in the custom blend, the ratio would be 90 to 94 percent Thinvert to 6 to 10 percent herbicide per gallon; this is equivalent to between 115 and 120 ounces of Thinvert and between 8 to 13 ounces of herbicide per gallon. A rate of three to five gallons of total mix per acre would result in approximately 24 to 39 ounces of herbicide being applied to one acre of vegetation. An acre of spot herbicide treatments could span several miles of a ROW, depending on ROW width and vegetation density. No aerial or broadcast application of herbicides would occur under the Proposed Action.

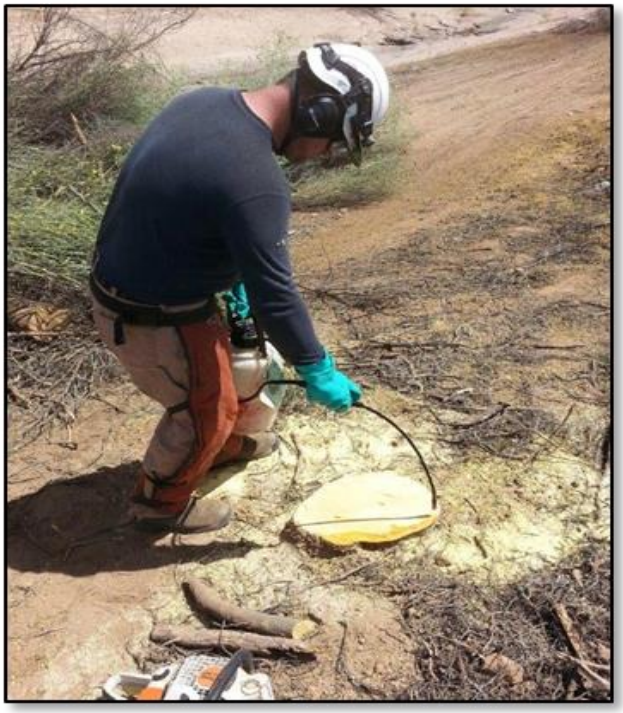
[17] An adjuvant is any substance in a herbicide formulation or added to the spray tank to improve herbicidal activity or application characteristics.
[18] Thinvert is approved by BLM and included on the List of Approved Herbicide Formulations and Adjuvants for BLM (BLM 2014).

The Utilities, after completion of the manual and mechanical vegetation removal, could employ four different herbicide application methods: foliar, cut stump, basal, and pre-emergence. The first three techniques are spot treatments that target specific vegetation, rather than broadcast treatments applied throughout the entire Utilities' ROW. The last, pre-emergence, is where herbicide is applied directly to the soil to prevent germination and is limited to being used only where the DSAP exists. As previously noted, no broadcast or aerial spraying would occur as part of the Proposed Action. Below is a brief description of the application methods.

Photograph 2-9. Foliar Application of Herbicides Using a Low-Volume Backpack Sprayer

Foliar application method would direct the herbicide mixture onto the leaves of the target vegetation, which would be most effective on smaller vegetation, between 1 and 5 feet tall and would be used on vegetation up to 10 feet tall (depicted in Photograph 2-9). This technique would typically be applied where high-density stands or thickets of incompatible vegetation are present.

The frequency of foliar treatments would depend on the amount and size of incompatible vegetation and regrowth. An initial treatment would typically occur one to two growing seasons after manual/mechanical treatments, and a second treatment would occur one to two growing seasons after the initial herbicide application. Routine herbicide treatments are anticipated to occur cyclically every eight years, as identified through ROW inspections. In the Proposed Action, foliar application would be the preferred technique when treating most ROW vegetation and is anticipated to constitute 75 to 80 percent of all herbicide applications on BLM-managed lands.



(Source: John Gauthier, APS, Phoenix, AZ)

Photograph 2-10. Cut-Stump Technique

Cut-stump application treatment would be used on the stumps of woody species that normally resprout after being cut. This application would be conducted in conjunction with manual and mechanical vegetation removal. Because of the way it works on the tree's metabolism, cut-stump treatment is most successful when applied immediately after the trunk is cut (typically within 15 minutes to an hour). Herbicides would be applied on the exposed cambium (living inner bark) of the stump and on exposed roots (depicted in Photograph 2-10). This treatment relies on translocation (movement of the herbicide within the plant) to the root system through the inner bark. Outer bark and heartwood would not be treated because these are not living tissue.

The cut-stump technique would most typically be used for localized treatment of small groups of trees or clumps of brush (e.g. thicket of locust saplings or chaparral).

Cut-stump treatments would also occur in conjunction with hazard tree removal. For species that resprout or on remote and isolated patches of vegetation, this application technique would be made concurrent with any manual/mechanical vegetation treatment. The frequency of this application technique would be between 10 and 11 years after the initial manual/mechanical and foliar herbicide treatment (refer to routine vegetation maintenance described in Section 2.3.2). Inspections would assist the Utilities with determining the maintenance cycles needed for any specific areas. This application method is anticipated to constitute 15 to 20 percent of all ROW herbicide application in the Proposed Action.

(Source: BASF)

Photograph 2-11. Basal Application

Basal application method would combine the herbicide with an oil- or wax-based adjuvant such as Thinvert. The herbicide would be applied directly to the lower 12 to 18 inches of the bark of the trunk (along all sides) of a standing tree, encircling stems, and root collars (depicted in Photograph 2-11). This application would be most effective on trees less than six inches in diameter with smooth bark (United States Department of Agriculture University of Florida 2015). The oil carrier penetrates the bark, carrying the herbicide into the plant. Basal applications can be made any time of the year but would be most effective during the growing season when plants are actively transporting nutrients into the roots. This method would typically be used where vegetation is too tall to effectively use foliar application methods or when an incompatible plant is adjacent to, or surrounded by, compatible vegetation.

The basal application method would rarely be used as part of routine vegetation management and is anticipated to constitute less than five percent of all ROW herbicide applications in the Proposed Action. Routine inspections would assist the Utilities with determining where basal applications would be effective as part of the routine vegetation maintenance cycles for any specific area.

Pre-emergence application method would be used only within the prescribed DSAP. About 10 percent of the DSAP would use a soil or pre-emergent[19] herbicide to keep vegetation from growing around poles housing electrical equipment. Within the 10-foot radius of these poles, applicators would apply herbicide directly to the soil using a hand held sprayer. Herbicides specifically labeled for soil applications would be used to prevent the germination of seeds, extending the length of vegetation control achieved through manual clearing methods. Pre-emergent herbicides are generally applied when there is predictable rainfall within 30-60 days of application, in order to minimize the potential for photodegradation of the herbicide before it has had a chance of moving into the germination zone of the soil.

The frequency of pre-emergence application treatments would depend on the DSAP maintenance cycle, soil type, time of the year, and amount and type of incompatible vegetation. The current DSAP program is on a three year cycle, and pre-emergent herbicides would improve vegetation control during a portion of the first year after treatment. As previously noted, pre-emergence application treatment would only occur with the DSAP maintenance activities; therefore, this treatment would be used on approximately 0.03 percent of the total ROW.

[19] Pre-emergent refers to an application of herbicide applied to the soil before vegetation begins to sprout or before seeds begin to germinate. The herbicide is formulated to eliminate the vegetation in the germination process.

2.3.6 Vegetation Disposal

The vegetation disposal methods in the Proposed Action would be the same as described in the No Action Alternative (refer to Section 2.2.5). Under the Proposed Action less vegetation would require disposal.

2.3.7 Incompatible Vegetation Maintenance Work Proposal

The incompatible vegetation maintenance work proposal in the Proposed Action would be the same as described in the No Action Alternative (refer to Section 2.2.6) with the addition of a Pesticide Use Proposal (PUP) for herbicide treatments as described in Section 2.3.8.

2.3.8 Pesticide Use Proposals

As part of the Proposed Action, when the Utilities plan to use herbicide treatments within the ROW, they would submit a PUP to the BLM Master Agreement Team and the BLM Invasive and Noxious Weeds Program Lead. The PUP would detail the location and herbicides proposed for use in the annual treatment plans, maintenance projects, and construction projects submitted to the BLM. Each PUP would include information on project specifications; herbicides proposed for use and the rate of application; surfactants; approximate dates of application; incompatible species targeted; key personnel responsibilities; appropriate site-specific buffers (as provided in BLM Handbook H-9011-1 [1988], biological conservation measures, or herbicide manufacturers' labels); and procedures for communication, safety, spill response, and emergencies. The analysis included in this EA would provide support for future PUPs and site-specific applications. The BLM Invasive and Noxious Weeds Program Lead, BLM Field Managers, and the BLM Deputy State Director for Resources and Planning are responsible for reviewing and approving the PUPs. The BLM would approve a PUP once it has been determined to be adequate; after which the Utilities could then begin herbicide treatments within the specified ROW.

2.3.9 Adaptive Management

Adaptive management and managerial flexibility are tools that allow decision-makers to take advantage of new information that becomes available after a decision has been made. It is possible that new or improved herbicide products could become available during implementation of the Proposed Action. If new or improved products are made available, the new herbicide product could be considered for use without further NEPA analysis. This would be the case only if the new or improved product fits within the same effects-analysis disclosure as herbicides proposed in this EA. An analysis would be done to determine the similarities of effects and whether the decision would be adapted to include that herbicide product.

2.3.10 Proposed Action Standard Operating Procedures

In addition to the procedures listed below, SOPs implemented as part of the Proposed Action would include the No Action Alternative SOPs (refer to Section 2.2.7). These procedures include BMPs, conservation measures, and applicable mitigation measures from related BLM/NEPA documents and resource plans. Conservation measures identified in the 2017 *Biological Assessment for Integrated Vegetation Management within Authorized Power Line Rights-of-Way on Bureau of Land Management Lands in Arizona* also apply and have been included as an appendix to this document (Appendix B). Specifically, in accordance with BLM Instruction Memorandum No. 2008-030 (BLM 2007f), the Proposed Action would incorporate relevant SOPs identified in the 2007 Herbicides PEIS and ROD (BLM 2007a, 2007c) and the 2016 Herbicides PEIS (BLM 2016a) based on environmental conditions, herbicide application methods, and specific herbicide active ingredients proposed for use.

GENERAL STANDARD OPERATING PROCEDURES FOR APPLYING HERBICIDES

In addition to the SOPs listed below, the Utilities would employ a closed chain-of-custody method consistent with the Utility Arborist Association's BMPs (Goodfellow and Holt 2011) for shipping, distribution, storage, and mixing of the BLM-approved herbicide. All mixing of the herbicide ingredients would occur at an off-site blending facility and would use returnable/reusable product-dedicated storage containers. The herbicide mix would consist of a premixed "ready to use" formulation stored in a sealed container. This closed delivery system would help to protect the licensed applicator and the environment by reducing the potential for leaks and spills during handling, transferring, and loading, as well as any potential leaks due to container damage. The closed delivery system would also ensure the correct concentration of spray mixture, including active ingredients, diluting agents, and adjuvants, and would reduce the potential for errors, omissions, and unauthorized change in the amounts or products. There would also be a reduction in the risk of regulatory noncompliance, such as application of off-label rates or improper disposal of ingredients or empty containers.

A licensed applicator would supervise the transfer and application process to ensure that proper techniques, cleanup, personal protective equipment, and safety procedures are followed. Support vehicles such as 4x4 trucks or ATVs would be located at intervals in the ROW where they would be accessible to transfer the herbicide mix from the pre-mixed herbicide storage containers to application containers (backpacks and tanks mounted to ATVs). In situations where a "closed connection"[20] is not available and the applicator must fill a container (typically a backpack) at the job site, the applicator would comply with the operational and spill contingency plan prepared during the PUP process. This would only occur in rare circumstances, as containers are typically filled prior to leaving for the site and would often last for the entire day of treatment. A closed connection is a leak-proof connection or valve used to transfer the pre-mixed herbicide from the storage container to the backpacks or ATV-mounted tanks. As previously mentioned, herbicides would be applied in select locations using backpacks or containers mounted on ATVs equipped with handheld spray wands for accurate spot treatment. The herbicide-mix storage containers would be removed from the ROW every day following the application process, and storage containers would be returned to the supplier when empty.

The closed containers are product-dedicated and can be refilled only with the same custom-blended herbicide formulations that they originally contained. Each sealed container is labeled with an EPA product registration number and the concentration of ingredients, including active ingredients, diluting agents, and adjuvants. The movement of the herbicides and containers through the chain of custody would be tracked by their unique identification numbers in the containers' bar codes. The auditable recordkeeping documentation would tie the supply container and its contents to the location where it was delivered for a minimum of three years. The third-party vendor who blends the herbicides would keep a sample of the herbicide mix for three years, in case any issues arise with effectiveness or off-ROW damage claims are made.

SOPs for herbicide applications include the following general procedures used for every herbicide application treatment.

General:

- Use herbicides after considering the effectiveness of all potential methods or in combination with other methods or controls.
- Prepare operational and spill contingency plan in advance of treatment.
- Select the herbicide that is least damaging to the environment while providing the desired results.

[20] Closed connection refers to a positive interlock valve or fitting between the pre-mixed herbicide storage container and the applicators container (JW Goodfellow 2010).

- Apply the least amount of herbicide needed to achieve the desired result.
- Minimize the size of application area, when feasible.
- Select herbicide products carefully to minimize additional impacts from degradates, adjuvants, inert ingredients, and tank mixtures.
- Follow herbicide product label for use and storage.
- Have licensed applicator present when applying herbicides.
- Use personal protective equipment as directed by the herbicide product label.
- Follow the closed chain-of-custody method for herbicide shipping, distribution, storage, and mixing.
- Use only BLM-approved herbicides and follow product label directions and advisory statements.
- Review, understand, and conform to the "Environmental Hazards" section on the herbicide product label. This section warns of known risks to the environment and provides practical ways to avoid harm to organisms or to the environment.
- Comply with herbicide-free buffer zones, if appropriate.
- Where appropriate, post treated areas with manufacturers' guidelines and resources for additional information in accordance with BLM requirements and as listed on the herbicide product label.
- Notify relevant landowners prior to treatment, if determined appropriate by the BLM.
- Keep a copy of the safety data sheets at work sites.
- Keep records of each application, including the active ingredient, formulation, application rate, date, time, and location.
- Avoid direct spray and spill conditions to minimize risks to resources.
- Use drift control agents and low volatile formulations.
- Use drift control agents, as appropriate, to reduce the drift hazard to non-target species, food, and water sources.
- Consider site characteristics, environmental conditions, and application equipment in order to minimize damage to non-target vegetation.
- Consider climate, soil type, slope, and vegetation type when developing herbicide treatment programs.
- Before herbicide application, consider the effects of wind, humidity, temperature inversions, and heavy rainfall on herbicide effectiveness and risks.
- Take into account the different types of application equipment and methods, where possible, to reduce the probability of contamination of non-target species, food, and water sources.
- Select proper application equipment (e.g., spray equipment that produces 200- to 800-micron-diameter droplets [spray droplets of 100 microns and less are most prone to drift]).
- Select proper application methods (e.g., set maximum spray heights, use appropriate buffer distances between spray sites and non-target resources).
- If there is a high probability (80 percent chance) of local, moderate rain (0.25 inch or less within 24 hours), then applications should only occur when it is anticipated that there shall be sufficient time (at least four hours) for the application to dry before rainfall occurs.

STANDARD OPERATING PROCEDURES AND MITIGATION MEASURES BY RESOURCE

In additional to the above general SOPs, resource-specific SOPs are included below:

Soil

- Herbicide treatments would be minimized in areas where herbicide runoff is likely, such as steep slopes when heavy rainfall is expected.
- Herbicide treatments would be minimized in areas that have high soil mobility, particularly in areas where soil properties increase the potential for mobility.
- Granular herbicides would not be used on slopes of more than 15 percent where there is the possibility of runoff carrying the granules into non-target areas.
- Pre-emergent herbicides would not be applied to sandy soils.

Water Resources

- Select herbicide products to minimize impacts on water. This is especially important for application scenarios that involve risk from active ingredients in a particular herbicide, as predicted by risk assessments.
- Minimize treating areas with high risk for groundwater contamination.
- Maintain buffers between treatment areas and water bodies. Buffer widths should be developed based on herbicide and site-specific criteria to minimize impacts to water bodies.

Wetlands and Riparian Areas

- Within riparian areas, wetlands, and aquatic habitats, conduct herbicide treatments only with herbicides that are approved for use in those areas.
- Use appropriate herbicide-free buffer zones for herbicides not labeled for aquatic use based on risk assessment guidance, with minimum widths of 10 feet for hand spray applications.
- Do not apply pre-emergent herbicides in riparian areas or areas where the water table is high.
- Within or near riparian areas, avoid using glyphosate formulations that include R-11, and either avoid using any formulations with polyethoxylated tallow amine, or seek to use the formulation with the lowest amount of polyethoxylated tallow amine available.
- Within or near riparian areas, special care would be followed when transporting and applying 2,4-D, bromacil, clopyralid, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, tebuthiuron, and triclopyr.
- If there is a high probability (80 percent chance) of local, moderate rain (0.25 inch or less within 24 hours), then applications should only occur when it is anticipated that there shall be sufficient time (at least four hours) for the application to dry before rainfall occurs.
- Implement the following buffers for riparian, wetlands, and other aquatic habitats when applying herbicide.
    - Herbicides rated as class 0 require no buffer. Herbicides that meet this criterion include: aminopyralid, glyphosate (aquatic formulation), imazapic, imazapyr (aquatic and nonaquatic formulations).

- Do not apply herbicides rated as class 1 within 30 feet of the waterbody or wetland to be protected. Herbicides that meet this criterion include: bromacil, chlorsulfuron, clopyralid, fluroxypyr (acid formulation), glyphosate (non-aquatic formulation), hexazinone, metsulfuron methyl, picloram, sulfometuron methyl, tebuthiuron, and triclopyr (amine salt formulation).
- Do not apply herbicides rated as class 2 within 50 feet of the waterbody or wetland to be protected and within 10 feet of riparian vegetation, if present. Herbicides that meet this criterion include: 2,4-D (aquatic and non-aquatic amine salt formulations), dicamba, diuron, and triclopyr (ester formulation).
- Do not apply herbicides rated as class 3 within 100 feet of the edge of the waterbody or wetland to be protected and within 20 feet of riparian vegetation, if present. Herbicides that meet this criterion include: 2,4-D aquatic and non-aquatic ester formulations.
- For pool habitats, do not apply herbicides within 30 feet of pools when there is no surface flow of water in and out of pool.

- For treatment of aquatic vegetation, (1) treat only that portion of the aquatic system necessary to achieve acceptable vegetation management, (2) use the appropriate application method to minimize the potential for injury to compatible vegetation and aquatic organisms, and (3) follow water use restrictions presented on the herbicide label.

Pollinators

- Design vegetation treatment projects so that nectar and pollen sources for important pollinators and resources are treated in patches rather than in one single treatment.
- Minimize herbicide application rates. Use typical rather than maximum rates where there are important pollinator resources.

General Vegetation

- For treatment of aquatic vegetation, (1) treat only that portion of the aquatic system necessary to achieve acceptable vegetation management, (2) use the appropriate application method to minimize the potential for injury to compatible vegetation and aquatic organisms, and (3) follow water use restrictions presented on the herbicide label.

Fish and Other Aquatic Organisms

- Use appropriate buffer zones based on product label and risk assessment guidance.
- For non-special-status fish, minimize treatments near fish-bearing waterbodies.
- Use herbicides of low toxicity to wildlife, where feasible.
- For treatment of aquatic vegetation, 1) treat only that portion of the aquatic system necessary to achieve acceptable vegetation management, 2) use the appropriate application method to minimize the potential for injury to compatible vegetation and aquatic organisms, and 3) follow water use restrictions presented on the herbicide label.
- Herbicide treatments would be minimized in areas where herbicide runoff is likely, such as steep slopes when heavy rainfall is expected.
- Granular herbicides would not be used on slopes of more than 15 percent where there is the possibility of runoff carrying the granules into non-target areas.

- Within riparian areas, wetlands, and aquatic habitats, conduct herbicide treatments only with herbicides that are approved for use in those areas.
- When working in riparian areas, wetlands, and near other aquatic habitats, access work site only on existing roads, and limit all travel on roads when damage to the road surface would result or is occurring.
- Within or near riparian areas, avoid using glyphosate formulations that include R-11, and either avoid using any formulations with polyethoxylated tallow amine, or seek to use the formulation with the lowest amount of polyethoxylated tallow amine available.
- Implement the following buffers for riparian, wetlands, and other aquatic habitats when applying herbicide:
    - Herbicides rated as class 0 require no buffer. Herbicides that meet this criterion include: aminopyralid, glyphosate (aquatic formulation), imazapic, imazapyr (aquatic and nonaquatic formulations).
    - Do not apply herbicides rated as class 1 within 30 feet of the waterbody or wetland to be protected. Herbicides that meet this criterion include: bromacil, chlorsulfuron, clopyralid, fluroxypyr (acid formulation), glyphosate (non-aquatic formulation), hexazinone, metsulfuron methyl, picloram, sulfometuron methyl, tebuthiuron, and triclopyr (amine salt formulation).
    - Do not apply herbicides rated as class 2 within 50 feet of the waterbody or wetland to be protected and within 10 feet of riparian vegetation, if present. Herbicides that meet this criterion include: 2,4-D (aquatic and non-aquatic amine salt formulations), dicamba, diuron, and triclopyr (ester formulation).
    - Do not apply herbicides rated as class 3 within 100 feet of the edge of the waterbody or wetland to be protected and within 20 feet of riparian vegetation, if present. Herbicides that meet this criterion include: 2,4-D aquatic and non-aquatic ester formulations.
- For pool habitats, do not apply herbicides within 30 feet of pools when there is no surface flow of water in and out of pool.

Wildlife

- Use herbicides of low toxicity to wildlife, where feasible.
- A qualified biologist or resource specialist would provide maintenance crew members with training on migratory bird nest reporting and nest avoidance: crews are to report active nests that occur on vegetation or on the ground internally per each Utilities' avian reporting procedures. Do not conduct herbicide treatments on the vegetation containing the nest and vegetation adjacent to ground nesting birds until after nesting is complete.

Threatened, Endangered, and Sensitive Species

- Consider effects on special-status species when designing herbicide treatment programs, if appropriate.
- Use an appropriately labeled herbicide and backpack sprayer to minimize risks to special-status plants.
- Avoid treating vegetation during time-sensitive periods (e.g., nesting and migration, sensitive life stages) for special-status species in area to be treated.
- See Appendix C of this EA for a complete list of conservation measures specific to threatened, endangered, and sensitive species.

Livestock

- The BLM would notify grazing permittees a minimum of 30 calendar days prior to herbicide treatments, when the removal of grazing animals is directed by the herbicide product label.Wild Horses and Burros
- Minimize using herbicides in areas grazed by wild horses and burros.

Cultural Resources

- Follow standard procedures for compliance with Section 106 of the NHPA as implemented through the *Programmatic Agreement among the Bureau of Land Management, Arizona State Historic Preservation Officer, Arizona Public Service Company, and Salt River Project Agricultural Improvement and Power District* (BLM 2017 *Pending*) regarding the manner in which BLM would meet its responsibilities under the NHPA and state protocols or 36 CFR Part 800, including necessary consultations with State Historic Preservation Office (SHPO) and interested tribes (refer to Appendix F).

Visual Resources

- Minimize off-site drift and mobility of herbicides to contain visual changes to the intended treatment area.

Recreation

- If appropriate, schedule treatments to avoid recreational events, while taking into account the optimum management period for the targeted species.
- The BLM to notify the public of treatment methods, hazards, times, and nearby alternative recreation areas, if necessary.
- Use herbicides during periods of low human use, where feasible.

Social and Economic Values

- The BLM to notify grazing permittees of livestock feeding restrictions in treated areas, if necessary, per herbicide product label instructions.
- Provide public educational information on the need for vegetation treatments and the use of herbicides in an IVM program, if appropriate.

Human Health and Safety

- Establish a buffer between treatment areas and human residences based on guidance given in the Human Health Risk Assessment, in accordance with the label, with a minimum buffer of 100 feet for ground applications, unless a written waiver is granted.

2.4 Alternatives Considered but Eliminated from Detailed Study

2.4.1 Grazing

Using livestock, such as goats or sheep, can control some species of incompatible vegetation, especially when used with other vegetation treatment methods. However, the effectiveness of this type of treatment would vary throughout the season, depending on what stage of plant growth is the livestock's preferred food. It would not be practical to keep livestock within the Utilities' ROW because of the time that would be needed to achieve any substantial level of vegetation control through grazing. Livestock could also consume compatible plant communities and therefore would need to be moved to prevent overgrazing of desired vegetation. Fencing

would also have to be added to keep livestock within the ROW, and predators would have to be managed to prevent loss of livestock. This alternative has been eliminated from further analysis since it is ineffective and it would not address the purpose and need.

2.4.2 Herbicide Application by Foot Only

Under this alternative, the application of herbicide would be completed on foot using work crews and backpack sprayers. The Utilities would use selected, BLM-approved herbicides on incompatible vegetation within ROWs on BLM-managed lands as part of the Utilities' IVM program. The Utilities would continue using manual and mechanical methods such as mowing, chipping, or hand cutting as described in the No Action Alternative in combination with herbicide treatment methods discussed in the Proposed Action. Applicators would transport and apply herbicides within the ROW using backpack sprayers only. No vehicles would be used to transport or apply herbicides within the ROW. This alternative would require workers to transport and apply herbicides within the ROW while on foot over long distances using only backpack sprayers. As a result of using only backpack sprayers, the herbicide quantity carried by the workers would be less than if tank-mounted ATVs were being used. Backpack sprayer can hold approximately five gallons of product, while a tank mounted to an ATV can hold between 20 and 50 gallons of product. This would require more frequent refilling of the backpack sprayers in the ROWs, which would increase the likelihood of spills. This would also increase the duration of treatments, since it would increase travel time to and from the work areas and require maneuvering within the ROW on foot. The applicator's walking speed would depend on many different factors, including terrain, vegetation cover, and land slope (travelling uphill and downhill), but typical speed on level terrain without vegetative cover is approximately 3 to 4 miles per hour. Additionally, some herbicide application methods such as the cut-stump technique must be completed immediately after mechanical treatment, requiring workers to also transport mechanical equipment such as chainsaws, etc. Cut-stump technique effectiveness is reduced if not completed shortly after mechanical treatment (typically within 15 to 60 minutes). This has the potential to result in having to use more herbicide to gain control of vegetation. On foot application of herbicide is primarily intended to be used in limited areas, particularly those inaccessible by vehicle or near the vicinity of sensitive areas. Furthermore, the remote locations and rugged terrain of some ROWs does not allow typical vehicular use along existing access roads with well-defined access points. This would require workers to walk long distances on foot over rugged terrain. Traversing the ROW in remote locations for long distances with equipment and no vehicles could prove to be hazardous for workers. This alternative would not be practical due to the long linear nature of the ROW and the remote locations. Therefore, this alternative was eliminated from further analysis since it is ineffective and would not adequately address the purpose and need.

2.4.3 Comparison of Alternatives

Table 2-2 provides a summary of the environmental effects of the Proposed Action compared to the No Action Alternative. The full analysis of the Proposed Action and the No Action Alternative are provided in Chapter 3 of this EA. The magnitude of impact (negligible, minor, moderate, or major) for each resource is summarized in the appropriate column. For each resource the type (adverse or beneficial), duration (long- and short-term), and effect (direct and indirect) are provided. For example, Table 2-2 identifies that the No Action Alternative would result in long-term, direct, negligible, adverse effects and long-term, indirect, beneficial effects on soils. Additionally, the No Action Alternative would have short-term, direct and indirect, minor, adverse effects on soils.

Table 2-2. Environmental Impact Summary by Alternative

Resource	No Impact	Negligible	Minor	Moderate
Soils – No Action		(LT/D/A)	(LT/ID/B) (ST/D/ID/A)	
Soils – Proposed Action			(ST/D/ID/A)	(LT/D/ID/B)
Water Resources and Quality (Drinking/Surface/Groundwater) – No Action		(LT/D/A) (ST/ID/B) (LT/ID/B)	(ST/D/A)	
Water Resources and Quality (Drinking/Surface/Groundwater) – Proposed Action		(ST/ID/B)	(ST/D/A)	(LT/D/ID/B)
Wetlands and Riparian Areas – No Action		(ST/D/ID/A)	(LT/D/ID/B)	
Wetlands and Riparian Areas – Proposed Action		(ST/ID/A)	(ST/D/A)	(LT/D/ID/B)
Noxious and Invasive Weeds – No Action			ST/D/B)	(LT/D/ID/A) (ST/ID/A)
Noxious and Invasive Weeds – Proposed Action			(ST/D/B)	(ST/ID/A) (LT/D/ID/B)
General Vegetation – No Action				(ST/D/ID/A) (LT/D/ID/A)
General Vegetation –Proposed Action				(ST/D/ID/A) (LT/D/ID/B
General Fish and Wildlife – No Action		(ST/D/ID/A)	(LT/D/ID/A)	
General Fish and Wildlife – Proposed Action		(ST/D/ID/A)		(LT/D/ID/B)
Federally Listed Species – No Action				
Chiricahua leopard frog California condor Yuma clapper rail		(ST/D/ID/A) (LT/D/ID/B)		
Southwestern willow flycatcher Yellow-billed cuckoo Acuña cactus Northern Mexican gartersnake		(ST/D/A) (LT/D/A)	(ST/ID/A) (LT/ID/A)	
Desert pupfish	X			
Gila chub Gila topminnow	(ST/D) (LT/D)	(ST/ID/A) (LT/ID/A)		
Lesser long-nosed bat Sonoran pronghorn Arizona hedgehog cactus Huachuca water-umbel Peebles Navajo cactus		(ST/D/ID/A) (LT/D/ID/A)		
Ocelot	(ST/D/ID) (LT/D)	(LT/ID/B)		
Federally Listed Species – Proposed Action				
Chiricahua leopard frog California condor Yuma clapper rail		(ST/D/ID/A) (LT/D/ID/A)		
Southwestern willow flycatcher Yellow-billed cuckoo Acuña cactus Northern Mexican gartersnake		(ST/D/A) (LT/D/A)	(ST/ID/A) (LT/ID/A)	
Desert pupfish	(ST/D) (LT/D)	(ST/ID/A) (LT/ID/A)		
Gila chub Gila topminnow		(ST/D/ID/A) (LT/D/ID/A)		
Lesser long-nosed bat Sonoran pronghorn Arizona hedgehog cactus Huachuca water-umbel Peebles Navajo cactus		(ST/D/ID/A) (LT/D/ID/A)		
Ocelot	(ST/D/ID) (LT/D)	(LT/ID/B)		

Resource	No Impact	Negligible	Minor	Moderate
BLM Sensitive Species – No Action		(ST/D/ID/A) (LT/D/ID/A)		
BLM Sensitive Species – Proposed Action		(ST/D/ID/A) (LT/D/ID/B)		
Migratory Birds – No Action		(ST/D/ID/A) (LT/D/ID/A)		
Migratory Birds – Proposed Action		(ST/D/ID/A) (LT/D/ID/B)		
Fire and Fuel Management – No Action		(ST/D/ID/B) (LT/D/ID/B)		
Fire and Fuel Management – Proposed Action				(ST/D/ID/B) (LT/D/ID/B)
Special Management Areas – No Action			(ST/D/ID/A) (LT/D/A)	(LT/ID/B)
Special Management Areas – Propsoed Action			(ST/D/ID/A)	(LT/D/ID/B)
Cultural Resources – No Action		(ST/D/ID/A) (LT/D/ID/A)		
Cultural Resources – Proposed Action		(ST/D/ID/B) (LT/D/ID/B)		

Table Notes: ST = Short-term; LT = Long-term; D = Direct; ID = Indirect; A = Adverse; B = Beneficial

PAGE INTENTIONALLY LEFT BLANK

CHAPTER 3
AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 Introduction

The following information describes the affected (existing) environment in the ROW and presents the potential effects of the No Action Alternative, and the Proposed Action. Measures to avoid or minimize impacts have also been identified and are listed at the end of each resource discussion and in the Mitigation Measures section of this EA. Direct and indirect impacts are described in this chapter and cumulative impacts addressed in Chapter 4. Potential impacts are described in terms of duration, intensity, type, and context. Definitions of impact terms are provided below.

In this document, the terms "effect" and "impact" are used synonymously. Effects fall into two categories:

- ***Direct:*** caused by the action, same time and place.
- ***Indirect:*** caused by the action, but later in time or further in distance, but are still reasonably foreseeable.

For the purposes of this analysis, duration of the impact is defined as follows:

- ***Short-term*****:** impacts that would be less than 10 years in duration.
- ***Long-term*****:** impacts that would be 10 years or greater in duration.

For the purposes of this analysis, intensity or severity of the impact is defined as follows:

- ***Negligible*****:** changes would not be detectable and/or measureable. The resource would be essentially unchanged or unaltered.
- ***Minor*****:** changes would be detectable, localized, and/or measurable. The resource would be slightly changed or altered.
- ***Moderate*****:** changes would be clearly detectable, measurable, and/or have an appreciable effect on the resource. The resource would be notably changed or altered.
- ***Major*****:** changes would be readily detectable, and/or have a severe effect on the resource. The resource would be substantially changed or altered.

For the purposes of the type of impact is defined as follows:

- ***Adverse:*** impacts that would have a detrimental effect to a resource.
- ***Beneficial:*** impacts that would have a positive effect to a resource.

Context is the setting within which an impact is analyzed:

- ***Local:*** within and immediately adjacent to the project area/ROW.
- ***Regional:*** remaining area outside of the ROW but within the BLM field office.

For any given resource, the definition of the magnitude of effect may be more specific to the resource and is noted in the appropriate section of the chapter. Descriptions of potential impacts are provided in each resource by alternative.

3.2 Resources Considered for Analysis

The BLM is required to address specific elements of the environment that are subject to requirements in statute or regulation or by executive order (BLM 2008a). Table 3-1 lists the elements that must be addressed in all environmental analyses and indicates whether the Proposed Action or No Action Alternative affects those elements. Other resources of the human environment that have been considered for analysis are listed in Table 3-1.

Table 3-1. Rationale for Determination of Resources Analysis

Resource or Issue	May Be Present (Yes/No)	May Be Affected (Yes/No)	Rationale for Determination of Analysis
Air Quality/Climate Change/ Greenhouse Gases	Yes	No	Neither alternative is expected to contribute to measurable or detectible impacts to air quality. The 2007 Herbicide PEIS (pages 4-5 through 4-13) and the 2016 Herbicide PEIS (pages 4-5 through 4-9) provides a detailed analysis of potential air quality impacts associated with the application of herbicides. According to this analysis, the potential impacts from herbicide applications on local and regional air quality would be minor and did not require mitigation. The Utilities are not proposing activities different from those analyzed in the Vegetation Treatment PEIS, would use BLM-approved herbicides, and would only use targeted treatment methods. Consistent with the BLM PEISs, the No Action Alternative (manual and mechanical treatment) would be expected to have a greater potential air quality impact as an alternative that would increase the use of ground vehicles and equipment, and treatment would have to occur more frequently resulting in additional emissions without the use of herbicides. Only herbicides included in the BLM Herbicide PEIS/ROD would be used. The Proposed Action would not result in greater impacts than previously disclosed in the BLM PEISs. The Utilities would perform herbicide application consistent with applicable SOPs. There is no potential for new or modified impacts that have not been disclosed in prior environmental documentation so this issue is not discussed further in this EA.
Environmental Justice	No	No	Resource not present within the ROW. There are no low income or minority populations as described in Executive Order 12898.
Farmlands (Prime or Unique)	No	No	Resource not present within the ROW. There are no United States Department of Agriculture (USDA)-designated prime or unique farmlands present within the ROW.
Floodplains	Yes	No	Executive Order 11988, Floodplain Management, requires an evaluation of impacts to floodplains for all federal actions and directs federal entities to reduce impacts to floodplains and minimize flood risks to human safety. The application of herbicides within the ROW through BLM-managed lands would not result in any modification of a floodplain that would impede or redirect flood flows that would result in property damage on- or off-site. The flood-carrying capacity of the floodplain, the pattern, or the magnitude of the flood flow would not be affected.
Lands and Realty	Yes	No	Although rights-of-way/leases may be present, the Proposed Action would have no impact to these authorizations and activities. No temporary or permanent access limitations are associated with either of the alternatives.

Resource or Issue	May Be Present (Yes/No)	May Be Affected (Yes/No)	Rationale for Determination of Analysis
Livestock Grazing	Yes	No	Livestock grazing may be present within the ROW. No temporary or permanent access limitations or impacts to grazing rotations are anticipated with the Proposed Action. Spot treatment and the use of the adjuvant Thinvert would eliminate the need for any restricted or limited access. Potential to eliminate forage needed to feed grazing livestock (i.e., animal unit month), however, is not anticipated to be substantial enough to affect this resource. Livestock grazing will not be further discussed in this EA.
Mineral Resources	Yes	No	No impacts are anticipated since there would be very limited ground disturbance. No mining claims are present in the ROW and none of the alternatives would affect any on-going exploration activities.
Paleontology	No	No	Resource not present within the ROW. Paleontological resources would not be impacted by the Proposed Action or the No Action Alternative.
Recreation	Yes	No	Although dispersed recreation and trails are present in the ROW, none of the alternatives would affect recreational activities. No access restrictions or limitations would be required. Where appropriate, the Utilities would post treated areas with manufacturers' guidelines and resources for additional information in accordance with BLM requirements and as listed on the herbicide product label. Therefore, recreation will not be further discussed in this EA.
Socio-Economics	Yes	No	The Proposed Action would not alter the permanent population or result in long-term changes to the socioeconomic characteristics in the ROW. No new or modified impacts are associated with the application of herbicides; therefore, socioeconomics will not be further discussed in this EA.
Travel Management	Yes	No	While there are travel routes within the ROW, the Proposed Action is not considering new road construction or enhancements to any existing roads. There will be no temporary limitations, no road closures/obstructions that would impede vehicle travel during active operations. Where appropriate, the Utilities would post treated areas with manufacturers' guidelines and resources for additional information in accordance with BLM requirements and as listed on the herbicide product label. Therefore, travel management will not be further discussed in this EA.
Wild and Scenic Rivers	No	No	Resource not present within the ROW.
Wild Horses and Burros	Yes	No	No potential effect on herd or populations as a whole. No temporary displacement would occur during active treatments because there would be no access restrictions, closures of any treated areas, or any need to prevent wildlife from entering treated areas. Spot treatment and the use of the adjuvant would eliminate the need for any restricted or limited access. Therefore, wild horses and burros will not be further discussed in this EA.

Resource or Issue	May Be Present (Yes/No)	May Be Affected (Yes/No)	Rationale for Determination of Analysis
Public Health and Safety	Yes	No	The use of herbicides would involve the potential risk or the perception of risk to workers and members of the public engaging in activities in or near the ROW. The 2007 and 2016 Herbicide PEISs provide detailed analysis of the potential human health and safety impacts associated with the application of herbicides (pages 4-174 through 4-197 [BLM 2007a] and pages 4-85 through 4-102 [BLM 2016a]) and is hereby incorporated in this EA by reference. Additional analysis on effects of vegetation management including manual, mechanical, and herbicide treatment methods are also presented in the 2007 Herbicide PER on pages 4-134 through 4-140 (BLM 2007e). SOPs for human health and safety are included in Chapter 2 of this EA. The Utilities would perform herbicide application consistent with these applicable SOPs. The use of selected BLM-approved herbicides would not result in any new or greater impacts than previously disclosed in the 2007 and 2016 Herbicide PEISs. Therefore, public health and safety will not be further discussed in this EA.
Waste, Hazardous or Solid	Yes	No	Herbicides would be brought on-site by a licensed contractor, would not be stored on-site, and would be used immediately. Herbicides would be handled in accordance with applicable regulations. The Proposed Action would not result in greater impacts than previously disclosed in the 2007 and 2016 Herbicide PEIS. The Utilities would perform herbicide application consistent with applicable SOPs. There is no potential for new or modified impacts that have not been disclosed in prior environmental documentation therefore, waste (hazardous or solid) will not be further discussed in this EA.
Soils	Yes	Yes	See discussion in Affected Environment/Environmental Consequences Section 3.3.
Water Resources/Quality (Drinking/Surface/ Groundwater)	Yes	Yes	See discussion in Affected Environment/Environmental Consequences Section 3.4.
Wetlands/Riparian Areas	Yes	Yes	See discussion in Affected Environment/Environmental Consequences Section 3.5.
Noxious Weeds/ Invasive Species (Executive Order 13112)	Yes	Yes	See discussion in Affected Environment/Environmental Consequences Section 3.6.
General Vegetation	Yes	Yes	See discussion in Affected Environment/Environmental Consequences Section 3.7.
General Fish and Wildlife	Yes	Yes	See discussion in Affected Environment/Environmental Consequences Section 3.8.
Federally Listed Species	Yes	Yes	See discussion in Affected Environment/Environmental Consequences Section 3.9.
BLM Sensitive Species	Yes	Yes	See discussion in Affected Environment/Environmental Consequences Section 3.10.
Migratory Birds and Eagles	Yes	Yes	See discussion in Affected Environment/Environmental Consequences Section 3.11.

Resource or Issue	May Be Present (Yes/No)	May Be Affected (Yes/No)	Rationale for Determination of Analysis
Fire/Fuel Management	Yes	Yes	See discussion in Affected Environment/Environmental Consequences Section 3.12.
Special Management Areas	Yes	Yes	See discussion in Affected Environment/Environmental Consequences Section 3.13.
Visual Resources	Yes	No	The ROW within the various BLM field offices includes Visual Resource Management Classes II, III, and IV. Class III and IV allow for moderate to high level of modifications to the visual landscape. Visual Resource Management Class II allows for low modification to the visual character. The percent of the Class II areas within the ROW is 0.07% of the total acres of Class II within the Field Offices. The potential effects to visual resources from the application of herbicides would be most apparent in forested areas which are dominated by evergreen trees. Treated annual grasses would not be as apparent because the landscape is dominated by low-growing shrubs with brown, gray, or other earth tone colors. Impacts within the ROW would be indistinguishable from the No Action Alternative where mechanical, manual, and DSAP treatments are already authorized. Although not all of the approximately 420 poles with electrical equipment have been treated, the total DSAP treatment area within the ROW would be approximately 3.03 acres. The DSAP poles are generally located in the wildland-urban interface areas near residential development. The visual quality and landscape character has already been altered by the overhead power lines and structures. Therefore, visual resources will not be further discussed in this EA.
Cultural Resources	Yes	Yes	See discussion in Affected Environment/Environmental Consequences Section 3.14.
Native American Religious Concerns	No	No	Resource concerns have not been identified within the ROW, through consultation with Native American tribes.

3.3 Soils

3.3.1 Introduction

In this EA, the discussion of soil resources includes soils and biological soil crusts. Soil refers to the layer of rocks, minerals, organic materials, air, and water that is found on the surface of the land. Proper soil condition is a fundamental aspect to high functioning ecosystems and supports important physical and biological processes. As several resources and resource uses such as livestock grazing, recreational uses, and wildlife habitat, depend upon suitable soils, their attributes, conditions, and management should be considered during management decisions.

Biological soil crusts refer to the community of multiple, unrelated organisms that occur together on the soil surface in arid and semi-arid landscapes. Structurally, biological crusts are a rough, uneven carpet or skin of low stature (less than 4 inches in height). They function as living mulch by retaining soil moisture, reducing wind and soil erosion, and discouraging annual weed growth, and they contribute to soil organic matter (BLM 2001).

Federal, state, and local units of government provide guidance for the management of soil resources through a broad array of regulations, guidelines, and formal planning processes. Federal land management agencies, including BLM, are responsible for administration of soil protection guidelines on federal lands. Through state and local agency offices, the Natural Resources Conservation Service (NRCS) administers soil conservation programs on private lands.

On lands managed by the BLM, the agency addresses soil resources primarily through BLM Handbook H-4180-1, (Rangeland Health Standards, BLM 2001a). The Rangeland Health Standards are based on 43 CFR 4180.1, "Fundamentals of Rangeland Health." This regulation directs the BLM to ensure that "watersheds are in, or are making substantial progress toward, properly functioning physical condition, including their upland, riparian-wetland, and aquatic components; soil and plant conditions support infiltration, soil moisture storage, and the release of water that are in balance with climate and landform and maintain or improve water quality, water quantity, and timing and duration of flow."

3.3.2 Issues Identified for Analysis

- What would the potential be for increased soil loss and runoff following vegetation removal?
- What would the effects of herbicides be on soils; specifically, would there be changes in soil function (productivity or infiltration rates); would there be changes in soil chemistry (dependent on type of chemical and how long it remains in the soil); and would herbicide treatments on bare ground lead to accelerated erosion?
- What would the impacts to soils be from using ATVs for herbicide treatment application when the vehicles are going cross-country within the ROW?
- What would the impacts to biological soil crusts be from herbicide use?

3.3.3 Affected Environment

In the semi-arid to arid environment across the ROW, the differences in topography, elevation, vegetation, and water sources are reflected in the diversity and productivity of soil types found within the state (USDA 2012). Similar types of soils are grouped together into soil orders based on their characteristics, such as organic matter, clay content, and pH that give soil their unique properties (Jenny 1980). Soils in the ROWs are classified into the following six soil orders by the NRCS: Alfisols, Aridisols, Entisols, Inceptisols, Mollisols, and Vertisols. These soil orders group the soils at the broadest level of classification. A detailed description of the soil orders is presented in the 2007 Herbicide PEIS (BLM 2007a:3-7 to 3-9) and is incorporated here by reference. Table 3-2 lists the estimated acres and percent of soil orders found in the ROW by BLM field office.

Table 3-2. Soil Orders Acres within ROW

Soil Order	Hassayampa	Kingman	Lake Havasu	Lower Sonoran	Safford	Tucson	Yuma	Total ROW Acres	Percent of Total ROW
Aridisols	1,318.26	711.05	286.57	4,257.14	181.77	502.40	2,217.87	9,475.06	82%
Entisols	310.80	48.20	20.98	386.71	8.30	307.86	85.03	1,167.89	10%
Alfisols	516.77			1.26	0.78			518.81	5%
Inceptisols	65.58			34.02				99.60	1%
Mollisols	0.16	120.08			18.90			139.13	1%
Unknown		0.83	1.75		131.48			134.06	1%
Vertisols	0.44							0.44	<1%

Source: USDA/NRCS National Geospatial Center of Excellence, Digital General Soil Map of U.S.

Management activities can result in changes to soil quality and to certain properties such as organic matter and susceptibility to erosion. Soil quality refers to a soil's capacity to function and sustain productivity and the ability of the soils to filter, buffer, degrade, immobilize, and detoxify (BLM 2007a). Table 3-3 provides information on some of the soil properties and characteristics that contribute to soil quality within the ROW. More detailed

information on the soils within the ROW can be obtained through review of soil surveys conducted by the NRCS, which can be accessed online at: http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm. Other related factors that contribute to the condition of the soil resource include biological soil crusts, micro- and macro-organisms, soil compaction, and soil disturbance. These factors are described in both the 2007 Herbicides PEIS and 2016 Herbicides PEIS on pages 3-9 to 3-11 and 3-7 to 3-8, respectively, and the descriptions are incorporated here by reference.

Table 3-3. Soil Orders Properties within ROW

Soil Order	Average Percent Organic Matter[a]	Average Percent Clay[b]	Average T Factor[c]	Average Wind Erosion Group Rating[d]	Average Water Erosion Risk Rating K Factor[e]	Average pH Value[f]	Percent of Total ROW
Aridisols	0.72	16.33	3.39	5.09 (L)	0.19 (L)	7.87 (SA)	82%
Entisols	0.68	15.01	3.75	3.99 (M)	0.22 (M)	8.01(MSA)	10%
Alfisols	6.40	16.57	3.27	5.03 (L)	0.24 (M)	7.03 (N)	5%
Inceptisols	2.71	14.29	2.9	5.51 (L)	0.16 (L)	7.74 (SA)	1%
Mollisols	3.88	22.38	2.91	5.65 (L)	0.21 (M)	7.36 (N)	1%
Vertisols	1.56	46.20	3.33	5.36 (L)	0.15 (L)	7.72 (SA)	<1%

Source: 2017 NRCS General Soil Map of the State of Arizona.

[a] Organic matter consists of decomposed plant and animal material. On any soil, the amount of organic matter is critical to maintaining soil structure and function, allowing water and air to infiltrate to low depths, and providing a source of energy to microbial communities. It increases water capacity and nutrient supply, as well as provides positive benefits to soil structure and limits erosion by increasing water capacity.

[b] Average organic material (OM) and clay contents derived from the top six inches for all soils within the order, not the entire profile. In some cases, this includes an organic horizon, which increases the average OM content and lowers clay contents.

[c] T Factor: Refers to the maximum amount of soil loss (tons per acre per year) at which the quality of the soil can be maintained for plant growth/productivity. The factor of 1 ton per acre per year is for shallow soils and 5 tons per acre per year is for deep soils that are the least subject to damage by erosion.

[d] Wind Erosion Groups rate the tons per acre soil loss potential for wind erosion on 70 percent-plus unvegetated soil. Ratings are 1 = 160-310 tons / acre / year; 2 = 134 tons; 3 and 4= 86 tons; 5 = 56 tons, 6 = 48 tons; 7 = 38 tons; and, 8 = 0 tons (USDA 1999). Wind erosion ratings between 3 and 4 are considered moderately susceptible to wind erosion and those with ratings between 4 and 8 are considered to have a low susceptibility to wind erosion.

[e] K Factor Erosion Risk Rating: Low 0.05 to 0.20, Medium 0.21 to 0.40, High 0.41+. Erosion factor K appears in the Universal Soil Loss Equation (Wischmeier and Smith 1978) as a relative index of susceptibility of bare cultivated soil to sheet and rill erosion by rainfall (data derived from USDA 2009). Soils high in clay and coarse texture soils have low K values because they resist detachment. Medium textured soils such as fine sandy loams have moderate K values because they are moderately susceptible to detachment and runoff.

[f] Soils with a high pH are alkaline and soils with a low pH are considered acidic. The pH scale ranges from 0 to 14, with 7 is considered neutral (neither acidic nor alkaline). Soils with a pH between 6.6 and 7.3 are considered neutral (N); pH between 7.4 and 7.8 considered slightly alkaline (SA); and those with a pH between 7.9 and 8.8 considered moderately to strongly alkaline.

The majority of the soils within the ROW are in the Aridisol soil order. In any soil, the amount of organic matter[21] is important in maintaining soil structure and function, allowing water and air to infiltrate to low depths, and providing a source of energy to microbial communities. Since many herbicides readily bind to organic matter, soils with less than 1 percent of organic matter would most likely not constrain the movement of herbicides in the soil, which would make the herbicide available to be taken up by the vegetation. Both Aridisol and Entisols soils, which make-up approximately 92 percent of the soils within the ROW, fall into this category of low organic matter with less than 1 percent of organic matter present within the top 6 inches of soil. Organic matter levels greater than 2.5 to 3 percent (Alfisols, Inceptisols, and Mollisols) may tie up soil-applied herbicides, making them

[21] Organic matter consists of decomposed plant and animal material. On any soil, the amount of organic matter is critical to maintaining soil structure and function, allowing water and air to infiltrate to low depths, and providing a source of energy to microbial communities. It increases water capacity and nutrient supply, as well as provides positive benefits to soil structure and limits erosion by increasing water capacity.

less available to the plant roots. Only approximately 757.55.74 acres (or 7 percent) of the ROW are currently mapped by the NRCS as having organic matter levels greater than 2.5 percent.

Clayey soils have more surface area per volume and provide greater binding sites for herbicides and water, supporting herbicide breakdown by microorganisms. However, as the percentage of clay in a given soil increases, the potential for compaction and runoff also increases. If the soil is nearly all clay, seasonal drying and wetting can produce wide, deep cracks in the soil. Herbicides may end up deeper into the soil. Of the currently mapped NRCS acres, there is less than an acre of ROW where the clay content is higher than 25 percent (see Table 3-3).

Erosion is the process where soil and rock material is removed from the land surface due to water, wind and other factors. Finer particles and organic material are more prone to erosion and are removed more easily, which results in soil with reduced nutrients (Brady and Weil 1999). Vegetation is a major factor in controlling erosion because it reduces the ground-disturbing effects of precipitation, restricts surface flow, and improves infiltration. Biological soil crusts are also important for protecting the soil and controlling erosion in desert regions of the state (BLM 2007a). Soils are rated by NRCS to assess the amount of erosion that can be lost before productivity is reduced. Within the ROW, Aridisols and Entisols soils can lose approximately 3.39 and 3.75 tons of soil per acre per year, respectively, before their long-term productivity would be reduced (see T-Factor, Table 3-3). These soils also have a relatively moderate to low average wind erosion group rating (5.09 to 3.99) if 70 percent or more of their surface becomes exposed. In addition, Aridisols and Entisols soils have a low to moderate water erosion risk factor, respectively (see K-Factor, Table 3-3). Adsorption[22] increases as the pH decreases (becomes acidic) and with increasing clay and organic matter content (Tu et al. 2001). At a soil pH above 7 the herbicide is less tightly adsorbed and more available to plants. According to NRCS, the average pH of the soil orders in the ROW are all neutral to alkaline, with an average range of pH between 7.03-8.01 (see Table 3-3). Approximately 83 percent of the soils are slightly alkaline and 10 percent of soils are moderately to strongly alkaline. Soils considered neutral amount to 6 percent of those currently mapped. There are no soils considered to be acidic within the ROW at the soil order level.

3.3.4 Standard Operating Procedures

MANUAL AND MECHANICAL TREATMENT METHODS

- Within the ROW, ATVs and vehicles may drive off-road if necessary with the implementation of relevant SOPs below:
    - ATVs and vehicles would be used only during dry conditions to avoid rutting, except under hazard vegetation maintenance situations.
    - ATVs and vehicles would be driven at low speeds (less than 10 miles per hour) when traveling off-road within the ROW.
    - ATVs and vehicles would avoid driving directly up slopes and other areas that may contain highly erodible soils.
- Small chips produced during vegetation treatments would be broadcast across the ROW at a thickness no greater than four inches.

[22] Soil adsorption is measured by the sorption coefficient (K_{oc}), which describes the tendency of a herbicide to bind to soil particles. The higher the K_{oc} the greater the sorption potential, which limits the movement of the herbicide and increases it's persistence in the soil. The herbicides with a K_{oc} value greater than 1,000 milliliter (ml) per gram (g) indicates strong adsorption to soil whereas low K_{oc} values (less than 500) tend to allow movement with water more so than movement absorbed to soil (BLM 2011).

- During manual vegetation treatment, the following methods of disposal would be used:
    - Lop and scatter: Limbs and logs of less than 9 inches in diameter would be lopped and scattered throughout the immediate area in a manner such that limbs and logs would be left no taller than 18-24 inches above the ground. Logs over 9 inches diameter would remain where felled and would be cut in sections to lay flush with the ground.
    - Chipping: Limbs and logs less than 9 inches in diameter would be chipped and broadcast on site with chips placed no deeper than four inches.

HERBICIDE TREATMENT METHODS

- Herbicide treatments would be minimized in areas where herbicide runoff is likely, such as steep slopes when heavy rainfall is expected.
- Herbicide treatments would be minimized in areas that have high soil mobility, particularly in areas where soil properties increase the potential for mobility.
- Granular herbicides would not be used on slopes of more than 15 percent where there is the possibility of runoff carrying the granules into non-target areas.
- Pre-emergent herbicides would not be applied to sandy soils.

3.3.5 Environmental Consequences

Direct and Indirect Effects of the No Action Alternative

Vegetation management activities under the No Action Alternative would include hazard vegetation removal, routine vegetation, and DSAP maintenance. Vegetation removal and disposal activities would include the use of tracked or wheeled vehicles, field crews, and hand and machine equipment such as chainsaws and large mowers in some circumstances. This assessment of impacts assumes that the SOPs for manual and mechanical treatment methods designed to reduce potential unintended impacts to soil would be followed for all vegetation management activities in the No Action Alternative.

Treatment methods in the No Action Alternative may cause compaction, displacement of upper surface layers of soil, and increase the risk of erosion. Bare or compacted soils can be more susceptible to erosion and colonization by invasive plants more readily than native plants, as invasive plants tend to be better adapted to establishing on such altered sites. Compaction decreases soil pore space and increases soil density, which in turn can decrease productivity and reduce the ability of water to infiltrate through the soil. Decreased soil infiltration can lead to more water moving across the surface during storm events, thereby increasing erosion (BLM 2015c). Plant roots in the No Action Alternative would remain in place, which would help reduce the potential for soil erosion before grasses and forbs become established (BLM 2007e). Manual and mechanical treatments as well as DSAP maintenance treatments would reduce fuel loads within the ROW, create fire breaks, and decrease the risk of high intensity wildland fires. These efforts to help minimize the excessive loss of vegetation would have an indirect effect on soil resources by avoiding soil disturbance and erosion from catastrophic wildfires.

Manual methods would be the most common method used to treat incompatible vegetation within the ROW and would involve cutting vegetation with non-motorized hand equipment or hand held power equipment such as chainsaws. Ground disturbance would be due primarily to off-road use of vehicles including 4x4 trucks and ATVs used to transport equipment and workers, and to a lesser extent, foot traffic. ATVs and other vehicles would be used off-road only during dry conditions to avoid rutting. Driving directly up slopes or on highly erodible soils would be avoided in order to limit compaction and soil surface disturbance. In addition, the

vehicles would be driven at low speeds at all times. Some contamination of the soil from petroleum products used in vehicles and hand-held power equipment could occur, but these effects would be localized (BLM 2007e).

Manual treatments would affect soils by removing vegetative cover, which could reduce the soil moisture and nutrient recycling and increase the risk of erosion. As the vegetation regrows, these impacts to soils would be substantially reduced. Leaving vegetation debris (wood chips) on the soil surface, or mulching and spreading them after a manual treatment, would help protect the soil surface by reducing the risk of erosion, retaining moisture, and supplying nutrients. Since grasses, forbs, and many shrubs would remain untreated (except for DSAP), this would provide soil with some vegetative cover. This would reduce impacts to soil resources because approximately 82 percent of the soils within the ROW are within the soil order Aridosols. Aridosols soils are characterized by an extreme water deficiency, have low organic matter content, support limited vegetative cover, and are prone to developing hardpans[23] that limit depth of water infiltration.

The recovery rate of any disturbance to biological soil crusts would generally be much slower than the regrowth of vegetation. Adding the wood chips to the soil surface may result in smothering the biological soil crusts. Limiting the layer of mulch to no more than 4 inches would help reduce this potential impact (BLM 2007a and BLM 2007e).

Mechanical methods in the No Action Alternative would be used less than five percent of the time within the ROW. These methods would generally consist of rotary and drum style cutting devices mounted on a vehicle with rubber tires or tracks. Similar to manual treatments, ground disturbance and soil compaction would occur from foot traffic and the vehicles used to transport equipment and workers; mechanical methods would also cause ground disturbance and soil compaction from the use of heavy equipment. The actual shredding, cutting, and chopping of vegetation would not directly disturb the soil. However, mechanical treatments, like manual treatments, would affect soils by removing vegetative cover (BLM 2007e).

Manual methods would have less direct impacts on soil resources within the ROW than mechanical methods. The type and weight of equipment used in mechanical vegetation treatment would have a greater potential to shear and rut soils as compared to the vehicles and equipment used in the manual treatment method. Although, similar to mechanical treatments, ATVs and vehicles would be used only during dry conditions to avoid rutting, except under hazard vegetation maintenance situations. Using tracked or rubber tires that would distribute vehicle weight over a larger area would help reduce the pressure on soil as compared to conventional tires. Compaction and erosion susceptibility can also be reduced by covering the treatment area with the mulched vegetation debris that could serve to protect the soil surface. The mulching of the woody vegetation would occur in front of the cutting equipment, leaving a cushion of mulch for the equipment to travel over, thereby reducing surface disturbance, risk of erosion, and the amount of compaction. The mulch would also help protect the biological soil crusts from the vehicles driven on the surface of the soil crust by creating a layer of cushion. As vegetation becomes reestablished and extend out their root masses, the erosion from exposed soils would decrease. Similar to manual methods, there may also be the potential for some contamination of the soil resources from petroleum products used by the equipment, but these effects would be extremely localized (BLM 2007a and BLM 2007e).

The *DSAP maintenance* activities associated with the No Action Alternative would consist of manually removing all combustible vegetation within the 10-foot radius of poles with equipment that can spark. Clearing the DSAP totally of vegetation would directly disturb the soil and any micro- and macro-organisms in addition to the removal of the root system of any vegetation within the 10-foot radius as well. The disturbed soil would be vulnerable to increased erosion, soil productivity and soil quality would be reduced, and cleared area would be

[23] USDA defines hardpan as a hardened or cemented soil horizon, or layer (USDA 2015).

susceptible to invasive species establishment. The total treatment area within the DSAP maintenance program would impact approximately 3.03 acres of the 11,534.99-acre ROW.

The No Action Alternative is anticipated to result in localized disturbance to soil resources from manual and mechanical treatments and DSAP maintenance activities. Over the long-term, the routine vegetation maintenance requirements in terms of the number of acres to be treated, the density of vegetation to be removed, and the number of work crew members, equipment, and vehicles required are anticipated to be relatively the same for each work cycle. The regrowth of vegetation within the ROW would occur between work cycles and any detrimental effects to soil quality and erosion susceptibility from treatment activities would be reduced. Therefore, the No Action Alternative would have short-term, direct and indirect, minor adverse impacts on soil resources because the intensity and duration of treatments and regrowth of vegetation would be localized and slightly alter soil resources. Over the long-term, the No Action Alternative would have direct, negligible adverse impacts to soil resources. Additionally, this alternative would have long-term, indirect, minor, beneficial impacts on soil resources by decreasing the risk of high intensity wildland fires in the ROW.

Direct and Indirect Effects of the Proposed Action

In addition to the short-term effects associated with the No Action Alternative described above, the Proposed Action would also result in impacts on soil and soil organisms from the use of herbicides as part of the management of incompatible vegetation within the ROW. The 2007 and 2016 Herbicide PEISs provided detailed analysis of potential soil resources impacts associated with the application of herbicides including their fate and transport of herbicides in soils (pages 4-13 through 4-22 [BLM 2007a] and pages 4-10 through 4-13 [BLM 2016a]). Additional analysis on effects of vegetation treatment including manual, mechanical, and herbicide treatments are also presented in the 2007 Herbicide PER on pages 4-11 through 4-19 (BLM 2007e). The detailed discussion of the analyses is not repeated in this EA and is instead incorporated by reference and summarized in this document. In the Proposed Action, only BLM-approved herbicides would be used, which would also include the application of herbicides approved for pre-emergent use by the BLM for DSAP treatments. The activities associated with herbicide application in the Proposed Action were analyzed in the 2007 and 2016 Herbicide PEISs and in the 2007 Herbicide PER. There are no new or modified short-term direct or indirect impacts on soil resources from the Proposed Action that have not been disclosed in these prior environmental documentations. Based on the PEISs and PER findings, the short-term direct and indirect impacts on soil resources from the Proposed Action are considered to be minor.

Some amount of disturbance to soils and biological soil crusts would occur during initial manual and mechanical vegetation treatments with the Proposed Action. The amount of soil loss or erosion, or changes in soil characteristics would be minor and localized, as would the relative size of the area affected as compared to all of BLM-managed lands in Arizona. Herbicide treatments may be completed at the same time as manual and mechanical methods such as for DSAP maintenance or for hazardous vegetation removal. Increased soil disturbance and compaction may occur during these combined treatments if additional work crews and vehicles are needed in order to apply herbicide spot treatment immediately following the manual and/or mechanical treatments.

Herbicides would affect few soil organisms directly (USDA 2004). However, research on the toxicity of herbicides to soil organisms is limited. Chlorsulfuron, picloram, and metsulfuron methyl are known to have some adverse effect on soil organisms; generally reducing but not eliminating local populations for a limited period. Other herbicides, including 2,4-D, clopyralid, dicamba, glyphosate, sulfometuron methyl, and triclopyr, are reported to have no or slight adverse effect on soil organisms, with some organisms showing increases in populations after herbicide treatments (BLM 2015c). Of the limited studies found to have been conducted on soil organisms for the remaining products, effects have been demonstrated, but at application rates many times higher than the typical rates proposed for use in the Proposed Action, or the decrease in soil organisms is temporary

(BLM 2015c). Populations of soil organisms have increased in some situations. The application of herbicide treatments would not affect soil chemistry such as pH or amount of organic matter (BLM 2011). Because the approved herbicides that would be used have not been shown to substantially decrease soil microbial activity, only short-term and localized minor adverse impacts would be expected on soil productivity until native species become prolific within the ROWs.

Potential indirect impacts to soils associated with transporting herbicides to unintentional areas would be negligible because only targeted herbicide applications would be used within the ROWs. The foliar application of herbicides using the adjuvant Thinvert as the carrier would result in the herbicide adhering to the targeted plants, which would minimize spray drift. The herbicide would also be more likely to remain on the plant reducing effects on soil resources. In addition, approximately 92 percent of the soils within the ROW has moderate to low erosion susceptibility rates. As a result, herbicides would tend to remain where applied with limited unintended transport by soil particles from erosion.

Natural decomposition of the herbicide would occur over time, further reducing any long-term impacts. Of the herbicides approved by the BLM for use, only imazapic and tebuthiuron have a half-life[24] in soils greater than 90 days, while dicamba, sulfometuron methyl, and 2,4-D are relatively non-persistent in soil, having a half-life in soils of 20 days or less. Over 90 percent of soils in the ROW are considered sandy, the majority of the soils have low organic matter accumulation. This combination of attributes limits the ability of soils in the ROW to filter, store and process herbicides. In addition, most of the herbicides identified under the Proposed Action have a low adsorption potential and conversely high movement rating. Of the BLM-approved herbicides selected for use in the Proposed Action, only glyphosate has a strong adsorption to soil (BLM 2007a and BLM 2007e). Except in the treatment of DSAP areas, the net effect of these factors would be that in the event that herbicides come in contact with soils, their effects on soils would be minimal.

Herbicides may also indirectly affect soil through plant removal resulting in changes in physical and biological soil parameters. As vegetation is removed, there would less plant material to intercept rainfall and less to contribute organic material to the soil. Loss of plant material and soil organic matter can increase the risk of soil susceptibility to wind and water erosion (BLM 2007a). The Proposed Action would be limited to spot treatment of incompatible vegetation and no broadcast application would occur. The risk for increased erosion would be minor and temporary, lasting only until vegetation was reestablished. When herbicide treatments lead to revegetation with native plants, soil stability would be improved relative to sites dominated by invasive plants (BLM 2007a).

The use of IVM techniques under the Proposed Action would reduce the frequency of future mechanical and manual treatments, subsequently reducing potential impacts to soils. The impact reduction is based on successful use of herbicides that would prevent a species from returning for approximately eight years; generally disturbing less soil for most areas. Long-term, indirect impacts would be based on the successful use of herbicide and establishment of low-growing vegetation as a result of the reduced frequency of vegetation management treatments.

In comparison to the Proposed Action, the manual and mechanical treatment methods associated No Action Alternative would result in a greater number of treatments over the long-term, which would mean an increase in the number of ground vehicles and equipment within the ROW and a greater risk of erosion and compaction. The No Action Alternative routine vegetation maintenance requirements in terms of the number of acres to be treated, the density of vegetation to be removed, and the number of work crew members, equipment, and vehicles required are anticipated to be the same for each work cycle. Conversely, with the Proposed Action, the routine vegetation maintenance requirements would substantially decrease over time within the ROW.

[24] The measure of persistence of a product in soil is calculated as the soil half-life. A half-life is the average time it takes for a certain amount of an herbicide to be reduced by half as it dissipates or breaks down in the environment. A half-life can be categories as non-persistent (less than 30 days), moderately persistent (30 to 90 days), and persistent (greater than 90 days) (BLM 2011).

Therefore, the Proposed Action would have short–term, direct and indirect, minor adverse impacts on soil resources. Additionally, the Proposed Action would have long-term, direct and indirect, moderate, beneficial impacts on soil resources by the reduced frequency and intensity of vegetation management treatments as compared to the No Action Alternative by allowing low-growing native compatible vegetation, and decreasing the risk of high intensity wildland fires within the ROW.

3.3.6 Mitigation Measures

No mitigation measures are recommended.

3.4 Water Resources and Quality (Drinking/Surface/Groundwater)

3.4.1 Introduction

Water resources refer to surface water such as rivers, reservoirs, and ponds and groundwater. Water resources are important for fish and wildlife habitat as well as a variety of human needs, including domestic consumption, crop irrigation, and recreation. Water quality is defined in relation to its specified and/or beneficial uses, such as human consumption and fisheries and is measured by its chemical, physical, biological, and radiological characteristics. The Clean Water Act (CWA), as amended in 1972, is the framework that regulates water quality standards and pollutant discharges into waters of the U.S. The water resources analysis area consists of the surface and groundwater resources that are located within the ROW and were identified through various geographic information system (GIS)-based data sets.

3.4.2 Issues Identified for Analysis

WATER RESOURCES

- What are the impacts to surface waters from the use of herbicides?

WATER QUALITY

- What are the impacts to water quality from the use of herbicides?
- Would the loss of incompatible riparian vegetation increase sedimentation in surface waters?

3.4.3 Affected Environment

WATER RESOURCES

Water resources include perennial streams and rivers (continually flowing), intermittent streams (groundwater component with augmentation by seasonal precipitation), ephemeral streams (flowing in response to precipitation events), and groundwater within the watersheds. The quantity and quality of surface water resources are affected by precipitation, topography, soil type, vegetation, agricultural practices, urbanization, and general land use practices, especially for large tracts of public land. The alteration of vegetative cover from land use practices can effect on water infiltration, soil erosion, and stream sedimentation (BLM 2007a).

The ROW is located within the Lower Colorado River hydrologic region. Within this hydrologic region, the climate is arid, and precipitation primarily occurs in the winter months (BLM 2007a). Surface water flow is ephemeral to non-existent most of the year and only major rivers such as the Gila and San Pedro Rivers have perennial flow. Groundwater can have variable flow rates and can recharge from streams and upland areas. Aquifers (underground water-bearing rock) are generally located in the northeastern and middle to southern

portions of the state with smaller areas of shallow aquifers found in the mountainous alluvial stream valleys (Robson and Banta 1995).

Surface Water. The National Hydrography Dataset (NHD), a GIS dataset that represents the surface water drainage network of named streams, rivers, canals, lakes, and reservoirs in the U.S. (US Giological Survey [USGS] 2011) was used to analyze eight digit Hydrologic Unit Code (HUC) watersheds where the Utilities propose herbicide treatments within authorized. Table 3-4 identifies the 36 watersheds and associated acres that the ROW crosses.

Table 3-4. Hydrologic Unit Code 8 Watersheds within ROW

HUC 8 Watershed Name	HUC 8 Watershed Number	Hassayampa (acres)	Kingman (acres)	Lake Havasu (acres)	Lower Sonoran (acres)	Safford (acres)	Tucson (acres)	Yuma (acres)	Total ROW Acres
Aguirre Valley	15050305						51.33		51.33
Aqua Fria	15070102	1,574.01							1,574.01
Bill Williams	15030204			34.80					34.80
Bouse Wash	15030105	0.15		200.56				33.98	234.69
Burro	15030202		26.24						26.24
Centennial Wash	15070104	394.67		67.17	719.85			16.03	1,197.71
Chevlon Canyon	15020010					57.26			57.26
Detrital Wash	15010014		257.98						257.98
Hassayampa	15070103	221.06							221.06
Havasu-Mohave Lakes	15030101		50.42						50.42
Imperial Reservoir	15030104			2.88				9.46	12.34
Lake Mead	15010005		80.20						80.2
Leroux Wash	15020009					11.13			11.13
Lower Colorado	15030107							57.93	57.93
Lower Gila	15070201				937.02			1,909.73	2,846.74
Lower Gila-Painted Rock Reservoir	15070101				2,218.54				2,218.54
Lower Puerco	15020007					8.66			8.66

HUC 8 Watershed Name	HUC 8 Watershed Number	Hassayampa (acres)	Kingman (acres)	Lake Havasu (acres)	Lower Sonoran (acres)	Safford (acres)	Tucson (acres)	Yuma (acres)	Total ROW Acres
Lower Salt	15060106	1.58			140.40				141.98
Lower San Pedro	15050203						27.99		27.99
Lower Santa Cruz	15050303				34.58		158.74		193.32
Middle Gila	15050100				480.07		493.50		973.57
Middle Little Colorado	15020008					130.42			130.42
Red Lake	15010007		442.53						442.53
San Carlos	15040007				0.90				0.9
San Cristobal Wash	15070203				9.80			1.19	10.99
Santa Maria	15030203	1.33	22.79						24.12
Santa Rosa Wash	15050306				39.47				39.47
Silver	15020005					65.52			65.52
Tenmile Wash	15070202				46.28			3.04	49.32
Tyson Wash	15030106			3.90				254.30	258.20
Upper Little Colorado	15020002					67.20			67.20
Upper Salt	15060103				52.24				52.24
Upper San Pedro	15050202						16.90		16.90
Upper Verde	15060202	19.20							19.20
Whitewater Draw	15080301					1.05	61.81		62.85
Yuma Desert	15030108							17.24	17.24

Source: USGS NHD HUC 8 2016

Major river systems, including the Agua Fria River, Gila River, Hassayampa River, New River, Salt River, and the San Pedro River are located within the ROW. Additionally, a total of 54 named waterbodies are located within the ROW. Table 3-5 through

Table **3-11** provide the named waterbody within the ROW and the miles of the surface water within the ROW for each field office.

Table 3-5. Surface Water within ROW within Hassayampa Field Office

Surface Waters	Miles of Surface Waters within ROW
Agua Fria River	0.34
Antelope Creek	0.03
Big Bug Creek	0.03
Bishop Creek	0.09
Bitter Creek	0.07
Bumble Bee Creek	0.02
Castle Creek	0.03
Central Arizona Project Aqueduct	0.17
Cottonwood Creek	0.01
Deadman Wash	0.02
Government Spring Wash	0.01
Hackberry Creek	0.01
Hackberry Wash	0.01
Hassayampa River	0.01
Little Squaw Creek	0.71
Morgan City Wash	0.01
New River	0.01
Old Camp Wash	0.04
Tank Creek	0.08
Weaver Creek	0.03
Yarber Wash	0.01
Yarnell Creek	0.02

Source: USGS NHD Flowlines 2016; USGS NHD Waterbody 2016

Table 3-6. Surface Water within ROW within Kingman Field Office

Surface Waters	Miles of Surface Waters within ROW
Detrital Wash	0.04

Source: USGS NHD Flowlines 2016; USGS NHD Waterbody 2016

Table 3-7. Surface Water within ROW within Lake Havasu Field Office

Surface Waters	Miles of Surface Waters within ROW
Bouse Wash	0.01
Calcite Wash	0.02
Central Arizona Project Aqueduct	0.02
Cunningham Wash	0.01
Giers Wash	0.01
Mineral Wash	0.01
Spenser Wash	0.01

Source: USGS NHD Flowlines 2016; USGS NHD Waterbody 2016

Table 3-8 Surface Water within ROW within Lower Sonoran Field Office

Surface Waters	Miles of Surface Waters within ROW
Bloody Tanks Wash	0.05
Bulldog Wash	0.04
Copper Wash	0.01
Fourth of July Wash	0.09
Gila River	0.05
Loudermilk Wash	0.09
Quail Wash	0.16
Queen Creek	0.04
Waterman Wash	0.09
Weekes Wash	0.17
West Prong Waterman Wash	0.08
Yellow Medicine Wash	0.08

Source: USGS NHD Flowlines 2016; USGS NHD Waterbody 2016

Table 3-9. Surface Water within ROW within Safford Field Office

Surface Waters	Miles of Surface Waters within ROW
Tanner Wash	0.15
Washboard Wash	0.01

Source: USGS NHD Flowlines 2016; USGS NHD Waterbody 2016

Table 3-10. Surface Water within ROW within Tucson Field Office

Surface Waters	Miles of Surface Waters within ROW
Bloodsucker Wash	0.04
Durham Wash	0.01
Gila River	0.04
Horse Foot Wash	0.04
Indian Camp Wash	0.04

Source: USGS NHD Flowlines 2016; USGS NHD Waterbody 2016

Table 3-11. Surface Water within ROW within Yuma Field Office

Surface Waters	Miles of Surface Waters within ROW
Big Eye Wash	0.09
Columbus Wash	0.03
French Creek	0.01
La Cholla Wash	0.01
Long Mountain Wash	0.09
Twin Tanks Wash	0.01
Vinegarroon Wash	0.70

Source: USGS NHD Flowlines 2016; USGS NHD Waterbody 2016

Groundwater. Within the Lower Colorado hydrologic region, groundwater is found in the alluvium of the shallow basins and in the bedrock of the mountainous areas (i.e., deep reservoirs to depths of many thousands of feet). Groundwater occurs within an aquifer, or layers of permeable rocks that are recharged by precipitation in the mountains and infiltration of stream flow that percolates through the unsaturated zone to the water table. Within Arizona, average annual precipitation varies greatly depending on location. Within lower elevations, precipitation ranges between 3 to 11 inches, while higher elevations may experience 29 to 45 inches (ASU 2016).

Aquifers vary in size and yield based on location and rates of infiltration and discharge. *The Groundwater Atlas of the United States* identifies Arizona as occurring within the Colorado Plateaus aquifers and the Basin and Range aquifers; however, much of Arizona does not have a principal aquifer (USGS 1995). The Colorado Plateau aquifers are located in the northeastern portion of the state and consist of the Dakota-Glen Canyon, the Coconino-De Chelly, and the Mesaverde aquifers. The ROW is located within the boundaries of the Dakota-Glen Canyon and Coconino-De Celly aquifers but not within the boundary of Mesaverde aquifer. The depth to the top of the Dakota-Glen Canyon aquifer is less than 2,000 feet for portions that occur within Arizona, but exceeds 12,000 feet in substantial parts throughout the system (USGS 1995). With the Coconino-De Chelly aquifer, fractures in sandstone formations in the vicinity of the Grand Canyon act as conduits that allow groundwater to drain and emerge from underlying rocks at springs in the Grand Canyon and tributaries of the Colorado River (USGS 1995).

Basin and Range aquifers account for a large portion of the middle to southern portion of Arizona. These aquifers are considered surficial aquifers due to their shallow depth to groundwater; however, they are considered part of a deeper and more extensive aquifer system that runs throughout the southwest. Basin fill deposits dominate the surface of these aquifers. Basin fill is considered highly permeable and primarily consists of unconsolidated to moderately consolidated, well to poorly sorted beds of gravel, sand, silt, and clay deposited on alluvial fans, pediments, flood plains, and playas (USGS 1995).

Groundwater is obtained primarily from wells that tap into aquifers. The largest quantities of useable freshwater occur as groundwater, which provides drinking water for more than 97 percent of the rural population. It also provides between 30 and 40 percent of the water used for agriculture (Alley et al. 1999).

As a result of extensive planning by the Arizona Department of Water Resources (ADWR), under the Arizona Department of Environmental Quality (ADEQ), Arizona is divided into seven individual planning areas. These planning areas are composed of 51 individual groundwater basins to support water planning and development efforts by providing water-related information on a local, regional and statewide level (ADEQ 2010). Established under an ADWR work plan and developed by the Environmental Working Group of the Water Resources Development Commission, the final report "Arizona's Inventory of Water-Dependent Natural Resources" evaluates the relationship between Arizona's waters and the environmental resources those waters support (WRDC 2011). The final report documented groundwater level change from the late 1980s/mid 1990s to the mid/late 2000s by measuring depth to water in groundwater wells located in each groundwater basin to assist in making qualitative assessments of each groundwater basin's current overdraft status. As a result of this review, a mean depth to water below land surface (BLS) for each ADWR groundwater basin and respective subbasin was estimated. Table 3-12 provides the acres of ROW within each groundwater basin located within the ROW and the mean depth to water of each corresponding groundwater basin and subbasin.

Table 3-12. Groundwater Basins within ROW

Groundwater Basin	Groundwater Sub-basin	Hassayampa (acres)	Kingman (acres)	Lake Havasu (acres)	Lower Sonoran (acres)	Safford (acres)	Tucson (acres)	Yuma (acres)	Mean Depth to Water (Feet BLS)
Agua Fria		1,239.03							55
Bill Williams	Burro Creek		3.59						No Data
Bill Williams	Alamo Reservoir			26.73					276
Bill Williams	Clara Peak			8.12					22
Bill Williams	Santa Maria		45.44						55
Bill Williams	Skull Valley	1.11							150
Butler Valley				30.15					247
Detrital Valley			255.35						354
Douglas						1.05	61.60		162
Donnelly Wash							400.28		No Data
Gila Bend					997.27				221
Harquahala		5.76		11.51	9.61			30.99	342
Hualapai Valley			423.10						459
Lake Mohave			53.05						387
INA	Joseph City					32.21			No Data
Little Colorado River Plateau						307.97			230
Lower Gila	Childs Valley				55.86				676
Lower Gila	Dendora Valley				689.62				96
Lower Gila	Wellton-Mohawk				242.16			1,598.52	141
Lower San Pedro	Camp Grant Wash						25.12		72
Lower San Pedro	Mammoth						71.42		94
McMullen Valley		10.06		59.65					474
Parker	Cibola Valley							8.03	No Data
Parker	La Posa Plains			55.41				255.26	238

Groundwater Basin	Groundwater Sub-basin	Hassayampa (acres)	Kingman (acres)	Lake Havasu (acres)	Lower Sonoran (acres)	Safford (acres)	Tucson (acres)	Yuma (acres)	Mean Depth to Water (Feet BLS)
Peach Springs			99.63						486
Phoenix AMA	Carefree	0.34							94
Phoenix AMA	East Salt River	2.02			612.58		5.08		217
Phoenix AMA	Hassayampa	525.40			892.93				234
Phoenix AMA	Lake Pleasant	230.74							169
Phoenix AMA	Rainbow Valley				977.21				370
Phoenix AMA	West Salt River	102.72			102.12				182
Pinal AMA	Aquirre Valley						55.25		273
Pinal AMA	Eloy				7.17		22.66		195
Pinal AMA	Maricopa-Stanfield				39.47				314
Prescott AMA	Little Chino Valley	19.20							214
Prescott AMA	Upper Agua Fria	5.34							245
Ranegrass Plain				117.73					231
Safford	San Carlos Valley				1.00				722
Salt River	Salt River Lakes				52.14				68
Tucson AMA	Avra Valley						151.74		311
Upper Hassayampa		70.30							356
Upper San Pedro	Sierra Vista						17.11		116
Yuma								392.05	56

Source: WRDC 2011; ADWR 2011

Table Notes: BLS = Below Land Surface, No Data = No BLS data available from the WRDC Final Report, INA = Irrigation Non-Expansion Area

Established under Section 1424(e) of the U.S. Safe Drinking Water Act (SDWA), the U.S. EPA's Sole Source Aquifer Program allows for EPA environmental review of any action which is financially assisted by federal grants or federal loan guarantees. Actions are evaluated to determine whether they have the potential to contaminate a sole source aquifer (SSA). The Upper Santa Cruz & Avra Basin Aquifer and the Bisbee-Naco Aquifer are the only SSAs located within the state of Arizona. Table 3-13 provides the total acres located within the ROW.

Table 3-13. Sole Source Aquifers within ROW

BLM Field Office	Sole Source Aquifer Name	Total ROW Acres
Tucson	Upper Santa Cruz & Avra Basin	151.74
Tucson	Bisbee-Naco	1.06

Source: USEPA 2016a

WATER QUALITY

The CWA is the primary law governing water quality. It establishes the basic structure for regulating discharges of pollutants into the waters of the U.S. and regulating quality standards for surface waters. Section 402 of the CWA created the National Pollutant Discharge Elimination System permit program, which is administered by most individual states and includes stormwater permits and requirements for construction areas. With oversight of the EPA, ADEQ administers Section 402 of the CWA on BLM-managed lands in Arizona through the Arizona Pollution Discharge Elimination System (AZPDES) General Permit. Additionally, on October 31, 2011, the AZPDES Pesticide General Permit (PGP) (AZPGP2011-001) was issued for the application of pesticides to, including over and near, waters of the U.S. in Arizona, except for Indian country. The AZPDES PGP authorizes chemical and biological pesticide discharges to, over, and in the vicinity of waters of the U.S. for various activities including for weed, algae, and vegetation control. Section 313 of the CWA requires all federal agencies to comply with all state water quality standards. BLM Manual Section 7240 (Water Quality) directs the agency to manage water quality on BLM-managed lands to meet both state and federal water quality standards. BLM has a responsibility to fulfill its obligations under the CWA and SDWA, to maintain waters that meet or surpass designated beneficial uses, to restore impaired water resources in support of their designated beneficial uses, and to provide water for public consumption and use (BLM 2014). To comply with this requirement, Arizona assigns designated uses to classify surface water. Regulatory programs for water quality standards include default narrative standards, non-degradation provisions, a total maximum daily load regulatory process for impaired waters, and associated minimum water quality requirements for the designated uses of listed surface waterbodies within the state. The ADEQ implements the standards set by the EPA and regulates the discharge of pollutants into surface and ground water and enforces the Primary Drinking Water Regulations.

3.4.4 Standard Operating Procedures

MANUAL AND MECHANICAL TREATMENT METHODS

- Within the ROW, ATVs and vehicles may drive off-road if necessary with the implementation of relevant SOPs below.
  - ATVs and vehicles would avoid driving through rivers, standing water, and other water sources except on established roads.
  - ATVs and vehicles would avoid driving directly up slopes and other areas that may contain highly erodible soils.
- All areas with the potential for flowing water (e.g., culverts, ditches, and washes) would be kept free of slash, logs, and debris from vegetation removal operations.

HERBICIDE TREATMENT METHODS

- Select herbicide products to minimize impacts on water. This is especially important for application scenarios that involve risk from active ingredients in a particular herbicide, as predicted by risk assessments.
- Minimize treating areas with high risk for groundwater contamination.
- Maintain buffers between treatment areas and water bodies. Buffer widths should be developed based on herbicide and site-specific criteria to minimize impacts to water bodies.

3.4.5 Environmental Consequences

Direct and Indirect Effects of the No Action Alternative

Vegetation management activities under the No Action Alternative would include hazard vegetation removal, routine vegetation and DSAP maintenance. Vegetation removal and disposal activities would include the use tracked or wheeled vehicles, field crews, and hand and machine equipment such as chainsaws and in some circumstances large mowers. This assessment of impacts assumes that the SOPs for manual and mechanical treatment methods designed to reduce potential unintended impacts to water resources and water quality would be followed for all vegetation management activities in the No Action Alternative.

Vegetation treatments in the No Action Alternative could affect both surface water and groundwater quality and quantity. Removal of vegetation could cause short-term effects on surface water by increasing surface runoff, promoting erosion and sedimentation, reducing shading and increasing water temperature, and limiting the amount of organic debris entering water bodies. Sediment, which has been described as the greatest non-point source of pollution, increases turbidity and contributes to reduction in dissolved oxygen. Vegetation treatments could also affect water quality by reducing nutrient uptake by plants, resulting in a pulse of nutrients to nearby water bodies. Soluble nutrients, such as nitrogen, would likely enter streams or other water bodies via groundwater, while nutrients adsorbed to soil particles (e.g., phosphorous) could be carried to surface water in runoff (BLM 2007e). The direct and indirect impacts to surface water quality would be localized with the potential to affect a total of 4.18 miles of surface waters that are present within the ROW.

In locations near surface waters, water quality degradation could result from the reduction in shade and potentially increase water temperatures within the ROWs. As the vegetation regrows, the risk of erosion and runoff and increased water temperatures would be reduced. The loss of vegetation cover could slightly improve groundwater recharge over the short term by reducing the amount of water lost from evapotranspiration by plants (BLM 2007e). However, the average depth to groundwater within the ROW is 248.70 feet and ranges from 22 feet to 722 feet and any changes would most likely not be detectable.

The reduction of hazardous fuels from public lands would result in a long-term positive effect to surface water quality by helping reduce the risk of a future high-severity wildfire within the ROW. Wildfires and wildfire suppressions can increase surface soil erosion, resulting in short-term increases in stream flows. The use of fire retardants to suppress wildfires could also affect water quality because they contain nitrogen and phosphorus that could cause nutrient enrichment of surface waters. In addition, the, use of water from nearby sources to extinguish wildfires could reduce the quantity of surface water resources, particularly during the dry, fire seasons in Arizona.

Manual methods would be used the majority of the time to treat incompatible vegetation within the ROW. Ground disturbance created by manual methods would be attributed primarily to vehicles used to transport equipment and workers and to a lesser extent, foot traffic. ATVs and other vehicles would be used off-road only

during dry conditions to avoid rutting and driving directly up slopes or on highly erodible soils would be avoided. The vehicles would be driven at low speeds at all times thereby reducing ground disturbance and the risk of erosion and runoff. Precautions would be taken to minimize risks to surface and groundwater quality associated from fuel spills from the use of chainsaws or other power tools. Leaving vegetation debris on the soil surface, or mulching and spreading them after a manual treatment, would help protect the soil surface by reducing the risk of erosion and increased sedimentation to surface waters (BLM 2007e).

Mechanical method effects on water quality would result from the compaction of soil by heavy equipment, which would increase the likelihood of surface runoff by reducing the soil's infiltration capacity. However, leaving debris in place would limit any detrimental effects on infiltration rates and sedimentation into streams. There could be risks to water quality from fuel leaks and spills associated with the use of heavy machinery or mechanized equipment. Releases of fuel would be more likely to affect surface water than groundwater, and would have the greatest effects to water quality if fuel was released directly into the water (BLM 2007e).

The *DSAP maintenance* activities associated with the No Action Alternative would remove all combustible vegetation within the 10-foot radius of poles with equipment that can spark. The disturbed soil would be vulnerable to increased erosion and runoff, which in turn could increase sedimentation to surface waters. The total treatment area within the DSAP maintenance program would impact approximately 3.03 acres of the 11,534.99 acres of the total ROW on BLM lands. The effects to water resources and quality from DSAP maintenance activities would not be detectable.

With the implementation of SOPs, the No Action Alternative would result in short-term, localized effects on water resources from the soil disturbance and associated potential for runoff from manual, mechanical, and DSAP maintenance activities. Over the long-term, the routine vegetation maintenance requirements are anticipated to be relatively the same for each work cycle. The regrowth of vegetation within the ROW would occur between work cycles and any detrimental effects to surface and groundwater quality from treatment activities would be further reduced. Therefore, the No Action Alternative would have localized, short-term, direct, minor adverse impacts and localized, long-term, negligible, adverse impacts on water resources. The reduction of hazardous fuels would result in a short- and long-term, indirect negligible beneficial impact to surface water quality by helping reduce the risk of a future high-severity wildfire within the ROW.

Direct and Indirect Effects of the Proposed Action

In addition to the short-term, direct and indirect adverse effects associated with the No Action Alternative described above, the Proposed Action would also result in impacts on water resources from the use of herbicides as part of the management of incompatible vegetation within the ROW. The 2007 and 2016 Herbicide PEISs provided detailed analysis of potential water resources impacts associated with the application of herbicides (pages 4-24 through 4-36 [BLM 2007a] and pages 4-14 through 4-21 [BLM 2016a]). Additional analysis on effects of vegetation treatment including manual, mechanical, and herbicide treatments are also presented in the 2007 Herbicide PER on pages 4-20 through 4-27 (BLM 2007e). The detailed discussion of the analyses is not repeated in this EA and is instead incorporated by reference and summarized in this document. In the Proposed Action, only BLM-approved herbicides would be used, which would also include the application of herbicides approved for pre-emergent use by the BLM for DSAP treatments. The Proposed Action would not include any activities associated with herbicide application different from those analyzed in the 2007 and 2016 Herbicide PEISs. Consequently, there is no potential for new or modified short-term direct or indirect impacts on water resources from the Proposed Action that have not been disclosed in prior environmental documentation.

The Proposed Action would not include the application of herbicides directly to surface waters, and therefore, no direct impacts to surface quality are anticipated. In areas of the ROW near surface waters, herbicides registered for aquatic use would be used. Buffer zones would be established between treatment areas and

water bodies to minimize impacts; the width of the buffer zones would be developed based on herbicide- and site-specific criteria.

The use of herbicides to control incompatible vegetation could have short-term, indirect impact on water quality. Surface water quality could be indirectly affected by runoff, leaching, and drift of herbicides. The application of herbicides must be relatively persistent in order to have the potential for surface water runoff. The 2007 Herbicide PEIS (BLM 2007a) and the 2016 Herbicide PEIS (BLM 2016a) discusses in detail the off-site movement potential for each herbicide selected for use in the Proposed Action. Aminopyralid, glyphosate, diuron, hexazinone, metsulfuron methyl, and sulfometuron methyl are anticipated to have high surface water runoff potential. Triclopyr is anticipated to have a low (triclopyr TEA) to high (triclopyr BEE) surface water runoff potential, depending on the herbicide form. Of these selected herbicides, only glyphosate is rated for aquatic use. The use of the adjuvant Thinvert and the implementation of SOPs would reduce the potential impacts to surface waters.

Similar to the No Action Alternative, localized increase in runoff and sediment yield into waterbodies may be expected due to surface disturbance and decreased canopy. Adherence to product labels, the use of buffers, and proper application techniques would reduce the potential for herbicides to impact water quality. Additionally, application of herbicides by the Utilities would be completed by or under the direction of a licensed applicator, and the closed chain-of-custody method would substantially reduce the potential for spills to occur. Any unintended releases would be promptly reported, cleaned up immediately, and reported to the BLM per the PUP, applicator licensing, and ROW agreements. During application, drift of herbicides has the potential to degrade surface water quality when airborne as a result of application techniques, weather conditions, or applicator error. Spot, low-volume, use of Thinvert, and localized application techniques associated with the Proposed Action are less likely to result in drift because applications are targeted to specific plants and per product labels. Application of herbicides applied directly to source plant material also has limited potential to be absorbed by the soil and migrate to surface waters or into groundwater aquifers.

Even if an herbicide has a runoff or leaching potential, the likelihood of the herbicide reaching a surface waters or groundwater aquifers would depend on site characteristics. Herbicides that are highly water soluble, relatively persistent, and not readily adsorbed by soil particles have the greatest potential for movement into the groundwater. Sandy soils low in organic content are the most susceptible to groundwater contamination. Implementation of SOPs related to not applying herbicides with high soil mobility in areas where soils could increase the potential for mobility would minimize potential impacts to groundwater.

The Proposed Action would have no direct impact on groundwater quantity; no groundwater would be used in the application of herbicides. Potential indirect adverse impacts to groundwater quality from use of selected herbicides would not be detectable. Approximately 82 percent of the soils within the ROW are within the soil order Aridosols. These soils are prone to developing hardpans that limit depth of water, and consequently, the ability of herbicides reaching groundwater. Of the herbicides approved by the BLM for use, only imazapic and tebuthiuron have a half-life in soils greater than 90 days. All of the other selected herbicides would decompose in a shorter time period. In addition, the foliar application of herbicides using the adjuvant Thinvert as the carrier would result in the herbicide adhering to the targeted plants which would minimize spray drift. The herbicide would also be more likely to remain on the plant reducing effects the potential to reach groundwater levels. It is unlikely that herbicides would reach aquifers, and no indirect impact to groundwater is anticipated.

The use of IVM techniques under the Proposed Action would reduce the frequency of future mechanical and manual treatments, subsequently reducing potential impacts to water resources and water quality. With the Proposed Action, the routine vegetation maintenance requirement would decrease over time resulting in less area needing treatment and a reduction in the number of equipment, vehicles, and field crews within the ROW.

Therefore, with the implementation of the proposed SOPs, the Proposed Action would have localized, short-term, direct, minor adverse impacts on water resources and water quality and short-term localized indirect negligible beneficial impacts. Additionally, the Proposed Action would have localized, long-term, moderate, direct and indirect, beneficial impacts on water resources by the decreasing the risk of future high-severity wildfire within the ROW and the reduced frequency and intensity of vegetation management treatments over time as compared to the No Action Alternative.

3.4.6 Mitigation Measures

WATER RESOURCES

No mitigation measures for water resources are recommended.

WATER QUALITY

No mitigation measures for water quality are recommended.

3.5 Wetlands and Riparian Areas

3.5.1 Introduction

Wetlands are generally defined as areas inundated by water at a frequency and duration sufficient to support vegetation that is typically adapted for propagation and growth in saturated soil. Executive Order 11990, Protection of Wetlands (Exec. Order No. 11990, 3 C.F.R. 1 1977) requires federal actions to conduct an evaluation of effects to wetlands and to minimize impacts to wetlands. Riparian areas are water-dependent ecosystems bordering streams, springs, and lakes. They form ecological links between the terrestrial and aquatic components of the landscape. Wetlands and riparian areas provide important ecological functions, including flood water attenuation, wildlife habitat, sediment trapping, and nutrient retention (BLM 2007e).

3.5.2 Issues Identified for Analysis

- How would herbicide treatment impact riparian/wetland habitat? Would there be a loss of bank stabilizing vegetation from herbicide application?
- Would there be indirect impacts leading to additional erosion and modification of channel structure (knickpoints, etc.) from herbicide application?
- How would herbicides affect wetland vegetation and physical function?

3.5.3 Affected Environment

Wetlands and riparian areas, including the perennial or ephemeral surface waters which support them, are scarce in Arizona with an estimated 0.5 percent of wetlands and riparian areas occupying the state's total land area (Arizona Riparian Council 2004). The National Wetlands Inventory Program (NWI) produced by the USFWS is a nationwide inventory of wetlands across the U.S., which provides biologists and others with information on the distribution and types of wetlands to aid in conservation efforts. The NWI wetland data is derived from aerial photography that varies greatly in scale, resolution, and time of acquisition. Wetland mapping may differ in size and composition from actual ground conditions. According to the NWI, there are approximately 228.78 acres of wetlands within the ROW with over half of the mapped wetlands falling within the Lower Sonoran Field Office (refer to Table 3-14).

Wetland types mapped throughout the ROW include freshwater forested/shrub wetlands, freshwater ponds, lakes, and riverine. The freshwater forested/shrub wetlands consist of both broad leaved and needle leaved deciduous forested wetlands that are seasonally and temporarily flooded, as well as intermittently and seasonally flooded wetlands dominated by persistent woody shrub vegetation. Riverine wetlands are defined by wetland communities associated with riverine floodplains that are seasonally and temporarily flooded. These wetlands may also be found as littoral vegetated communities along streambeds and streambanks. The wetlands designated as ponds are all associated with impounded waterbodies, both natural and man-made. The wetland communities may be seasonally, intermittently, or permanently flooded. They are all considered palustrine wetlands that are characterized by persistent emergent forested, shrub, or marsh vegetation. Table 3-14 identifies the acreage of wetlands within the ROW by wetland type.

Table 3-14. NWI Wetland Type Acres within ROW

Wetland Type	Hassayampa	Kingman	Lake Havasu	Lower Sonoran	Safford	Tucson	Yuma	Total ROW Acres
Freshwater Forested/Shrub Wetland	12.96	0.00	1.30	5.87	0.00	0.00	12.06	32.19
Freshwater Pond	0.78	0.00	0.02	0.77	0.00	0.00	0.03	1.60
Lake	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.22
Riverine	31.49	6.75	3.35	120.92	0.90	10.49	20.87	194.77
ROW Total/Percent[a]	45.23/ (0.37%)	6.75/ (0.02%)	4.66/ (0.02%)	127.57/ (0.28%)	0.90/ (0.00%)	10.49/ (0.11%)	33.18/ (0.13%)	228.78 (0.13%)

Source: USFWS 2016g

[a] Percent represents the total of wetland acres in ROW by overall wetland acres in the respective BLM Field Office.

Riparian vegetation communities are influenced by landform, water availability, soil, elevation, and climate, as well as disturbance factors. These communities may consist of herbaceous or woody vegetation, or a combination of these two vegetation types. Presence and dominance are associated with vegetation species' obligation or sensitivity to saturation, as well as the circumstances and conditions during which opportunities for establishment occur. Progression of a riparian community following changes in the physical characteristics of the site (particularly large changes in soil or water status) may result in a different potential natural community, that is, the vegetation that would be expected given environmental constraints (climate, geomorphology, geology) without human intervention or a hazard event (BLM 1992c).

Five riparian vegetation community types occur within the ROW for a total of 38.56 acres. Of these five riparian communities, tamarisk riparian vegetation is the most prevalent with 22.96 acres (59 percent) within the ROW. Each of the vegetation communities is characterized by dense tree canopies and may have shrub understories composed of species such as arrowweed (*Pluchea sericea*) and desertbroom (*Baccharis sarothroides*). Cottonwood/willow riparian forests may also exist with no understory, where the ground is covered with leaf litter and is frequently flooded. A flood scoured riparian vegetation type may consist of sparsely forested or other sparsely vegetated herbaceous areas frequently flooded by high velocity waters following a storm event. Mixed broadleaf forests may include of a variety of species such as ash (*Fraxino velutina*), boxelder (*Acer* negundo), alder (Alnus oblongifolia), and willow (*Salix* spp). Strand riparian vegetation typically consists of a mixture of riparian tree and shrub species including Fremont cottonwood (*Populus fremontii*), Goodding willow (*Salix gooddingii*), tamarisk (*Tamarix* spp.), and mesquite (*Prosopis* spp.), as well as herbaceous species, found in a thin linear formation following a stream or river course. Tamarisk is a non-native, highly invasive tree species that forms large dense riparian forests throughout the southwest.

Table 3-15. Riparian Vegetation Community Types within ROW

Riparian Vegetation Community Type	Hassayampa	Lake Havasu	Lower Sonoran	Tucson	Yuma	Total ROW Acres
Cottonwood Willow	0.00	3.01	0.00	0.31	0.00	3.32
Flood Scoured	0.05	0.00	1.42	0.00	0.00	1.47
Mixed Broadleaf	5.92	0.00	0.00	0.00	0.00	5.92
Strand	0.60	0.00	4.30	0.00	0.00	4.90
Tamarisk	0.00	0.28	3.94	0.00	18.74	22.96
ROW Total/(Percent of ROW Acres of Riparian Vegetation within BLM Field Offices[a])	6.56/ (0.84%)	3.28/ (0.20%)	9.66/ (0.31%)	0.31/ (0.01%)	18.74 (0.31%)	38.56/ (0.17%)

Source: Arizona Game and Fish Department (AGFD), Riparian Vegetation, 1994

[a] There are no riparian vegetation community types within utility ROWs in the Safford or Kingman field offices.

3.5.4 Standard Operating Procedures

MANUAL AND MECHANICAL METHODS

- Within the ROW, ATVs and vehicles may drive off-road if necessary with the implementation of relevant SOPs below:
  - ATVs and vehicles would avoid driving through rivers, standing water, and other water sources except on established roads.
  - ATVs and vehicles would be driven at low speeds (less than 10 miles per hour) when traveling off-road within the ROW.
- When working in riparian areas, wetlands, and near other aquatic habitats, access work site only on existing roads, and limit all travel on roads when damage to the road surface would result or is occurring.
- All areas with the potential for flowing water (e.g., culverts, ditches, and washes) would be kept free of slash, logs, and debris from vegetation removal operations.
- Do not operate a mechanical mower within riparian vegetation. Riparian vegetation shall be removed or pruned using manual methods.

HERBICIDE TREATMENT METHODS

- Use appropriate herbicide-free buffer zones for herbicides not labeled for aquatic use based on risk assessment guidance, with minimum widths of 10 feet for hand spray applications.
- Do not apply pre-emergent herbicides in riparian areas or areas where the water table is high.
- Within riparian areas, wetlands, and aquatic habitats, conduct herbicide treatments only with herbicides that are approved for use in those areas.

- Within or near riparian areas, avoid using glyphosate formulations that include R-11, and either avoid using any formulations with polyethoxylated tallow amine, or seek to use the formulation with the lowest amount of polyethoxylated tallow amine available.
- Within or near riparian areas, special care would be followed when transporting and applying 2,4-D, bromacil, clopyralid, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, tebuthiuron, and triclopyr.
- If there is a high probability (80 percent chance) of local, moderate rain (0.25 inch or less within 24 hours), then applications should only occur when it is anticipated that there shall be sufficient time (at least four hours) for the application to dry before rainfall occurs.
- Implement the following buffers for riparian, wetlands, and other aquatic habitats when applying herbicide[25]:
    - Herbicides rated as class 0 require no buffer. Herbicides that meet this criterion include: aminopyralid, glyphosate (aquatic formulation), imazapic, imazapyr (aquatic and nonaquatic formulations).
    - Do not apply herbicides rated as class 1 within 30 feet of the waterbody or wetland to be protected. Herbicides that meet this criterion include: bromacil, chlorsulfuron, clopyralid, fluroxypyr (acid formulation), glyphosate (non-aquatic formulation), hexazinone, metsulfuron methyl, picloram, sulfometuron methyl, tebuthiuron, and triclopyr (amine salt formulation).
    - Do not apply herbicides rated as class 2 within 50 feet of the waterbody or wetland to be protected and within 10 feet of riparian vegetation, if present. Herbicides that meet this criterion include: 2,4-D (aquatic and non-aquatic amine salt formulations), dicamba, diuron, and triclopyr (ester formulation).
    - Do not apply herbicides rated as class 3 within 100 feet of the edge of the waterbody or wetland to be protected and within 20 feet of riparian vegetation, if present. Herbicides that meet this criterion include: 2,4-D aquatic and non-aquatic ester formulations.
    - For pool habitats, do not apply herbicides within 30 feet of pools when there is no surface flow of water in and out of pool.
- For treatment of aquatic vegetation, (1) treat only that portion of the aquatic system necessary to achieve acceptable vegetation management, (2) use the appropriate application method to minimize the potential for injury to compatible vegetation and aquatic organisms, and (3) follow water use restrictions presented on the herbicide label.

3.5.5 Environmental Consequences

Direct and Indirect Effects of the No Action Alternative

Vegetation removal and disposal activities in the No Action Alternative would include only manual methods using tracked or wheeled vehicles, field crews, and hand equipment in wetland and riparian areas. There are no poles with equipment that can spark within wetland or riparian areas, therefore no DSAP maintenance

[25] The list of herbicides provided under each toxicity level (Class 1, 2 or 3) was derived by listing out the toxicity for each proposed herbicide from the categories from Table 54, Appendix H: Herbicide Reference Tables that are applicable to species that may occur in riparian area, wetlands, and other aquatic habitats. These categories included Small Avian, Reptile, Aquatic Amphibian, Terrestrial Amphibian, Cold Water Fish, Warm Water Fish, and Aquatic Arthropod. To determine the herbicide toxicity class of each herbicide, the highest toxicity number for all these categories was used. For example, triclopyr has a Class 0 or Class 1 herbicide toxicity in some categories but Class 2 in other categories, so this herbicide was included in the Class 2 buffer under conservation measure 7.c.

treatments would occur. This assessment of impacts assumes that the SOPs for manual treatment methods designed to reduce potential unintended impacts to wetlands and riparian areas would be followed for all vegetation management activities in the No Action Alternative.

Manual treatments would only occur at the margin of an emergent wetland, not within inundated or flooded wetlands. Riparian vegetation communities mapped within the ROW primarily consist of broad leaved and deciduous forested communities. Riparian and forested wetland vegetation within the ROW would be maintained at a low height with targeted manual treatment of trees, tall shrubs, and other woody vegetation. Routine vegetation maintenance in riparian and forested wetland portions of the ROW would tend to be more frequent than in upland areas because the vegetation tends to be relatively fast growing and in the case of tamarisks, capable of resprouting easily from cut stumps. Control and reduction of tamarisk stands in riparian areas would conform to specific implementation goals in the RMPs for the Lake Havasu, Lower Sonoran, Safford, and Yuma field offices.

In most cases, incompatible vegetation near a wetland or riparian area could be removed without disturbing non-targeted species. Typically, plant debris would be mulched and left on site. There would be no overland travel or use of ATVs within wetlands in the ROW. Vehicles would remain on existing roads and crews would walk to remove incompatible vegetation. Foot traffic within wetlands may trample some vegetation and result in some soil compaction; however these impacts would be short-term and negligible. Standing on and traversing streambanks and dry wash banks has the potential to destabilize soil and create the potential for localized erosion. Fuel and lubricant spills that could result from using chainsaws and trimmers would be contained or cleaned up before contamination spread to surrounding sensitive areas.

The No Action Alternative is anticipated to have undetectable effects on wetlands and riparian areas from manual treatment activities because ground disturbance would be limited and non-targeted vegetation would not be impacted. Over the long-term, the routine vegetation maintenance would help control the spread of tamarisks and reduce the risk of wildland fire that could destroy compatible riparian and forested wetland vegetation. Therefore, the No Action Alternative would have localized short-term, direct and indirect, negligible adverse impacts on wetlands and riparian areas because the use of only manual vegetation treatments and the implementation of the SOPs would limit any measureable effects to the resources. This would result in a long-term, direct, minor beneficial impacts to wetland and riparian areas by the overall routine control of tamarisk and long-term, indirect, minor, beneficial impacts by the reduction of hazardous fuels, reducing the risk of a future high-severity wildfire within the ROW.

Direct and Indirect Effects of the Proposed Action

In addition to the short-term, direct and indirect effects associated with the No Action Alternative described above, the Proposed Action would also result in impacts on wetland and riparian areas from the use of herbicides as part of the management of incompatible vegetation within the ROW. The 2007 and 2016 Herbicide PEISs provided detailed analysis of potential wetland and riparian area impacts associated with the application of herbicides (pages 4-36 through 4-44 [BLM 2007a] and pages 4-21 through 4-25 [BLM 2016a]). Additional analysis on effects of vegetation treatment including manual and herbicide treatments are also presented in the 2007 Herbicide PER on pages 4-27 through 4-33 (BLM 2007e). The detailed discussion of the analyses is not repeated in this EA and is instead incorporated by reference and summarized in this document. In the Proposed Action, only BLM-approved herbicides would be used. The Proposed Action would not include any activities associated with herbicide application different from those analyzed in the 2007 and 2016 Herbicide PEISs. Consequently, there is no potential for new or modified short-term, direct or indirect impacts on soil resources from the Proposed Action that have not been disclosed in prior environmental documentation.

The potential adverse effects to wetlands and riparian areas from the use of herbicides would be related to the amount, selectivity, and persistence of the herbicide used, application methods, and the specific plant species present. Spray drift can also degrade water quality in wetlands and riparian areas and could damage non-target vegetation. Application of herbicide within emergent wetlands would occur as a spot treatment of specific species where incompatible vegetation may occur. However these spot treatments would only occur at the margin of an emergent wetland, not within inundated or flooded wetlands. There are no pole locations within wetlands that would require DSAP treatment; therefore no herbicide applications would be necessary for complete vegetation removal at distribution line poles.

Herbicides selected in the Proposed Action would use a low volume application method, and no broadcast or aerial application would be used. As with the No Action Alternative, there would be no overland travel or use of ATVs within wetlands in the ROW. Vehicles would remain on existing roads and crews would walk to remove incompatible vegetation. Herbicide application in wetlands and riparian areas would be completed using backpacks with hand held sprayers using aquatic selected herbicides.

Within riparian areas, wetlands, and aquatic habitats, only herbicides that are approved for use in those areas would be applied. Most aquatic herbicides are non-selective and could cause adverse impacts to non-target wetland and riparian species. To minimize potential impacts to non-targeted species, herbicide application would be limited to backpack sprayers, as previously noted, and the adjuvant Thinvert would be used as the carrier. Thinvert, which is a paraffinic (waxy) oil carrier, would result in the herbicide adhering to the targeted plants and minimized spray drift. It acts as a drift control agent, each droplet spreading across the leaf surface to provide better contact and adsorption so that less product is needed to be effective. Because the herbicide would be more likely to remain on the plant, the potential adverse effects on non-targeted species and soil resources would be reduced. Potential impacts to non-targeted species would also be minimized by using appropriate herbicide-free buffer zones for herbicides not labeled for aquatic use based on risk assessment guidance, with minimum widths of 10 feet for hand spray applications.

Herbicide applications could reduce plant cover, leading to a potential increase in erosion, sedimentation, nutrient loading, and water temperature. Risks to wetlands and riparian areas from surface runoff would be influenced by precipitation rates, soil types, and proximity to the application area. Some herbicides (e.g., sulfometuron methyl) that adsorb into soil particles could be carried off-site. These potential impacts would be localized and considered minor, short-term, adverse effects. Successful control of incompatible vegetation in wetlands and riparian areas would lead to improved conditions in these habitats over the long-term. The eventual growth of compatible vegetation in treated areas would moderate water temperatures, buffer the input of sediment and herbicides from runoff, and promote bank stability in riparian areas. Ongoing efforts by the BLM to enhance wetland and riparian vegetation would also help to increase the acres of wetlands that are in proper functioning condition (BLM 2007e).

Forested wetlands within the ROW may be treated with herbicides using targeted applications to recently cut tree stumps (cut-stump application) or new tree growth one to two years following manual treatment of the vegetation. The forested wetland type may include wetlands that are dominated by tamarisk. Tamarisk is extremely difficult to control through manual treatment methods alone and is capable of resprouting easily from cut stumps. Targeted herbicide application within approximately 23 acres of tamarisk stands would allow for more effective treatment and removal of the species from forested wetlands in the ROW. Tamarisk stands and other forested wetland types provide habitat for a variety of wildlife species. However, tamarisk would be maintained at a frequency in the No Action Alternative that would not allow canopy development and would not be considered high value wildlife habitat (refer to Sections 3.9 and 3.10 for detailed analysis of federally listed threatened and endangered species and sensitive riparian species). The Proposed Action would allow less frequent manual maintenance and would more effectively control the growth and recruitment of tamarisk in the

ROW. The eventual transition of forested wetlands to shrublands types would provide valuable wildlife habitat. The Proposed Action would have a long-term, beneficial impact resulting from the control of tamarisk stands and reduced frequency of manual treatments.

Unintentional applications and spills could have detrimental effects for wetlands and riparian systems. In particular, accidental spills near wetland and riparian areas could be particularly damaging to wetland and riparian vegetation. A licensed applicator would supervise the application process to ensure that proper techniques, cleanup, personal protective equipment, and safety procedures are followed. The licensed applicator would comply with the operational and spill contingency plan prepared during the pesticide-use proposals process.

In the Proposed Action, the frequency of the routine vegetation maintenance in wetland and riparian areas would decrease over time resulting in less area needing treatment and a reduction in the equipment, vehicles, and field crews within the ROW. The eventual growth of compatible vegetation in treated areas would moderate water temperatures, buffer the input of sediment and herbicides from runoff, and promote bank stability in riparian areas. Therefore, with the implementation of the SOPs, the Proposed Action would have localized, short-term, direct, minor, adverse impacts on wetlands and riparian areas and indirect negligible adverse impacts. Additionally, the Proposed Action would have long-term, moderate, direct and indirect, beneficial impacts on wetlands and riparian areas by more effectively controlling tamarisks, reducing the risk of a future high-severity wildfire, reducing the frequency and intensity of vegetation management treatments as compared to the No Action Alternative, and by allowing low-growing native compatible vegetation within the ROW which would improve wetland and riparian habitat values.

3.5.6 Mitigation Measures

No mitigation measures for wetland and riparian areas are recommended.

3.6 Noxious and Invasive Weeds

3.6.1 Introduction

On February 3, 1999 Executive Order 13112 was issued to develop a federal response to the invasive species problem. Under the Executive Order an invasive species is defined as a harmful nonnative species, causing or likely to cause harm to the economy, environment, or animal or human health. Projects with a federal nexus have the responsibility to "(i) prevent the introduction of invasive species; (ii) detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner; (iii) monitor invasive species populations accurately and reliably; and (iv) provide for restoration of native species and habitat conditions in ecosystems that have been invaded." Noxious weeds are plant species which are legally designated and regulated by state and federal laws (BLM 2007a). They are invasive plants and generally non-native (BLM 2007a), but according to Arizona State Legislature (2017), can be any species that is "determined to be detrimental or destructive and difficult to control or eradicate."

Noxious and invasive weeds are highly competitive and can often out-compete the desired compatible vegetation, especially on recently disturbed sites. It has been estimated that noxious and invasive weeds have infested over 35 million acres of BLM-managed lands, and further that noxious and invasive weeds spread at a rate of approximately 4,600 acres per day on federal lands alone in the western US (Center for Invasive Plant Management 2012). Invasive vegetation and noxious weeds degrade or reduce soil productivity, water quality and quantity, native plant communities, wildlife habitat, wilderness values, recreational opportunities, and

livestock forage; their presence are detrimental to the agriculture and commerce of the US and to public health (National Academy of Sciences 1968; BLM 2000b). Weed infestations can become permanent if left untreated.

Regulation by state and federal laws is the greatest difference between noxious weeds and invasive plants. Legally, a noxious weed is a plant designated by a federal, state, or county government as injurious to public health, agriculture, recreation, wildlife, or property. Although noxious and invasive plants have similar effects on native plant communities, not all invasive plants have been put on noxious weeds lists in federal and state laws or state regulations. This occurs for a variety of reasons, including lack of information about the distribution of the species, differing public opinion about the effects of a species, and lack of proponents to list a species. Officially-listed noxious weeds are inherently invasive. The plants' ability to establish themselves in a variety of habitats and then quickly dominate an area is the prime reason that noxious vegetation is so problematic. They can destroy wildlife habitat and displace native species as well as threatened and endangered species; reduce plant and animal diversity; disrupt migratory bird flight patterns and nesting habitats; and cost millions of dollars in treatment and loss of productivity (BLM 2010h).

3.6.2 Issues Identified for Analysis

- Is there a potential to establish noxious weeds?
- Are there potential beneficial effects since weeds would be removed in the target areas, along with other incompatible vegetation?
- Would vehicles introduce new noxious and/or invasive weed seeds to the area?

3.6.3 Affected Environment

Arizona has 51 officially designated noxious weeds (Table 3-16) (Arizona Department of Agriculture 2012). In Arizona, approximately 8.3 million acres of BLM-managed lands are infested with invasive weeds (BLM 2007a). Due to the extent of the ROW and the ability of many noxious and invasive weeds to spread into open and disturbed areas more readily than undisturbed areas with successional advanced plant communities, many of the designated weeds can be found within or adjacent to power line ROWs (BLM 2007a).

The clearing of vegetation and reclaiming of the power line ROWs presents the opportunity for noxious and invasive species to become established. Invasive plants that are not classified as noxious, and not regulated by law in Arizona, can and do exist along the ROWs and pose just as serious a threat to natural ecosystems. These species, whether native like the common sunflower (*Helianthus annuus*), or naturalized exotics like Russian thistle (*Salsola tragus*) and kochia (*Kochia scoparia*), have the ability to infest disturbed areas and adjacent lands at the expense of other native plants. Other invasive plant species include camphorweed (*Heterotheca subaxillaris*), Russian olive (*Elaeagnus angustifolia*), Johnsongrass (*Sorghum halepense*), mullein (*Verbascum thapsus*), and Sahara mustard (*Brassica tournefortii*). Just like noxious weeds, most invasive plant species form monocultures that reduce soil stability, destroy the complex structure of native plant communities, and degrade the natural aesthetics of the area. Invasive plants also present threats to the power lines and power line infrastructure. Examples include saltcedar (*Tamarix* spp.) growing into contact with a line, causing a fire ignition or power outage; camelthorn (*Alhagi maurorum*) undermining and infiltrating the footings of structures, speeding their deterioration; and wildfire threats posed by many invasive grasses that increase fuel loads and carry wildfires, threatening power line infrastructure.

Table 3-16. Invasive and Noxious Weed Species Regulated by the Arizona Department of Agriculture

Species Name	Common Name
Acroptilon repens[a,c]	Russian knapweed
Aegilops cylindrical[a,c]	Jointed goatgrass
Alhagi pseudalhagi[a,c]	Camelthorn
Alternanthera philoxeroides[a]	Alligator weed
Cardaria chalepensis[a]	Lens podded hoary cress
Cardaria draba[a,c]	Globed podded hoary cress (Whitetop)
Cardaria pubescens[a]	Hairy whitetop
Carduus acanthoides[a]	Plumeless thistle
Cenchrus echinatus[a,b]	Southern sandbur
Cenchrus incertus[a,b]	Field sandbur
Centaurea calcitrapa[a]	Purple starthistle
Centaurea iberica[a]	Iberian starthistle
Centaurea squarrosa[a]	Squarrose knapweed
Centaurea sulphurea[a]	Sicilian starthistle
Centaurea diffusa[a,c]	Diffuse knapweed
Centaurea maculosa[a,c]	Spotted knapweed
Centaurea solstitialis[a,c]	Yellow starthistle (St. Barnaby's thistle)
Chondrilla juncea[a]	Rush skeletonweed
Cirsium arvense[a]	Canada thistle
Convulvulus arvensis[a,b]	Field bindweed
Coronopus squamatus[a]	Creeping watercress
Cucumis melo[a]	Dudaim melon (Queen Anne's melon)
Cucsuta spp.[a,c]	Dodder
Drymaria arenarioides[a]	Alfombrilla (Lightningweed)
Eichhornia azurea[a]	Anchored water hyacinth
Eichhornia crassipes[a,b,c]	Floating water hyacinth
Elytrigia repens[a,c]	Quackgrass
Euphorbia esula[a]	Leafy spurge
Euryops sunbcamosus subsp. *vulgaris*[c]	Sweet resinbush
Halogeton glomeratus[a,c]	Halogeton
Helianthus ciliaris[a,c]	Texas blueweed
Hydrilla verticillata[a]	Hydrilla
Ipomoea spp.[a]	Morning glory*
Ipomoea triloba[a,c]	Three-lobed morning glory
Isatis tinctoria[a]	Dyers woad
Linaria genistifolia var. *dalmatica*[a,c]	Dalmation toadflax

Species Name	Common Name
Lythrum salicaria[a]	Purple loosestrife
Medicago polymorpha[a,b]	Burclover
Nassella trichotoma[a]	Serrated tussock
Onopordum acanthium[a,c]	Scotch thistle
Orobanche ramosa[a]	Branched broomrape
Panicum repens[a]	Torpedo grass
Peganum harmala[a]	African rue (Syrian rue)
Pennisetum ciliare[a,b]	Buffelgrass
Portulaca oleracea[a,b]	Common purselane
Rorpipa austriaca[a]	Austrian fieldcress
Salvinia molesta[a]	Giant salvinia
Senecio jacobaea[a]	Tansy ragwort
Solanum carolinense[a]	Carolina horsenettle
Sonchus arvensis[a]	Perennial sowthistle
Solanum viarum[a]	Tropical soda apple
Stipa brachychaeta[a]	Puna grass
Striga spp.[a]	Witchweed
Trapa natans[a]	Water-chestnut
Tribulus terrestris[a,b]	Puncturevine

Source: Arizona Department of Agriculture 2017

[a] Pest species, prohibited from entering the state

[b] Regulated pest, if found within the state may be controlled to prevent further infestation or contamination

[c] Restricted pest, if found within the state shall be quarantined to prevent further infestation or contamination

* All species except *Ipomoea carnea* (Mexican bush morning glory), *Ipomoea triloba* (three-lobed morning glory), and *Ipomoea arborescens* (morning glory tree).

Invasive plants directly affect the compatible plants by competing with them for space, light, and moisture. Invasive plants often capture resources so successfully they reduce the vigor of existing natives and in many cases, eliminate them. Invasive annual grasses also form a continuous thatch layer, which burns more readily and increases fire frequency. Sagebrush and other woody plants are not adapted to frequent fire and take decades to reestablish allowing aggressive noxious and invasive weeds to establish. Reduction of the abundance and vigor of native plants affects the condition of the plant community. Once a threshold is exceeded, permanent loss of historical plant associations and the organisms that depend on them occurs (USDI 2010a:598). The effect of invasive plants can be permanent when economic and environmental factors limit the ability of a managing agency to restore the ecosystem to a healthy state (NAS 2002). The fewer invasive plants present, the more likely it is that restoration is feasible.

The susceptibility of plant communities to infestation by invasive plants is influenced by many factors, including community structure, proximity to currently infested areas, and the biological traits of the invading species. The factors of spread are highly variable and while some of these are natural (wind, water, and wildlife), weeds are often spread by human activity as well. Seeds get caught in tires or the undercarriage of vehicles (including

ATVs), stuck on clothing or the tread of shoes and boots and can be accidentally transported. The amount of pre-existing invasive plants, on-site precipitation, disturbance, slope, aspect, and seed viability all have contributing influences from site to site. Noxious weeds are spread in a variety of ways and usually have more than one method of propagation. In general, vegetation types with frequent gaps in plant cover, such as sagebrush-steppe rangelands, woodlands, and dry forests, are more susceptible to invasive plant establishment than vegetation types with relatively closed plant cover.

A description of the ecosystems and vegetation communities/associations documented within the ROW is provided in Section 3.7 General Vegetation. The analysis of the effects of invasive species resulting from the Proposed Action and No Action Alternatives is derived from specific understanding of the biology of invasive and noxious weed species as well as an understanding of the general vegetation conditions.

3.6.4 Standard Operating Procedures

MANUAL AND MECHANICAL TREATMENT METHODS

- Within the ROW, ATVs and vehicles may drive off-road if necessary with the implementation of relevant SOPs below.
    - ATVs and vehicles would be driven at low speeds (less than 10 miles per hour) when traveling off-road within the ROW.
    - ATVs and vehicles would avoid driving directly up slopes and other areas that may contain highly erodible soils.

HERBICIDE TREATMENT METHODS

No additional SOPs have been included beyond the general SOPs outlined in Section 2.3.10.

3.6.5 Environmental Consequences

Direct and Indirect Effects of the No Action Alternative

Under the No Action Alternative, vegetation would be removed manually and/or mechanically on routine vegetation maintenance cycles as described in Section 2.2.2. Manual and mechanical vegetation management would require over land travel by tracked or wheeled vehicles (e.g., ATVs or 4x4 trucks) to gain access to the treatment areas approximately every 3 to 5 years. Vegetation management activities under the No Action Alternative would include routine vegetation and DSAP maintenance.

The No Action Alternative would target noxious or invasive weeds within the ROW with the existing vegetation management activities where they are incompatible with the Utilities set goals and objectives or as identified by BLM. Where invasive weeds do not align with the goals of the utilities vegetation management program, they will be specifically targeted for treatment. Under the No Action Alternative there would be no herbicide use in the ROW.

Manual methods make up the majority of the Utilities' routine vegetation maintenance activities. Manual treatments tend to be selective and focused on target plants. Vegetation removal and disposal activities would include the use tracked or wheeled vehicles, field crews, and personnel maneuvering around the ROWs with hand-held equipment such as chainsaws. All of the equipment and movement around the ROWs could inadvertently transport noxious and invasive weeds to the disturbed work areas.

With the current cutting techniques, the root system of individual plants would be left in place and in some cases this may perpetuate the growth of incompatible vegetation. Treatment methods in the No Action

Alternative may displace of upper surface layers of soil, and increase the potential for noxious or invasive weeds to be introduced or spread. Bare soils can be more susceptible to invasive plant infestations than native plants, as invasive plants tend to be better adapted to establishing on altered sites. Along with the No Action Alternative, personnel, equipment, and vehicles would enter the ROW either from other areas or from other portions of the ROW that may have active weed infestations and/or seedbank present in the soil. Seed and plant parts can be carried into the ROW on clothing, tires, and equipment distributing seed into previously un-infested areas. Typically, plant debris would be mulched and left on site.

Mechanical methods would have the same effects that manual treatments would have relating to work crew site access. Mechanical treatments would also be selective and focused on target incompatible vegetation but could impact non-target vegetation as a result of ground disturbance within the ROW. Mechanical methods may create greater ground disturbance and greater potential to expose soils from the use of heavy machinery. The additional ground disturbance would provide greater opportunity for the introduction of non-native and invasive species to the landscape.

The *DSAP maintenance* activities would target vegetation and debris consisting of complete removal to expose soil, assuming that soil compaction would occur within the entire 10-foot radius. The total treatment area for this maintenance program would be approximately 3.03 acres of ROW on BLM lands. Because vegetation and debris would be completely removed to expose soil, it is assumed that these areas would have the highest risk for the introduction of noxious or invasive weeds within the entire 10-foot radius.

The lack of targeted control of noxious and invasive weed species and frequency of treatments would allow current infestations to continue and possibly spread while new infestations would become established and begin to dominate vegetation communities. Manual and mechanical vegetation maintenance would continue at a frequency of approximately every 3 to 5 years. The frequency of maintenance would require continued use of manual and mechanical equipment with the potential to introduce noxious and invasive species seeds on equipment and personnel (as discussed above), which could increase over time, resulting in long-term minor adverse impacts. Tamarisk is extremely difficult to control through manual treatment methods alone and is capable of resprouting easily from cut stumps. As discussed in Section 2.3, only a partial removal of trees using manual treatments would result in only a short-term benefit. Similar to manual treatments, repeated mechanical treatments could adversely affect compatible vegetation by altering species composition.

Therefore, the No Action Alternative would have short-term minor direct beneficial effects to noxious and invasive vegetation by treating those weeds within the ROW that are incompatible with the Utilities set goals and objectives (such as tamarisk). The No Action Alternative would also result in short-term moderate indirect adverse effects to the spread of noxious and invasive vegetation based on the ground disturbance from manual and mechanical equipment, ATVs, vegetation removal/disposal, and 4x4 vehicle uses in the ROWs transporting non-native seeds. Without reducing the frequency of manual or mechanical maintenance, the No Action Alternative would not be successful at promoting the establishment of compatible vegetation and therefore the frequency and intensity of treatments may increase due to resprouting. The No Action Alternative would have a long-term moderate direct and indirect adverse effect because the continued frequent disturbances and routine vegetation maintenance cycles would increase the effects of previous disturbance by disrupting the reestablishing vegetation and posing a continued risk for the introduction or allowing the continued spread of noxious or invasive weeds.

Direct and Indirect Effects of the Proposed Action

In addition to the short-term effects associated with the No Action Alternative described above, the Proposed Action would employ the use of herbicides to augment current manual and mechanical methods of vegetation maintenance within the Utility's ROW. As in the No Action Alternative, the Proposed Action would treat noxious

and invasive weeds within the ROW with the existing vegetation management activities if they are incompatible with the Utilities goals and objectives and/or as identified by BLM.

Herbicide treatments completed at the same time as manual and mechanical methods include treatments for DSAP maintenance, hazardous vegetation removal, cut-stump, and/or basal application. Increased disturbance is anticipated during the initial vegetation cycle when these specific treatment methods are included. Because these treatments occur at the same time and in the same location as the manual and mechanical treatments, additional vehicles and field crew members typically would not be necessary. Additional foot traffic is anticipated from the use backpack sprayers, while additional overland travel may be required from the use of ATV-mounted sprayers. The combined treatments and additional work crew members and vehicles necessary would have a negligible localized effect from the slight increase in site activity.

The forested wetlands may include areas dominated by tamarisk which would be extremely difficult to control through manual treatment methods alone, but instead would benefit from a combination of treatments with targeted herbicide. Application within approximately 23 acres of tamarisk stands would allow for more effective treatment and removal of the species from the ROW. The Proposed Action would require less frequent maintenance and would more effectively control the growth and recruitment of tamarisk and other incompatible vegetation in the ROW. The eventual transition of the vegetation community types would also provide valuable components for wildlife habitat, fire and fuels reduction, and would have a beneficial impacts from the control of tamarisk stands and less frequent site disturbance (refer to Section 3.3 and Section 3.7).

The Proposed Action would indirectly benefit reduction of established noxious and invasive weeds by removing those that are incompatible with the Utilities goals. The establishment of low-growing compatible vegetation increases soil stabilization and provides additional wildlife habitat. The vegetation composition would typically be low growing shrubland communities deliberately targeted by the overall vegetation maintenance plan. These communities would not require herbicide application to control height and density of the vegetation in the ROW. Herbicides would serve as an additional tool that would reduce the frequency between vegetation maintenance cycles, resulting in less ground disturbance than with manual and mechanical methods alone. Less frequent maintenance cycles would mean less need for corridor entry and the reduced potential to transport noxious or invasive vegetative parts or seeds to new locations.

The 2007 Herbicide PER states that herbicides are an effective means of controlling weeds and other invasive vegetation. Sagebrush rangelands are often treated with herbicides to increase herbaceous plants, with herbicides that remove broad-leaved plants without harming grasses being the most widely used. Treatments that remove hazardous fuels from public lands reduce the spread of weeds and other invasive vegetation, and restore compatible vegetation in areas that have been degraded by human-related activities would benefit. Treatments would help to restore natural succession and disturbance processes to which native wildlife have adapted. In addition, treatments would increase plant diversity across landscapes, and in turn increase the number and types of wildlife that can be supported.

Pre-emergent herbicide application would be used in association with DSAP treatments, where vegetation would be completely removed from the 10-foot radius around poles housing equipment that could spark. The use of pre-emergence is common in ROWs near infrastructure and utility lines where vegetation must be eliminated for safety and to reduce fire hazards. Other treatment methods, such as manual methods are often not as effective at eliminating vegetation as the use of herbicides (BLM 2007e).

Native ecosystems adjacent to BLM-managed lands may also suffer when invasive plants spread from BLM-managed lands. Adjacent landowners may control these plants with less environmentally friendly methods or products, or by using more herbicides to combat invading plants than would be needed if all ownerships were participating. Adverse effects may occur near property lines, and landscape-scale values such as watershed or

wildlife values may be degraded by the need to compensate for poor control of BLM invasive plants, particularly where the BLM-managed lands are in a checkerboard pattern intermixed with private lands. In addition, native and other compatible plants including crops on adjacent lands can suffer irreparable damage when uncontrolled invasive plants from BLM-managed lands move across property lines (BLM 2010d).

The short-term impacts would be the same as the No Action Alternative, resulting in short-term minor direct beneficial effects and short-term indirect moderate adverse impacts to noxious and invasive vegetation by treating noxious and/or invasive weeds within the ROW where they are incompatible with the Utilities set goals and objectives. Long-term direct and indirect moderate beneficial impacts are anticipated as herbicide treatments are more effective in controlling incompatible vegetation and treating noxious and invasive weeds, assisting with compatible vegetation community transition. Although the Proposed Action does not directly target noxious and invasive weeds, the longer duration between treatment cycles would mean less site disturbance and less likelihood of transporting noxious or invasive weed and the seed establishing and/or spreading.

3.6.6 Mitigation Measures

No mitigation measures for noxious and invasive weeds are recommended.

3.7 General Vegetation

3.7.1 Introduction

This section describes the general vegetation within the ROW and assesses the potential impacts to vegetation from the Proposed Action and No Action Alternative. The term "general vegetation" refers to all shrubs, grasses, trees, and cacti species. Specific species of vegetation protected under state or federal laws or regulations are assessed in more detail in Section 3.9 Federally Listed Species and Section 3.10 BLM Sensitive Species. Additionally, the 2017 BLM Herbicide BA (BLM 2017) provides detailed vegetation information related to the power lines associated with specific species. Additionally, noxious and invasive weeds are discussed in Section 3.6. Data presented in this section were compiled from a literature review and specific knowledge of the ROW. The BLM manages vegetation using BLM manuals for guidance. Those manuals include BLM Manual 6840 (Special Status Species Management; BLM 2008a) and BLM Manual Section 6780 (Habitat Conservation Management Planning).

3.7.2 Issues Identified for Analysis

- What is the disturbance/damage to vegetation from cross-county ATV use within the ROW?
- Is the potential impact from drift minimized by design features related to wind and waxy consistency of herbicide?
- Is there a greater potential mortality due to spill or overspray or overland flow with the use of herbicides?
- Would herbicides change the structure and composition of the vegetation in the project area?
- How would herbicides remove target vegetation without removing non-target vegetation?

3.7.3 Affected Environment

Arizona's natural environment, including the areas within the ROWs, is characterized by an extreme diversity of climate, soils, vegetation, and wildlife. The northern half of the state is composed of a series of plateaus and the southern half consists of deserts broken by numerous isolated mountain ranges. Like most arid and semiarid regions, Arizona is a land of great climatic contrasts. In the Sonoran Desert, freezing temperatures seldom, if

ever, last longer than 24 hours, and summer temperatures are typically among the highest in the U.S. with daily highs often exceeding 100°F. Precipitation averages between 3 and 11 inches annually in the desert areas, depending on elevation, with well-defined winter and summer rainy seasons. Temperatures are much lower at higher elevations in the northern part of the state, and heavy snow events and below zero temperatures are common in winter. Annual precipitation can approach 60 inches at the higher elevations.

Vegetation community types within Arizona are extremely varied as would be expected from the great diversity of topography, elevation, soils, and climate. There is a great diversity in plant life ranging from tall ponderosa pines and Douglas-fir trees of the high mountains to xerophytic low shrubs and grasses in the desert areas.

ECOREGIONS

The U.S. Geological Survey (USGS) broadly characterizes regional ecosystems using an ecoregion system. Level III Ecoregions group areas of ecological similarity into broad classifications. Table 3-17 through Table 3-21 identifies Level III ecoregions present in each BLM field office.

Arizona/New Mexico Mountains make up approximately 7.56 percent (872.23 acres) of the ROW, and are defined by lower elevations and associated with vegetation that is indicative of a drier, warmer environment. Lower elevations are composed of chaparral, the middle elevations contain pinyon-juniper and oak woodlands, and ponderosa pine forest covers the higher elevations. There are nine ecoregions within the Arizona/New Mexico Mountains. Sunset Crater Volcanic ecoregion includes volcanic cones, lava flows, and cinder and ash deposits. The vegetation is commonly made up of stunted conifer trees and endemic species. Lower Mogollon Transition is found between 3,000 and 5,000 feet and contains diverse vegetation, such as desert scrub, semi-desert grasslands, and chaparral communities. At the highest elevation, the Arizona/New Mexico Subalpine Forests occurs above 9,000 feet and includes Engelmann spruce, corkark fir, blue spruce, white fir, and aspen (USGS 2014). The ROW crosses the Arizona/New Mexico Mountain Ecoregion in the Hassayampa, Kingman, Lower Sonoran, Safford, and Tucson field offices.

Table 3-17. Level III Ecoregion within ROW—Arizona/New Mexico Mountains

	Hassayampa (acres)	Kingman (acres)	Lake Havasu (acres)	Lower Sonoran (acres)	Safford (acres)	Tucson (acres)	Yuma (acres)	Total Acres/Percent of Level III Ecoregion
Total in Field Office	206,346.98	349,430.99		5,600.20	10,238.94	37,116.09		608,733.20
Within ROW	729.53	49.03		53.17	22.51	17.99		872.23
Percent of Level III Ecoregion	0.35	0.01		0.95	0.22	0.05		0.14

Source: USEPA 2016.

[a] Chihuahuan Deserts ecoregion is located within the Safford field office although no ROW crosses this ecoregion.

Arizona/New Mexico Plateau makes up approximately 4.01 percent (462.92 acres) of the ROW and is a transitional region with high relief, extending across northern Arizona, northwestern New Mexico, and into the San Luis Valley of Colorado. The Grand Canyon ecoregion has extreme relief and rough topography, ranging from 2,000 to 8,000 feet. Lower elevations contain willows, mesquite, catclaw acacia, big sagebrush, blackbrush, and rubber rabbitbrush. Higher elevations have pinyon-juniper woodlands with snakeweed, Mormon tea, Utah agave, yuccas, winterfat, Indian ricegrass, dropseed, and needlegrass as the dominate vegetation. The Virgin/Shivwits Woodland ecoregion ranges from 4,000 to 8,000 feet within the Virgin Mountains in Nevada and Arizona. Interior chaparral species combine with singleleaf pinyon, Utah juniper, juniper, Joshua tree, and Mojave yucca. Other species include pinyon, juniper, big sagebrush, cliffrose, Mormon tea, and various grasses. The Semiarid lands

ecoregion consists of mesas, plateaus, valleys, and canyons that reach elevations from 5,000 to 7,500 feet. Grasslands and Pinyon-juniper woodlands are common with species such as alkali sacaton, shadscale, fourwing saltbush, with inclusions of mixed gramas, Indian ricegrass, and galleta being present (USGS 2014). The ROW crosses the Arizona/New Mexico Plateau Ecoregion in the Kingman and Safford field offices.

Table 3-18. Level III Ecoregion within ROW—Arizona/New Mexico Plateau

	Hassayampa (acres)	Kingman (acres)	Lake Havasu (acres)	Lower Sonoran (acres)	Safford (acres)	Tucson (acres)	Yuma (acres)	Total Acres/Percent of Level III Ecoregion
Total in Field Office	3,056.63	187,301.56			186,505.44			376,863.62
Within ROW		145.25			317.67			462.93
Percent of Level III Ecoregion		0.08			0.17			0.12

Source: USEPA 2016.

Madrean Archipelago makes up the least amount of the ROW with approximately 1.19 percent (136.81 acres) of the ROW and is also known as the Sky Islands found at 3,000 to 5,000 feet. This is a region of basins and ranges with medium to high local relief. Common vegetation includes grama-tobosa shrub-steppe, oak-juniper woodlands, and ponderosa pine. Apachian Valleys and Low Hills ecoregion is found around 3,200 to 5,500 feet and is composed of desert scrub and semi-desert grassland. Exotic species have greatly altered historical grassland areas. Lower Madrean Woodland is found generally above 4,500 or 5,000 feet. Emory, silverleaf, and Arizona white oaks, pinyon, juniper, mesquite, and chaparral species are common to this ecoregion. Madrean Pine-Oak and Mixed Conifer Forests ecoregion is found above 6,500 feet. Ponderosa pine, southwestern white pine, Apache pine, Chihuahuan pine, Douglas-fir, gambel oak, and alligator juniper are found in this ecoregion (USGS 2014). The ROW crosses the Madrean Archipelago Ecoregion in the Safford and Tucson field offices.

Table 3-19. Level III Ecoregion within ROW—Madrean Archipelago

	Hassayampa (acres)	Kingman (acres)	Lake Havasu (acres)	Lower Sonoran (acres)	Safford (acres)	Tucson (acres)	Yuma (acres)	Total Acres/Percent of Level III Ecoregion
Total in Field Office				27.31	816,406.93	196,215.98		1,012,650.22
Within ROW					1.05	135.76		136.80
Percent of Level III Ecoregion					0.00	0.07		0.01

Source: USEPA 2016.

Mojave Basin and Range makes up approximately 5.95 percent (685.87 acres) of the ROW and stretches across southeastern California, southern Nevada, southwestern Utah, and northwestern Arizona. Lower elevation includes Arid Valleys and Canyonlands ecoregion that is dominated by sparse shrub cover such as creosote bush and white brittlebush. In the Lower Grand Canyon ecoregion elevations range from about 1,300 to 6,100 feet with extreme relief and vegetation such as creosote bush, mesquite, willows, exotic tamarisk, and catclaw acacia. The Mojave Playas are mostly barren with some saltbush vegetation. Eastern Mojave Basins ecoregion includes woody leuminous species, such as mesquite and acacia, creosote bush, white bursage, and galletta grass. The Eastern Mojave Low Ranges and Arid Footslopes ecoregion contains blackbrush, Mojave Desert forbs, succulent species,

and shrubs. The last ecoregion in the Mojave Basin and Range is the Eastern Mojave Mountain Woodland and Shrubland ecoregion, containing pinyon trees, juniper trees, curl-leaf mountain-mahogany, shrubs, and cliffrose (USGS 2014). The ROW crosses the Mojave Basin and Range Ecoregion only in the Kingman Field Office.

Table 3-20. Level III Ecoregion within ROW—Majave Basin and Range

	Hassayampa (acres)	Kingman (acres)	Lake Havasu (acres)	Lower Sonoran (acres)	Safford (acres)	Tucson (acres)	Yuma (acres)	Total Acres/Percent of Level III Ecoregion
Total in Field Office		1,216,067.30	29,302.32					1,245,369.62
Within ROW		685.87	0.00					685.87
Percent of Level III Ecoregion		0.06	0.00					0.06

Source: USEPA 2016.

Sonoran Basin and Range makes up the majority of the ROW with approximately 81.29 percent (9,377.14 acres) of the ROW, consists of scattered low mountains containing paloverde-cactus shrub and giant saguaro cactus. May include white bursage, ocotillo, brittlebush, creosote bush, catclaw acacia, cholla, desert saltbush, prickly pear, ironwood, and mesquite. It contains rugged terrain dissected by dry washes. The vegetation includes creosote bush, white bursage, brittlebush, ocotillo, teddy bear and staghorn cholla, range ratany, barrel cactus, beavertail cactus, and littleleaf paloverde. The Arizona Upland/Eastern Sonoran Basins ecoregion is made up of broad alluvial plains, fans, and bajadas found at elevations mostly between 1,500 and 3,000 feet. Common vegetation includes saguaro, foothills paloverde, ironwood, triangle-leaf bursage, ocotillo, mesquite, and acacias. Another ecoregion is the Middle Gila/Salt River Floodplains ecoregion which contains an elevation range from about 600 to 1,900 feet. This ecoregion contains highly altered habitat with agriculture being popular in this area (USGS 2014). The Sonoran Basin and Range Ecoregion is found within the Hassayampa, Lake Havasu, Lower Sonoran, Tucson, and Yuma field offices.

Table 3-21. Level III Ecoregion within ROW—Sonoran Basin and Range

	Hassayampa (acres)	Kingman (acres)	Lake Havasu (acres)	Lower Sonoran (acres)	Safford (acres)	Tucson (acres)	Yuma (acres)	Total Acres/ Percent of Level III Ecoregion
Total in Field Office	762,132.30	718,943.73	1,278,360.68	1,410,783.78	59,416.26	408,872.34	1,236,314.22	5,874,823.29
Within ROW	1,482.47		309.30	4,625.97		656.51	2,302.89	9,377.16
Percent of Level III Ecoregion	0.19		0.02	0.33		0.16	0.19	0.16

Source: USEPA 2016.

VEGETATION ASSOCIATIONS/COMMUNITIES

Within ecoregions, vegetation assemblages are mapped at a local scale and classified according to association. Further defined, a vegetation association refers to dominant plant species that co-occur within a vegetation community, creating the primary composition of the vegetation community (UA 1993). Different vegetation communities are defined by their structure, form, and/or species composition. At broad scales, vegetation types are based strongly on shared growth forms that dominate an area and reflect patterns of climate, substrate, and

disturbances. At fine scales, vegetation types are based on assemblages of plant species that co-occur in an area and are linked by their interactions with each other and their environment. At all scales, vegetation types can be described by repeating patterns in species composition and/or growth forms and structure, and relationships to the environment.

Thirty-seven different vegetation associations/communities occur within the ROW (Table 3-22). Generally, the most prevalent vegetation associations within the ROW are desert shrubland communities with Creosotebush-Bursage (41.16 percent), Mixed Paloverde-Cacti (24.63 percent), and Mixed Paloverde-Cacti and Creosotebush-Bursage communities (10.55 percent). The acreages within the remaining associations range between 0 and 4.81 percent[26] and when combined make up 5.64 percent of the ROW. The dominant communities have sparse vegetative cover and low species diversity. In addition to desert scrub communities, forested, riparian, and grassland communities exist throughout the ROW.

Riparian vegetation communities consist of herbaceous or woody vegetation, or a combination of these two vegetation types. Five riparian vegetation community types occur within the ROW for a total of 38.56 acres. Because of their rarity and importance for wildlife, water, and the human environment, wetlands and riparian vegetation is a carefully managed resource and discussed further in Section 3.5 Wetland and Riparian Areas.

Table 3-22. Vegetation Associations Acres within ROW

Vegetation Association	Hassayampa	Kingman	Lake Havasu	Lower Sonoran	Safford	Tucson	Yuma	Total ROW Acres/Percent of Total Vegetation Type	Percent of Total ROW
Creosotebush - Bursage (Lower Colorado River Valley) Communities	378.91/0.22		105.92/ 0.07	3,726.26/ 0.41		34.99/0.08	617.38/ 0.21	4,863.47/0.28	42.16
Mixed Paloverde - Cacti Communities	1,117.75/0.19		176.30/ 0.02	857.50/ 0.19		648.20/0.1 8	41.24/ 0.01	2,840.00/0.10	24.63
Mixed Paloverde - Cacti & Creosotebush - Bursage Communities		51.37/ 0.03		0.74/0.003			1,216.40/ 0.29	1,217.15/0.27	10.55
Shrub - Grass - Scrub Disclimax Communities	503.61/0.56	91.73/ 0.33						554.98/0.19	4.81
Saltbush Communities	14.53/8.68	212.79/ 0.03		33.57/0.15	5.39/ 0.02		311.02/ 1.30	456.24/0.43	3.96
Larrea Divaricata - Franseria Dumosa Associations		192.70/ 0.07						212.79/0.03	1.84
Joshuatree Communities								192.70/0.07	1.67

[26] The row in Table 3-12 labeled "Other Vegetation" is not a individual category but instaed a combination of 26 separate vegetation associations/communities each with such a minor amount within the ROW (0-1 percent) that they have been combined in this table for easier viewing. Each of the 26 individaul associations/communities alone is less than 3.53 percent.

Vegetation Association	Hassayampa	Kingman	Lake Havasu	Lower Sonoran	Safford	Tucson	Yuma	Total ROW Acres/Percent of Total Vegetation Type	Percent of Total ROW
Plains Grassland	3.30/0.17	64.37/ 0.03			124.58/ 0.39			127.88/0.29	1.11
Pinyon - Juniper Communities	3.08/0.11				80.41/ 0.10			147.86/0.04	1.28
Desert (Scrub) Grassland	37.21/0.29					89.75/0.13		126.96/0.02	1.10
Interior Chaparral	130.50/0.99	260.39/ 0.11						130.50/0.83	1.13
Other Vegetation[a]	23.10/0.03		27.08/ 0.01	61.06/0.32	130.85/ 0.04	31.21/0.02	116.86/ 0.12	650.55/0.01	5.64

Source: Brown and Lowe (1979)

[a] Other Vegetation refers to 26 different vegetation associations/communities found in less than 5.64 percent of the ROW. A full list is included in the project record found in the BLM Phoenix District Office.

(Source: Beautiful Scenery Photography http://bfz.biz/tag/sonoran-desert)

Photograph 3-1 Creosotebush – Bursage

Creosotebush - Bursage (Lower Colorado River Valley) Communities: The most common plant in this vegetation association is the creosote bush (See Photograph 3-1). Common small trees also include mesquite, palo verde, ironwood, and smoketree. Other plants grow only in these larger desert wash habitats due to their higher water requirements (wash obligates). These species include desert willow (tree) and chuparosa, desert honeysuckle, and canyon ragweed (shrubs). Other shrubs are found growing in the drier tiny shallow water courses such as: catclaw acacia, burro-brush, Anderson thorn-bush, and desert broom (Brown 1994).

(Source: FireScape https://www.azfirescape.org/galiuro/ecosystem-description/sonoran-paloverde-mixed-cacti-desert-scrub)

Photograph 3-2 Mixed Paloverde – Cacti

Mixed Paloverde - Cacti Communities: The most extensive series is dominated by leguminous trees (e.g., foothills palo verde) and columnar cacti (e.g., saguaro) (See Photograph 3-2). Typical vegetation also includes mesquite, prickly pear, blue palo verde, and perennial grasses (Brown 1994).

(Source: Sonoran Desert Soil Distributions 2012 http://practicalbio.blogspot.com/2011/09/sonoran-desert-soil-distributions.html)

Photograph 3-3 Mixed Paloverde – Cacti & Creosotebush – Bursage

Mixed Paloverde - Cacti & Creosotebush - Bursage Communities: Common species include blue palo verde, ironwood, desert lavender, Schott's dalea, jojoba, and other typically Sonoran species (See Photograph 3-3) (Brown 1994).

(Source: Wild Sonora http://wildsonora.com/vegetation-communities/semi-desert-grasslands)

Photograph 3-4 Shrub – Grass

Shrub - Grass - Scrub Disclimax Communities: This area was once dominated by perennial grasses, but now supports species including: mesquite, beargrass, sotol, one-seed juniper, agave, jimmyweed, snakeweed, and prickly pear. Very few perennial grasses still remain (see Photograph 3-4) (Brown 1994).

(Source: Imgarcade 2017 http://www.laspilitas.com/nature-of-california/plants/108--atriplex-polycarpa)

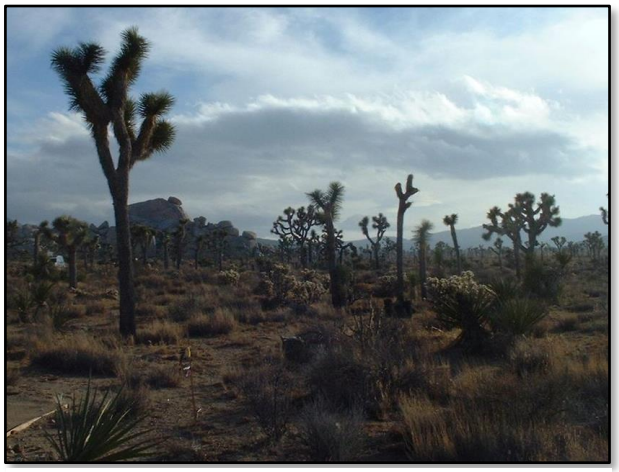
Photograph 3-5 Saltbush

Saltbush Communities: These communities are characterized by one or more species of Atriplex, such as All-scale, shadscale, four-wing saltbush, and desert holly, commonly in combination with other halophytic chenopods such as pickleweed, alkali weeds, glassworts, seep weeds, and greasewood (See Photograph 3-5). These communities are represented in the adjacent Great Basin and Sonoran desertscrub biomes and Mohave desertscrub (Brown 1994).

(Source: Imgarcade http://imgarcade.com/creosote-bush.html)

Photograph 3-6 Larrea Divaricata - Franseria Dumosa

Larrea Divaricata - Franseria Dumosa Associations: Common vegetation species include chaparral and sagebush (See Photograph 3-6) (Brown 1994).



(Source: Barclaycard Travel 2017 https://www.barclaycardtravel.com/t5/Travel-Stories/Joshua-Trees/ba-p/1969885)

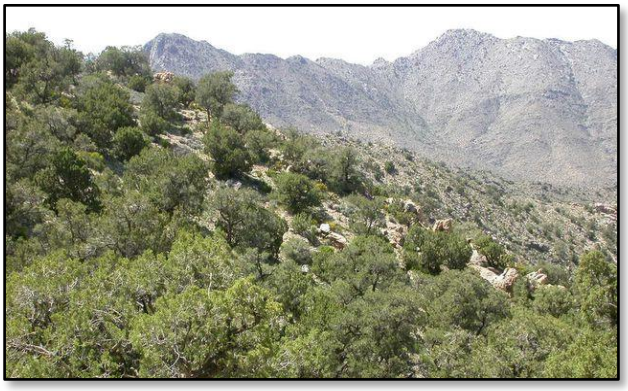
Photograph 3-7 Joshua Tree

Joshua Tree Communities: The Joshua tree is the most well-known Mohave Desert endemic species (See Photograph 3-7). This community is found throughout the periphery of the Mohave Desert where this biome grades upslope into cooler moister vegetation (Benson and Darrow, 1954). It may also at times be associated with species from Great Basin desertscrub and Great Basin conifer woodland (Brown 1994).

(Source: Arizona Biomes http://jan.ucc.nau.edu/~plants-c/bio414/Biozone/pln_gsl.html)

Photograph 3-8 Plains Grassland

Plains Grassland: Plains grasslands are found on the Colorado Plateau at wetter elevations above the Great Basin Desert-scrub. These grasslands grow at elevations of 5,000 to 6,000 feet, slightly higher than the drier semi-desert grassland. The principal grasses of this community are perennial sod-forming grasses (See Photograph 3-8) (Brown 1994).



(Source: Sweeney Granite Mountains Desert Research Center http://granite.ucnrs.net/?page_id=915)

Photograph 3-9 Pinyon – Juniper

Pinyon - Juniper Communities: Common vegetation includes blue grama as well as side-oats grama, western wheatgrass, and tobosa. Cliffrose, winterfat and silktassel may also be present. Snakeweed and threadleaf groundsel may also be common. (Yavapai County Native Naturalized Plants 2017) (See Photograph 3-9) (Brown 1994).

(Source: USGS 2004 https://www.werc.usgs.gov/OLDsitedata/fire/lv/fireandinvasives/study_ecosystems.htm)

Photograph 3-10 Desert (Scrub) Grassland

Desert (Scrub) Grassland: The Mojave Desert is also dominated by creosote bush over large areas (See Photograph 3-10). The Mojave Desert may be distinguished from the Sonoran Desert by its lack of blue palo verde and ironwood trees (very important species in the Sonoran Desert) as well as honey mesquite trees and smoketree, teddy bear cholla cactus, and shrubs chuparosa, bitter condalia, longleaf ephedra (mormon tea), crucifixion thorn, and jojoba. The Mojave Desert contains many species of smaller cacti such as chollas, prickly pears, barrels, and hedgehog cacti. One plant that can often be used to identify the Mojave Desert in Arizona is the Joshua tree. While this plant does not grow everywhere in the Mojave Desert, it does grow in most of the Arizona portion. The Mojave Desert is rich in other yucca species as well (Brown 1994).

(Source: Arizona-Sonoran Desert Museum 2017 http://www.desertmuseum.org/desert/habitats/chap/chapgallery.php)

Photograph 3-11 Interior Chaparral

Interior Chaparral: This vegetation type is a by shrub-dominated community (See Photograph 3-11). The shrubs are typically dense with evergreen and waxy leaves. Chaparral vegetation contains many species, but the shrub live oak is most common. Other common species include: birchleaf mountain-mahogany; skunkbush Sumac; a variety of silktassels; desert ceanothus; Arizona rosewood; barberry; cliffrose; hollyleaf buckthorn; and manzanita (Brown 1994).

VEGETATION AND SOILS

There is a close relationship between soil type and vegetation. Vegetation plays an important part in the formation of soils from solid rock, and is particularly important in supplying the soil with organic matter. Different types of vegetation create different forms of organic matter in soils. Soil and vegetation exhibit an integral relationship in that soil gives support (moisture, nutrient, and anchorage) to vegetation to grow, and in return, vegetation provides protective cover for soil, reduces soil erosion, and helps to maintain soil nutrients through litter accumulation and subsequent decay (nutrient cycling). Vegetation strongly affects soil characteristics, including soil volume, chemistry, and texture, which in turn may affect vegetation characteristics, including productivity, structure, and composition.

VEGETATION MANAGEMENT

The ROWs were initially cleared during construction and are continually maintained to remove incompatible vegetation. As previously noted, incompatible vegetation includes plants under, above, and near power lines that could disrupt the safe, reliable, and continuous delivery of electricity to the Utilities' customers.

Electric Reliability Standard FAC-003-4 requires that trees and other vegetation growing in or adjacent to the ROW be trimmed to prevent power outages caused by tree contact with a power line. Any power line contact or arching with a tree can cause a short circuit which may lead to a blackout or threaten public safety. Table 2 in the Electric Reliability Standard FAC-003-4 identifies the minimum vegetation clearance distance (MVCD) vegetation can be before arching with a power line (FAC-003-04, Table 2; page 16). In general, the MVCD ranges between 1.1 and 14.3 feet, depending on the voltage for a particular power line. Trees and other vegetation are regularly pruned or removed well away from MVCD to account for the fact that vegetation continuously grows, sways with the wind, and can hang lower from snow build-up, or that power lines can sag due to high usage, heat, or snow and ice build-up. Each utility develops and implements its own vegetation management plan clearance requirements that accounts for requirements of state or local authorities and any applicable ROW or easement agreement with the property owner as well as multiple factors, such as line condition, vegetation condition, environmental factors, geographic conditions, maintenance cycle, and approved maintenance methods. Therefore, specific clearance distances may vary between power lines, utilities, and landowners, but would always exceed the MVCD established in FAC-003-4.

There are also certain requirements for columnar cacti (mostly saguaros) since they are slow growing but still have the potential to become a threat to the power lines as these cacti are full of water and conductive to electricity. Some agave species, although typically low-growing may have stalks that grow up to 30 feet tall which can be a threat to power lines when growing under the right conditions. If the same agave species are growing in a location where the stalk would not pose a threat, the agave is left untreated. In other instances, only the removal of the agave stalk is necessary and the agave plant remains. Columnar cacti are not removed from the ROWs unless they have the potential to become a hazard in the near future. The typical clearance between the power line and the cacti would be between 5 and 22 feet (depending on the power line voltage) to be considered a potential threat and in need of removal or pruning.

Power line ROWs have a lower density of tall growing vegetation than surrounding areas due to ongoing vegetation management and therefore only a portion of the acreage within the ROWs require treatment within a given maintenance cycle. In various regions of the ROW, the vegetation structure is not tall enough to pose a threat to the power line and would not need to be treated. For example, grasslands or shrub-lands within the ROW typically would not be a potential concern since these vegetation types do not grow tall enough to make contact or interfere with the utility infrastructure. However, some areas with very dense or taller shrubs (e.g., dense interior chaparral or pinyon juniper) may need to be cleared or thinned to reduce fuel loads (i.e., threat of fire). In some case, vegetation that may not necessarily grow tall enough to be a potential risk from contact may

still be a concern and pose a fire threat. Interior chaparral vegetation, manzanita, tar bush, ponderosa pine, and juniper may pose a potential risk of wildfire because the vegetation burns at a higher temperature and the smoke produced holds a high carbon content. Build-up of carbon on the utility conductors would cause additional potential hazards for the Utilities.

3.7.4 Standard Operating Procedures

MANUAL AND MECHANICAL TREATMENT METHODS

- Within the ROW, ATVs and vehicles may drive off-road if necessary with the implementation of relevant SOPs below.
    - ATVs and vehicles would be used only during dry conditions to avoid rutting, except under hazard vegetation maintenance situations.
    - ATVs and vehicles would be driven at low speeds (less than 10 miles per hour) when traveling off-road within the ROW.

HERBICIDE TREATMENT METHODS

All of the general herbicide SOPs outlined in Section 2.3.10 applies, in addition to the SOPs listed below.

- For treatment of aquatic vegetation, (1) treat only that portion of the aquatic system necessary to achieve acceptable vegetation management, (2) use the appropriate application method to minimize the potential for injury to compatible vegetation and aquatic organisms, and (3) follow water use restrictions presented on the herbicide label.

3.7.5 Environmental Consequences

Direct and Indirect Impacts of the No Action Alternative

Under the No Action Alternative, vegetation would be removed manually and/or mechanically on routine vegetation maintenance cycles as described in Section 2.2.2. Manual and mechanical vegetation management would require over land travel by tracked or wheeled vehicles (e.g., ATVs or 4x4 trucks) to gain access to the treatment areas approximately every 3 to 5 years. Additionally, equipment such as chain, pole, and hand saws (manual devices) and/or mowers, chippers, and brushcutters (mechanical devices) would be used to conduct removal. Routine vegetation maintenance would be completed to maintain a reduced vegetation height, manage regrowth, reduce fire potential, and treat noxious and invasive weeds, where appropriate. This assessment of impacts assumes that the SOPs for manual and mechanical treatment methods designed to reduce potential unintended impacts to vegetation would be followed for all vegetation management activities in the No Action Alternative.

Manual methods make up the majority of the Utilities' routine vegetation maintenance activities. Manual treatments involving hand operated equipment tend to be selective and focused on target plants. With the current cutting techniques, the root system of individual plants would be left in place and relatively unaffected after the removal of the aboveground portion of the stem. In some cases this may perpetuate the growth of incompatible vegetation because of the biological response to rapidly resprout stems and reestablish enough leaves to support the root system. When a stem is cut, multiple sprouts can grow from the severed stump or the root system (also known as root-suckering). These sprouts are fast-growing because they are fed from a root system which is already well established. A repetitive cycle of cutting and sprouting can result in an increasing density of tall growing species (PG&E 2000). The rapid resprouting and increase in stem count ultimately creates a larger root mass.

Potential impacts to vegetation from manual treatments are discussed in the 2007 Herbicide PER (BLM 2007e: page 4-49), including the general benefit to native plant communities and the low risk of adversely effecting non-target species because manual treatment methods are highly selective.

Manual treatments could benefit native communities by controlling woody shrub species, which have invaded desert grasslands and now occur in much greater densities than they have historically. These treatments, when timed correctly, can effectively control desert shrub species, such as creosote bush (Wood et al. 1991). Manual treatments would have a short-term benefit to native plant communities by removing encroaching woody species, and by stimulating the growth of understory forbs and grasses.

Since the manual treatments only remove the aboveground portion of the plant, leaving the root system intact, there would be few lasting effects on non-target species because they would typically be able to recover quickly by resprouting. Damage may occur to non-target plants by minor trampling, breakage, and occasional mortality to individuals. Indirect impacts may also occur from soil disturbance that could increase the germination of any seeds present, particularly since repeated treatments are often required to prevent the reestablishment of aggressive vegetation. Removal of vegetation as part of vegetation management treatments would create areas vulnerable to erosion and stormwater runoff, which in turn could increase sedimentation to surface waters. The use of vehicles such as ATVs or 4x4 vehicles transporting crews to, or working within, the ROW could negatively affect native plant communities by bringing seeds of non-native species into treatment sites, creating opportunities for incompatible vegetation establishment (refer to Section 3.6 Noxious and Invasive Weeds). Additionally, ATVs and other vehicles, piling or spreading cut vegetation, or walking within the ROW would impact vegetation by compacting soils (refer to Section 3.3 Soils). Since manual treatments would occur on a frequent routine basis, the repeated trips and activities within the ROW and/or treatments that remove large areas of vegetation, could adversely affect native communities by altering species composition. Fuels and other chemicals used in association with manual treatments (e.g., from vehicles and/or hand-held equipment, such as chainsaws or spilling oil) could also be released to the environment, harming or killing vegetation.

Manual treatments are effective in environmentally sensitive areas with specific vegetation, such as wetland and riparian areas, because of the selective nature of the treatments. Shredding is effective in the control of shrubs, such as mesquite and juniper, and for management of sagebrush (Payne and Bryant 1998). Materials generated from thinning and other vegetation treatments are available for use as soil amendments.

Manual vegetation treatments would also have indirect effects from the removal of hazardous fuels from the ROW. This would generally benefit the health of plant communities in which natural fire cycles have been altered. Continued historical wildfire management practices results in the buildup of dead plant materials (e.g., litter and dead woody materials), and often increases the density of flammable living fuels on a site (e.g., dead branches on living shrubs or live plants, especially during dry periods). The resultant fires burn hotter, spread more quickly, and consumes more plant materials than the historical fires that occurred under conditions of lower fuel loading.

Treatments that restore and maintain fire-adapted ecosystems, through the appropriate use of routine thinning and other vegetation treatment methods, would decrease the effects from wildfire to communities and improve ecosystem resilience and sustainability. Vegetation treatments within the ROW would also reduce the incidence and severity of adjacent wildfires by creating a gap in vegetation or other combustible material, acting as a barrier to slow or stop the progress of a bushfire or wildfire.

Mechanical methods would have the same effects that manual treatments would have relating to work crew site access. Mechanical treatments would also be selective and focused on target incompatible vegetation but could impact non-target vegetation as a result of ground disturbance within the ROW. Mechanical methods may create greater ground disturbance and potentially expose barren soils, providing a greater opportunity for the

introduction of non-native and invasive species to the landscape. Mechanical equipment has larger cutting devices than chainsaws which makes it more difficult to only treat target vegetation.

The 2007 Herbicide PER (BLM 2007e: pages 4-45 to 4-49 and pages 4-54 to 4-55) addresses impacts from mechanical treatment methods and notes that mechanical treatments generally have the greatest effect on woody plant species, which typically take about 10 years or longer to recover and regain their dominance, depending on the effectiveness of control and the reproductive success of the species. Herbaceous plants would typically be more resilient to top-removal treatment methods, as many of these species die back annually. Growth of herbaceous plants often increases after mechanical treatments as a result of reduced competition with woody species for light, nutrients, and water (Cox et al. 1982). Treatments occurring during the growing period and prior to seed maturation and dispersal would have the greatest potential effects on herbaceous species. Mechanical methods are effective in removing thick stands of vegetation, although requires routine treatments or in combination with herbicide (which is not part of the No Action Alternative) to maintain.

Potential additional or compounded effects to vegetation from mechanical treatments include damage from the use of heavy vehicles, such as an increased soil compaction (which can lead to the puddling of water), scarification, and mixing of soil layers (Spence et al. 1996). Reducing the potential for water infiltration due to the compaction of soils can hinder the re-establishment of seedlings or the growth of established vegetation. Mixing of mineral and organic layers influences the revegetation process as well (Beschta et al. 1995). The disturbance from heavy equipment and maintenance crews may result in the compaction and degradation of soils, thereby impacting the soil structure and reduce its ability to provide functions necessary for vegetation to thrive. Similar to manual treatments, repeated mechanical treatments could adversely affect compatible vegetation by altering species composition.

For example, successful mechanical treatments of pinyon-juniper would benefit native plant communities by reducing the occurrence of pinyon and juniper species, however with only a partial removal of trees mechanical treatments would only have a short-term benefit. Areas of pinyon-juniper would have to be retreated frequently because small trees and seedlings often survive these treatments and may rapidly regrow once free from competition. Benefits would be minimal on sites where low precipitation or shallow soils limit revegetation of understory species. In addition, as previously mentioned mechanical treatments on sites with a large component of herbaceous species could result in an increase of these incompatible species. Mowing treatments would favor herbaceous species rather than shrubs. However, mowing is generally not considered to be useful for long-term control of sagebrush, as the effects last less than 5 years. Although mechanical treatment has the potential to result in greater disturbance, this treatment method is only used approximately 5 percent of the time.

The *DSAP maintenance* activities would be completed around poles with electrical equipment that have a potential to spark as discussed in Section 2.2.2. Maintenance activities are consistent with the manual and mechanical treatments previously discussed, but would also use string trimmers to cut vegetation and hand rakes to remove all vegetation debris within the 10-foot radius (20 feet diameter) around the base of the poles and up to a height of 10 feet. The total treatment area for this maintenance program would be approximately 3.03 acres of ROW on BLM lands. Because vegetation and debris would be completely removed to expose soil, it is assumed that soil compaction would occur within the entire 10-foot radius.

Therefore, the No Action Alternative would have short-term moderate direct and indirect adverse effects to vegetation based on the ground disturbance from manual and mechanical equipment, ATVs, vegetation removal/disposal, and 4x4 vehicle uses in the ROWs. Without reducing the frequency of manual or mechanical maintenance, the No Action Alternative would not be successful at promoting the establishment of compatible vegetation and therefore the frequency and intensity of treatments may increase due to resprouting and development of larger root mass. The No Action Alternative would have a long-term moderate direct and

indirect adverse effect because the continued frequent disturbances and routine vegetation maintenance cycles would increase the effects of previous disturbance by disrupting the reestablishing vegetation and posing a continued risk for the introduction of noxious or invasive weeds.

Direct and Indirect Effects of the Proposed Action

In addition to the short-term effects associated with the No Action Alternative described above, the Proposed Action would employ the use of herbicides to augment current manual and mechanical methods of vegetation maintenance within the Utilities' ROW. To prevent plant species from resprouting, the entire root system must be removed. Herbicides interfere with specific botanical biochemical pathways of plants thereby assisting with the control of individual plants prone to resprout after the removal of the above ground portion of the plant. When trees that resprout or sucker are removed without herbicide treatment, dense thickets develop which could impede access, increase workloads and vegetation treatment costs, and potentially result in hazardous fuel loads. Herbicide application in conjunction with manual and mechanical treatments is a more effective treatment for incompatible vegetation. All herbicides would be used in conjunction with manual and mechanical treatments during the routine vegetation maintenance cycle and/or in subsequent years to treat regrowth and seedlings, as outlined in Section 2.3.5. Only BLM-approved herbicides would be used, which would also include the application of herbicides approved for pre-emergent use by the BLM for DSAP treatments. Selective herbicides only affect certain plant species, whereas non-selective herbicides affect all or most plant species. The non-selective herbicides include bromacil, diuron, glyphosate, imazapyr, sulfometuron methyl, and tebuthiuron. The other herbicides (2,4-D, Aminopyralid, chlorsulfuron, clopyralid, dicamba, fluroxypr, hexazinone, imazapic, metsulfuron methyl, picloram, and triclopyr) exhibit some selective qualities.

Foliar application would be applied to the vegetation regrowth, which is likely to be one to two growing seasons after manual or mechanical treatments (refer to Section 2.3.5). The following year after the initial herbicide treatment a second follow-up treatment would be completed to retreat localized vegetation that may have been missed or that may be in need of a second treatment at that time. This would require additional trips to the ROW in subsequent years after manual or mechanical treatments initially, although herbicide treatment in the ROW would reduce the frequency and intensity of vegetation management efforts (manual, mechanical, and herbicide) over time through the establishment of a low growing compatible vegetation community as part of an IVM approach to vegetation management. With use of herbicides, and by encouraging the establishment of low-growing native communities in the ROW, routine vegetation maintenance cycles would be extended from every three to five years to approximately every eight years. This would result in less overland travel through vegetation communities which would in turn reduce disturbance and damage to vegetation by mechanical equipment (mowers), trucks, and ATVs. With the Proposed Action and extended time between maintenance cycles, there would be a reduction in the size of treatment areas, as well as a reduction in the equipment, vehicles, and field crews within the ROW, resulting in long-term beneficial impacts to vegetation.

Herbicide treatments completed at the same time as manual and mechanical methods include treatments for DSAP maintenance, hazardous vegetation removal, and cut-stump and potentially basal application. Increased vegetation disturbance is anticipated during the vegetation cycle when these specific treatment methods are included. Because these treatments occur at the same time and in the same location as the manual and mechanical treatments, additional vehicles and field crew members typically would not be necessary. Additional foot traffic is anticipated from the use backpack sprayers, while additional overland travel may be required from the use of ATV-mounted sprayers. The combined treatments and additional work crew members and vehicles necessary would have a negligible localized effect to vegetation from the slight increase in site activity.

The Utilities would only use pre-emergent herbicide application in association with DSAP treatments, where vegetation would be completely removed from the 10-foot radius around poles housing equipment that could

spark. According to the 2007 Herbicide PEIS, the use of pre-emergence is common in ROWs near infrastructure and utility lines where vegetation must be eliminated for safety and to reduce fire hazards. Other treatment methods, such as manual methods are often not as effective at eliminating vegetation as the use of herbicides (BLM 2007a).

A detailed description and analysis of impacts to vegetation by the specific active ingredients are presented in the 2007 Herbicide PEIS (BLM 2007a: pages 4-48 to 4-63) and 2016 Herbicide PEIS (BLM 2016a: pages 4-27 to 4-31) and are not repeated in this EA but instead incorporated by reference and summarized in this document. The detailed description includes effects to target and non-target vegetation by exposure scenario (direct spray, accidental spill to a pond, off-site drift, surface runoff, and wind erosion) (BLM 2007a: Table 4-11; pages 4-49 and 4-50 and BLM 2016a: Table 4-7; page 4-29).

Control of broadleaf plants by selective herbicides, such as 2,4-D, usually increases grass production. 2,4-D is also effective in controlling weedy forbs, such as Scotch thistle. 2,4-D can be tank mixed with other herbicides, such as glyphosate, dicamba, picloram, and triclopyr to enhance the activity of these herbicides. Applications of selective herbicides, such as 2,4-D, are expected to increase grasses and decrease broadleaf species (BLM 1991a). Herbicides such as picloram and tebuthiuron are used to control woody species such as mesquite, creosote bush, and snakeweed. These herbicides usually decrease woody plant growth and increase growth of grasses, although it may take several years before grass and forb production increases in response to reduced competition from shrubs. Picloram is effective in controlling general woody plant and broad-leafed weeds, while tebuthiuron is effective in controlling creosote bush and tarbrush (BLM 1991b). Imazapic has been successful in control the spread of aggressive invasive species and poses few risks to non-target vegetation (Whitson 2001, Shinn and Thill 2002).

The 2007 Herbicide PEIS and the 2016 Herbicide PEIS indicated that the risk to non-target terrestrial and special status terrestrial plants associated from off-site drift would be low for aminopyralid, clopyralid, fluroxypyr, hexazinone, imazapyr, metsulfuron methyl, and triclopyr. Moderate risk is associated with bromacil, chlorsulfuron, dicamba, and picloram. No risk was identified with diuron, imazapic, sulfometuron methyl, tebuthiuron, or glyphosate. 2,4-D was not evaluated for risk to non-target vegetation from off-site drift. The herbicide application rate is a major factor in determining risk, the higher the application rates the more likely to pose a risk to vegetation. The Utilities would use a low volume spot application method to selectively apply the herbicide ingredients to target incompatible vegetation. The foliar application of herbicides using the adjuvant Thinvert as the carrier would result in the herbicide adhering to the targeted plants, which would minimize spray drift. The herbicide would also be more likely to remain on the plant reducing effects potential on non-target vegetation. Additionally, no aerial or broadcast application of herbicides would occur under the Proposed Action, further reducing the potential to risk and impact to non-target vegetation.

Herbicides have the potential to be carried to non-target plant by runoff, which is common when rainfall occurs shortly after the herbicide application. Prior to the application of herbicides the applicator would consider site characteristics, environmental conditions, and application equipment in order to minimize damage to non-target vegetation. Additionally, if there is a high probability (80 percent chance) of local, moderate rain (0.25 inch or less within 24 hours), then applications would only occur when it is anticipated that there would be sufficient time (at least four hours) for the application to dry before rainfall occurs. Of the 17 proposed herbicides, 14 had no impact to vegetation (terrestrial and special status terrestrial plants) from surface runoff, 1 had a moderate risk (triclopyr), and 2 were not evaluated. The use of Thinvert, which is a paraffinic (waxy) oil, allows for ultra-low volume application, minimizing the volume of liquid applied and active ingredient used. Thinvert application minimizes drift and runoff when compared to water based-operations because the small droplets of active ingredients are captured within the waxy oil. The Thinvert mix is applied to the plant by making one slow, controlled pass of the hand wand across the targeted portion of the plant. The application is made using a special nozzle that produces small, uniform droplets that do not readily break up into finer droplets as water

droplets do, thereby minimizing drift and drip (Waldrum Specialties 2002). Additionally, since approximately 92 percent of the soils within the ROW has moderate to low erosion susceptibility rates and the proposed herbicides have a low absorption rate, herbicides would tend to remain where applied with limited unintended transport from runoff.

Herbicide treatment over large contiguous areas requires large quantities of herbicide that may be stored in tanks, drums, backpack sprayers, and barrels or other small containers. A spill or leak of herbicides from storage tanks or malfunctioning equipment would result in potential overland flow of herbicides across a localized area of the landscape causing mortality to vegetation located within the spill area. Spills or leaks from small storage containers such as barrels or backpack sprayers would result in up to several gallons of herbicide in contact with vegetation in a localized area with minimal overland flow. Unintentional applications and spills could have adverse effects to vegetation. Bromacil, chlorsulfuron, dicamba, aminopyralid, and fluroxypyr would have high potential risk while tebuthiuron would have a moderate risk, and imazapic would have a low risk to non-target terrestrial and special status terrestrial plants as a result of an accidental spill. 2,4-D was not evaluated and the remaining herbicide risks would vary depending on if the vegetation was terrestrial or special status terrestrial plants[27] (BLM 2007a). SOPs were included as part of the Proposed Action to not only minimize the risk of spills, but also to require the development of a spill contingency plan that outlines how spills would be contained and managed. ATVs would be driven at slow speeds to reduce the risk of accidents, mixing of materials would occur off-site, and a closed chain of custody process reduces risk from open containers and potential for spills or leaks on-site (refer to Section 2.3.10). With these SOPs in place, the risk of spill would be limited to potential unforeseen equipment malfunction from ATV-mounted tanks and backpack sprayers.

According to the risk tables, the highest risk to non-target vegetation would occur from accident spill. Due to the implementation of the closed chain-of-custody, the chance of spills would be minimized. None of the herbicides were identified to pose risk under wind erosion scenarios. Effects to non-target plants would be minimal since the Proposed Action accounts for the implementation of the SOPs and would apply herbicides by spot treatment targeting only incompatible vegetation.

Additionally, while columnar cacti and agave are sometimes treated using manual methods, the Proposed Action does not target agave or columnar cacti. Indirect spray through drift could impact these plants; however, the use of Thinvert as a drift and drip control agent minimizes herbicide drift onto non-target plants and drip to the soil and underlying plants. It also allows for ultra-low volume application, minimizing the volume of liquid applied and active ingredient used.

Herbicides offer an effective and often resource efficient means of treating and managing unwanted vegetation. Mechanical and manual treatments are often more time and labor intensive than herbicide applications, and they cause soil disturbance, which can provide the appropriate conditions for invasive weeds to resprout from roots or grow from dormant seeds. The use of herbicides would benefit plant communities by decreasing the growth, seed production, and competitiveness of target plants, thereby relieving competitive pressures (e.g., water, nutrient, and space availability) to low-growing compatible vegetation. The success of treatments would depend on numerous factors, and could require the use of a combination of methods to combat incompatible vegetation.

Therefore, the Proposed Action would have short-term moderate direct and indirect adverse effects to vegetation from the ground disturbance associated with the manual and mechanical treatments, vegetation disposal, and additional ATV and 4x4 vehicle uses in the ROWs. The Proposed Action would have long-term,

[27] Diuron (moderate risk for terrestrial plants/high risk for special statsus terrestrial plants); sulfometuron methyl (no risk for terrestrial plants/high risk for special statsus terrestrial plants); clopyralid (high risk for terrestrial plants/no risk for special statsus terrestrial plants); glyphosate (moderate risk for terrestrial plants/low risk for special statsus terrestrial plants); imazapyr (high risk for terrestrial plants/moderate risk for special statsus terrestrial plants); metsulfuron methyl (high risk for terrestrial plants/low risk for special statsus terrestrial plants); and triclopyr (high risk for terrestrial plants/not evaluated for special statsus terrestrial plants).

direct and indirect, moderate beneficial impacts from the changes in the structure and composition of the vegetation in the ROW, a reduction in frequency and intensity of vegetation management treatments as compared to the No Action Alternative, establishment of low-growing vegetation communities, and a reduction in the risk of future high-severity wildfire.

3.7.6 Mitigation Measures

No mitigation measures are recommended.

3.8 General Fish and Wildlife

3.8.1 Introduction

This section describes the general wildlife and fish within the ROW and assesses the potential impacts to wildlife from the Proposed Action and No Action Alternative. The term "general wildlife" refers to all mammal, bird, invertebrate, reptile, and amphibian species. Species protected under state or federal laws or regulations are assessed in more detail in Section 3.9 Federally Listed Species and 3.10 BLM Sensitive Species. Data presented in this section were compiled from a literature review and specific knowledge of the ROW. The BLM manages habitat for fish and other aquatic organisms using several BLM manuals for guidance. Those manuals include BLM Manual Section 6500 (Wildlife and Fisheries Management); BLM Manual Section 6720 (Aquatic Resources Management); BLM Manual Section 6780 (Habitat Conservation Management Planning); and BLM Manual 6840 (Special Status Species Management; BLM 2008c). A large portion of the BLM-managed lands in Arizona drain into the Colorado River and, in particular, into the Lower Colorado River. The U.S. Bureau of Reclamation and other cooperators completed the Lower Colorado River Multiple Species Conservation Program that the Secretary of Interior signed in 2005. This program represents a 50-year-long comprehensive native species conservation approach to both federal actions and nonfederal activities on the lower Colorado River management. All participating USDI officials are directed to cooperate and implement agreements to achieve the important species conservation actions identified within the program.

3.8.2 Issues Identified for Analysis

- Would the use of herbicides contaminate surface water or indirectly impact wildlife?
- Would the vegetation treatments result in a loss of vegetation for forage, nesting, and/or cover?
- Would there be a temporary displacement of wildlife during active operations?
- Would there be potential mortality to wildlife due to spills, overspray, or overland flow from the application of herbicides?
- What would the potential impacts be on habitat for specific species?
- Would there be potential mortality impacts to migratory birds from loss of active nests from vegetation treatments?
- What would be the impact from loss of vegetation in wildlife corridors?
- How would direct mortality of small animals caused by collisions with ATVs be limited?
- What is the potential for direct disturbance of nesting habitat including nest eggs and nesting birds?
- What are the potential changes in food sources, seed production, and invertebrates?
- Would there be improvements in habitat for some species and less compatible habitat changes for other species?
- Would there be potential habitat-fragmentation impacting wildlife including reptiles and birds?

3.8.3 Affected Environment

GENERAL WILDLIFE

The state of Arizona can be characterized by a number of ecoregions that capture the range of ecosystems and variation in ecology throughout the state. Within these ecoregions a number of vegetation communities (or associations) create a mosaic of wildlife habitat within the state. The primary vegetation types found on BLM lands in Arizona include creosote shrub scrub, cold desert grasslands, pinyon juniper woodlands, chaparral, Joshua tree, and mixed palo verde cacti communities. The vegetation composition is identified within the ROW and discussed in Section 3.7 General Vegetation.

Mixed Palo Verde Cacti and Lower Colorado River Valley Creosote-Bursage are the two most common vegetation types throughout the seven BLM field offices. Mixed Palo Verde Cacti receives 8-16 inches of rainfall per year, on average. Common plants include palo verde (*Parkinsonia*), ironwood (*Olneya tesota*), saguaro (*Carnegiea gigantea*), yucca (*Yucca*), cholla (*Cylindropuntia*), small grasses, and forbs. Wildlife species common to Mixed Palo Verde Cacti vegetation types include bobcat (*Lynx rufus*), cactus wren (*Campylorrhynchus brunneicapillus*), grey fox (*Urocyon cinereoargenteus*), big brown bat (*Eptesicus fuscus*), and Mojave rattlesnake (*Crotalus scutulatus*). Lower Colorado River Valley Creosote-Bursage, receives less than 8 inches of rainfall per year, on average. Common plants include creosotebush (*Larrea tridentate*), white bursage (*Ambrosia dumosa*), velvet mesquite (*Prosopis* velutina), and ironwood (*Olneya tesota*). Wildlife species common to this vegetation type include kit fox (*Vulpes macrotis*), coyote (*Canis latrans*), western whiptail (*Cnemidophorus tigris*), black-tailed jackrabbit (*Lepus californicus*), Harris's hawk (*Parabuteo unicinctus*), and greater roadrunner (*Geococyx californianus*).

Riparian areas are found throughout the state, though limited across the landscape. These areas provide important habitat for many wildlife species. Common vegetation found associated with riparian areas includes Fremont cottonwood (*Populus fremontii*), common cattail (*Typha latifolia*), Goodding Willow (*Salix gooddingii*), and velvet mesquite (*Prosopis velutinia*). Wildlife species often found in riparian areas include Sonoran whipsnake (*Coluber bilineatus*), great blue heron (*Ardea herodias*), Woodhouse's toad (*Anaxyrus woodhousii*), and ring-tail cat (*Bassariscus astutus*) (Arizona Game and Fish Department [AGFD] 1994). Five riparian vegetation community types occur within the ROW for a total of 38.56 acres. Because of their rarity and importance for wildlife, water, and the human environment, wetlands and riparian vegetation is discussed further in Section 3.5.

GENERAL FISH AND AQUATIC SPECIES

As discussed in Water Resources and Quality (refer to Section 3.4), the utility alignments cross numerous perennial drainages, major drainages, and approximately 54 surface water crossings and washes. Some of these drainages support fish and other aquatic organisms.

Wildlife agencies estimate that there are approximately 30 native fish species in Arizona. Of Arizona's native fish species, at least two-thirds are listed as threatened or endangered by the USFWS. Threats to native fish include exotic competitors (and predators), irrigation diversion, dams, and overuse of available water by our increasing human population. These factors have led to fragmentation and reduction of habitat available to native fish species. Currently in Arizona, there are three times as many species of introduced or non-native fishes as there are native species. The native fish species are often preyed upon or outcompeted for food and territory by introduced species. Loss or alteration of habitat is equally detrimental to native fishes, which are often highly adapted (Ivanyi 2017).

There are a number of streams spanned by the ROW which are thought to support various fish species, as well as more widespread habitat for other aquatic species. No fish or aquatic species surveys have been conducted specifically for this project; therefore, this analysis utilizes the best available existing data.

The condition of fish habitat is related to hydrologic conditions of the upland and riparian areas associated with, or contributing to, a specific stream or water body, and to stream channel characteristics. Riparian vegetation (particularly native riparian vegetation), reduces solar radiation by providing shade, and thereby, moderates water temperatures, adds structure to the banks to reduce erosion, provides overhead cover for fish, provides organic material (a food source for macroinvertebrates), and provides insects and other foods for fish. Intact vegetated floodplains dissipate stream energy, store water for later release, and provide rearing areas for juvenile fish. Water quality parameters (especially factors such as temperature, sediment, and dissolved oxygen) are also important components of fish habitat.

The loss of water volume during summer low flows, mainly due to water withdrawal for irrigation purposes and hydropower dam operations, has directly affected stream temperature. Increasing air temperatures in summer months, compounded by the effects of climate change, can also affect stream temperatures, especially in areas where riparian vegetation and stream shade are currently lacking. In many areas, fish-bearing streams can be reduced to almost no flow during summer months (June to August).

In aquatic systems, invasive plants may also clog slow-moving water bodies and contaminate water with an overabundance of organic material. Dense concentrations of invasive aquatic plants also reduce light and dissolved oxygen levels, eliminating habitat and decreasing growth or killing native species of plants and animals (Payne and Copes 1986). Additionally, the buildup in hazardous fuel levels, and increase in invasive vegetation has led to more frequent fires, resulting in increased soil erosion. These conditions have also lead to deterioration in water quality and fish habitat.

3.8.4 Standard Operating Procedures

Specific SOPs relating to species protected under state or federal laws or regulations apply to general wildlife and are found within the respective sections, including Section 3.9 Federally Listed Species and 3.10 BLM Sensitive Species and therefore not repeated below. Additionally, SOPs for migratory birds have not been repeated here, but instead can be found within Section 3.11. Some of the SOPs listed in this section of the EA have been incorporated from the species specific conservation measures identified in the draft BLM Biological Assessment (BA) associated with this EA. The SOPs listed here have been edited to be more consistent with the terms and language of this EA; the prescription or intent of the SOPs has not been altered. The SOP as written in the 2017 BA would take precedence if there are any perceived discrepancies.

MANUAL AND MECHANICAL TREATMENT METHODS

- Within the ROW, ATVs and vehicles may drive off-road if necessary with the implementation of relevant SOPs below.
    - ATVs and vehicles would be used only during dry conditions to avoid rutting, except under hazard vegetation maintenance situations.
    - ATVs and vehicles would avoid driving through rivers, standing water, and other water sources except on established roads.
    - ATVs and vehicles would be driven at low speeds (less than 10 miles per hour) when traveling off-road within the ROW.

- ATVs and vehicles would only be operated during daylight hours, except under hazard vegetation maintenance situations.
- ATVs and vehicles would avoid driving directly up slopes and other areas that may contain highly erodible soils.
- ATVs and vehicles would not drive on slopes greater than 20 percent when traveling off established roads.

- Small chips produced during vegetation treatments would be broadcast across the ROW at a thickness no greater than four inches.
- During manual vegetation treatment, the following methods of disposal would be used:
  - Lop and scatter: Limbs and logs of less than 9 inches in diameter would be lopped and scattered throughout the immediate area in a manner such that limbs and logs would be left no taller than 18-24 inches above the ground. Logs over 9 inches diameter would remain where felled and would be cut in sections to lay flush with the ground.
  - Chipping: Limbs and logs less than 9 inches in diameter would be chipped and broadcast on site with chips placed no deeper than four inches.
- Provide maintenance crew members with training on nest reporting and nest avoidance measures when completing vegetation maintenance on BLM-managed lands during migratory bird nesting season.
- Do not operate a mechanical mower within riparian vegetation. Riparian vegetation shall be removed or pruned using manual methods.
- When working in riparian areas, wetlands, and near other aquatic habitats, access work site only on existing roads, and limit all travel on roads when damage to the road surface would result or is occurring.

HERBICIDE TREATMENT METHODS

- Within riparian areas, wetlands, and aquatic habitats, conduct herbicide treatments only with herbicides that are approved for use in those areas.
- Use appropriate buffer zones based on product label and risk assessment guidance.
- For non-special-status fish, minimize treatments near fish-bearing waterbodies.
- Use herbicides of low toxicity to wildlife, where feasible.
- For treatment of aquatic vegetation, 1) treat only that portion of the aquatic system necessary to achieve acceptable vegetation management, 2) use the appropriate application method to minimize the potential for injury to compatible vegetation and aquatic organisms, and 3) follow water use restrictions presented on the herbicide label.
- Herbicide treatments would be minimized in areas where herbicide runoff is likely, such as steep slopes when heavy rainfall is expected.
- Granular herbicides would not be used on slopes of more than 15 percent where there is the possibility of runoff carrying the granules into non-target areas.
- When working in riparian areas, wetlands, and near other aquatic habitats, access work site only on existing roads, and limit all travel on roads when damage to the road surface would result or is occurring.
- Within or near riparian areas, avoid using glyphosate formulations that include R-11, and either avoid using any formulations with polyethoxylated tallow amine, or seek to use the formulation with the lowest amount of polyethoxylated tallow amine available. Implement the following buffers for riparian, wetlands, and other aquatic habitats when applying herbicide:

- Herbicides rated as class 0 require no buffer. Herbicides that meet this criterion include: aminopyralid, glyphosate (aquatic formulation), imazapic, imazapyr (aquatic and nonaquatic formulations).
- Do not apply herbicides rated as class 1 within 30 feet of the waterbody or wetland to be protected. Herbicides that meet this criterion include: bromacil, chlorsulfuron, clopyralid, fluroxypyr (acid formulation), glyphosate (non-aquatic formulation), hexazinone, metsulfuron methyl, picloram, sulfometuron methyl, tebuthiuron, and triclopyr (amine salt formulation).
- Do not apply herbicides rated as class 2 within 50 feet of the waterbody or wetland to be protected and within 10 feet of riparian vegetation, if present. Herbicides that meet this criterion include: 2,4-D (aquatic and non-aquatic amine salt formulations), dicamba, diuron, and triclopyr (ester formulation).
- Do not apply herbicides rated as class 3 within 100 feet of the edge of the waterbody or wetland to be protected and within 20 feet of riparian vegetation, if present. Herbicides that meet this criterion include: 2,4-D aquatic and non-aquatic ester formulations.
- For pool habitats, do not apply herbicides within 30 feet of pools when there is no surface flow of water in and out of pool.

3.8.5 Environmental Consequences

GENERAL WILDLIFE

Direct and Indirect Effects of the No Action Alternative

Under the No Action Alternative, manual and mechanical vegetation management would be used within the ROW and would consist of hand tools and equipment including ATVs, chain saws, and mowers. Management activities occur at an average frequency of 3 to 5 years. Vegetation that persists within the ROW is maintained through height reduction or complete removal under specific circumstances such as DSAP areas. Noise and physical disturbance from manual and mechanical treatments would occur within the ROW under the No Action Alternative. Human presence and use of manual tools would create frequent disturbances during the period of treatment. These disturbances would likely cause wildlife to temporarily disperse from the area. Mobile species and animals that can use a variety of habitats usually move into other habitat types when change occurs.

Manual methods allow for more precise vegetation control than other methods and are often suitable in areas with sensitive wildlife species. Hand-held equipment, such as chainsaws, creates noise that can disturb animals and cause them to flee or alter their behavior or habitat use. These effects would be short-term and not likely to have much effect on the long-term health and habitat use of wildlife in the ROW. ATVs and vehicles would only be operated during daylight hours, except under hazard vegetation maintenance situations, and driven at low speeds at all times thereby reducing the risk of potential collisions between wildlife and vehicles. Precautions would be taken to minimize risks to surface and groundwater quality associated with fuel spills from the use of chainsaws or other power tools. Maintenance crews would receive training on nest reporting and nest avoidance measures when completing treatments during migratory bird nesting season.

Direct impacts on wildlife habitat would include removal of vegetation during the routine vegetation maintenance cycles. Utility ROWs were initially cleared during construction and are continually maintained to remove incompatible vegetation. As previously noted, incompatible vegetation includes plants under, above, and near power lines that could disrupt the safe, reliable, and continuous delivery of electricity to the Utilities' customers. The ROWs undergo routine vegetation maintenance, but portions which pass through areas with low

vegetation, or in areas where the distance between the conductor or line and the top of the tallest mature tree is greater than 50 feet (line that span a canyon or ravine), the entire ROW does not necessarily need to be cleared of all vegetation. Clearing of vegetation would alter habitat quantity and quality for wildlife species, and the degree of this impact (positive or negative) would vary depending on habitat type affected and the time necessary for the disturbed vegetation to regrow. Changes may be beneficial to some species (e.g. providing shelter in plant debris for rodents) and create travel corridors for large wildlife.

While large and medium-sized mammals would likely flee the disturbance area, small mammals, reptiles, and amphibians would seek nearby security cover. Given the slow travel speeds within ROWs, most wildlife should easily be able to avoid vehicular and pedestrian traffic. Those species and individuals with small home ranges or which are at 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 vegetation treatments occur during the nesting season, though implementation of the following SOP reduces this chance: Maintenance crews would receive training on nest reporting and nest avoidance measures when completing treatment during migratory bird nesting season. Because treatments are generally of short duration and spatially limited, most of these disturbance impacts are likely to have negligible impacts on wildlife's ability to forage, seek shelter, and reproduce effectively. Additionally, there would be minimal risk of wildlife injury to eggs or immobile young from the use of hand tools.

The manual vegetation treatments could affect wildlife through habitat fragmentation. Fragmentation refers to the breaking up of contiguous areas of vegetation/habitat into smaller patches. The process of fragmentation can affect wildlife and habitat quality in a variety of ways such as altering nutrient flows/cycling, increasing the rate of invasion by noxious weeds and invasive wildlife species, lowering the carrying capacity of a habitat/patch, and disrupting meta-population dynamics (Johnson and O'Neil 2001). In addition, fragment edges (both natural edges and those created by human activities) play a crucial role in ecosystem interactions and landscape function, including the distribution of plants and animals, fire spread, vegetation structure, and wildlife habitat. As previously mentioned, the ROWs currently undergo routine vegetation maintenance, but the entire ROW does not necessarily need to be cleared of all vegetation. And in certain areas where the ROW spans a canyon or ravine no vegetation treatment would occur since the vegetation would never reach a height where it would be a potential concern. Therefore, fragmentation does not necessarily occur across all power lines.

Mechanical methods in the No Action Alternative would be used less than five percent of the time. Similar to the manual methods, equipment is often noisy, and noise may alter animal behavior or cause wildlife to leave an area during the disturbance period. There would also be risks to water quality associated with the use of heavy machinery or mechanized equipment from fuel leaks and spills (BLM 2007e). Localized erosion, soil disturbance, and reduced foliar cover of some vegetation associated with equipment working within ROWs can impact water quality and habitat effectiveness. Treatments using mechanical methods have a higher chance of impacting burrows and undetected nests of ground nesting birds.

The *DSAP maintenance* activities associated with the No Action Alternative would consist of manually removing all combustible vegetation within the 10-foot radius of poles with equipment that can spark. The disturbed soil would be vulnerable to increased erosion and runoff, which in turn could increase sedimentation to surface waters. The total treatment area within the DSAP maintenance program would impact approximately 3.03 acres of the 11,534.99 acres of the total ROW on BLM lands. The effects to general wildlife within the ROW from DSAP maintenance activities would be negligible and localized.

Treatments that remove hazardous fuels from public lands, reduce the spread of noxious or invasive vegetation, and restore compatible vegetation would benefit wildlife habitat. Although the intent is not to specifically target noxious or invasive weeds by the vegetation treatments, treatments would help to restore natural succession and disturbance processes to which native wildlife have adapted. In addition, treatments would increase plant

diversity across landscapes, and in turn increase the number and types of wildlife that can be supported. Fragmentation has isolated some animal populations and reduced the ability of populations to disperse across the landscape. Regrowth of vegetation between routine vegetation maintenance should reduce fragmentation and restore connectivity among blocks of similar habitat (BLM 2007e). Treatments that thin vegetation to reduce hazardous fuels could create openings in dense forest stands that would promote development of understory vegetation, benefiting ground- and shrub-dwelling birds and other wildlife.

The No Action Alternative is anticipated to have short-term, direct and indirect, negligible adverse effects on general wildlife due to the localized vegetation treatments, potential habitat disturbance, and associated potential for runoff from manual and mechanical treatments and DSAP maintenance activities. Over the long-term, the routine vegetation maintenance requirements are anticipated to be relatively the same for each work cycle. The regrowth of vegetation within the ROW would occur between work cycles and any adverse effects to wildlife from treatment activities would be reduced since the treatments would continuous impact potential habitat.

Therefore, the No Action Alternative would result in short- and long-term, direct and indirect, moderate adverse effects on general wildlife because the intensity and duration of treatments, continued routine disturbances by vehicles and maintenance crews, and regrowth of vegetation from the No Action Alternative would be localized, consistent over time, and not cumulative in nature.

Direct and Indirect Effects of the Proposed Action

In addition to the short-term effects associated with the No Action Alternative described above, the Proposed Action would employ the use of herbicides to augment current manual and mechanical methods of vegetation maintenance within the Utility's ROW. Direct herbicide exposure to non-target vegetation and resident wildlife would be limited by the use of direct spot application methods and the adjuvant Thinvert. The addition of Thinvert used as a carrier has drift and drip control properties. It also allows for ultra-low-volume application, minimizing the volume of liquid applied and active ingredient used (Waldrum Specialties 2002). No broadcast and aerial applications will occur.

A detailed description and analysis of impacts to wildlife by active ingredients are presented in the 2007 Herbicide PEIS (BLM 2007a: pages 4-102 to 4-109) and 2016 Herbicide PEIS (BLM 2016a: pages 4-54 to 4-57). The detailed discussion of the analyses is not repeated in this EA and is instead incorporated by reference and summarized in this document. The PEISs include the risks and potential impacts to wildlife by exposure scenario (direct spray, indirect contact with vegetation, and ingestion of food items contaminated by direct spray) (BLM 2007a: Table 4-22; page 4-103 and BLM 2016a: Table 4-7; page 4-29). Additionally, Appendix B includes an ecotoxicity rating table for pesticide active ingredients and various formulations. This table provides the ecotoxicity ratings of the herbicides by species category for the proposed herbicides including herbicides that are highly toxic to large, small, and predatory mammals (dicamba), birds (dicamba), reptiles (dicamba), amphibians (dicamba and ester formulation of triclopyr), fish (2,4-D, and ester formulation of triclopyr), arthropods (2,4-D, diuron), and fresh water mollusk (2,4-D, bromacil, diuron). Additionally, SOPs for migratory birds include not applying 2,4-D and dicamba within 0.5 mile of burrowing owl nests until birds have left the area. To protect all other migratory birds, dicamba would not be used within set buffers for each bird category (refer to Section 3.11.4).

The 2007 Herbicide PEIS and 2016 Herbicide PEIS identified aminopyralid, Chlorsulfuron, dicamba, fluroxypyr, imazapic, imazapyr, metsulfuron methyl, sulfometuron methyl, and tebuthiuron would have no effect on small mammals (100 percent absorption or 1st order dermal absorption) or pollinating insects if directly sprayed. Bromacil, clopyralid, diuron, and picloram would have no effect to small mammals (100 percent absorption or 1st order dermal absorption) but would have a low effect to pollinator insects. Glyphosate and hexazinone would have no effect to small mammals (100 percent absorption) but would have low effect to small mammals

(1st order dermal absorption) and pollinator insects. Triclopyr would have a low effect to small mammals and pollinator insects and 2,4-D would have no effect to small mammals (100 percent absorption) and moderate effect to small mammals (1st order dermal absorption) and pollinator insects. Due to the mobility of most wildlife, species could avoid direct exposure by dispersing from the area during applications. Immobile young and eggs would be at risk for direct exposure during treatments depending on the herbicide being used and if they were in the targeted vegetation. The implementation of SOPs would reduce the risk of potential unanticipated impacts.

If wildlife enters the ROW immediately after treatment, animals may be exposed through dermal contact or through the ingestion of recently sprayed vegetation. Impacts to wildlife may vary depending on the species; for example, amphibians are more susceptible to dermal absorption of herbicides. All of the herbicides tested for effects to small animals by dermal absorption reported no risk. Additionally, large populations of wildlife are unlikely to occur in the ROW during or immediately following treatment. In addition, the herbicide impacts on non-target vegetation and surrounding resources would be minimized through implementation of SOPs.

It is highly unlikely that any wildlife species would be directly sprayed with herbicide, though species could come in contact with vegetation that has been sprayed. Most herbicides are non-toxic to slightly or moderately toxic to most fish and wildlife species. Bromacil, 2,4-D, Dicamba, Diuron, and Triclopyr are highly toxic to very highly toxic to various fish and wildlife species (refer to Appendix B, Herbicide Reference Table). All of these herbicides but triclopyr would rarely be used by the utilities (refer to Table 2-1 for frequency of herbicide use) and only after review of special circumstances during the PUP process (see Section 2.3.8). The amine formulation of triclopyr would be a commonly used herbicide during treatments; this herbicide is nontoxic to low in toxicity to fish and wildlife. The ester formulation of triclopyr is nontoxic to low in toxicity to most species, but high in toxicity to fish and amphibians; however, it is unlikely to be used. It is not labeled for aquatic use and it tends to volatilize at temperatures above 85 degrees Fahrenheit. Therefore, even if fish or amphibians come into contact with treated vegetation, it is unlikely the herbicide would have any effect on the species.

Vegetation in the ROW is currently managed manually and mechanically, and continued management under the Proposed Action would not constitute a large scale modification of habitat. Forested areas currently managed to prevent development of tree canopies would potentially provide shrubland habitat following years of successful treatment. BLM lands outside the ROW would provide available suitable habitat for general wildlife species both during and after herbicide treatments.

The addition of herbicide treatments under the Proposed Action would reduce, over time, the frequency and intensity of manual and mechanical treatment. As frequency of disturbance decreases, the need for wildlife to disperse from the area in response to disturbance would lessen. This in turn reduces situational stress on individuals and populations, stabilizes wildlife movement patterns, and increases site fidelity.

The ROWs should include a diverse mixture of native grasses, low-growing shrubs, and other ground cover to promote a thriving wildlife habitat. Well-managed ROWs can therefore provide food and cover for wildlife, in addition to their primary function of providing safe and reliable electric service. Herbicide treatments can be used to manage incompatible vegetation in a manner that is less intrusive than the current manual and mechanical methods. Control of incompatible vegetation through the judicious use of herbicides following manual and mechanical vegetation treatment assists in the establishment of low-growing, compatible vegetation within the utility authorized ROW. Low-growing, compatible vegetation can extend maintenance periods and therefore substantially minimize the time and cost required for subsequent vegetation management operations. Indirectly, the elimination of invasive and unwanted woody vegetation promotes the growth of native grasses and other native ground cover preferred by many wildlife species.

Therefore, the Proposed Action would have short-term, direct and indirect, negligible adverse impacts on wildlife due to the clearing of vegetation from manual and mechanical treatments, unintentional contact with the herbicide, and flushing of wildlife from the ROW during treatments. The Proposed Action would have long-term, direct and indirect, moderate beneficial impacts to general wildlife species because it would establish low-growing sessional vegetation that would require less manual and mechanical treatments, reducing the need for vegetation disturbance.

GENERAL FISH AND AQUATIC SPECIES

Potential impacts on aquatic species are closely related to those discussed in the Water Resources and Quality (Section 3.4), Wetlands and Riparian Areas (Section 3.5), and the Endangered, Threatened, Candidate, and Sensitive Species (Section 3.9). Erosion impacts on soil can cause water quality concerns; whenever the water quality of a fish-bearing stream is affected, so are the fish and other aquatic organisms. Specifically, fish are affected by turbidity, sedimentation, loss of large organic debris, loss of shading (and associated temperature increases), and exposure to hazardous substances.

Direct and Indirect Effects of the No Action Alternative

Under the No Action Alternative, vegetation removal and disposal activities would include only manual methods using tracked or wheeled vehicles, field crews, and hand equipment in fish habitat and aquatic areas, similar to wetlands and riparian areas. Vehicles also remain on existing access roads. Impacts to aquatic resources typically occur as changes to stream hydrology (timing and amount of water flows), riparian habitats through manipulation of vegetation adjacent to habitats, and fine sediment and pollutant delivery from upland vegetation is removed.

Manual methods could impact fish and other aquatic organisms by the type and amount of soil disturbance, vegetation removed, proximity of the treatment to water, and potential for manual equipment fuel and lubricant spills to enter the water. Manual treatments would only occur at the margin of an emergent wetland, not within inundated or flooded wetlands or aquatic habitat. Broadleaf and deciduous forested communities within the ROW would be maintained at a low height with targeted manual treatment of trees, tall shrubs, and other woody vegetation. Routine vegetation maintenance in riparian and aquatic areas tend to be more frequent than in upland areas because the vegetation is fast-growing, especially true with tamarisks, capable of resprouting quickly following manual treatments. Control and reduction of tamarisk stands in riparian areas would conform to specific implementation goals in the RMPs for the Lake Havasu, Lower Sonoran, Safford, Tucson, and Yuma field offices

Impacts to fish and other aquatic species from manual treatment methods are identified in the 2007 BLM Herbicide PER (BLM 2007e: pages 4-65 to 4-67). The detailed discussion of the analyses is not repeated in this EA and is instead incorporated by reference and summarized in this document. Vegetation removal activities could disturb the soil and reduce the amount of vegetation that can bind to soil, causing slight erosion and sedimentation of water bodies. Sedimentation may adversely affect fish by covering eggs or spawning gravels, reducing prey availability, or directly harming fish gills, reducing stream carrying capacity for fish. Fish typically avoid turbid or silty water, and the density and diversity of fish and macroinvertebrate populations tend to decline as streams become more silted (Gore 1985; Wagner and LaPerriere 1985; Aldridge et al. 1987; Steinman and McIntire 1990). However, the risk of harm to aquatic ecosystems due to fine sediment production from manual treatment or use of motorized hand tools is low, and short-term, resulting in localized and minor impacts. Vegetation would be mulched and spread within the ROW, reducing the potential for erosion and subsequent sediment delivery to streams or other waterbodies. No water depletions are associated with the No Action Alternative.

There would be no overland travel or use of ATVs within wetlands, riparian areas, or aquatic habitat within the ROW except on existing roads open to the public. Vehicles would remain on existing roads and crew members would walk through the ROW to remove incompatible vegetation. Standing on and traversing streambanks and dry wash banks has the potential to destabilize soil and foot traffic within these areas may trample some vegetation and result in some soil compaction, creating the potential for localized erosion. However, these impacts would be short-term and negligible, and are not likely to result in sediment delivery to waterbodies.

Manual methods could also result in minor and localized decreased shading of riparian areas and modification of riparian vegetation profiles along creeks and suitable habitats for fish and aquatic species. Due to the linear nature of the power lines, ROWs typically cross aquatic habitats perpendicular or a slight variation thereof, which may account for only a small portion of specific aquatic habitat. The specific species and abundances of various species of aquatic macroinvertebrates may change with alterations in shading of streams and temporary inputs of fine sediments, but the densities and availability of aquatic macroinvertebrates is not expected to be altered enough so that decreases in fish occupancy or densities of affected reaches would occur. The ROWs have been initially cleared for construction and currently undergo routine vegetation maintenance to treat incompatible vegetation and keep vegetation and canopy cover low. Neither stream hydrology, nor the amount and timing of water delivery to aquatic habitats, are expected to be altered from the ongoing treatment of vegetation within ROWs. Additionally, incompatible vegetation removal activities are anticipated in such small portions of the watersheds, that any increased water delivery generated from the implementation of the No Action Alternative would be so minor that it would be undetectable.

Hand-held power tool use near water can potentially cause water contamination with minor amounts of chainsaw oil or minor fuel spill. An oil skim on water, while highly unlikely, can deplete oxygen levels and cause fish to die. This effect is more likely for fish living in ponds than for fish living in rivers or streams since the flow of water in streams would move and disperse small amounts of oil. However, these spills would be small and, in most cases, easily cleaned up before they spread to aquatic bodies.

As analyzed in the 2007 BLM Herbicide PER, the removal of incompatible riparian vegetation would increase the amount of sunlight reaching water bodies, which could raise water temperatures above normal. Water temperature affects the metabolism, behavior, and survivorship of aquatic species (Beschta et al. 1987, Bjornn and Reiser 1991). Changes in water temperature and water quality can be especially harmful to macroinvertebrates. Warmer water temperatures would stimulate the production of algae, especially in waters with high nitrogen content. While increased algae production may benefit macroinvertebrate production, algae can also crowd out more compatible plant species. The removal of vegetation and soil disturbance decreases the amount of rainfall captured by plants, detritus, and soil, and can lead to increased stormwater flows and runoff velocity (Spence et al. 1996). Increased stormwater runoff can scour stream channels and modify stream channel morphology, affecting the distribution and abundance of aquatic organisms (Hicks et al. 1991).

The loss of large trees to vegetation treatments could reduce the amount of large woody debris that would later fall into the water body and provide food and shelter for fish and other aquatic organisms. Woody debris helps to capture and store sediments, reduces the erosional effects of high stream flows, and enhances pool development and maintenance (Bisson et al. 1987). The effects of debris removal would be greatest for smaller water bodies, or where vegetation was removed along lengthy stretches (300 feet or more) of a stream.

Ash and smoke produced by fires can affect water chemistry. Ash falling into a stream can increase ammonia concentrations and acidity (pH) in the stream (Spencer and Hauer 1991), which are harmful to a variety of fish (Minshall et al. 1989). Targeting incompatible vegetation within aquatic areas, including tamarisk would indirectly help reduce impacts to fish and aquatic species by reducing the potential fire fuel load. Establishing a

low-growing vegetation cover would reduce the need for frequent manual treatments and reduce the potential for fuel where a wildfire can thrive.

Mechanical methods are not used in riparian areas. Target vegetation would typically be removed by manual methods as described above.

The *DSAP maintenance* activities would not be completed within wetland, riparian areas, or aquatic habitats since no poles with equipment that can spark are located within these areas.

The No Action Alternative is anticipated to have minor effects on fish and aquatic species from manual treatment activities because ground disturbance would be limited and nontargeted vegetation would not be impacted. Over the long-term, the routine vegetation maintenance would help control the spread of tamarisks and help reduce the risk of wildland fire that could destroy compatible riparian and forested wetland vegetation.

Therefore, the No Action Alternative would have short-term, direct and indirect negligible adverse effects on fish and aquatic species because the removal of vegetation would decrease the potential shading of riparian areas, modifying the riparian vegetation profiles along creeks and impacting the potential suitable habitats for fish and aquatic species and create more soil disturbance. The No Action Alternative would result in localized, minor indirect impacts from the control of tamarisk, resulting in the reduction of hazardous fuels. Additionally, the No Action Alternative would result in long-term, direct and indirect, minor adverse effects to fish and aquatic species from the continuous vegetation treatments, bank and soil disturbance, and increase in water temperatures, stimulating the production of algae and potentially crowding out more compatible plant.

Direct and Indirect Effects of the Proposed Action

In addition to the short-term effects associated with the No Action Alternative described above, the Proposed Action would employ the use of herbicides to augment current manual methods of vegetation maintenance within the Utility's ROW. The 2007 Herbicide PEIS (BLM 2007a: pages 4-80 to 4-88) and 2016 Herbicide PEIS (BLM 2016a: pages 4-44 to 4-46) discuss the impacts to fish and aquatic organisms by specific herbicide. The detailed discussion of the analyses is not repeated in this EA and is instead incorporated by reference and summarized in this document. The PEISs also include the risks and potential impacts to fish and aquatic species by exposure scenario (direct spray, accidental spill to a pond, off-site drift and surface runoff) (BLM 2007a: Table 4-17; page 4-81 and BLM 2016a: Table 4-10; page 4-45). The Proposed Action would not include any activities associated with herbicide application different from those analyzed in the 2007 and 2016 BLM Herbicide PEISs. Consequently, there is no potential for new or modified short-term direct or indirect impacts on fish and aquatic species from the Proposed Action that have not been disclosed in prior environmental documentation.

The 2007 BLM Herbicide PER states that the use of herbicides to control noxious and nuisance aquatic plant species represents one of the most widely known and effective management options available. Herbicide control of invasive aquatic weeds is often the first step in a long-term integrated control program. Ecological risk assessments were conducted by the BLM and Forest Service to evaluate the risks to fish and other aquatic organisms from the use of the specific herbicides. The results of these assessments, including study methodology, herbicide mode of action, exposure scenarios, and toxicity characteristics for each herbicide, are summarized in the 2007 and 2016 BLM Herbicide PEISs.

There would be no direct spray of herbicides to standing water or aquatic habitats; direct spray would only occur on the target terrestrial plants. As with the No Action Alternative, there would be no overland travel or use of ATVs within wetlands in the ROW. Vehicles would remain on existing roads and crews would walk to remove incompatible vegetation. Within riparian areas, wetlands, and aquatic habitats, only herbicides that are approved for use in those areas would be applied (refer to Appendix B). Most aquatic herbicides are non-

selective and could cause adverse impacts to non-target wetland and riparian species. To minimize potential impacts to non-targeted species, herbicide application would be limited to backpack sprayers, as previously noted, and the adjuvant Thinvert would be used as the carrier. Thinvert, which is a paraffinic (waxy) oil carrier, would result in the herbicide adhering to the targeted plants and minimized spray drift. Potential impacts to non-targeted species would also be minimized by implementation of SOPs which minimize drift and off-target spray, and by using appropriate buffer zones for herbicides not labeled for aquatic use based on risk assessment guidance, with minimum widths of 10 feet for hand spray applications.

It is highly unlikely that any fish or aquatic species would be directly sprayed with herbicide, though species could come in contact with vegetation that has been sprayed. Most herbicides are non-toxic to slightly or moderately toxic to most fish and aquatic species. Bromacil, 2,4-D, Dicamba, Diuron, and Triclopyr are highly toxic to very highly toxic to various fish and aquatic species (refer to Appendix B). All of these herbicides but triclopyr would rarely be used by the utilities (refer to Table 2-1) and only after review of special circumstances during the PUP process (refer to Section 2.3.8). The amine formulation of triclopyr would be a commonly used herbicide during vegetation treatments and is nontoxic to low in toxicity to fish and wildlife. The ester formulation of triclopyr is nontoxic to low in toxicity to most species, but high in toxicity to fish and amphibians; however, it is unlikely to be used. It is not labeled for aquatic use and it tends to vaporize at temperatures above 85 degrees Fahrenheit. Thus, even if fish or amphibians come into contact with treated vegetation, it is unlikely the herbicide would have any effect on the species.

Impacts from drift or runoff would be minimized by implementing the proper application methods and drift control agents to ensure that only target vegetation is treated and non-target species exposure to herbicide is minimized. The chance that herbicides would leach or runoff into the aquatic environment is very low. By design, the proposed application method minimizes the risk of water contamination and changes to aquatic habitat would be minimal as the spot application of herbicides is very targeted and selective. Because the Proposed Action includes measures to minimize leaching, drift, and runoff, it is anticipated that changes in vegetation composition adjacent to aquatic habitat would be minimal. In addition, the ongoing management of vegetation in these ROWs has resulted in slightly different vegetation composition in the ROWs in comparison to adjacent vegetation and the addition of herbicides would result in very minor changes to existing conditions.

Unintentional applications and spills could occur within aquatic areas. In particular, accidental spills near aquatic areas could be damaging to vegetation. Due to the implementation of the closed chain-of-custody, the chance of spills would be minimized. A licensed applicator would supervise the application process to ensure that proper techniques, cleanup, personal protective equipment, and safety procedures are followed. The licensed applicator would comply with the operational and spill contingency plan prepared during the pesticide-use proposals process.

Riparian systems in the ROW are dominated by tamarisk stands (refer to Section 3.5). Other non-native and invasive species often co-occur with tamarisk; combined, these species are generally detrimental and tend to crowd out more compatible native aquatic species. Invasive plants are generally less efficient at holding soil in place, and cause water-quality problems. The replacement of native riparian plant species with invasive plants may adversely affect stream morphology (including shading and in stream habitat characteristics), bank erosion, and flow levels. Invasive plants break down the complex natural vegetative physical structure and interfere with natural processes. Fish are affected by turbidity, sedimentation, loss of large organic debris, loss of shading (and associated temperature increases), and exposure to hazardous substances. Erosion increases turbidity and sedimentation that can reduce fish feeding success. Invasive plants often support fewer native insects than native plant species, which could affect food availability for insectivorous fish species. Dense concentrations of aquatic plants can reduce light penetration and lower the concentration of dissolved oxygen in the water, thereby upsetting the balance of the fish community by providing too much cover for small fish (Payne and Copes 1986).

With the Proposed Action, the frequency of the routine vegetation maintenance requirement near fish and aquatic species habitat would decrease over time resulting in fewer trips and less site disturbance during the treatments with a reduction in vegetation requiring treatment within the ROW. The potential for impacts to fish and aquatic species and their habitats would be minimal because of the low potential for exposure. The eventual growth of compatible vegetation in treated areas would moderate water temperatures, buffer the input of sediment and herbicides from runoff, and promote bank stability in these areas.

Therefore, the Proposed Action would have short-term, direct and indirect, negligible adverse effects on fish and aquatic species because the use of only manual vegetation treatments and implementation of the SOPs would limit any measureable effects to the resources. The Proposed Action would have long-term, direct and indirect, moderate beneficial impacts on fish and aquatic species by more effectively controlling tamarisks, reducing the risk of a future high-severity wildfire, reducing the frequency and intensity of vegetation management treatments as compared to the No Action Alternative, and by allowing low-growing native, compatible vegetation within the ROW which improves habitat values.

3.8.6 Mitigation Measures

No mitigation measures are recommended.

3.9 Federally Listed Species

3.9.1 Introduction

The ESA was passed by Congress in 1973 (16 USC 1536) for the conservation of imperiled species and the ecosystems on which they depend. Under the act, species are listed or proposed for listing as “Endangered,” which is a species that is in danger of extinction, or “Threatened,” which is a species that is likely to become endangered within the foreseeable future. The ESA protects listed species and their habitat by prohibiting “take” and the interstate or international trade of these species without a permit. Administration of the ESA is carried out by the USFWS for terrestrial and freshwater organisms (USFWS and National Marine Fisheries Service 1998).

Section 7 of the ESA (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 (Wildlife and Fisheries) 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.

Sections 7(b) (4) and 7(o) (2) of the Act do not apply to the incidental take of listed plant species. However, protection of listed plants is provided to the extent that the Act requires a federal permit for removal or reduction to possession of threatened or endangered plants from areas under federal jurisdiction, or for any act that will remove, cut, dig up, or damage or destroy endangered plants on any other area in knowing violation of any regulation of any state or in the course of any violation of a state criminal trespass law.

3.9.2 Issues Identified for Analysis

- Will the use of herbicide contaminate surface water and indirectly impact sensitive species?
- What are the impacts on sensitive wildlife species from the loss of vegetation for forage, nesting, and/or cover?
- Will there be a temporary displacement of sensitive wildlife species during active operations?
- Will there be a potential mortality impact to sensitive wildlife species due to spill, overspray, or overland flow from the application of herbicides?
- What would the potential impacts be on habitat for sensitive species?
- What are the impacts on special-status plants that are located within the ROW?
- Will there be direct mortality of sensitive wildlife species caused by collisions with ATVs?
- Will Peebles Navajo cactus and Fickeisen plains cactus be destroyed as a result of vegetation treatments?

3.9.3 Affected Environment

The USFWS's Information, Planning, and Conservation online decision support system was accessed on April 18, 2016 to obtain a federally listed threatened, endangered, and proposed species list for the ROW. The list of 71 species was reviewed to determine whether any of these species have the potential to occur in the ROW (refer to Appendix D for the list of federally listed and proposed species). Table 3-23 through Table 3-27 summarize general information for federally listed threatened, endangered, and proposed species that are analyzed in detail. Fifty-five species with no potential to occur within the ROW, based on the species' current range and habitat requirements, were excluded from further evaluation because the project would have no effect to those species. The list of these species along with the rationale for excluding them from further consideration is provided in Appendix D.

Of the 16 species considered to be present or which have suitable habitat within the ROW, three are listed as threatened species, 11 are listed as endangered species, and two are listed as experimental, non-essential species (see Table 3-23 through Table 3-27). In addition, two species have designated critical habitat[28], and three species have proposed critical habitat in the ROW. Four species potentially present could occur in the ROW on an incidental basis while moving or foraging, whereas the plant species may occupy or be located directly adjacent to the ROW. The three fish species may traverse the ROW via waterways that bisect the ROW or may occur in suitable habitat that is within proximity or downstream of the ROW. Although some individual federally listed species may be present within the ROW, no listed species are known to occupy the ROW exclusively. A brief description of each of the 16 federally listed species is provided below. A more detailed description of each species and associated habitat is provided in BA for Integrated Vegetation Management within Authorized Power Line Rights-Of-Way on Bureau of Land Management Lands in Arizona (2017 Herbicides BA) (BLM 2017).

Table 3-23. BLM Sensitive Species List within ROW — Amphibians and Reptiles

Common Name, Scientific Name	BLM Field Office	Status[a]	Designated Critical Habitat in ROW
Chiricahua leopard frog, *Lithobates chiricahuensis*	Tucson	T	No

[a] Status Definitions: T = Threatened, E = Endangered, XN = Experimental, Nonessential Population, PT = Proposed Threatened

[28] Critical habitat is the specific areas within the geographic area, occupied by the species at the time it was listed, that contain the physical or biological features that are essential to the conservation of endangered and threatened species and that may need special management or protection. Critical habitat may also include areas that were not occupied by the species at the time of listing but are essential to its conservation (USFWS March 2017).

Table 3-24. BLM Sensitive Species List within ROW — Birds

Common Name, Scientific Name	BLM Field Office	Status[a]	Designated Critical Habitat in ROW
California condor, *Gymnogyps californianus*	Kingman, Safford	E/XN	No
Southwestern willow flycatcher, *Empidonax traillii extimus*	Lower Sonoran, Tucson	E	Yes
Yellow-billed cuckoo, *Coccyzus americanus*	Hassayampa Lake Havasu, Lower Sonoran, Tucson, Yuma	T	Proposed
Yuma clapper rail, *Rallus longirostris yumanensis*	Lower Sonoran	E	No

[a] Status Definitions: T = Threatened, E = Endangered, XN = Experimental, Nonessential Population, PT = Proposed Threatened

Table 3-25. BLM Sensitive Species List within ROW — Fish and Invertebrates

Common Name, Scientific Name	BLM Field Office	Status[a]	Designated Critical Habitat in ROW
Desert pupfish, *Cyprinodon macularius*	Hassayampa	E	No
Gila chub, *Gila intermedia*	Hassayampa	E	Yes
Gila topminnow, *Poeciliopsis occidentalis*	Hassayampa	E	No

[a] Status Definitions: T = Threatened, E = Endangered, XN = Experimental, Nonessential Population, PT = Proposed Threatened

Table 3-26. BLM Sensitive Species List within ROW — Mammals

Common Name, Scientific Name	BLM Field Office	Status[a]	Designated Critical Habitat in ROW
Lesser long-nosed bat, *Leptonycteris curasoae yerbabuenae*	Lower Sonoran, Tucson	E	No
Ocelot, *Leopardus pardalis*	Tucson	E	No
Sonoran pronghorn, *Antilocapra americana sonoriensis*	Lower Sonoran, Tucson, Yuma	E	No

[a] Status Definitions: T = Threatened, E = Endangered, XN = Experimental, Nonessential Population, PT = Proposed Threatened

Table 3-27. BLM Sensitive Species List within ROW — Plants

Common Name, Scientific Name	BLM Field Office	Status[a]	Designated Critical Habitat in ROW
Acuña cactus, *Echinomastus erectocentrus* var. *acunensis*	Lower Sonoran, Tucson	E	Yes
Arizona hedgehog cactus, *Echinocereus triglochidiatus* var. *arizonicus*	Lower Sonoran	E	No
Huachuca water-umbel, *Lilaeopsis schaffneriana*	Tucson	E	Yes
Peebles Navajo cactus, *Pediocactus peeblesianus* var. *peeblesianus*	Safford	E	No

[a] Status Definitions: T = Threatened, E = Endangered, XN = Experimental, Nonessential Population, PT = Proposed Threatened

CHIRICAHUA LEOPARD FROG

The Chiricahua leopard frog was listed as threatened under the ESA in 2002, and its critical habitat was designated in 2012. A recovery plan was prepared for the species in 2007. Since the listing, evidence indicates that the overall population of Chiricahua leopard frogs in the U.S. is either static or, more likely, improving (USFWS 2011a). This species inhabits springs, pools, streams, and rivers. It requires permanent or semi-permanent pools for nesting, water with low levels of contaminants, and moderate pH (USFWS 2007b, 2011a).

Chiricahua leopard frog populations in Arizona are divided into two areas: the northern population, which extends from montane areas in central Arizona, east and south along the Mogollon Rim to montane parts of west-southwestern New Mexico; and the southern population, which is located in the mountains and valleys south of the Gila River in southeastern Arizona and southwestern New Mexico, extending into Mexico (AGFD 2011c). The only known location of Chiricahua leopard frog suitable habitat within the ROW is found along the Upper San Pedro River within the Tucson Field Office (USFWS 2011a). There is no designated critical habitat within the ROW. Adults, tadpoles, and eggs may be present at this location. There are 0.31 acres of ROW within riparian vegetation at the San Pedro River crossing. This area contains suitable habitat for Chiricahua leopard frog with historical observations recorded from 1986 to 1993 (AGFD 2016c). There are no poles requiring DSAP treatment within or near Chiricahua leopard frog habitat at this location.

CALIFORNIA CONDOR

The California condor was listed as endangered under the ESA in 1967 and critical habitat was designated only in California in 1976. A recovery plan was prepared for the species in 1996. In Arizona, condors have been reintroduced and are part of an "experimental, nonessential population," as characterized under Section 10(j) of the ESA (USFWS 1996). California condors are carrion consumers, feeding on the carcasses of both domestic and wild animals, and regularly travel long distances (25–30 miles) from roost sites each day in search of food. Roost sites include cliffs and tall trees, including dead trees (snags). Condors in Arizona spend the majority of their perching, roosting, and foraging time in locations such as the South Rim of Grand Canyon National Park and Vermillion Cliffs National Monument (USFWS 1996).

A total of 749.66 acres of ROW occur within the experimental, nonessential population habitat area, of which 670.01 acres occur in the Kingman Field Office and 79.65 acres occur in the Safford Field Office. The California condor habitat covers 3,436,236 acres on BLM-managed lands. The ROWs account for 0.02 percent of the experimental, nonessential population habitat area on BLM-managed lands in Arizona. It is highly unlikely that California condor nest sites or roosts occur within or near the ROW. California condors nest in various types of rock formations, including crevices, ledges, and potholes (Snyder et al. 1986), none of which occur near the ROW within the experimental, nonessential population habitat area.

SOUTHWESTERN WILLOW FLYCATCHER

The southwestern willow flycatcher was listed as endangered under the ESA in 1995, and its critical habitat was designated in 2013. A recovery plan was prepared for the species in 2002, and a total of 1,227 stream miles are designated as critical habitat. Critical habitat is designated in 13 counties in Arizona, as well as counties in Utah, Nevada, Colorado, California, and New Mexico (USFWS 2013f). The southwestern willow flycatcher is found in cottonwood/willow and tamarisk vegetation communities along rivers and streams at elevations below 8,500 feet. Nesting southwestern willow flycatchers prefer dense riparian thickets in areas where perennial flow, surface water, or saturated soil is present from April through September. The southwestern willow flycatcher can be found in Arizona during the nesting season from late April through August. This species is an insectivore, foraging within and above dense riparian vegetation, taking insects on the wing or gleaning them from foliage (USFWS 1995a).

The historical breeding range of the southwestern willow flycatcher included southern California, southern Nevada, southern Utah, Arizona, New Mexico, western Texas, southwestern Colorado, and extreme northwestern Mexico. There are approximately 2.83 acres of ROW within designated critical habitat in the Tucson Field Office. In addition, there is approximately 9.89 acres of ROW along the Gila and San Pedro rivers in the Lower Sonoran and Tucson Field Office, respectively, that crosses over suitable habitat for the southwestern willow flycatcher in five locations that has not been designated as critical habitat. At each of the intersections with critical habitat or suitable habitat, the Utilities already maintain vegetation to favor low-growing grasses, forbs, and shrubs, which is unsuitable for nesting southwestern willow flycatchers.

YELLOW-BILLED CUCKOO

The western distinct population segment of the yellow-billed cuckoo was listed as threatened under the ESA in 2014, and its critical habitat was proposed in 2014. A recovery plan has not been prepared for the species. In total, 546,335 acres is proposed as critical habitat in Arizona, California, Colorado, Idaho, Nevada, New Mexico, Texas, Utah, and Wyoming. Proposed critical habitat within Arizona includes areas along the Colorado River, Gila River, Mule Creek, Bill Williams River, and Agua Fria River. In Arizona, yellow-billed cuckoos breed in large blocks of riparian habitat below 6,500 feet, particularly in cottonwood-willow, mesquite, ash, sycamore, and tamarisk forests with dense understory foliage (USFWS 2014f). The ROW intersects with approximately 14.21 acres of proposed critical habitat for the yellow-billed cuckoo in the Hassayampa, Lake Havasu, Lower Sonoran, Tucson, and Yuma field offices and 9.89 acres of suitable habitat within the ROW in the Tucson Field Office. At each of these locations where the ROW crosses proposed critical or suitable habitat for this species, the ROW is currently maintained to favor low-growing grasses, forbs and shrubs and the vegetation is unsuitable for nesting western yellow-billed cuckoos.

YUMA CLAPPER RAIL

The Yuma clapper rail was listed as endangered under the ESA in 1967. Critical habitat has not been designated for this species. A recovery plan was prepared for the Yuma clapper rail in 1983. The Yuma clapper rail is associated with dense emergent riparian vegetation and requires wet substrates, such as mudflats and sandbars, with dense herbaceous or woody vegetation for nesting and foraging. Most individuals do not migrate but may move within their range along with seasonal fluctuations. They primarily consume crayfish, along with small fish, frogs, and aquatic invertebrates (USFWS 2009c).

The Yuma clapper rail occurs along the lower Colorado River and its tributaries (Virgin River, Bill Williams River, lower Gila River) in Arizona, California, Nevada, and Utah; the Salton Sea in California; and the Cienega de Santa Clara and Colorado River Delta in Mexico (USFWS 2009c). This species population is considered to be stable based on surveys conducted in 1998–2002, when numbers of Yuma clapper rails remained in the range of 500–600 birds (USFWS 2006b). At the crossings of the lower Gila River, the ROW is located in riparian woodland, not marsh habitat. Riparian woodland habitat is not ideal breeding habitat for the Yuma clapper rail. The Utilities maintain vegetation in these locations to favor low-growing grasses, forbs, and shrubs. It is possible that nests could occur in marsh habitat adjacent to the ROW. Suitable habitat within the ROW is estimated at 9.26 acres in the Lower Sonoran Field Office.

DESERT PUPFISH

The desert pupfish was listed as endangered under the ESA in 1986, and critical habitat was also designated in 1986. A draft recovery plan was prepared for the species in 1993. Critical habitat for the desert pupfish was designated in 1986 at Quitobaquito Spring, Organ Pipe Cactus National Monument, Pima County, Arizona, and along portions of San Felipe Creek, Carrizo Wash, and Fish Creek Wash, Imperial County, California (USFWS 1986). The ROW does not cross any designated critical habitat for the desert pupfish and no suitable habitat has been identified.

Pupfish occur in a variety of habitats, including habitat with high temperatures and salinity, but opportunistically they utilize less extreme habitats when available. Pupfish are predacious and feed on small aquatic insects, worms, and larger zooplankton and may also feed on detritus and plants (USFWS 2010a).

The desert pupfish was extirpated from Arizona, however, successful reintroductions at 16 locations have occurred throughout southern Arizona in a variety of small aquatic habitats. There are also 27 captive populations of desert pupfish in Arizona (USFWS 2010a, USFWS 2010b). Desert pupfish were reintroduced into Larry Creek and Lousy Canyon Creek within the Agua Fria National Monument. However, recent surveys have not detected desert pupfish in these streams, though they may still be present (BLM 2015a). Power line ROWs occur near to Larry Creek and Lousy Canyon Creek, though no suitable habitat for desert pupfish occurs within the power line ROWs.

GILA CHUB

The Gila chub was listed as endangered under the ESA in 2005, and critical habitat was also designated in 2005. A draft recovery plan was prepared for the species in 2015. Gila chub commonly inhabit pools in smaller streams, springs, and cienegas and can survive in small artificial impoundments. They are highly secretive, preferring quiet, deeper waters and ponds or remaining under the cover of logs, boulders, and overhanging bank vegetation. Gila chub feed on both plants and animals. Adults are primarily carnivorous, feeding on large and small terrestrial and aquatic insects and sometimes other small fishes. Smaller individuals often feed on organic debris and aquatic plants, especially filamentous algae (USFWS 2005b).

Currently, all populations of the Gila chub occur in rivers, streams, and spring-fed tributaries of the Gila River Basin, central and southeastern Arizona, and possibly the northeastern tip of Sonora, Mexico (USFWS 2015c). On BLM-managed lands, natural populations of Gila chub occur in Indian and Silver Creeks, and reintroduced populations occur in Larry Creek and Lousy Canyon, all within the Agua Fria National Monument (BLM 2015a). Silver Creek, Larry Creek, and Lousy Canyon Creek occur near the ROW. However, there are no ROWs crossing these creeks.

GILA TOPMINNOW

The Gila topminnow was listed as endangered under the ESA in 1967; critical habitat has not been designated for this species. A recovery plan was prepared for the Gila topminnow in 1984. Habitat requirements of the Gila topminnow are broad; Gila topminnows prefer shallow, warm, fairly quiet waters in ponds, cienegas, tanks, pools, springs, small streams, and the margins of larger streams. Dense mats of algae and debris along the margins of the habitats are an important component for cover and foraging. This species also occurred historically in the backwaters of large rivers, but it is currently isolated to small streams and springs. Gila topminnows are generalist feeders, utilizing detritus, plants, small crustaceans, and insect larvae (USFWS 1999a).

Range-wide, the Gila topminnow has been reduced from one of the most common fishes of the Gila River Basin to one that exists in no more than 32 known locations—14 natural and 18 stocked—with an additional 20 captive populations in existence (USFWS 2013d). On BLM-managed lands, reintroduced populations occur in Tule Creek, Buckhorn Spring, Chalky Spring within the Bradshaw-Harquahala Planning Area, and Larry Creek and Lousy Canyon within the Agua Fria National Monument (BLM 2015a). The ROWs occur near to Larry Creek and Lousy Canyon Creek, but do not cross any of these creeks.

LESSER LONG-NOSED BAT

The lesser long-nosed bat was listed as endangered under the ESA in 1988; critical habitat has not been designated for this species. A recovery plan was prepared for the lesser long-nosed bat in 1994. When present in Arizona, these bats are typically associated with desert grassland and scrubland up to oak transition areas, though the Sonoran desert scrub vegetation community provides the early summer forage base (USFWS 1995b).

Two resources are critical for this species: suitable day roosts and adequate concentrations of food plants. Day roosts are typically caves and abandoned mines; however, lesser long-nosed bats will also use night roosts for short periods to digest meals. Night roosts may include day roosts, as well as other caves, mines, rock crevices, and occasionally abandoned buildings. The bat's primary food sources are nectar and pollen from paniculate agave flowers, along with nectar, pollen, and fruits of columnar cacti. Some studies suggest that the foraging radius of these bats from their day roosts to areas holding food plants may be on the order of 30–60 miles (USFWS 2016f).

Since the lesser long-nosed bat was initially protected under ESA in 1988 (U.S. Fish and Wildlife 2998), this bat species has experienced vastly improved numbers of bats and roosts in the U.S. Southwest and Mexico. In 1988, there were thought to be fewer than 1,000 bats at 14 known roosts range-wide. In the U.S., there are between 50 and 60 roost sites known and 25 to 30 roost sites in Mexico. Of these known roosts, there are 13 maternity roosts in U.S. and Mexico where the bats give birth and raise their young. Based on current numbers of lesser long-nosed bats observed at known roost sites, the current population of lesser long-nosed bats is likely greater than 200,000 individuals. Within the ROW, lesser long-nosed bat roost sites occur near the New Cornelia Mine just south of the town of Ajo, Arizona in the Lower Sonoran Field Office and at Old Mammon Mine on the Tohono O'odham Nation. None of ROW occurs in the immediate vicinity of these roost sites. A 40-mile buffer was placed on roost sites to determine which portion of the ROW occurs within lesser long-nosed bat foraging habitat. There are a total of 335.62 acres of ROWs in lesser long-nosed bat foraging habitat on BLM-managed lands. There are 18 poles that may receive DSAP treatment within lesser long-nosed bat foraging habitat.

OCELOT

The ocelot was listed as endangered under the ESA in 1982; critical habitat has not been designated for this species. A draft recovery plan was prepared for the species in 2010. The ocelot is listed as endangered throughout its range in the western hemisphere. Ocelots are secretive, nocturnal carnivores that inhabit dense vegetative cover (more than 75 percent canopy covering the northern part of its range) (USFWS 2010e). Habitats used by the ocelot throughout its range vary from tropical rainforest to pine forest to savanna, shrublands, and marshlands. Contiguous areas of vegetation are necessary for ocelot dispersal. Its prey consists primarily of rabbits, rodents, birds, and lizards (USFWS 2010e).

Currently, the ocelot ranges from extreme southern Texas and southern Arizona (although recent documentation in Arizona is sparse) through the coastal lowlands of Mexico to Central America, Ecuador, and northern Argentina (USFWS 1982, 2010e). Because vegetation is sparse along and within the ROW in ocelot potentially suitable habitat, it is unlikely that ocelot would inhabit the ROW. Transient ocelots could occur within the power line corridors while moving between scrub patches. Within the ROW, the San Pedro River area and surrounding mountain habitats (Sky Islands) are the most likely location to encounter ocelots. Potentially suitable habitat occurs in Southern Arizona in Cochise, Santa Cruz, and Pima Counties. There are a total of 79.17 acres of power line ROW in ocelot potentially suitable habitat. There are approximately 15 combustible-free space poles with 0.11 acres of ROW in ocelot habitat. Vegetation within these ROWs is sparse.

SONORAN PRONGHORN

The Sonoran pronghorn was listed as endangered under the ESA in 1967; critical habitat has not been designated for this species. A draft recovery plan was prepared for the species in 2015. An experimental, nonessential population of Sonoran pronghorn has been established within southwestern Arizona in its historical habitat in King Valley, Kofa National Wildlife Refuge, in Yuma County, and the Barry M. Goldwater Range, Maricopa County under section 10(j) of the ESA of 1973 (USFWS 2011b).

The Sonoran pronghorn is the smallest and palest of the three pronghorn subspecies that occur in Arizona. Sonoran pronghorns are opportunistic foragers. Although 132 different plant taxa have been found in their diet, they prefer nutritionally and moisture-rich plants when available. Cactus fruits, such as chain fruit cholla, are highly utilized in hot, dry seasons to supplement water requirements. Adult Sonoran pronghorn may survive a prolonged summer drought on a diet reduced primarily or solely to cactus fruit, but fawns are likely to perish. Natural and artificial water sources are used opportunistically by adults and fawns (USFWS 2015f).

Currently, Sonoran pronghorn only occupy approximately 7.6 percent of their historical range. Within the experimental, nonessential population area for Sonoran pronghorn, there is a total of 6,227.09 acres of ROW, which is 0.25 percent of the total Sonoran pronghorn experimental, nonessential population area in Arizona on BLM-managed lands within the Yuma, Lake Havasu, Lower Sonoran, and Tucson field offices. There are combustible-free space poles along most of the distribution lines within the experimental, nonessential population area on BLM-managed lands, with an estimated 140[29] poles that may receive DSAP treatment within the Sonoran pronghorn nonessential population area. Outside the experimental, nonessential population area for Sonoran pronghorn, an endangered population of pronghorn occurs south of Interstate 8, west of State Route 85 (SR 85), and east of the Copper and Cabeza Prieta mountains (USFWS 2015f). There are 19.77 acres of power line ROW and 20 poles (0.14 acres) within the Cabeza Prieta endangered population area for Sonoran pronghorn that may require DSAP treatment around the poles.

ACUÑA CACTUS

The acuña cactus was listed as endangered under the ESA in 2013, and critical habitat was designated in 2016. A recovery plan has not been prepared for the species. Critical habitat for the acuña cactus has been designated as distinct delineated units. A detailed description of the critical habitat units and basis for designation is provided in the Final Rule to designate critical habitat for the acuña cactus and the Fickeisen Plains cactus (USFWS 2016b).The acuña cactus occurs in valleys and on small knolls and gravel ridges within palo verde-saguaro vegetation communities. Microclimate may play a role in distribution of the species within suitable habitat (USFWS 2013c).

Five distinct populations of acuña cactus are known to occur in southern Arizona in Maricopa, Pima, and Pinal counties, as well as from Mexico to the U.S. border. The species has been documented primarily on National Park Service (NPS), Bureau of Reclamation, Department of Defense, Tohono O'odham Nation, and private lands (USFWS 2013c). The ROW crosses designated critical habitat and suitable habitat on BLM-managed lands near Ajo, Arizona within the Lower Sonoran Field Office. There is a total of 1.12 acres of ROW in critical habitat within Ajo Unit 2. This is 0.02 percent of the total acres of acuña cactus critical habitat on BLM-managed lands (there are 5,977 acres on Lower Sonoran and Tucson Field Offices). Additionally, observations of acuña cactus were recorded in 2011 within 500 feet of the ROW (AGFD 2016c). There are five poles with equipment that could spark, for which DSAP treatment would be considered, totaling 0.36 acres. Where the ROW occurs within critical habitat and suitable habitat for acuña cactus, vegetation consists of foothills paloverde (*Parkinsonia microphylla*), saguaro (*Carnegia gigantea*), various cholla species, creosote bush (*Larrea tridentata*), and organ pipe cactus (*Stenocereus thurberi*).

[29] Numbers of poles with equipment that can spark are estimated and represent and over-estimate. GIS analysis was used to obtain these numbers using a dataset with all distribution equipment. Each type of equipment (e.g., transformers, fuses, switches, and capacitor banks) is recorded as a single point. This point data was used to estimate the number of poles with equipment. However, there may be multiple pieces of equipment on a single pole, so a single pole may be recorded multiple times using the equipment point data. Approximately 140 pieces of equipment on BLM lands within Sonoran pronghorn 10(j) habitat could spark which represents an overestimate of poles. When the numbers are recalculated using only transformers, which are the most prevalent piece of equipment that could spark, there are approximately 109 poles within 10(j) habitat on BLM lands.

ARIZONA HEDGEHOG CACTUS

The Arizona hedgehog cactus was listed as endangered under the ESA in 1979, and critical habitat has not been designated for this species. A recovery plan has not been prepared for the Arizona hedgehog cactus. The Arizona hedgehog cactus is found at elevations ranging from 3,300 to 5,700 feet within the ecotone between the Madrean Evergreen Woodland and Interior Chaparral biotic communities. Preferred habitat for Arizona hedgehog cactus is exposed, stable bedrock and boulders exhibiting sufficient fracturing or rock interstices for establishment. The majority of Arizona hedgehog cacti are found scattered on open, rocky slopes of 20 to 90 degrees and on steep, fissured cliffs (USFWS 2014b).

The Arizona hedgehog cactus occupies a narrow geographic range between Superior and Globe in Pinal and Gila counties in central Arizona. A total of approximately 6,010 plants have been located due to data collection for Section 7 consultations under the ESA; this number represents the best available scientific data on abundance counts (USFWS 2014b). Potentially suitable Arizona hedgehog cactus habitat occurs on BLM-managed lands in the ROW west and south of the town of Miami, Arizona on the BLM Lower Sonoran Field Office. The ROW crosses potentially suitable Arizona hedgehog cactus habitat, totaling approximately 39.1 acres of ROW. There are four combustible-free space poles on the PZ 01 power line within the ROW totaling 0.03 acres in potentially suitable Arizona hedgehog cactus habitat that may receive DSAP treatment.

HUACHUCA WATER-UMBEL

The Huachuca water-umbel was listed as endangered under the ESA in 1997 and critical habitat was designated in 1999. A recovery plan has not been prepared for the species. Critical habitat areas were selected to provide for the conservation of the Huachuca water-umbel throughout the remaining portion of its geographic range in the U.S. At least one segment of critical habitat is designated in each watershed containing the species, with the exception of the Rio Yaqui watershed, where the plants are found on the San Bernardino National Wildlife Refuge. That population is secure under current management and, therefore, does not require special management considerations or protection (USFWS 1999b). The Huachuca water-umbel is restricted to streams and springs in permanently wet (or nearly so) muddy or silty substrates with some organic content. The plant is generally found in shallow and slow-flowing waters that are relatively stable or in active stream channels where the plants can escape the effect of scouring floods. At present, the known populations are largely isolated from other waterways (USFWS 2014c).

The Huachuca water-umbel is generally found at an elevation range of 4,000–6,500 feet that crosses the Sierra Madrean Region of southeastern Arizona and is adjacent to portions of Sonora, Mexico (USFWS 2014c). There are approximately 0.06 acres of ROW within suitable and critical habitat for this species at the San Pedro River riparian area in the Tucson Field Office. This area is predominately cottonwood and willow and the vegetation re-sprouts quickly and typically requires vegetation removal annually. There are no poles that would require DSAP treatment within Huachuca water-umbel habitat.

PEEBLES NAVAJO CACTUS

The Peebles Navajo cactus was listed as endangered under the ESA in 1979; critical habitat has not been designated for this species. A recovery plan was prepared for the Peebles Navajo cactus in 1984.The Peebles Navajo cactus has specialized soil requirements within low hills in the Plains and Great Basin Grassland biotic community (USFWS 2008e). It requires cold winters; moist, cool springs; summer dormancy; and drying-out periods (USFWS 2008e). Peebles Navajo cactus grows in exposed, sunny gravely soils that are sparsely vegetated (Falk et al. 2001; Taylor 2008).

The Peebles Navajo cactus is an endemic species to Arizona, occupying a limited geographic area (approximately seven miles in length) located northwest to southeast within the immediate vicinity of Joseph City and Holbrook,

Navajo County, Arizona. In 1989, 4,876 acres of Peebles Navajo cactus habitat was set aside by BLM as the Tanner Wash ACEC (USFWS 2008e). Approximately 13.58 acres of ROW crosses the ACEC, which is 0.3 percent of the total acres within the ACEC. There are no poles that require DSAP treatment within the ACEC. Only four acres of ROW has any vegetation and consists of very sparse tamarisk and camelthorn. The tamarisk occurs within a small wash, which is not suitable habitat for Peebles Navajo cactus. The rest of the ROW generally does not contain any vegetation requiring treatment.

NORTHERN MEXICAN GARTERSNAKE

The northern Mexican gartersnake was listed as threatened under the ESA in 2014, and critical habitat was proposed in 2013. A recovery plan has not been prepared for the species. Proposed critical habitat for the northern Mexican gartersnake was published in 2013 (USFWS 2013e). In total, 421,423 acres, divided into fourteen individual critical habitat units, is proposed as critical habitat in the various river basins and areas throughout New Mexico and Arizona (USFWS 2013e). The northern Mexican gartersnake is generally found in riparian areas when not engaged in dispersal, gestation, or hibernation behaviors. It is also often found in streams, stock tanks, ephemeral pools, and spring sources within large-river riparian woodlands, forests, streamside gallery forests, and grasslands (USFWS 2014d).

There are 29 known localities for the northern Mexican gartersnake in the U.S. with only five populations considered likely viable where the species remains reliably detected. Approximately 69.32 acres of ROW crosses proposed critical habitat on BLM-managed lands within the Hassayampa and Tucson Field Offices. Of this, the majority (68.6 acres) occur in the Agua Fria River. In the summer of 2016 a survey conducted over a two-week period failed to detect northern Mexican gartersnakes in the Agua Fria River (Burger 2016), though there is the potential that the northern Mexican gartersnake could occur in these Agua Fria River locations.

In addition to power lines in proposed critical habitat, there is ROW occurring along the San Pedro River near proposed critical habitat which is included in the analysis. This ROW includes approximately 2.42 acres of ROW within suitable riparian and upland habitat for northern Mexican gartersnakes. There are no poles with equipment that could spark that would require DSAP treatment in the species habitat.

3.9.4 Standard Operating procedures

The SOPs listed in this section of the EA have been incorporated from the species specific conservation measures identified in the 2017 Herbicide BA. The SOPs listed here have been edited to be more consistent with the terms and language of this EA; the prescription or intent of the SOPs has not been altered. The SOP as written in the 2017 Herbicide BA would take precedence if there are any perceived discrepancies.

MANUAL AND MECHANICAL TREATMENTS

- Within the ROW, ATVs and vehicles may drive off-road if necessary with the implementation of relevant SOPs below.
    - ATVs and vehicles would be used only during dry conditions to avoid rutting, except under hazard vegetation maintenance situations.
    - ATVs and vehicles would avoid driving through rivers, standing water, and other water sources except on established roads.
    - ATVs and vehicles would be driven at low speeds (less than 10 miles per hour) when traveling off-road within the ROW.
    - ATVs and vehicles would only be operated during daylight hours, except under hazard vegetation maintenance situations.

- ATVs and vehicles would avoid driving directly up slopes and other areas that may contain highly erodible soils.
- ATVs and vehicles would not drive on slopes greater than 20 percent when traveling off established roads.

- Stumps from tree removal would be cut within six inches of the ground or if possible stumps would be cut flush with the ground.
- All areas with the potential for flowing water (e.g., culverts, ditches, and washes) would be kept free of slash, logs, and debris from vegetation removal operations.
- Small chips produced during vegetation treatments would be broadcast across the ROW at a thickness no greater than four inches.
- During manual vegetation treatment, the following methods of disposal would be used:
  - Lop and scatter: Limbs and logs of less than 9 inches in diameter would be lopped and scattered throughout the immediate area in a manner such that limbs and logs would be left no taller than 18-24 inches above the ground. Logs over 9 inches diameter would remain where felled and would be cut in sections to lay flush with the ground.
  - Chipping: Limbs and logs less than 9 inches in diameter would be chipped and broadcast on site with chips placed no deeper than four inches.
- Consider site characteristics, environmental conditions, and equipment in order to minimize damage to non-target vegetation.
- All areas with the potential for flowing water (e.g., culverts, ditches, and washes) would be kept free of slash, logs, and debris from vegetation removal operations.
- Do not operate a mechanical mower within riparian vegetation. Riparian vegetation shall be removed or pruned using manual methods.
- A qualified biologist or resource specialist would provide maintenance crew members with training on migratory bird nest reporting and nest avoidance: crews are to report active nests that occur on vegetation or on the ground internally per each Utilities' avian reporting procedures. Do not conduct routine vegetation maintenance and DSAP treatments on the vegetation containing the nest and vegetation adjacent to ground nesting birds until after nesting is complete.
- When working in riparian areas, wetlands, and near other aquatic habitats, access work site only on existing roads, and limit all travel on roads when damage to the road surface would result or is occurring.
- Manual vegetation maintenance activities would not be conducted within suitable habitat for southwester willow flycatcher during the nesting season from May 1 to August 31.
- ATVs would not be driven within 164 feet (50 meters) of southwestern willow flycatcher suitable habitat (riparian vegetation) during the nesting season (May 1 to August 31) except on existing roads that are open to the public.
- ATVs would not be driven within 164 feet (50 meters) of yellow-billed cuckoo habitat (riparian vegetation) during the nesting season (May 15 to September 30) except on existing roads that are open to the public.
- Manual vegetation maintenance activities would not be conducted within suitable habitat for Yuma clapper rail during the nesting season from February 1 to July 31.

- ATVs would not be driven within 164 feet (50 meters) of river channels and open water marsh habitat during the Yuma clapper rail nesting season of February 1 to July 31 except on existing roads that are open to the public.
- Driving over lesser long-nosed bat forage plants, including agave and young columnar cacti, would be avoided during manual and mechanical treatments.
- All field personnel would be trained on how to identify important lesser long-nosed bat forage plants, including agave and columnar cacti, and the importance of their protection. Important forage plants for lesser long-nosed bats would include saguaro cactus (*Carnegia gigantea*), organ pipe cactus (*Stenocereus thurberi*), and various species of agave.
- Mechanical mowers would not be used for routine vegetation maintenance within acuña cactus critical and suitable habitats.
- Prior to manual cutting of vegetation in acuña cactus critical and suitable habitats, pretreatment surveys would be conducted for acuña cactus. Biologists or other professionals experienced in the identification and survey of this cactus would survey the ROW area to be treated and would locate and flag all acuña cacti within or immediately adjacent to the area. In an effort to be conservative, all other similar looking cacti would be flagged and avoided.
- During manual cutting of vegetation within critical and suitable habitats for the acuña cactus, check for acuña cactus under incompatible plants to be treated prior to cutting to identify cacti that may have been missed during the pretreatment surveys. If an acuña cactus is found, appropriate conservation measures would be implemented to avoid the cactus.
- During manual vegetation maintenance work, if an acuña cactus occurs underneath and is shaded by the incompatible plant to be cut, either the targeted plant would be left untreated or the plant would be selectively trimmed to provide protection for the acuña cactus.
- Vehicles and ATVs would be driven only on existing roads to access the ROW and ATVs would not be driven off-road within the ROW in acuña cactus suitable and critical habitats.
- Mechanical mowers for routine vegetation maintenance would not be used within Arizona hedgehog cactus potentially suitable habitat.
- Prior to manual cutting of vegetation in Arizona hedgehog cactus potentially suitable habitat, pretreatment surveys would be conducted for Arizona hedgehog cactus. Biologists or other professionals experienced in the identification and survey of this cactus would survey the ROW area to be treated and would locate and flag all Arizona hedgehog cacti within or immediately adjacent to the area. In an effort to be conservative, all other similar looking cacti would be flagged and avoided.
- During manual cutting of vegetation within potentially suitable habitat for the Arizona hedgehog cactus, check for Arizona hedgehog cactus under incompatible plants to be treated prior to cutting to identify cacti that may have been missed during the pretreatment surveys. If an Arizona hedgehog cactus is found, appropriate conservation measures would be implemented to avoid the cactus.
- During manual vegetation maintenance work, if an Arizona hedgehog cactus occurs underneath and is shaded by the incompatible plant to be cut, either the targeted plant would be left untreated or the plant would be selectively trimmed to provide protection for the Arizona hedgehog cactus.
- Vehicles and ATVs would be driven only on existing roads to access the ROW and ATVs would not be driven off-road within the ROW in Arizona hedgehog cactus potentially suitable habitat.

- Pretreatment surveys for Huachuca water-umbel in species habitat would be conducted in accordance with USFWS protocols or do not survey and assume all habitats are occupied. Conservation measures would be applied to occupied habitat or assumed occupied habitat where pretreatment surveys have not been conducted.
- Vehicles and ATVs would be driven only on existing roads to access the ROW and ATVs would not be driven off-road within the ROW in suitable and critical habitat for Huachuca water-umbel.
- Manual treatment work crews would be supplied with species identification information to minimize stepping on Huachuca water-umbel and to ensure special precaution is taken around this plant.
- Prior to manual treatment work in Tanner Wash ACEC, pretreatment surveys for Peebles Navajo cactus would be conducted. Biologists or other professionals experienced in the identification and survey of this cactus would survey the ROW area to be treated and would locate and flag all Peebles Navajo cacti within or immediately adjacent to the area. In an effort to be conservative, all other similar looking cacti would be flagged and avoided.
- Drive vehicles (including ATVs) only on existing roads to access the ROW and do not drive ATVs off-road within the ROW in Tanner Wash ACEC.
- Manual treatment workers would be educated on the avoidance of Peebles Navajo cactus prior to scheduled work in potential habitat. The training of applicators would involve one or more applicators, crew foreman, or utility employee overseeing work and include: education on appearance of Peebles Navajo cactus; reference materials to assist in avoidance in the field; field visit, if needed, for refinement of search image; and procedures on avoiding cacti not found during survey.
- During manual cutting of vegetation within suitable habitat for the Peebles Navajo cactus, check for Peebles Navajo cactus under incompatible plants to be treated prior to cutting to identify cacti that may have been missed during pretreatment surveys. If a Peebles Navajo cactus is found, appropriate conservation measures would be implemented to avoid the cactus.
- Mechanical mowers would not be used within suitable riparian and upland habitat for northern Mexican gartersnake.
- Work crews would be provided materials in the identification of northern Mexican gartersnake prior to manual treatment of vegetation. If a northern Mexican gartersnake (or similar looking snake) is encountered, treatment would not occur until the snake has moved, or, if necessary, the snake would be moved to a safe, sheltered place away from work activities.
- Within northern Mexican gartersnake suitable habitat, vehicles would not be driven off established roads.

HERBICIDE TREATMENT

- Avoid treating vegetation during time-sensitive periods (e.g., nesting and migration, sensitive life stages) for special-status species in area to be treated.
- Within riparian areas, wetlands, and aquatic habitats, conduct herbicide treatments only with herbicides that are approved for use in those areas.
- Within or near riparian areas, using glyphosate formulations that include R-11 would be avoided, and any formulations with polyoxyethylene tallow amine would be avoided or use the formulation with the lowest amount of polyoxyethylene tallow amine available.
- Within or near riparian areas, special care would be followed when transporting and applying 2,4-D, bromacil, clopyralid, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, tebuthiuron, and triclopyr.

- If there is a high probability (80 percent chance) of local, moderate rain (0.25 inch or less within 24 hours), then applications would only occur when it is anticipated that there would be sufficient time (at least 4 hours) for the application to dry before rainfall occurs.

Chiricahua Leopard Frog

To protect the Chiricahua leopard frog, the following SOPs would be applied:

- If there is a high probability (80 percent chance) of local, moderate rain (0.25 inch or less within 24 hours), then applications would only occur when it is anticipated that there would be sufficient time (at least 4 hours) for the application to dry before rainfall occurs.
- Within upland Chiricahua leopard frog suitable habitat, glyphosate, hexazinone, imazapyr, metsulfuron, and triclopyr would be applied at the typical (rather than the maximum) application rate.
- Inside Chiricahua leopard frog aquatic suitable habitat, 2,4-D, glyphosate, and imazapyr would not be used.
- Within Chiricahua leopard frog suitable habitat, the following buffers would be implemented within the habitat and at least 0.5 mile upstream and 300 feet downstream of the habitat area in any ephemeral to perennial contributing channel, tributary, or spring run (referred to below as "species habitat"):
    - Herbicides that are rated with a Class 0 toxicity rating[30] in the Aquatic Amphibian, Aquatic Arthropod, and Terrestrial Arthropod toxicity groups) would not require a buffer within Chiricahua leopard frog suitable habitat. These herbicides would include the use of aminopyralid, chlorsulfuron, clopyralid, imazapic, and triclopyr – amine salt formulation
    - Herbicides with a Class 1 toxicity rating in the Aquatic Amphibian toxicity group and with a Class 2 or Class 3 toxicity rating in the Aquatic Arthropod or Terrestrial Arthropod toxicity groups would not be used below the high water line of the Chiricahua leopard frog suitable habitat or within 30 feet over land from the high water line of the suitable habitat. These herbicides would include the use of 2,4-D – all formulations, bromacil, dicamba, diuron, fluroxypyr, glyphosate – non-aquatic formulation, hexazinone, metsulfuron methyl, picloram, sulfometuron methyl, and tebuthiuron.
    - Triclopyr – ester formulation, a Class 2 toxicity rated herbicide in the Aquatic Amphibian toxicity group, would not be used below the high water line of Chiricahua leopard frog suitable habitat or within 50 feet over land from the high water line of suitable habitat.

California Condor

To protect the California condor, the following SOPs would be applied:

- The Utilities would contact USFWS and/or AGFD for information on the California condor before application of herbicides near release sites, nest sites, or known communal roost sites in species habitat of canyon lands and mountain ridges.
- Herbicides would not be applied within 0.25 miles of currently occupied California condor nests, roosts, or release sites.

[30] The toxicity classes refer to USFWS's recommended protection measures based on a screening-level hazard assessment for chemical ingredients used as pesticides and herbicides. The chemicals are rated by a classification system that categorizes the level or type of protection to be given for a particular chemical with respect to toxicity for various groups of animal species such as warm water fish. Class 0 herbicides are practically nontoxic to a specific group of animal species that have similar toxicological responses. Class 1 herbicides are slightly to moderately toxic to a specific group of animal species that have similar toxicological responses. Class 2 herbicides are highly toxic to a specific group of animal species that have similar toxicological responses. Class 3 herbicides are very highly toxic to a specific group of animal species that have similar toxicological responses (White 2007).

- Typical rather than the maximum application rates of glyphosate, hexazinone, and triclopyr would be applied within California condor suitable habitat.

Southwestern Willow Flycatcher

To protect the southwestern willow flycatcher, the following SOPs would be applied:

- When working in riparian areas, wetlands, and near other aquatic habitats, access work site only on existing roads, and limit all travel on roads when damage to the road surface would result or is occurring.
- ATVs would not be driven within 164 feet (50 meters) of southwestern willow flycatcher suitable habitat (riparian vegetation) during the nesting season (May 1 to August 31) except on existing roads that are open to the public.
- Within southwestern willow flycatcher suitable habitat, glyphosate, hexazinone, and triclopyr would be applied at the typical rather than the maximum application rate.
- Within southwestern willow flycatcher suitable habitat, 2,4-D would not be used.
- The following buffers would be implemented for southwestern willow flycatcher suitable habitat:
    - Herbicides with a Class 0 or Class 1 toxicity rating in the Small Avian toxicity group could be applied with no buffer. These herbicides would include all selected BLM-approved herbicides except for dicamba.
    - Dicamba, a Class 2 toxicity rated herbicide in the Small Avian toxicity group, would not be applied within 10 feet of the edge of the specie's habitat.
- Herbicide application would be avoided during the southwestern willow flycatcher nesting season from May 1 to August 31 whenever possible. If herbicide application is necessary during the nesting season, work would be conducted with the least number of trips in and out and workers would walk only in the ROW and open areas and not in dense thickets of vegetation.

Yellow-billed Cuckoo

To protect the yellow-billed cuckoo, the following SOPs would be applied:

- Within yellow-billed cuckoo suitable habitat, glyphosate, hexazinone, and triclopyr would be applied at the typical rather than the maximum application rate.
- 2,4-D would not be applied within yellow-billed cuckoo suitable habitat.
- The following buffers would be implemented for yellow-billed cuckoo suitable habitat:
    - Herbicides with a Class 0 or Class 1 toxicity rating in the Small Avian toxicity group could be applied with no buffer. This would include all selected BLM-approved herbicides except for dicamba.
    - Dicamba, a Class 2 toxicity rated herbicide in the Small Avian toxicity group, would not be applied within 10 feet of the edge of the species habitat.
- Herbicide application would be avoided during critical times of the Yellow-billed cuckoo nesting season from June 1 to September 30 whenever possible. If herbicide application is necessary during the nesting season, work would be conducted with the least number of trips in and out and workers would walk only in the ROW and open areas and not in dense thickets of vegetation.

Yuma Clapper Rail

To protect the Yuma clapper rail, the following SOPs are to be applied:

- 2, 4-D, glyphosate or imazapyr would not be used inside waterbodies or wetlands serving as Yuma clapper rail habitat; within at least 0.5 miles upstream from the habitat area in any contributing channel, tributary, or spring run; or within 300 feet of the species habitat.
- The following buffers would be implemented for application of herbicides on land adjacent to water bodies and wetlands that serve as Yuma clapper rail habitat. Buffer zones would be used for the entire Yuma clapper rail habitat, at least 0.5 miles upstream from the habitat area in any contribution channel, tributary, or spring run, or within 300 feet downstream from the habitat area.
    - Herbicides with a Class 0 toxicity rating in the warm water fish toxicity group may be applied at the edge of the waterbody or wetland to be protected. Herbicides in this toxicity class would include aminopyralid, chlorsulfuron, clopyralid, 2,4-D aquatic and nonaquatic amine salt formulations, glyphosate aquatic formulation, hexazinone, imazapic, imazapyr, and triclopyr amine salt formulation.
    - Herbicides with Class 1 toxicity rating in the Warm Water Fish toxicity group would not be applied within 10 feet of the edge of the waterbody or wetland to be protected. Herbicides in this toxicity class would include bromacil, dicamba, diuron, fluroxypyr, glyphosate non-aquatic formulation, metsulfuron methyl, picloram, sulfometuron methyl, and tebuthiuron.
    - Herbicides with a Class 2 or Class 3 toxicity rating in the Warm Water Fish toxicity group would not be applied within 20 feet of the edge of the waterbody or wetland to be protected. Herbicides in these toxicity classes would include 2,4-D ester formulations and triclopyr ester formulation.
- Herbicide application would be avoided during critical times of the Yuma clapper rail nesting season from February 1 to July 31 whenever possible. If herbicide application is necessary during the nesting season, work would be conducted with the least number of trips in and out and workers would walk only in the ROW and open area and not in dense thickets of vegetation.

Desert Pupfish

To protect the desert pupfish, the following SOPs would be applied where the ROW crosses or occurs near the Agua Fria River in Agua Fria National Monument.

- 2,4-D, glyphosate, and imazapyr aquatic formulations would not be applied within desert pupfish suitable habitat; within at least 1 mile upstream from the habitat area in any contributing channel, tributary, or spring run; or within 300 feet downstream of the species habitat.
- The following buffers would be implemented for application of herbicides on land adjacent to waterbodies and wetlands that serve as desert pupfish suitable habitat. Buffer zones would be used for the entire desert pupfish habitat, which would include at least 1 mile upstream from the habitat area in any contribution channel, tributary, or spring run, or within 300 feet downstream from the habitat area.
    - Herbicides with Class 0 or Class 1 toxicity ratings in the Warm Water Fish toxicity group would not be applied within 10 feet of the edge of the waterbody or wetland of desert pupfish suitable habitat. These herbicides would include all selected BLM -approved herbicides except for 2,4-D aquatic and non-aquatic ester formulation and triclopyr ester formulation.
    - Herbicides with a Class 2 toxicity rating in the Warm Water Fish toxicity group would not be applied within 50 feet of the edge of the waterbody or wetland of desert pupfish suitable habitat. These herbicides would include 2,4-D aquatic and non-aquatic ester and triclopyr ester formulations.

Gila Chub

To protect the Gila chub, the following SOPs would be applied where the ROW crosses or occurs near the Agua Fria River in Agua Fria National Monument.

- 2,4-D, glyphosate, and imazapyr aquatic formulations would not be applied within the Gila chub suitable habitat; within at least 1 mile upstream from the suitable habitat area in any contributing channel, tributary, or spring run; or within 300 feet downstream of the habitat.
- The following buffers would be implemented for application of herbicides on land adjacent to waterbodies and wetlands that serve as the Gila chub suitable habitat. Buffer zones would be used for the entire Gila chub suitable habitat, which would include at least 1 mile upstream from the suitable habitat area in any contribution channel, tributary, or spring run, or within 300 feet downstream from the habitat.
    - Herbicides with Class 0 or Class 1 toxicity ratings in the Warm Water Fish toxicity group would not be applied within 10 feet of the edge of the waterbody or wetland of Gila chub suitable habitat. These herbicides would include all selected BLM -approved herbicides except for 2,4-D aquatic and non-aquatic ester formulation and triclopyr ester formulation.
    - Herbicides with a Class 2 toxicity rating in the Warm Water Fish toxicity group would not be applied within 50 feet of the edge of the waterbody or wetland of Gila chub suitable habitat. These herbicides would include 2,4-D aquatic and non-aquatic ester and triclopyr ester formulations.

Gila Topminnow

To protect the Gila topminnow, the following SOPs would be applied where the ROW crosses or occurs near the Agua Fria River in Agua Fria National Monument.

- 2,4-D, glyphosate, and imazapyr aquatic formulations would not be applied within the Gila topminnow suitable habitat; within at least 1 mile upstream from the habitat area in any contributing channel, tributary, or spring run; or within 300 feet downstream of the species habitat.
- The following buffers would be implemented for application of herbicides on land adjacent to waterbodies and wetlands that serve as the Gila topminnow suitable habitat. Buffer zones would be used for the entire Gila topminnow suitable habitat, which would include at least 1 mile upstream from the suitable habitat area in any contribution channel, tributary, or spring run, or within 300 feet downstream from the habitat.
    - Herbicides with Class 0 or Class 1 toxicity ratings in the Warm Water Fish toxicity group would not be applied within 10 feet of the edge of the waterbody or wetland of Gila topminnow suitable habitat. These herbicides would include all selected BLM -approved herbicides except for 2,4-D aquatic and non-aquatic ester formulation and triclopyr ester formulation.
    - Herbicides with a Class 2 toxicity rating in the Warm Water Fish toxicity group would not be applied within 50 feet of the edge of the waterbody or wetland of Gila topminnow suitable habitat. These herbicides would include 2,4-D aquatic and non-aquatic ester and triclopyr ester formulations.

Lesser Long-Nosed Bat

To minimize or avoid impacts to the lesser long-nosed bat, the following SOPs would be applied to the ROWs within lesser long-nosed bat foraging habitat.

- Driving over lesser long-nosed bat forage plants, including agave and young columnar cacti, would be avoided during herbicide application.
- In lesser long-nosed bat foraging habitat, herbicides would not be applied when drift onto forage plants is likely.

Acuña Cactus

To minimize effects to acuña cactus, the SOPs and buffer zones listed below would be followed when applying herbicide on ROW crossing designated acuña cactus critical and suitable habitats.

- Prior to any herbicide application in acuña cactus critical and suitable habitats, pretreatment surveys would be conducted for acuña cactus. Biologists or other professionals experienced in the identification and survey of this cactus would survey the ROW area to be treated and would locate and flag all acuña cacti within or immediately adjacent to the area. In an effort to be conservative, all other similar looking cacti would be flagged and avoided.
- A 20-foot buffer around each flagged acuña cactus or clump of cacti would be established. No herbicide treatments would occur within the 20-foot buffer.
- Bromacil, diuron, hexazinone, picloram, and tebuthiuron would not be used in acuña cactus occupied habitat.
- Herbicides would not be used for DSAP maintenance treatments if the acuña cactus pretreatment survey results indicate cacti in the 10-foot radius treatment area.
- 2,4-D and diuron would not be used within 300 feet of occupied acuña cactus habitat to minimize effects to pollinators.

Arizona Hedgehog Cactus

To minimize effects to Arizona hedgehog cactus, the SOPs listed below would be followed when applying herbicide on the ROW in potentially suitable habitat.

- Prior to any herbicide application in Arizona hedgehog cactus potentially suitable habitat, pretreatment surveys would be conducted for the cactus. Biologists or other professionals experienced in the identification and survey of Arizona hedgehog cactus would survey the ROW area to be treated and would locate and flag all cacti within or immediately adjacent to the area. In an effort to be conservative, all other similar looking cacti would be flagged and avoided.
- A 20-foot buffer around each flagged Arizona hedgehog cactus or clump of cacti would be established. No herbicide treatments would occur within the 20-foot buffer.
- Bromacil, diuron, hexazinone, picloram, and tebuthiuron would not be used in Arizona hedgehog cactus occupied habitat.
- Herbicides would not be used for DSAP maintenance treatments if the Arizona hedgehog pretreatment survey results indicate cacti in the 10-foot radius treatment area.
- 2,4-D and diuron would not be used within 300 feet of occupied Arizona hedgehog cactus habitat to minimize effects to pollinators.

Huachuca Water-Umbel

To minimize effects to Huachuca water-umbel, the SOPs listed below would be followed where the ROW crosses the San Pedro River.

- Pretreatment surveys for Huachuca water-umbel would be conducted in accordance with USFWS protocols or if pretreatment surveys are completed then all habitats would be considered as occupied habitat. SOPs listed below would be applied to occupied habitat or assumed occupied habitat where surveys have not been conducted.

- Vehicles and ATVs would be driven only on existing roads to access the ROW and ATVs would not be driven off-road within the ROW in suitable or critical habitats for Huachuca water-umbel.
- 2,4-D, glyphosate, and imazapyr would not be used inside Huachuca water-umbel suitable or critical habitats; within at least 1 mile upstream from the habitat areas in any contributing channel, tributary, or spring, and within 300 feet downstream of any suitable or critical habitats.
- Implement the following conservation measures to Huachuca water-umbel occupied habitat. If surveys have not been conducted assume occupancy to all portions of suitable habitat:
    - Foliar application technique of any herbicides would not be used within 50 feet of the edge of the waterbody or wetland containing Huachuca water-umbel; within at least 1 mile upstream from occupied habitat of any contributing channel, tributary, or spring run; and within 300 feet downstream of the Huachuca water-umbel occupied habitat.
    - Cut stump or basal treatment techniques would only be used inside Huachuca water-umbel occupied habitat, within 50 feet of the waterbody or wetland .containing Huachuca water-umbel, within at least 1 mile upstream from habitat of any contributing channel, tributary, or spring run, or within 300 feet downstream of Huachuca water-umbel occupied habitat.
    - Herbicide work crews would be supplied with species identification information to minimize stepping on Huachuca water-umbel and to ensure special precaution is taken around this plant.
- 2,4-D, diuron, bromacil, hexazinone, and tebuthiuron would not be applied within Huachuca water-umbel occupied habitat.

Peebles Navajo Cactus

To minimize effects to Peebles Navajo cactus, the SOPs listed below would be followed on ROW within the Tanner Wash ACEC.

- Prior to herbicide application in Tanner Wash ACEC, pretreatment surveys for Peebles Navajo cactus would be conducted. Biologists or other professionals experienced in the identification and survey of this cactus would survey the ROW area to be treated and would locate and flag all Peebles Navajo cacti within or immediately adjacent to the area. In an effort to be conservative, all other similar looking cacti would be flagged and avoided.
- Herbicide applicators would be educated on the avoidance of Peebles Navajo cactus prior to scheduled work in potential habitat. The training of applicators would involve one or more applicators, crew foreman, or utility employee overseeing work and include: education on appearance of Peebles Navajo cactus; reference materials to assist in avoidance in the field; field visit, if needed, for refinement of search image; and procedures on avoiding cacti not found during survey.
- Prior to herbicide application, under the targeted plant would be checked for Peebles Navajo cactus prior to applying herbicide to identify cacti that may have been missed during the pretreatment survey. If a cactus is found, appropriate conservation measures would be implemented to avoid the cactus.
- Vehicles would only be driven on existing roads to access the ROW and ATVs would not be driven off-road within the ROW in the Tanner Wash ACEC.
- A 20-foot buffer would be established around each flagged Peebles Navajo cactus or clump of cacti. No herbicide treatments would occur within the 20-foot buffer.
- 2,4-D, diuron, bromacil, hexazinone, picloram and tebuthiuron would not be applied within Peebles Navajo cactus occupied habitat.

Northern Mexican Gartersnake

To protect northern Mexican gartersnake, the following SOPs would be applied where the ROW intersects with the northern Mexican gartersnake proposed critical habitat.

- Work crews would be provided materials in the identification of northern Mexican gartersnake prior to herbicide application. If a northern Mexican gartersnake (or similar looking snake) is encountered, treatment would not occur until the snake has moved, or, if necessary, the snake would be moved to a safe, sheltered place away from work activities.
- If there is a high probability (80 percent chance) of local, moderate rain (0.25 inch or less within 24 hours), then herbicide applications within northern Mexican gartersnake proposed critical habitat would only occur when it is anticipated that there would be sufficient time (at least 4 hours) for the application to dry before rainfall occurs.
- Within upland habitats occupied by northern Mexican gartersnake (or within suitable habitat if occupancy is unknown) glyphosate, hexazinone, imazapyr, metsulfuron methyl, and triclopyr would be applied at the typical rather than the maximum application rates.
- 2,4-D, glyphosate, and imazapyr aquatic formulations would not be used inside northern Mexican gartersnake occupied or potentially occupied aquatic habitat.
- Within northern Mexican gartersnake suitable habitat, vehicles would not be driven off established roads.
- Within northern Mexican gartersnake occupied habitat or suitable habitat that has not been surveyed, the following buffers would be established within the habitat and at least 0.5 mile upstream or 300 feet downstream of the habitat area in any ephemeral to perennial contributing channel, tributary, or spring run :
    - Herbicides with a Class 0 toxicity rating in the Aquatic Amphibian, Aquatic Arthropod, and Terrestrial Arthropod toxicity groups require no buffer within northern Mexican gartersnake habitat. These herbicides include aminopyralid, chlorsulfuron, clopyralid, imazapic, and triclopyr – amine salt formulation.
    - Herbicides with a Class 1 toxicity rating in the Aquatic Amphibian toxicity group and as Class 2 or Class 3 toxicity ratings in the Aquatic Arthropod or Terrestrial Arthropod toxicity groups would not be used below the high water line of the species habitat or within 30 feet over land from the high water line of species habitat. These herbicides include bromacil, 2,4-D – all formulations, dicamba, diuron, fluroxypyr, glyphosate – non-aquatic formulation, hexazinone, metsulfuron methyl, picloram, sulfometuron methyl, and tebuthiuron.
    - Triclopyr – ester formulation, which has a Class 2 toxicity rating in the Aquatic Amphibian toxicity group would not be used below the high water line of species habitat or within 50 feet over land from the high water line of species habitat.

3.9.5 Environmental Consequences

There are three federally listed species that have been listed since the BLM PEIS for BLM Vegetation Treatments was completed in 2007 and are considered to be present or which have suitable habitat within the ROW (BLM 2007a). These species are: yellow-billed cuckoo, northern Mexican gartersnake, and acuña cactus. These species were not included in the 2007 PEIS for which 15 of the 17 proposed herbicides were analyzed. These three species were analyzed for two of the 17 proposed herbicides (aminopyralid and fluroxypyr) in the 2015 BA for Vegetation Treatments using Aminopyralid, Fluroxypyr, and Rimsulfuron on Bureau of Land Management Lands in 17 Western States (BLM 2015a).

To ensure consistency with the 2007 PEIS for these newly listed species for the 15 proposed herbicides in the 2007 PEIS, analysis of similar species was used in developing conservation measures and in describing effects as described below:

- **Acuña cactus:** The 2007 PEIS BA analyzed 17 cacti species (BLM 2007a, Chapter 4, pages 4-1 to 4-134). Two of these 17 occur within the ROW, including Arizona hedgehog cactus and Peebles Navajo cactus. The BA for this project used relevant information from the 2007 PEIS for other cacti in developing conservation measures and analyzing effects of herbicide application on acuña cactus.
- **Northern Mexican gartersnake:** The 2007 PEIS BA analyzed 12 amphibians and reptiles (BLM 2007a, Chapter 6, pages 6-23 to 6-42). One of these, Chiricahua leopard frog, occurs within the ROW. The BA for this project used relevant information from Chiricahua leopard frog as well as other reptiles and amphibians analyzed in the 2007 PEIS BA in developing conservation measures and analyzing effects of herbicide application to northern Mexican gartersnake.
- **Yellow-billed cuckoo:** The 2007 PEIS BA includes a category for riparian birds that analyzed effects to three riparian birds (BLM 2007a, Chapter 6, pages 6-65 to 6-71). One of these, the southwestern willow flycatcher, occurs within the ROW. Relevant analysis and conservation measures were pulled from all the riparian birds analyzed in the 2007 BA and used in the analysis for yellow-billed cuckoo.

CHIRICAHUA LEOPARD FROG

Direct and Indirect Effects of the No Action Alternative

Under the No Action Alternative, routine aerial and ground inspections would be conducted and only manual methods would be used to maintain vegetation within the ROW. A description of the direct and indirect effects on the Chiricahua leopard frog and its habitat from inspections and manual maintenance treatments are presented in detail in the 2017 Herbicides BA on pages 16 through 21 (BLM 2017). There would be no mechanical or DSAP maintenance treatment within suitable habitat, and there is no designated critical habitat within the ROW. The detailed discussion of the analyses on the potential effects from inspections and manual treatment is not repeated here but is instead incorporated by reference and summarized below.

The presence of humans associated with ground inspections and manual treatment of vegetation may temporarily displace Chiricahua leopard frogs in the ROW. Adult frogs typically avoid terrestrial predators or unknown threats by jumping into water to avoid confrontation (USFWS 2011). The likelihood of direct effects to Chiricahua leopard frogs due to vehicle strikes would be remote because the use of vehicles in riparian habitat would be restricted to existing roads. The ROW contains a relatively small amount (0.31 acres) of riparian habitat considered to be suitable Chiricahua leopard frog habitat. The frequency of disturbance would create more opportunity for Chiricahua leopard frogs to be impacted; however, SOPs would minimize any potential impacts to the frog. Indirect effects to Chiricahua leopard frogs would not be detectable because treatments would be limited to manually cutting of regrowth vegetation and pruning mature trees at the edge of the ROW. The lower growing shrubs, grasses, and forbs would remain untreated. Therefore, the No Action Alternative would result in short- and long-term, direct and indirect, negligible adverse impacts to the Chiricahua leopard frog because the potential for direct contact with the species would be unlikely and their aquatic habitat would not be measurably disturbed. In addition, the 2017 Herbicide BA has made the determination that the No Action Alternative "may affect, but is not likely to adversely affect"[31] the Chiricahua leopard frog or its habitat.

[31] In order to meet the ESA Section 7 regulatory requirements for an action that is being propose to implement, fund or authorize, BLM must make one of the following preliminary determinations with respect to threatened or endangered species or designated critical

Direct and Indirect Effects of the Proposed Action

In addition to the short-term effects associated with the No Action Alternative described above, the Proposed Action would also result in impacts on the Chiricahua leopard frog from the use of herbicides as part of the management of incompatible vegetation within the ROW. The Final Programmatic BA Vegetation Treatments on Bureau of Land Management Lands in 17 Western States (BLM 2007d) and the BA for Vegetation Treatments Using Aminopyralid, Fluroxypyr, and Rimsulfuron on BLM Lands in 17 Western States PEIS (BLM 2015a) provided detailed analysis of potential impacts associated with the application of herbicides to the Chiricahua leopard frog (page 6-25 and pages 6-34 through 6-42 [BLM 2017] and pages 6-18 and 6-19 and pages 6-32 through 6-35 [BLM 2015a]). A description of the direct and indirect effects of herbicide treatments on the Chiricahua leopard frog and its habitat are also presented in the 2017 Herbicides BA on pages 16 through 21 (BLM 2017). The detailed discussion of the analyses is not repeated here but is instead incorporated by reference and summarized in this section of the EA. The Proposed Action would not include any activities associated with herbicide application different from those analyzed in the 2007 and 2015 Herbicide PEIS BA. Consequently, there is no potential for new or greater short-term direct or indirect impacts on the Chiricahua leopard frog or its habitat from the Proposed Action that have not been disclosed in prior environmental documentation.

Chiricahua leopard frogs could be unintentionally sprayed by herbicides during application. However, herbicides would not be directly applied to the water, and frogs are most likely to retreat to aquatic environments because of human presence during treatment. If in the unlikely event that direct contact of herbicides with Chiricahua leopard frogs would occur, only herbicides would be used within the areas of suitable habitat that have a toxicity rating of practically non-toxic to avoid any potential individual frog mortality. Herbicide treatments would be limited to spot applications to individual plants within the ROW, which would minimize overspray and avoid direct impacts to frogs. The quantity of vegetation treated over the ROW area is low with grasses, forbs, and lower growing shrubs remaining untreated. Changes in vegetation composition affecting Chiricahua leopard frog habitat due to herbicide application would be minimal and insignificant. Indirect effects to Chiricahua leopard frogs would be limited to manually cutting of regrowth vegetation, pruning mature trees at the edge of the ROW, and spot applications of herbicide to individual plants within the ROW. Thinvert, a drift and drip reduction agent would be used to minimize surface runoff and any drift of herbicide onto non-target plants.

With the implementation of species-specific SOPs, only herbicides with low toxicity to Chiricahua leopard frogs would be used within suitable habitat, buffers would be designated to exclude the use of higher toxicity herbicides near suitable habitat, and the timing of application would be limited to times when the possibility of precipitation is low. Therefore, the Proposed Action would result in direct and indirect, short-term, negligible adverse impacts to the Chiricahua leopard frog because the potential for direct contact with the species would be unlikely and their suitable habitat of approximately 0.31 acres within the ROW would not be measurably disturbed. There would also be long-term, direct and indirect, negligible beneficial impacts to the Chiricahua leopard frog because the frequency of routine vegetation maintenance would decrease, which would reduce the presence of workers and noise from handheld equipment within suitable habitat. In addition, the 2017 Herbicide BA has made the determination that the Proposed Action "may affect, but is not likely to adversely affect" the Chiricahua leopard frog or its habitat.

habitat: 1.) No effect; 2.) May affect, but is not likely to adversely affect; or 3.). May affect, and is likely to adversely affect. These effects determinations must be based on all direct and indirect effects of the actions under consideration. The 2017 Herbicides BA has made an effects determination for both the No Action Alternative and the Proposed Action.

CALIFORNIA CONDOR

Direct and Indirect Effects of the No Action Alternative

Under the No Action Alternative, routine aerial and ground inspections would be conducted along with manual and mechanical vegetation treatment methods within the ROW. A description of the direct and indirect effects on the California condor and its suitable habitat from inspections and routine vegetation maintenance treatments are presented in detail in the 2017 Herbicides BA on pages 22 through 26 (BLM 2017). The detailed discussion of the analyses on the potential effects form the No Action Alternative is not repeated here but is instead incorporated by reference and summarized below.

There would be no DSAP maintenance treatment within suitable habitat. It is highly unlikely that California condor nest sites occur within or near the ROW since condors generally roost on cliffs and tall conifers, including dead snags, none of which occur near the ROW (USFWS 1996). Any interaction of California condor during vegetation treatment would likely be with transient California condors. California condors are naturally curious birds and may be attracted to vegetation treatment activities along the ROWs, which could result in unintended human/condor interaction. Displacement of individual condors from foraging may occur due to disturbance associated with vehicles including ATVs, chainsaw use, and aerial inspections. Vegetation is sparse within the ROW, and routine vegetation maintenance activities would be short in duration. The suitable habitat associated with the experimental population area within the ROW predominately is palo verde, mesquite, Joshua tree, and tamarisk. Snags from these species would not provide ideal roosting habitat for California condor. Indirect habitat impacts to foraging areas would be localized and undetectable because the ROW is already open terrain where very little vegetation occurs naturally. The lower growing shrubs, grasses, and forbs would remain untreated in the sparsely vegetated ROW. Direct contact with condors would be unlikely due to their ability of flight and the ROW lacks suitable nesting or foraging habitat. Therefore, the No Action Alternative would result in short- and long-term, direct and indirect, negligible adverse impacts to the California condor and its habitat. With regards to the ESA, the 2017 Herbicides BA has made the determination that the No Action Alternative "may affect, but is not likely to adversely affect" the California condor nonessential population or its habitat.

Direct and Indirect Effects of the Proposed Action

In addition to the short-term effects associated with the No Action Alternative described above, the Proposed Action would also result in impacts on the California condor experimental, non-essential population and its suitable habitat from the use of herbicides as part of the management of incompatible vegetation within the ROW. The 2007 Final Programmatic BA (BLM 2007d) and the 2015 Final Programmatic BA (BLM 2015a) provided detailed analysis of potential impacts associated with the application of herbicides to the California condor (page 6-78 through pages 6-82 [BLM 2007d] and page 6-62 through pages 6-64 [BLM 2015a]). A description of the direct and indirect effects of herbicide treatments on the California condor and its experimental, non-essential population area are also presented in the 2017 Herbicides BA on pages 22 through 26 (BLM 2017). The detailed discussion of the analyses is not repeated here but is instead incorporated by reference and summarized in this section of the EA. The Proposed Action would not include any activities associated with herbicide application different from those analyzed in the 2007 and 2015 Herbicide PEIS BA. Consequently, there is no potential for new or greater short-term direct or indirect impacts on the California condor or its suitable habitat from the Proposed Action that have not been disclosed in prior environmental documentation.

Vegetation is sparse in all areas within the California condor experimental population area. Herbicide application activities would be short in duration on a given ROW and targeted to individual plants. Thinvert would be used to minimize drift onto non-target plants. Any potential human/condor interactions would be localized as well as brief and unlikely to result in displacement of individual birds. Implementation of SOPs by identifying known nests, roosts, and release sites and applying a 0.25 mile buffer would further reduce the likelihood of any human

interaction with California condor. During low volume foliar application of herbicides within the ROWs, it is unlikely that California condors would be exposed to direct spray due to their ability of flight. Therefore, similar to the No Action Alternative, there would be short-term, direct and indirect, negligible adverse impacts because direct contact with condors would be unlikely due to their ability of flight and the ROW lacks suitable nesting or foraging habitat. Direct and indirect, long-term, negligible beneficial impacts to the California condor are anticipated because the frequency of routine vegetation maintenance would decrease, which would reduce the presence of workers and noise from equipment within suitable habitat. With regards to the ESA, the 2017 Herbicides BA has made the determination that the Proposed Action "may affect, but is not likely to adversely affect" the California condor nonessential population or its habitat.

SOUTHWESTERN WILLOW FLYCATCHER

Direct and Indirect Effects of the No Action Alternative

Under the No Action Alternative, routine aerial and ground inspections would be conducted along with manual and mechanical vegetation treatment methods within the ROW. There would be no DSAP maintenance treatment within suitable southwestern willow flycatcher habitat. A description of the direct and indirect effects on the flycatcher and its designated critical habitat from the No Action Alternative are presented in detail in the 2017 Herbicides BA on pages 27 through 38 (BLM 2017). The detailed discussion of the analyses on the potential effects from the No Action Alternative is not repeated here but is instead incorporated by reference and summarized in this section. Southwestern willow flycatchers utilize riparian vegetation for both breeding and migration habitat and could be present along the San Pedro River drainage in the vicinity of the ROW. In some locations, where the appropriate riparian vegetation exists, southwestern willow flycatchers may be nesting during nesting season adjacent to ROWs. During early spring or fall, migrating southwestern willow flycatchers could potentially be present within or adjacent to ROWs for brief periods of time.

Aerial and ground inspections would not likely affect flycatchers because of the short duration of these activities. Routine vegetation maintenance would be conducted outside the nesting season and would have no direct effect on breeding southwestern willow flycatchers, if present near the ROW. ATVs would not be driven within 164 feet (50 meters) of riparian vegetation during the nesting season except on existing roads that are open to the public. In addition, only manual treatments would be permitted in riparian areas, which would limit potential displacement of individual flycatchers during treatment activities. The crew workers associated with ground inspections and manual and mechanical treatment of vegetation may temporarily displace southwestern willow flycatchers present in the ROW. Disturbance to southwestern willow flycatchers from manual or mechanical treatment of vegetation would not likely have any measurable consequences to individual flycatchers or the population as a whole on BLM–managed lands because of the limited area that would need treatment. Between maintenance cycles, small sapling vegetation would develop, but this vegetation would continue to be cut and would not be allowed to reach maturity in the 2.83 acres and 9.89 acres of riparian vegetation within the ROW containing designated flycatcher critical and suitable habitat, respectively. Routine vegetation maintenance treatments would not alter the availability of insect prey populations. Direct contact with flycatchers would be unlikely due to their ability of flight and the ROW's limited suitable nesting or foraging habitats. Therefore, the No Action Alternative would result in short- and long-term, direct, negligible, adverse impacts as well as short- and long-term indirect, minor adverse impacts to the southwestern willow flycatcher and its designated critical habitat because vegetation would continue to be cut and would not be allowed to

reach maturity. In addition, the 2017 Herbicides BA has made the determination that the No Action Alternative "may affect, and is likely to adversely affect" southwestern willow flycatcher and its designated critical habitat[32].

Direct and Indirect Effects of the Proposed Action

In addition to the short-term effects associated with the No Action Alternative described above, the Proposed Action would also result in impacts on the southwestern willow flycatcher and its designated critical habitat from the use of herbicides as part of the management of incompatible vegetation within the ROW. The 2007 Final Programmatic BA (BLM 2007d) and the 2015 Final Programmatic BA (BLM 2015a) provided detailed analysis of potential impacts associated with the application of herbicides to the southwestern willow flycatcher (page 6-67 through pages 6-71 [BLM 2007d] and page 6-52 through pages 6-55 [BLM 2015a]). A description of the direct and indirect effects of herbicide treatments on the flycatcher and its designated critical habitat are also presented in the 2017 Herbicide BA on pages 27 through 38 (BLM 2017). The detailed discussion of the analyses is not repeated here but is instead incorporated by reference and summarized in this section of the EA. The Proposed Action would not include any activities associated with herbicide application different from those analyzed in the 2007 and 2015 Herbicide PEIS BA. Consequently, there is no potential for new or greater short-term direct or indirect impacts on the southwestern willow flycatcher from the Proposed Action that have not been disclosed in prior environmental documentation.

Potential impacts to breeding southwestern willow flycatchers would likely occur from presence of crew workers during application of targeted herbicides from backpack sprayers within the ROW. The noise level of herbicide application using a backpack sprayer is very low, and the applicators would not walk through dense patches of vegetation where suitable breeding habitat may occur. It is highly unlikely that breeding flycatchers would occur immediately adjacent to the ROW with such a small portion of suitable breeding habitat occurring within the ROW. Motorized vehicles would not be used near suitable habitat during the nesting season and herbicide application would be restricted during the nesting season within suitable habitat. Any birds in the ROW would more than likely fly away before crew workers could get close enough to inadvertently spray them with herbicide. Herbicides could be sprayed on insects that are, in turn, ingested by flycatchers. Targeted application of herbicides to only specific incompatible plants or resprouts limits the opportunity for insect prey species to be exposed. The use of low toxicity herbicides, would minimize potential direct effects on prey species due to toxicity. Given the limited potential for disturbance to nesting, roosting, or migrating flycatchers during application of targeted herbicide applications, any direct effects due to herbicide application would not likely have any measurable consequences to individual flycatchers or the population of southwestern willow flycatchers.

As noted in the No Action Alternative, vegetation maintenance is proposed on 2.83 acres of ROW that occurs within critical habitat and an additional 9.89 acres of ROW occurring within suitable habitat for southwestern willow flycatcher. In the Proposed Action, routine vegetation maintenance would be carried out within this ROW to manage for low growing plant communities by targeted herbicide applications to individual plants. Thinvert would be used to minimize drift onto non-target plants and potential effects to riparian vegetation with the designated critical habitat would be very small in scale. Long-term indirect effects to the riparian vegetation

[32] There are four species for which the Proposed Action and No Action Alternative would result in adverse effect to the species and critical habitat as identified in the biological assessment. These species are: southwestern willow flycatcher and its designated critical habitat; yellow-billed cuckoo and its proposed critical habitat; acuña cactus and its designated critical habitat; and northern Mexican gartersnake and its proposed critical habitat. For each of these species, the Proposed Action and No Action Alternative would remove young and new growth vegetation in such a way that would preclude this vegetation from growing to maturity. This treatment would alter the physical and biological features of the vegetation composition within the ROW long term and create small areas where vegetation would not be allowed to develop into suitable habitat and primary constituent elements of critical habitat for the species. This affect is small in scale and limited to the narrow ROWs where the power lines intersect with suitable and critical habitats for these four species.

within the ROW would occur because this portion of the ROW would not be allowed to develop into suitable breeding habitat for flycatchers.

Therefore, there would be short- and long-term, direct, negligible, adverse impacts because the southwestern willow flycatcher would likely fly away before crew workers could get close enough to inadvertently spray them with herbicide, therefore direct contact would be unlikely and the ROW's. Short- and long-term, indirect, minor adverse impacts are anticipated because the vegetation within areas of critical or suitable habitat would be continually maintained limiting suitable nesting, roosting, or foraging habitats to establish. In addition, the 2017 Herbicides BA has made the determination that the Proposed Action "may affect, and is likely to adversely affect" southwestern willow flycatcher and its designated critical habitat.

YELLOW-BILLED CUCKOO

Direct and Indirect Effects of the No Action Alternative

Under the No Action Alternative, routine aerial and ground inspections would be conducted along with manual and mechanical vegetation treatment methods within the ROW. There would be no DSAP maintenance treatment within proposed critical habitat for the yellow-billed cuckoo. A description of the direct and indirect effects on the cuckoo and its proposed critical habitat from the No Action Alternative are presented in detail in the 2017 Herbicides BA on pages 39 through 52 (BLM 2017BA). The detailed discussion of the analyses on the potential effects from the No Action Alternative is not repeated here but is instead incorporated by reference and summarized in this section. Yellow-billed cuckoos utilize riparian vegetation for breeding, foraging, and migration habitat and could be present along the Agua Fria, Hassayampa, Gila, Colorado, and San Pedro river drainages in the vicinity of the ROW.

Aerial and ground inspections would not likely affect yellow-billed cuckoos because of the short duration of these activities. Routine vegetation maintenance would be conducted outside the nesting season and would have no direct effect on breeding yellow-billed cuckoos, if present near the ROW. A buffer would be established around the riparian vegetation within the ROW and ATVs would not be driven within the riparian area during the nesting season except on existing roads that are open to the public. Only manual treatments would be permitted in riparian areas, which would limit potential displacement of individual cuckoos during treatment activities. The crew workers may temporarily displace yellow-billed cuckoos present in the ROW. Disturbance to yellow-billed cuckoos from manual or mechanical treatment of vegetation would not likely have any measurable consequences to individual cuckoos or the population as a whole on BLM–managed lands because of the relatively limited area of the ROW that would need treatment. In the No Action Alternative, incompatible vegetation would continue to be cut and would not be allowed to reach maturity in the 14.21 acres of riparian vegetation within the ROW containing suitable cuckoo habitat. Small changes within the stream corridor from maintaining the riparian vegetation and disposal of slash would have no overall effect on riverine processes. The No Action Alternative would be unlikely to have an effect on the river systems that are crossed by ROWs. Direct contact with cuckoos would be unlikely due to their ability of flight and the ROW's limited suitable breeding, migration, and foraging habitats. Routine vegetation maintenance treatments would not alter the availability of insect prey populations. Therefore, the No Action Alternative would result in short- and long-term, direct, negligible, adverse impacts and short- and long-term indirect, minor adverse impacts to the yellow-billed cuckoo and its proposed critical habitat because incompatible vegetation would continue to be cut and would not be allowed to reach maturity. In addition, the 2017 Herbicides BA has made the determination that the No Action Alternative "may affect, and is likely to adversely affect" yellow-billed cuckoo and its proposed critical habitat.

Direct and Indirect Effects of the Proposed Action

In addition to the short-term effects associated with the No Action Alternative described above, the Proposed Action would also result in impacts on the yellow-billed cuckoo and its proposed critical habitat from the use of herbicides as part of the management of incompatible vegetation within the ROW. The 2015 Final Programmatic BA (BLM 2015a) provided detailed analysis of potential impacts associated with the application of herbicides to the yellow-billed cuckoo (page 6-53 through pages 6-55 [BLM 2015a]). A description of the direct and indirect effects of herbicide treatments on the cuckoo and its proposed critical habitat are also presented in the 2017 Herbicides BA on pages 39 through 52 (BLM 2017). The detailed discussion of the analyses is not repeated here but is instead incorporated by reference and summarized in this section of the EA. The Proposed Action would not include any activities associated with herbicide application different from those analyzed in the 2015 Herbicide PEIS BA. Consequently, there is no potential for new or greater short-term direct or indirect impacts on the yellow-billed cuckoo or its suitable habitat from the Proposed Action that have not been disclosed in prior environmental documentation.

The use of low toxicity herbicides, establishment of buffers within or near suitable habitat, the application of targeted, short duration herbicide treatments, and the use of the drift and drip reduction agent, Thinvert, would reduce any potential direct effects to yellow-billed cuckoos by the Proposed Action. The likelihood of direct effects to yellow-billed cuckoo's nesting activities from herbicide treated vegetation would be discountable because the ROW does not contain suitable nesting habitat for cuckoos. Species-specific SOPs would restrict herbicide application within suitable habitat during the nesting season. Potential impacts to breeding yellow-billed cuckoos would likely occur from presence of crew workers during application of targeted herbicides from backpack sprayers within the ROW. Any birds in the ROW would more than likely fly away before crew workers could get close enough to inadvertently spray them with herbicide. In addition, vehicles would not be used near suitable habitat during the nesting season. Aerial and ground inspections are not likely to affect yellow-billed cuckoos due to the short duration of these activities.

Herbicides could be sprayed on insects that are, in turn, ingested by cuckoos. Targeted application of herbicides to only specific incompatible plants or resprouts limits the opportunity for insect prey species to be exposed. The use of low toxicity herbicides, would minimize potential direct effects on prey species due to toxicity. Given the limited potential for disturbance to nesting, roosting, or migrating cuckoos during application of targeted herbicide applications, any direct effects due to herbicide application would not likely have any measurable consequences to individual cuckoos or the population of yellow-billed cuckoos.

As noted in the No Action Alternative, vegetation maintenance is proposed on 14.21 acres of ROW that occurs within suitable habitat for yellow-billed cuckoo. In the Proposed Action, routine vegetation maintenance would be carried out within this ROW to manage for low growing plant communities by targeted herbicide applications to individual plants. Long-term indirect effects to the riparian vegetation component of critical habitat within the ROW would occur because this 19.47 acres of riparian vegetation would not be allowed to develop into suitable breeding habitat for cuckoos. Potential impacts to proposed critical habitat through effects to riparian woodlands and dynamic riverine processes would be relatively small in scale.

Therefore, there would be short- and long-term, direct, negligible, adverse impacts because the yellow-billed cuckoo would likely fly away before crew workers could get close enough to inadvertently spray them with herbicide, therefore direct contact would be unlikely and the ROW's. Short- and long-term, indirect, minor adverse impacts are anticipated to the yellow-billed cuckoo because of limited and localized potential for disturbance to nesting, roosting, or migrating cuckoos and because the riparian vegetation would be continually treated there would be no potential to become suitable habitat over time. In addition, the 2017 Herbicides BA

has made the determination that the Proposed Action "may affect, and is likely to adversely affect" yellow-billed cuckoo and its proposed critical habitat.

YUMA CLAPPER RAIL

Direct and Indirect Effects of the No Action Alternative

Under the No Action Alternative, routine aerial and ground inspections would be conducted and only manual methods would be used to maintain vegetation within the ROW. A description of the direct and indirect effects on the Yuma clapper rail and its habitat from inspections and manual maintenance treatments are presented in detail in the 2017 Herbicides BA on pages 53 through 59 (BLM 2017BA). There would be no mechanical or DSAP maintenance treatment within suitable habitat. The detailed discussion of the analyses on the potential effects from inspections and manual treatment is not repeated here but is instead incorporated by reference and summarized below. Yuma clapper rails utilize emergent riparian vegetation and require wet substrates with dense herbaceous or woody vegetation for nesting and foraging. This habitat is predominantly found in open water marsh areas, which are not present within the ROWs. The ROW is predominately located in riparian woodland, not marsh habitat, and riparian woodland habitats are not ideal breeding habitat for Yuma clapper rail.

Manual vegetation treatments would consist of cutting regrowth of previously cut vegetation, and newly grown vegetation since the last maintenance cycle. The vegetation maintenance would be conducted outside the nesting season and would have no direct effect on breeding Yuma clapper rail, if present near the ROW. Direct impacts to Yuma clapper rails could result from the presence of crew workers conducting ground inspections or when completing maintenance activities. Vehicles would not be used near suitable habitat during the nesting season. Vegetation treatment projects have been routinely carried out within the ROWs to manage for low growing plant communities; cattail and bulrush would not be cut using manual methods. In the No Action Alternative, changes in ROW vegetation composition affecting Yuma clapper rail's suitable habitat would be localized and not discernible. The frequency of maintenance activities would create more opportunity for Yuma clapper rails to be impacted; however, SOPs would minimize any potential impacts to the bird. Therefore, the No Action Alternative would result in direct and indirect, short- and long-term negligible, adverse impacts to the Yuma clapper rail because the ROWs do not contain suitable nesting habitat and manual vegetation treatments and the use of vehicles would be restricted during the nesting season. In addition, the 2017 Herbicides BA has made the determination that the No Action Alternative "may affect, but is not likely to adversely affect" the Yuma clapper rail or its habitat.

Direct and Indirect Effects of the Proposed Action

The 2007 Final Programmatic BA (BLM 2007d) and the 2015 Final Programmatic BA (BLM 2015a) provided detailed analysis of potential impacts associated with the application of herbicides to the Yuma clapper rail (page 6-56 through pages 6-59 [BLM 2007d] and page 6-42 through pages 6-44 [BLM 2015a]). A description of the direct and indirect effects of herbicide treatments on the clapper rail and its suitable habitat are also presented in the 2017 Herbicides BA on pages 53 through 59 (BLM 2017). The detailed discussion of the analyses is not repeated here but is instead incorporated by reference and summarized in this section of the EA. The Proposed Action would not include any activities associated with herbicide application different from those analyzed in the 2007 and 2015 Herbicide PEIS BA. Consequently, there is no potential for new or greater short-term direct or indirect impacts on the Yuma clapper rail from the Proposed Action that have not been disclosed in prior environmental documentation.

Yuma clapper rails could be unintentionally sprayed by herbicides during application. If in the unlikely event that direct contact of herbicides with Yuma clapper rails would occur, only herbicides with a toxicity rating of

practically non-toxic would be used within the areas of suitable habitat in order to avoid any potential individual bird mortality. The clapper rail would more than likely fly away or retreat deeply into vegetation before an applicator could get close enough to spray it. Birds could come into contact with sprayed vegetation, and herbicides could be sprayed on insects that are, in turn, ingested by Yuma clapper rail. Implementation of SOPs listed above, including use of low toxicity herbicides, would minimize potential direct effects to prey species due to toxicity.

In the Proposed Action, herbicide treatments would be limited to spot applications to individual plants within the ROW, which would minimize overspray and avoid direct impacts to the Yuma clapper rail. Thinvert, a drift and drip reduction agent would be used to minimize surface runoff and any drift of herbicide onto non-target plants. Therefore, the Proposed Action would result in direct and indirect, short-term, negligible adverse impacts to the Yuma clapper rail because the potential for direct contact with the species would be unlikely and their suitable habitat of approximately 9.26 within the ROW would not be measurably disturbed. There would also be direct, long-term, negligible beneficial impacts to the Yuma clapper rail because the frequency of routine vegetation maintenance would decrease, which would reduce the presence of workers and noise from handheld equipment within suitable habitat. In addition, the 2017 Herbicides BA has made the determination that the Proposed Action "may affect, but is not likely to adversely affect" the Yuma clapper rail or its habitat.

DESERT PUPFISH

Direct and Indirect Effects of the No Action Alternative

A description of the direct and indirect effects on the desert pupfish from the No Action Alternative is presented in detail in the 2017 Herbicides BA on pages 60 through 64 (BLM 2017). There is no designated critical habitat within the ROW. The detailed discussion of the analyses on the potential effects from inspections and manual and mechanical treatments is not repeated here but is instead incorporated by reference and summarized below. The desert pupfish was reintroduced into Larry and Lousy Canyon creeks within the Agua Fria National Monument in the Hassayampa Field Office so the effects analysis focused on any potential direct and indirect effects to desert pupfish and their habitat in Larry or Lousy Canyon creeks. There are no ROWs crossing either creek. Two segments of the ROW are located approximately 1.25 miles and 0.4 miles upstream of the Lousy Canyon and Agua Fria River confluence. Another portion of the ROW occurs parallel to the Agua Fria River, 1.6 miles downstream of the Larry Creek and Agua Fria River confluence. This reach of the Agua Fria River is occupied by predacious and competitive nonnative fishes and is not considered suitable habitat for the desert pupfish. USFWS has determined potential impacts on desert pupfish in the Agua Fria River that may temporarily occur as a result of emigration from Larry or Lousy Canyon creeks do not need to be considered by other future actions (USFWS 1998b).

Under the No Action Alternative, no manual, mechanical, or DSAP vegetation maintenance treatments or ground inspection would occur near Larry or Lousy Canyon creeks because the ROW does not cross these creeks. No direct effects would occur to desert pupfish due to manual and mechanical vegetation treatments. No direct effects to desert pupfish due to aerial inspections would occur because aerial inspections occur high above the ground and fish aquatic habitats. The nearest ROW crosses 0.4 miles upstream of the confluence of Lousy Canyon and the Agua Fria River. It would be unlikely that any sedimentation that may result from manual or mechanical treatments would reach Lousy Canyon Creek, and Larry Creek is upstream from the vegetation treatment in the ROW. Therefore, there would be no direct or indirect impacts on the desert pupfish or its aquatic habitat from the No Action Alternative. The 2017 Herbicides BA has made the determination that the No Action Alternative "may affect, but is not likely to adversely affect" the desert pupfish or its habitat.

Direct and Indirect Effects of the Proposed Action

The 2007 Final Programmatic BA (BLM 2007d) and the 2015 Final Programmatic BA (BLM 2015a) provided detailed analysis of potential impacts associated with the application of herbicides to the desert pupfish (page 5-52 and pages 5-56 through 5-76 [BLM 2007d] and page 5-46 through pages 5-47 and pages 5-66 through 5-72 [BLM 2015a]). A description of the direct and indirect effects of herbicide treatments on the desert pupfish and its suitable habitat are also presented in the 2017 Herbicides BA on pages 60 through 64 (BLM 2017). The detailed discussion of the analyses is not repeated here but is instead incorporated by reference and summarized in this section of the EA. The Proposed Action would not include any activities associated with herbicide application different from those analyzed in the 2007 and 2015 Herbicide PEIS BA. Consequently, there is no potential for new or greater short-term direct or indirect impacts on the desert pupfish from the Proposed Action that have not been disclosed in prior environmental documentation.

The Proposed Action would not include any treatment of aquatic and riparian vegetation within Lousy Canyon and Larry creeks. Due to the distance from perennial aquatic habitat and implementation of SOPs, which minimize drift and surface run-off of herbicides, the likelihood of herbicides reaching riparian or aquatic habitat in Lousy Canyon or Larry creeks would be unlikely. Herbicide treatments could reduce the number of invertebrates, thereby reducing food availability. However, because no herbicide treatment is proposed near or within the two creeks, it would be doubtful that any potential decline in invertebrates from herbicide treatments would occur and there would be no measurable impact to food availability for the pupfish. Therefore, the Proposed Action would have no direct impacts to the desert pupfish and would have short-and long-term, indirect, negligible adverse impacts to the pupfish and its habitat. The 2017 Herbicides BA has made the determination that the Proposed Action “may affect, but is not likely to adversely affect” the desert pupfish or its habitat.

GILA CHUB

Direct and Indirect Effects of the No Action Alternative

A description of the direct and indirect effects on the Gila chub from the No Action Alternative is presented in detail in the 2017 Herbicides BA on pages 65 through 71 (BLM 2017). The detailed discussion of the analyses on the potential effects from inspections and manual and mechanical treatments is not repeated here but is instead incorporated by reference and summarized below. There is no designated critical habitat within the ROW. Natural and reintroduced populations of Gila chub occur in Silver, Larry, and Lousy Canyon creeks, all within the Agua Fria National Monument, Hassayampa Field Office. One portion of the ROW occurs near the Agua Fria River 0.4 miles and 1.25 miles respectively, upstream of the Lousy Canyon Creek and Agua Fria River confluence. Other segments of the ROW cross the Agua Fria River 0.28 mile downstream of the Silver Creek and Agua Fria confluence and again 1.6 miles downstream of the Larry Creek and Agua Fria River confluence. During high flow events, Gila chub may move from Silver, Larry, or Lousy Canyon creeks into the Agua Fria River and then move back to tributaries as stream flow subsides.

Under the No Action Alternative, no manual or mechanical vegetation maintenance treatments or ground inspection would occur near Silver, Larry, or Lousy Canyon creeks because the ROW does not cross these creeks. No direct effects would occur to Gila chub due to manual and mechanical vegetation treatments. There are no poles that require DSAP treatment within the ROW near the Agua Fria River. No direct effects to Gila chub due to aerial inspections would occur because aerial inspections occur high above the ground and fish aquatic habitats. The nearest ROW crosses 0.4 miles upstream of the confluence of Lousy Canyon and the Agua Fria River. Vegetation treatments are proposed near the Agua Fria River where Gila chub may occur during high water events, but this work would be far enough away from the river that potential effects to aquatic habitat from manual and mechanical treatment of vegetation would be unlikely. Treatment of riparian vegetation would

occur approximately 30 feet from the Aqua Fria River bank at its closest point and would be conducted using manual methods with vehicles that would remain on existing road in this area. This treatment of vegetation is far enough away that sedimentation from hand crew operations or reduction in cover from the removal of vegetation would be very small and not measurable.

Manual and mechanical vegetation treatments would not occur within critical habitat for Gila chub. The No Action Alternative maintenance activities in the ROW would occur a mile away from the chub's designated critical habitat. It would be unlikely that these vegetation treatments would result in any effects to Gila chub critical habitat primary constituent elements (PCEs) of water quality, food base, and cover because of the distance of the ROW from the chub's designated critical habitat. Therefore, there would be no direct impacts and there would be short- and long-term indirect, negligible adverse impacts on the Gila chub or its aquatic habitat from the No Action Alternative. The 2017 Herbicides BA has made the determination that the No Action Alternative "may affect, but is not likely to adversely affect" the Gila chub or its habitat.

Direct and Indirect Effects of the Proposed Action

The 2007 Final Programmatic BA (BLM 2007d) and the 2015 Final Programmatic BA (BLM 2015a) provided detailed analysis of potential impacts associated with the application of herbicides to the Gila chub (page 5-36 through 5-37 and pages 5-56 through 5-76 [BLM 2007d] and page 5-40 through pages 5-41 and pages 5-66 through 5-72 [BLM 2015a]). A description of the direct and indirect effects of herbicide treatments on the Gila chub and its suitable habitat are also presented in the 2017 Herbicides BA on pages 65 through 71 (BLM 2017). The detailed discussion of the analyses is not repeated here but is instead incorporated by reference and summarized in this section of the EA. The Proposed Action would not include any activities associated with herbicide application different from those analyzed in the 2007 and 2015 Herbicide PEIS BA. Consequently, there is no potential for new or greater short-term direct or indirect impacts on the Gila chub from the Proposed Action that have not been disclosed in prior environmental documentation.

Gila chub could be exposed to herbicides that enter aquatic habitats through off-site drift or surface runoff. Because herbicide treatment only involves spot application, drift potential would be reduced. Additionally, Thinvert would be used as a carrier in the herbicide mix, which minimizes drift and runoff. Vegetation along this portion of the ROW is sparse, which would limit the need for herbicide treatment. Implementation of species-specific SOPs would stipulate that low toxicity herbicides would be used to further reduce any potential effect to Gila chubs and the associated aquatic habitat. Herbicide treatments could also reduce the number of invertebrates, reducing food availability. However, herbicide treatment is small in scale with only a portion of ROW near the Agua Fria River and only limited quantities of sparse vegetation treated. If impacted, only small numbers of invertebrates would be affected and any potential effect to Gila chub food availability would be localized. Reduction of riparian vegetation could impact Gila chub through reduction in cover. However, no vegetation would be removed directly adjacent to Gila chub potentially suitable habitat in the Agua Fria River. Vegetation in this area is sparse and occurs 30 feet or more from the river bank high water mark. It is highly unlikely and discountable that any vegetation removed would impact Gila chub cover.

Herbicide vegetation treatments would not occur within critical habitat for Gila chub. The Proposed Action maintenance activities in the ROW would occur a mile away from the chub's designated critical habitat. It would be unlikely that the application of herbicides would result in any effects to Gila chub critical habitat PCEs of water quality, food base, and cover because of the distance of the ROW from the chub's designated critical habitat.

Therefore, the Proposed Action would have short-and long-term, direct and indirect, negligible adverse impacts to the Gila chub and its habitat. The 2017 Herbicides BA has made the determination that the Proposed Action "may affect, but is not likely to adversely affect" the Gila chub or its habitat.

GILA TOPMINNOW

Direct and Indirect Effects of the No Action Alternative

A description of the direct and indirect effects on the Gila topminnow from the No Action Alternative is presented in detail in the 2017 Herbicides BA on pages 72 through 76 (BLM 2017). The detailed discussion of the analyses on the potential effects from inspections and manual and mechanical treatments is not repeated here but is instead incorporated by reference and summarized below. Reintroduced populations of Gila topminnow occur in Larry and Lousy Canyon creeks, both within the Agua Fria National Monument, Hassayampa Field Office. One portion of the ROW occurs near the Agua Fria River 0.4 miles and 1.25 miles respectively, upstream of the Lousy Canyon and Agua Fria River confluence. Other segments of the ROW cross the Agua Fria River 0.28 mile downstream of the Silver Creek and Agua Fria confluence and again 1.6 miles downstream of the Larry Creek and Agua Fria River confluence. As previously noted in the discussion of potential impacts to the Gila chub, this reach of the Agua Fria River is not considered suitable habitat for the Gila topminnow. USFWS has determined potential impacts on Gila topminnow in the Agua Fria River that may temporarily occur as a result of emigration from Larry or Lousy Canyon creeks need not to be considered by other future actions.

Under the No Action Alternative, no manual, mechanical, or DSAP vegetation maintenance treatments or ground inspection would occur near Larry or Lousy Canyon creeks because the ROW does not cross these creeks. No direct effects would occur to Gila topminnow due to manual and mechanical vegetation treatments. No direct effects to Gila topminnow due to aerial inspections would occur because aerial inspections occur high above the ground and fish aquatic habitats. The nearest ROW crosses 0.4 miles upstream of the confluence of Lousy Canyon Creek and the Agua Fria River. At this location, the power line is high above the canyon bottom and it would be unlikely that sediment from mechanical and manual treatments of vegetation would enter the water of the Agua Fria River and then carry into Lousy Canyon Creek. Therefore, there would be no direct impacts and there would short- and long-term indirect, negligible adverse impacts on the Gila topminnow or its aquatic habitat from the No Action Alternative. The 2017 Herbicides BA has made the determination that the No Action Alternative "may affect, but is not likely to adversely affect" the Gila topminnow or its habitat.

Direct and Indirect Effects of the Proposed Action

The 2007 Final Programmatic BA (BLM 2007d) and the 2015 Final Programmatic BA (BLM 2015a) provided detailed analysis of potential impacts associated with the application of herbicides to the Gila topminnow (page 5-36 and pages 5-56 through 5-76 [BLM 2007d] and page 5-36 through pages 5-37 and pages 5-66 through 5-72 [BLM 2015a]). A description of the direct and indirect effects of herbicide treatments on the Gila topminnow and its suitable habitat are also presented in the 2017 Herbicides BA on pages 72 through 76 (BLM 2017). The detailed discussion of the analyses is not repeated here but is instead incorporated by reference and summarized in this section of the EA. The Proposed Action would not include any activities associated with herbicide application different from those analyzed in the 2007 and 2015 Herbicide PEIS BA. Consequently, there is no potential for new or greater short-term direct or indirect impacts on the Gila topminnow from the Proposed Action that have not been disclosed in prior environmental documentation.

Gila topminnow could be exposed to herbicides that enter aquatic habitats through off-site drift or surface runoff. Because herbicide treatment would only involve spot application, drift potential would be reduced. It would be unlikely that any herbicide would reach Larry and Lousy Canyon creeks because of the distance from perennial aquatic habitat and implementation of SOPs, which minimize drift and surface run-off of herbicides. Species-specific SOPs would stipulate that low toxicity herbicides would be used to further reduce any potential effect to Gila topminnows and the associated aquatic habitat. Herbicide treatments could also reduce the number of invertebrates, reducing food availability. If impacted, only small numbers of invertebrates would be affected and any potential effect to Gila topminnow food availability would be localized. Therefore, the

Proposed Action would have would have short-and long-term, direct and indirect, negligible adverse impacts to the Gila topminnow and its habitat. The 2017 Herbicides BA has made the determination that the Proposed Action "may affect, but is not likely to adversely affect" the Gila topminnow or its habitat.

LESSER LONG-NOSED BAT

Direct and Indirect Effects of the No Action Alternative

Under the No Action Alternative, routine aerial and ground inspections would be conducted along with manual and mechanical vegetation treatment methods within the ROW. A description of the direct and indirect effects on the lesser long-nosed bat and its foraging habitat from the No Action Alternative are presented in detail in the 2017 Herbicides BA on pages 77 through 82 (BLM 2017). The detailed discussion of the analyses on the potential effects from the No Action Alternative is not repeated here but is instead incorporated by reference and summarized in this section. No ROW exists in the immediate vicinity of known roost sites. In the 2017 Herbicides BA a 40-mile buffer was placed on known roost sites to determine which portion of the ROW occurs within probable lesser long-nosed bat foraging habitat. A total of 335.62 acres of ROW occurs in this species' foraging habitat within the Lower Sonoran and Tucson field offices.

Disturbance to bats from aerial and ground-based inspection and vegetation treatment activities would be unlikely because these bats actively forage in the evenings and at night, while the aerial and ground-based activities occur during the day. Lesser long-nosed bats depend on nectar plants for food. These nectar plants potentially occur within all the ROWs in lesser long-nosed bat foraging habitat. The No Action Alternative would include the removal and pruning of select columnar cacti, mostly saguaros. Agaves would also be removed around 18 distribution poles that would receive DSAP treatment. The removal of columnar cacti and agave would affect the lesser long-nosed bat's food source, but many agave and columnar cacti plants would remain in the ROWs. Maintenance treatment of these plants would only occur within a small portion of this species' foraging range and the number of plants affected would not result in perceptible consequence to individual lesser long-nosed bats or the population as a whole. Therefore, the No Action Alternative would result in direct and indirect, short- and long-term, negligible, adverse impacts to the lesser long-nosed bat and the species' associated foraging habitat. In addition, the 2017 Herbicides BA has made the determination that the No Action Alternative "may affect, but is not likely to adversely affect" lesser long-nosed bat or its foraging habitat.

Direct and Indirect Effects of the Proposed Action

In addition to the short-term effects associated with the No Action Alternative described above, the Proposed Action would also result in impacts on the lesser long-nosed bat and its foraging habitat from the use of herbicides as part of the management of incompatible vegetation within the ROW. The 2007 Final Programmatic BA (BLM 2007d) and the 2015 Final Programmatic BA (BLM 2015a) provided detailed analysis of potential impacts associated with the application of herbicides to the southwestern willow flycatcher (page 6-109 through pages 6-113 [BLM 2007d] and page 6-77 through pages 6-80 [BLM 2015a]). A description of the direct and indirect effects of herbicide treatments on the lesser long-nosed bat and its designated critical habitat are also presented in the 2017 Herbicides BA on pages 77 through 82 (BLM 2017). The detailed discussion of the analyses is not repeated here but is instead incorporated by reference and summarized in this section of the EA. The Proposed Action would not include any activities associated with herbicide application different from those analyzed in the 2007 and 2015 Herbicide PEIS BA. Consequently, there is no potential for new or greater short-term direct or indirect impacts on the lesser long-nosed bat from the Proposed Action that have not been disclosed in prior environmental documentation.

Direct effects to bats could occur if nectar, pollen, and/or fruit was contacted or ingested after spraying with 2,4-D or diuron at the typical application rate, or with bromacil, glyphosate, hexazinone, or tebuthiuron at the

maximum application rate. Direct spraying of lesser long-nosed bats is unlikely because they roost in covered areas and actively forage in the evenings, while herbicide treatment work activities would be conducted during the day. It is possible that agave or columnar cacti could be affected through off-target drift of herbicides. Implementation of the SOPs would help to reduce any impacts to these forage plants as well as minimizing drift. The proposed herbicide application would also be small in scale, thereby affecting only scattered individual plants within 542.51 acres of foraging habitat. While combustible-free space treatment would also occur within lesser long-nosed bat foraging habitat, the treatment would be conducted on mineral soil using hand methods and application of pre-emergent herbicides. Therefore, there would be direct and indirect, short- and long-term, negligible adverse impacts to the lesser long-nosed bat because the Proposed Action would not result in perceptible consequence to individual lesser long-nosed bats or the population as a whole. In addition, the 2017 Herbicides BA has made the determination that the Proposed Action "may affect, but is not likely to adversely affect" lesser long-nosed bat or its foraging habitat.

OCELOT

Direct and Indirect Effects of the No Action Alternative

Under the No Action Alternative, routine aerial and ground inspections would be conducted along with manual, mechanical, and DSAP vegetation treatment methods within the ROW. A description of the direct and indirect effects on the ocelot and its suitable habitat from the No Action Alternative are presented in detail in the 2017 Herbicides BA on pages 83 through 86 (BLM 2017). The detailed discussion of the analyses on the potential effects from the No Action Alternative is not repeated here but is instead incorporated by reference and summarized in this section. There is no designated or proposed critical habitat for the ocelot within the ROWs. There are 79.17 acres of ROW within potentially suitable habitat and approximately 15 poles (0.11 acres) that may require DSAP treatment in ocelot potentially suitable habitat the Tucson Field Office.

Vegetation along the ROW within potential suitable ocelot habitat is sparse and would require minimal manual and mechanical vegetation treatment. Ocelots are nocturnal carnivores that inhabit dense vegetative cover. It would be unlikely that the No Action Alternative would have direct impacts to ocelots since vegetation inspection and maintenance activities would occur during day time hours. Ocelots' prey consists primarily of rabbits, rodents, birds, and lizards. There would be no direct or indirect impacts to prey species since the ROW has been continuously maintained and habitat values for these prey species would not change with the No Action Alternative over existing conditions. Therefore, there would be no short-term direct or indirect impacts and no long-term direct impacts to the ocelot or its habitat from the No Action Alternative. There would be long-term indirect, negligible beneficial impacts because woody vegetation would not be allowed to grow, which would improve the suitable habitat for the ocelot. In addition, the 2017 Herbicides BA has made the determination that the No Action Alternative "may affect, but is not likely to adversely affect" ocelots or its habitat.

Direct and Indirect Effects of the Proposed Action

In addition to the long-term effects associated with the No Action Alternative described above, the Proposed Action would also result in impacts on the ocelot and its habitat from the use of herbicides as part of the management of incompatible vegetation within the ROW. The 2007 Final Programmatic BA (BLM 2007d) and the 2015 Final Programmatic BA (BLM 2015a) provided detailed analysis of potential impacts associated with the application of herbicides to the ocelot (page 6-113 through page 6-116 [BLM 2007d] and page 6-80 through page 6-82 [BLM 2015a]). A description of the direct and indirect effects of herbicide treatments on the ocelot and its designated critical habitat are also presented in the 2017 Herbicides BA on pages 101 through 103 (BLM 2017). The detailed discussion of the analyses is not repeated here but is instead incorporated by reference and

summarized in this section of the EA. The Proposed Action would not include any activities associated with herbicide application different from those analyzed in the 2007 and 2015 Herbicide PEIS BA. Consequently, there is no potential for new or greater short-term direct or indirect impacts on the ocelot from the Proposed Action that have not been disclosed in prior environmental documentation.

An ocelot coming into direct contact with vehicles, crew workers, or equipment associated with herbicide application or in contact with the herbicide itself would be unlikely. Herbicide treatments would occur during the daytime with minimal quantities of herbicide applied to the ROW's sparse vegetation and ocelots are nocturnal. Ocelots could ingest prey that has come into contact with herbicide. No predator or rodent pesticide control agents would be used as part of the Proposed Action. All herbicides selected would be low in toxicity to predatory mammals. It would be unlikely for prey to consume herbicides and then be ingested soon thereafter by an ocelot. The frequency of the herbicide treatment in the Proposed Action would become less often than the No Action Alternative. Therefore, there would be no short-term direct or indirect impacts and no long-term direct impacts to the ocelot or its habitat from the Proposed Action. Similar to the No Action Alternative, over the long-term there would be indirect, negligible beneficial impacts because woody vegetation would not be allowed to grow, which would improve the suitable habitat for the ocelot. In addition, the 2017 Herbicides BA has made the determination that the Proposed Action "may affect, but is not likely to adversely affect" ocelots or its habitat.

SONORAN PRONGHORN

Direct and Indirect Effects of the No Action Alternative

Under the No Action Alternative, routine aerial and ground inspections would be conducted along with manual, mechanical, and DSAP vegetation treatment methods within the ROW. A description of the direct and indirect effects on the Sonoran pronghorn and its suitable habitat from inspections and routine vegetation maintenance treatments are presented in detail in the 2017 Herbicides BA on pages 87 through 91 (BLM 2017). The detailed discussion of the analyses on the potential effects form the No Action Alternative is not repeated here but is instead incorporated by reference and summarized below.

There are a total of 6,277.09 acres of ROW in Sonoran pronghorn experimental, nonessential population area on BLM-managed lands which is 0.25 percent of the total Sonoran pronghorn experimental, nonessential population area on BLM-managed lands. There are poles along most of the distribution lines within thenonessential population area with an estimated 140[33] poles that may receive DSAP treatment. Outside the experimental, nonessential population area for Sonoran pronghorn, an endangered population of pronghorn called the Cabeza Prieta population is located within the Lower Sonoran Field Office. There are 19.77 acres of power line ROW with the Cabeza Prieta endangered population and the ROWs account for 0.02 percent of the endangered population on BLM-managed lands. There are 20 poles with 0.14 acres within the Cabeza Prieta endangered population for Sonoran pronghorn that may require DSAP treatment.

Displacement of individual pronghorns from foraging may occur due to disturbance associated with crew workers, vehicles including ATVs, chainsaw use, and aerial inspections. Indirect habitat impacts to foraging areas would be localized and undetectable because the ROW is already open terrain from past continuous vegetation

[33] Numbers of poles with equipment that can spark are estimated and represent and over-estimate. GIS analysis was used to obtain these numbers using a dataset with all distribution equipment. Each type of equipment (e.g., transformers, fuses, switches, and capacitor banks) is recorded as a single point. This point data was used to estimate the number of poles with equipment. However, there may be multiple pieces of equipment on a single pole, so a single pole may be recorded multiple times using the equipment point data. Approximately 140 pieces of equipment on BLM lands within Sonoran pronghorn experimental nonessential population habitat could spark which represents an overestimate of poles. When the numbers are recalculated using only transformers, which are the most prevalent piece of equipment that could spark, there are approximately 109 poles within experimental nonessential population habitat on BLM lands.

management. Only a relatively small percent of suitable habitat, 0.07 percent and 0.02 percent of the nonessential and endangered populations, respectively would potentially be affected by vegetation maintenance activities. The lower growing shrubs, grasses, and forbs would remain untreated in the ROW. Therefore, the No Action Alternative would result in direct and indirect, short- and long-term negligible, adverse impacts to the Sonoran pronghorn experimental, nonessential population and the Cabeza Prieta population and its habitat. The proposed action "may affect, but is not likely to adversely affect" the Cabeza Prieta population of Sonoran pronghorn or its habitat.

Direct and Indirect Effects of the Proposed Action

In addition to the short-term effects associated with the No Action Alternative described above, the Proposed Action would also result in impacts on the Sonoran pronghorn experimental, non-essential and Cabeza Prieta populations from the use of herbicides as part of the management of incompatible vegetation within the ROW. The 2007 Final Programmatic BA (BLM 2007d) and the 2015 Final Programmatic BA (BLM 2015a) provided detailed analysis of potential impacts associated with the application of herbicides to the Sonoran pronghorn (page 6-116 through pages 6-119 [BLM 2007d] and pages 6-82 through 6-84 [BLM 2015a]). A description of the direct and indirect effects of herbicide treatments on the Sonoran pronghorn experimental, non-essential and endangered population areas are also presented in the 2017 Herbicides BA on pages 87 through 91 (BLM 2017). The detailed discussion of the analyses is not repeated here but is instead incorporated by reference and summarized in this section of the EA. The Proposed Action would not include any activities associated with herbicide application different from those analyzed in the 2007 and 2015 Herbicide PEIS BA. Consequently, there is no potential for new or greater short-term direct or indirect impacts on the Sonoran pronghorn or its suitable habitat from the Proposed Action that have not been disclosed in prior environmental documentation.

No direct spray to Sonoran pronghorn is expected. During herbicide application operations, pronghorns would likely leave the work area and remain away while workers are present. Since pronghorns are a large, readily visible species, the likelihood of accidentally spraying a Sonoran pronghorn is low. The selected BLM-approved herbicides are slightly toxic and could have adverse health effects to Sonoran pronghorn when applied at the typical application rate, if ingested. The use of Thinvert would allow for low volume applications, thereby minimizing the quantity of active ingredients used. Additionally, only a small portion of the ROW would be treated with herbicide, and individual plants would have targeted spot treatments. It is highly unlikely that the Sonoran pronghorn would have adverse effects from ingesting plants sprayed with herbicides. Herbicide treatments could reduce the cover of forage in Sonoran pronghorn habitat. However, herbicide application targets only vegetation already maintained through current vegetation management practices. Therefore, the Proposed Action would result in direct and indirect, short- and long-term negligible, adverse impacts to the Sonoran pronghorn experimental, nonessential population and the Cabeza Prieta population and its habitat. In addition, the 2017 Herbicides BA has made the determination that the Proposed Action "may affect, but is not likely to adversely affect" the experimental, nonessential population of Sonoran pronghorn or its habitat.

ACUÑA CACTUS

Direct and Indirect Effects of the No Action Alternative

Under the No Action Alternative, routine aerial and ground inspections would be conducted along with manual and DSAP vegetation treatment methods within the ROW. A description of the direct and indirect effects on the acuña cactus and its critical habitat from inspections and routine vegetation maintenance treatments are presented in detail in the 2017 Herbicides BA on pages 92 through 99 (BLM 2017). The detailed discussion of the analyses on the potential effects form the No Action Alternative is not repeated here but is instead incorporated by reference and summarized below.

The ROW crosses 1.12 acres of designated critical habitat within the Lower Sonoran Field Office. There are five poles with equipment that could spark within critical habitat for which DSAP treatment would be considered, totaling 0.036 acres. Conducting pretreatment cactus surveys, flagging acuña cactus and nurse plants[34], if present, using manual methods for incompatible vegetation management, and limiting vehicle and ATV use to established roads in acuña cactus critical and suitable habitats would minimize potential direct impacts to acuña cacti. Mechanical vegetation treatments would not occur in acuña cactus habitat. Implementing these and other species-specific SOPs would minimize any potential to affect habitat loss or degradation due to manual treatments. Manual treatments would have the potential to modify the local plant community within ROWs. However, the modification would be localized and would affect only a small number of plants at any treatment site within the ROW.

Only a portion of the ROW in designated critical habitat is covered by vegetation and some of that vegetation would be targeted for manual treatment. Native vegetation such as palo verde trees can typically provide protection to the acuña cactus. In the No Action Alternative, the native tree would remain (in some circumstances, limited pruning may be needed of the nurse plant). However, native plant species would be removed that are not already protecting acuña cacti and indirect effects may result from the loss of future nurse plants within the 1.12 acres of acuña cactus critical habitat. As taller growing vegetation is removed in the ROW, the treatment may provide open areas that would encourage acuña cactus seed germination. The No Action Alternative may result in beneficial effects associated with seed dispersal and germination of the cactus within the ROWs. Any cactus found within the non-combustible area associated with the 0.036 acres around DSAP treatment areas would remain and not be removed. Therefore, the No Action Alternative would result in short- and long-term direct, negligible, adverse impacts because even though the acuña cactus is not a target plant, vegetation treatments would be completed on vegetation that provides protective cover to the cactus. Implementation of SOPs including pre-work surveys to locate, flag, and avoid this cactus would help reduce the potential for direct impacts to the acuña cactus. Additionally, vehicles and ATV would be limited to existing established roads to minimize any potential for crushing the acuña cactus. Short- and long-term indirect, minor adverse impacts to the acuña cactus critical habitat may occur from the potential loss of vegetation that provides protection and cover as well as future nurse plants within acuña cactus critical habitat. The 2017 Herbicides BA has made the determination that the No Action Alternative "may affect, and is likely to adversely affect" the acuña cactus and its critical habitat.

Direct and Indirect Effects of the Proposed Action

In addition to the effects associated with the No Action Alternative described above, the Proposed Action would also result in impacts on the acuña cactus and its designated critical habitat from the use of herbicides as part of the management of incompatible vegetation within the ROW. The 2015 Final Programmatic BA (BLM 2015a) provided detailed analysis of potential impacts associated with the application of herbicides to the acuña cactus on pages 4-37 through 4-38 and pages 4-123 through 4-132 [BLM 2015a]). A description of the direct and indirect effects of herbicide treatments on the cactus and designated critical habitat are also presented in the 2017 Herbicides BA on pages 87 through 91 (BLM 2017). The detailed discussion of the analyses is not repeated here but is instead incorporated by reference and summarized in this section of the EA. The Proposed Action would not include any activities associated with herbicide application different from those analyzed in the 2015 Herbicide PEIS BA. Consequently, there is no potential for new or greater short-term direct or indirect impacts on the acuña cactus and its suitable habitat from the Proposed Action that have not been disclosed in prior environmental documentation.

[34] Nurse plants are those that facilitate the growth and development of other plant species beneath their canopy because they offer conditions that are more favorable for seed germination and/or plant growth than the surrounding environment.

Acuña cactus could be directly exposed to herbicides including the potential for direct spray of plants, off-site drift, and surface runoff. Effects associated with herbicide exposure may include mortality and reduced growth. However, these direct effects would be reduced because of the establishment of buffers around acuña cacti and their nurse plants based on pretreatment cacti surveys, a low-volume, targeted approach to herbicide application, the use of Thinvert as a carrier to minimizes herbicide drift onto non-target plants and drip to the soil and underlying plants, and restricting vehicles and ATVs to existing roads. If during a survey, acuña cacti were found in the DSAP combustible free space, the cactus would be left on site and no herbicide would be used for DSAP treatment. Because herbicides would only be applied if no acuña cacti were present within the DSAP treatment area and acuña cactus would be left in the DSAP area, it is anticipated that herbicide application for DSAP would have no direct effect on acuña cactus.

Indirect effects to acuña cactus could come from herbicide treatments conducted within cactus habitat because of the potential to modify the local plant community within the ROW. However, applications would be localized and would affect only a small number of plants at any given treatment site. The use of Thinvert as an additive to the spray mixture would further reduce drift and runoff beyond the target vegetation. Impacts to acuña cactus habitat are anticipated to be minimal and therefore negligible.

Herbicide treatments are proposed within 1.12 acres of ROWs that occur in acuña cactus critical habitat in addition to the five poles within acuña cactus critical habitat that could receive 0.036 acres of DSAP treatment. The Proposed Action treatments would be limited to select manual removal of vegetation and spot application to individual plants and DSAP treatments around select power poles over a very small portion of acuña cactus critical habitat. Herbicide would not be applied for DSAP treatment if acuña cactus occurs within the DSAP treatment area. In addition, the use of vehicles would be restricted to existing roads; only a portion of the ROWs are covered with vegetation that would be targeted with manual and herbicide treatments; drift and drip reduction agents would be used to minimize drift onto non-target plants; and only herbicides with a low toxicity to pollinators would be used. The Proposed Action would not affect soil type, composition, or slope. Any adverse effects to acuña cactus critical habitat would be relatively small in scale and localized. Some native vegetation would continue to be removed though nurse plants would remain untreated or pruned in some circumstances.

Therefore, the Proposed Action would result in short- and long-term, direct, negligible, adverse impacts because even though the acuña cactus is not a target plant, vegetation treatments would be completed on vegetation that provides protective cover to the cactus. Implementation of SOPs including pre-work surveys to locate, flag, and avoid this cactus would help reduce the potential for direct impacts to the acuña cactus. Additionally, vehicles and ATV would be limited to existing established roads to minimize any potential for crushing the acuña cactus. Short- and long-term, indirect, minor, adverse impacts to the acuña cactus may occur from the potential loss of vegetation that provides protection and cover as well as future nurse plants within acuña cactus critical habitat. The 2017 Herbicides BA has made the determination that the Proposed Action “may affect, and is likely to adversely affect” the acuña cactus and its critical habitat.

ARIZONA HEDGEHOG CACTUS

Direct and Indirect Effects of the No Action Alternative

Under the No Action Alternative, routine aerial and ground inspections would be conducted along with manual vegetation treatment methods within the ROW. A description of the direct and indirect effects on the Arizona hedgehog cactus and its potentially suitable habitat from the No Action Alternative are presented in detail in the 2017 Herbicides BA on pages 100 through 105 (BLM 2017). The detailed discussion of the analyses on the potential effects from the No Action Alternative is not repeated here but is instead incorporated by reference and summarized in this section. Potentially suitable Arizona hedgehog cactus habitat occurs on 39.1 acres of

ROW within the Lower Sonoran Field Office. Within these ROWs, there are four poles totaling 0.03 acres in potentially suitable Arizona hedgehog cactus habitat that may be considered for DSAP treatment. BLM has identified over 300,000 acres of potential habitat for the Arizona hedgehog cactus on public lands in east-central and southeastern Arizona (BLM PEIS BA 2015, page 4-32).

Conducting pretreatment cactus surveys, flagging Arizona hedgehog cacti and nurse plants, if present, using manual methods for incompatible vegetation management, and limiting vehicle and ATV use to established roads in potentially suitable habitats would minimize direct impacts to Arizona hedgehog cacti. Mechanical vegetation treatments would not be used in the ROW containing potentially suitable habitat. Implementing these and other species-specific SOPs would minimize any potential to affect habitat loss or degradation due to manual treatments. Manual treatments would have the potential to modify the local plant community within the ROW, however, treatments would be localized and affect only a small number of plants at any given treatment site with only 39.1 acres of ROW (0.013 percent of estimated potential suitable habitat) within potentially suitable habitat for Arizona hedgehog cactus on BLM-managed lands. In the No Action Alternative, the nurse plants associated with Arizona hedgehog cacti would be left untreated or in some circumstances, limited pruning may be needed. Any cactus found within the non-combustible area associated with the 0.03 acres around DSAP treatment areas would remain and not be removed. Therefore, the No Action Alternative would result in direct and indirect, short- and long-term negligible, adverse impacts to Arizona hedgehog cactus and its habitat. In addition, the 2017 Herbicides BA has made the determination that the Proposed Action "may affect, but is not likely to adversely affect" the Arizona hedgehog cactus or its habitat.

Direct and Indirect Effects of the Proposed Action

In addition to the short-term effects associated with the No Action Alternative described above, the Proposed Action would also result in impacts on the Arizona hedgehog cactus and its potentially suitable habitat from the use of herbicides as part of the management of incompatible vegetation within the ROW. The 2007 Final Programmatic BA (BLM 2007d) and the 2015 Final Programmatic BA (BLM 2015a) provided detailed analysis of potential impacts associated with the application of herbicides to this cacti (page 4-26 and pages 4-98 through 4-134 [BLM 2007d] and pages 4-32 through page 4-33 and pages 4-123 through 4-132 [BLM 2015a]). A description of the direct and indirect effects of herbicide treatments on the cacti and its designated critical habitat are also presented in the 2017 Herbicides BA on pages 100 through 105 (BLM 2017). The detailed discussion of the analyses is not repeated here but is instead incorporated by reference and summarized in this section of the EA. The Proposed Action would not include any activities associated with herbicide application different from those analyzed in the 2007 and 2015 Herbicide PEIS BA. Consequently, there is no potential for new or greater short-term direct or indirect impacts on the Arizona hedgehog cactus from the Proposed Action that have not been disclosed in prior environmental documentation.

Avoiding the use herbicides with prolonged soil residual activity such as picloram, establishment of buffers around flagged cactus or clumps of cacti, and the application of targeted herbicide treatments would reduce any potential direct effects to Arizona hedgehog cacti by the Proposed Action. Additional species-specific SOPs would restrict vehicles and ATVs to existing roads and prohibit ATVs from driving off-road within the ROW where there is suitable habitat would also minimize direct impacts to cacti. Herbicide treatments conducted within Arizona hedgehog cactus habitat would have the potential to modify the local plant community within the ROW. However, treatments would be localized and affect only a small number of plants at any given treatment site. For herbicide application, the use of Thinvert to minimize any drifting of herbicide onto non-target plants and drip to the soil and underlying plants.

As previously noted, there are currently four poles with 0.03 acres in Arizona hedgehog cactus potentially suitable habitat within the ROW that meet the DSAP treatment criteria. However, if, during pretreatment

survey, Arizona hedgehog cacti are found, the cactus would be left on site and no herbicide would be applied for the treatment of the DSAP area. The potential direct effects are expected to be localized and not measurable because only 0.03 acres occur within potentially suitable habitat, some of which may not be occupied. Therefore, the Proposed Action would result in direct and indirect, short- and long-term negligible, adverse impacts to the Arizona hedgehog cactus. In addition, the 2017 Herbicides BA has made the determination that the Proposed Action "may affect, but is not likely to adversely affect" the Arizona hedgehog cactus or its habitat.

HUACHUCA WATER-UMBEL

Direct and Indirect Effects of the No Action Alternative

Under the No Action Alternative, routine aerial and ground inspections would be conducted along with manual treatment methods within the ROW. A description of the direct and indirect effects on the Huachuca water-umbel and its critical habitat from inspections and routine vegetation maintenance treatments are presented in detail in the 2017 Herbicides BA on pages 106 through 112 (BLM 2017). The detailed discussion of the analyses on the potential effects form the No Action Alternative is not repeated here but is instead incorporated by reference and summarized below.

The ROW crosses 0.06 acres within designated critical habitat within the San Pedro Riparian National Conservation Area in the Tucson Field Office. There are no poles with equipment that could spark within critical habitat for which DSAP treatment would be considered. Mechanical vegetation treatments would not occur in Huachuca water-umbel habitat. Conducting pretreatment Huachuca water-umbel surveys and using manual methods for incompatible vegetation management in Huachuca water-umbel critical and suitable habitats would minimize potential direct impacts to Huachuca water-umbel. Implementing these and other species-specific SOPs would minimize any potential to affect habitat loss or degradation due to manual treatments. During ground inspections and manual vegetation treatment, vehicles would remain on existing established roads and would not come within or near the San Pedro River riparian area. Manual treatment of vegetation would be conducted by walking to the treatment area. Crews would be supplied with Huachuca water-umbel identification information to minimize stepping on the plant. While it is possible that a plant may be stepped on, the plant is likely to survive. The ROW has been continually maintained using hand removal and pruning operations and any change in vegetation following future manual treatment would be minimal and localized within the 0.06 acres of potentially suitable habitat within the ROW.

Under the No Action Alternative, the manual cutting of vegetation within designated critical habitat within the ROW would not result in any change to San Pedro River flow, substrate, flooding, and refugial sites. The manual treatment of riparian vegetation could slightly affect stream bank stability over the short-term. The treatment of riparian vegetation may slightly change the riparian plant community. However, the ROW has been continually maintained over time and already presents a varied community compared to adjacent riparian vegetation. The ROW is narrow, with only 0.06 acres of Huachuca water-umbel critical habitat. Potential effects are isolated to a small area with very little change to existing riparian plant community. Therefore, the No Action Alternative would result in direct and indirect, short- and long-term negligible, adverse impacts to the Huachuca water-umbel and its habitat. The 2017 Herbicides BA has made the determination that the No Action Alternative "may affect, but is not likely to adversely affect" the Huachuca water-umbel and its critical habitat.

Direct and Indirect Effects of the Proposed Action

In addition to the effects associated with the No Action Alternative described above, the Proposed Action would also result in impacts on the Huachuca water-umbel and its designated critical habitat from the use of herbicides as part of the management of incompatible vegetation within the ROW. The 2007 Final Programmatic BA (BLM 2007d) and the 2015 Final Programmatic BA (BLM 2015a) provided detailed analysis of potential impacts

associated with the application of herbicides to the water-umbel (page 4-24 and pages 4-98 through 4-134 [BLM 2007d] and page 4-30 and pages 4-123 through 4-132 [BLM 2015a]). A description of the direct and indirect effects of herbicide treatments on the Huachuca water-umbel and its designated critical habitat are also presented in the 2017 Herbicides BA on pages 106 through 112 (BLM 2017). The detailed discussion of the analyses is not repeated here but is instead incorporated by reference and summarized in this section of the EA. The Proposed Action would not include any activities associated with herbicide application different from those analyzed in the 2007 and 2015 Herbicide PEIS BA. Consequently, there is no potential for new or greater short-term direct or indirect impacts on the Huachuca water-umbel from the Proposed Action that have not been disclosed in prior environmental documentation.

Huachuca water-umbel could be directly exposed to herbicides. However, these direct effects would be minimized because foliar applications of herbicide would not be carried out within 50 feet of the edge of the waterbody or wetland, within 1 mile upstream, and within 300 feet downstream of Huachuca water-umbel occupied habitat. Only cut stump or basal treatment techniques would be used within the above-mentioned buffers. Herbicide applications would be limited to spot treatments of individual plants within the ROW and would be applied in a manner that reduces drip, drift, and runoff. Herbicides with a low toxicity to pollinators would be used and those that require uptake by plant roots would not be used.

As noted in the No Action Alternative, the existing vegetation has been routinely treated over time and already presents a varied community compared to adjacent riparian vegetation. The ROW is narrow, with only 0.06 acres of Huachuca water-umbel critical habitat. Potential effects are isolated to a small area with very little change expected to occur over the long-term to the existing riparian plant community. The Proposed Action would not result in changes to San Pedro River flow, substrate, flooding, and refugial sites. Stream bank stability should improve as native grasses, forbs, and small shrubs are established over time with the use of herbicides as part of the routine vegetation management program.

Therefore, the Proposed Action would result in direct and indirect, short- and long-term negligible, adverse impacts to the Huachuca water-umbel and its habitat. The 2017 Herbicides BA has made the determination that the Proposed Action "may affect, but is not likely to adversely affect" the Huachuca water-umbel and its critical habitat.

PEEBLES NAVAJO CACTUS

Direct and Indirect Effects of the No Action Alternative

Under the No Action Alternative, routine aerial and ground inspections would be conducted along with manual and mechanical vegetation treatment methods within the ROW. A description of the direct and indirect effects on the Peebles Navajo cactus and its suitable habitat from the No Action Alternative are presented in detail in the 2017 Herbicides BA on pages 113 through 117 (BLM 2017). The detailed discussion of the analyses on the potential effects from the No Action Alternative is not repeated here but is instead incorporated by reference and summarized in this section. Potentially suitable Peebles Navajo cactus habitat occurs on 13.58 acres of ROW within the Tanner Wash ACEC in the Safford Field Office. Within ROW, there are no poles requiring DSAP treatment. Only four acres of ROW has any vegetation consisting of very sparse tamarisk and camelthorn. The rest of the acres have no vegetation requiring manual or mechanical treatments. The tamarisk occurs within a small wash, which is not suitable habitat for Peebles Navajo cactus.

Conducting pretreatment Peebles Navajo cactus surveys, flagging any cacti located within the ROW, and limiting vehicle and ATV use to established roads in potentially suitable habitat would minimize direct impacts to the cacti. Implementing these and other species-specific SOPs would minimize any potential to affect habitat loss or degradation due to vegetation maintenance treatments. In the No Action Alternative, any nurse plants

associated with Peebles Navajo cacti would be left untreated or in some circumstances, limited pruning may be needed. Therefore, the No Action Alternative would result in direct and indirect, short- and long-term negligible, adverse impacts to Peebles Navajo cactus and its habitat. In addition, the 2017 Herbicides BA has made the determination that the No Action Alternative "may affect, but is not likely to adversely affect" the Peebles Navajo cactus or its habitat.

Direct and Indirect Effects of the Proposed Action

In addition to the effects associated with the No Action Alternative described above, the Proposed Action would also result in impacts on the Peebles Navajo cactus and its suitable habitat from the use of herbicides as part of the management of incompatible vegetation within the ROW. The 2007 Final Programmatic BA (BLM 2007d) and the 2015 Final Programmatic BA (BLM 2015a) provided detailed analysis of potential impacts associated with the application of herbicides to this cacti (page 4-32 and pages 4-98 through 4-134 [BLM 2007d] and pages 4-39 through page 4-40 and pages 4-123 through 4-132 [BLM 2015a]). A description of the direct and indirect effects of herbicide treatments on the cacti and its designated critical habitat are also presented in the 2017 Herbicides BA on pages 113 through 117 (BLM 2017). The detailed discussion of the analyses is not repeated here but is instead incorporated by reference and summarized in this section of the EA. The Proposed Action would not include any activities associated with herbicide application different from those analyzed in the 2007 and 2015 Herbicide PEIS BA. Consequently, there is no potential for new or greater short-term direct or indirect impacts on the Peebles Navajo cactus from the Proposed Action that have not been disclosed in prior environmental documentation.

Avoiding the use herbicides with prolonged soil residual activity such as picloram and tebuthiuron, establishment of buffers around flagged cactus or clumps of cacti, and prohibiting the use of herbicides within 20 feet around any cacti would reduce any potential direct effects to Peebles Navajo cacti by the Proposed Action. Additional species-specific SOPs which would restrict vehicles and ATVs to existing roads and prohibit ATVs from driving off-road within the ROW where there is suitable habitat would also minimize direct impacts to cacti. Additionally, the use of Thinvert would minimize any herbicide drift onto non-target plants and drip to the soil and underlying plants. It also would allow for low volume application, minimizing the volume of liquid applied and active ingredient used within the ROW. Because vegetation is very sparse in this location of the ROW, the amount of herbicide applied would be very minimal.

Indirect effects to Peebles Navajo cactus habitat would include the removal of nonnative species, most notably camelthorn, that have been identified as a potential threat to the cacti. Camelthorn is a hardy, aggressive species that has been known to come up through roadways and concrete. This invasive species is not a clearance concern for the power line wires but treatment of camelthorn may be needed to protect the power line infrastructure from potential damage from this aggressive, invasive plant. The proposed treatment of camelthorn would provide a benefit to Peebles Navajo cactus and its habitat. Therefore, the Proposed Action would result in direct and indirect, short- and long-term negligible, adverse impacts to the Peebles Navajo cactus. In addition, the 2017 Herbicides BA has made the determination that the Proposed Action "may affect, but is not likely to adversely affect" the Peebles Navajo cactus or its habitat.

NORTHERN MEXICAN GARTERSNAKE

Direct and Indirect Effects of the No Action Alternative

Under the No Action Alternative, routine aerial and ground inspections would be conducted and manual and mechanical methods would be used to maintain vegetation within the ROW. A description of the direct and indirect effects on the northern Mexican gartersnake and its proposed critical habitat from inspections and vegetation maintenance treatments are presented in detail in the 2017 Herbicides BA on pages 118 through

130 (BLM 2017). There would be no DSAP maintenance treatment within the portion of the ROW suitable for the gartersnake. Approximately 73.58 acres of ROW occur within northern Mexican gartersnake proposed critical habitat within the Hassayampa, Lake Havasu, and Tucson Field Offices. Of this, the majority (67.18 acres) of the proposed critical habitat occurs in the Agua Fria River. There is 2.42 acres of ROW within suitable habitat and upland habitat along the San Pedro River. The detailed discussion of the analyses on the potential effects from inspections and vegetation maintenance treatment is not repeated here but is instead incorporated by reference and summarized below.

Aerial inspections would occur annually for portions of the ROW, and potential direct effects to the northern Mexican gartersnake from helicopter inspections would be unlikely because the flights are at a high enough distance off the ground that a flight response from gartersnake would not be measurable. Potential impacts from ground inspections and vegetation management treatments in upland habitats could result in the injury or death of northern Mexican gartersnakes by vehicles or large equipment. Vehicle and large equipment use would be restricted as described in the species-specific SOPs. In the No Action Alternative, routine vegetation maintenance in northern Mexican gartersnake suitable habitat would only be performed by hand crews as identified by SOPs as noted in Section 2.2.7 above. In suitable upland habitat, northern Mexican gartersnakes could occur during gestation, brumation[35], or during migration. If northern Mexican gartersnakes are present in upland habitat during brumation, then the snakes are likely to be located in hollows created by rocks or downed debris and not in the vegetation being cut. Because the work would be conducted on foot with no large machinery, any potential effects to northern Mexican gartersnake due to routine vegetation maintenance work in upland habitat would be minimal.

In suitable riparian habitat, northern Mexican gartersnakes could potentially be found basking on shrubs or on saplings to be cut, though this may be unlikely in such a small portion of riparian suitable habitat in the ROW. If the gartersnake does not flee from the work area, then a crew member would move the gartersnake to a safe location according to protocols provided by USFWS. The movement or temporary displacement of gartersnakes due to routine vegetation maintenance, however, would be unlikely because of the small portion of riparian suitable habitat in the ROW. Human presence and use of chainsaws could temporarily displace gartersnakes near the work area, though this effect would be short in duration, generally only lasting a day or less where work occurs locally.

Upland and riparian vegetation has been continually maintained within the ROW and in the No Action Alternative, no wide-scale removal of vegetation is proposed. The removal and treatment of vegetation may result in minor local changes to northern Mexican gartersnake riparian and upland habitat. Important components for cover, such as woody debris would be maintained. The composition of canopy structure may be less important to northern Mexican gartersnake than ground cover. The downed material resulting from vegetation removal may create local areas of woody material for gartersnake cover.

Vegetation treatment projects have been routinely carried out within the ROWs to manage for low growing plant communities. In the No Action Alternative, vegetation maintenance would be limited to targeted manual treatment of individual plants. Effects to the organic structural complexity of streamside habitat may be expected, though impacting a relatively small amount of riparian vegetation components of critical habitat (1.18 acres). Therefore, the No Action Alternative would result in short- and long-term, direct, negligible, adverse impacts to the northern Mexican gartersnake and its habitat because of the displacement of the snake during vegetation maintenance activities. Short- and long-term, indirect, minor adverse impacts to the

[35] Brumation is a term used for the hibernation-like state that cold-blooded animals like snakes utilize during cold weather. Brumation occurs generally from November to February, though there may be active periods during this time when winter temperatures are higher.

gartersnake and its habitat are anticipated as a result of the No Action Alternative. The 2017 Herbicides BA has made the determination that the No Action Alternative "may affect, and is likely to adversely affect" the northern Mexican gartersnake and its proposed critical habitat.

Direct and Indirect Effects of the Proposed Action

In addition to the effects associated with the No Action Alternative described above, the Proposed Action would also result in impacts on the northern Mexican gartersnake and its proposed critical habitat from the use of herbicides as part of the management of incompatible vegetation within the ROW. The 2015 Final Programmatic BA (BLM 2015a) provided detailed analysis of potential impacts associated with the application of herbicides to the gartersnake on pages 6-28 and pages 6-32 through 6-35 [BLM 2015a]). A description of the direct and indirect effects of herbicide treatments on the northern Mexican gartersnake and proposed critical habitat are also presented in the 2017 Herbicides BA on pages 118 through 130 (BLM 2017). The detailed discussion of the analyses is not repeated here but is instead incorporated by reference and summarized in this section of the EA. The Proposed Action would not include any activities associated with herbicide application different from those analyzed in the 2015 Herbicide PEIS BA. Consequently, there is no potential for new or greater short-term direct or indirect impacts on the northern Mexican gartersnake and its suitable habitat from the Proposed Action that have not been disclosed in prior environmental documentation.

Direct effects to northern Mexican gartersnakes from contact with herbicides would be minimized by using approved low-toxicity herbicides within and near gartersnake habitat. The Proposed Action may introduce very minimal quantities of herbicide into the aquatic habitat through runoff or drift. Herbicide treatments would be limited to spot applications to individual plants within the ROW. The applications would be made when the chance of precipitation is low, and Thinvert would be used to limit runoff and off-site drift of herbicides. The use of herbicides would not result in any change to river flow or flooding regime. The quantity of vegetation treated over the ROW area is low with grasses, forbs, and lower growing shrubs remaining untreated. Changes in vegetation composition affecting northern Mexican gartersnake suitable and occupied habitat due to herbicide application could be expected. Prey species could come into contact with herbicide. However, SOPs that limit which herbicides can be used in northern Mexican gartersnake habitat would also ensure that herbicides have low toxicity to prey species. Therefore, the Proposed Action would result in short- and long-term direct negligible, adverse impacts as well as short- and long-term, indirect, minor, adverse impacts to the northern Mexican gartersnake and its proposed critical habitat. The 2017 Herbicides BA has made the determination that the Proposed Action "may affect, and is likely to adversely affect" the northern Mexican gartersnake and its proposed critical habitat.

3.9.6 Mitigation Measures

No mitigation measures are recommended.

3.10 BLM Sensitive Species

3.10.1 Introduction

BLM special status species include: 1) species listed or proposed for listing under the ESA and 2) species designated as BLM-sensitive by the State Director(s) since they require special management consideration to promote their conservation and reduce the likelihood and need for future listing under the ESA. Species listed or proposed for listing under the ESA are analyzed in Section 3.9 above. In compliance with existing laws, including the BLM multiple-use mission as specified in the FLPMA, the BLM designates sensitive species and implements measures to conserve these species and their habitat to promote their conservation and reduce the likelihood

and need for such species to be federally listed pursuant to the ESA. Species designated as BLM sensitive species in Arizona meet the following criteria: species are native to Arizona; found on BLM-managed lands for which BLM has the capability to affect the conservation status of the species through management; and either: 1) there is information that a species is predicted to undergo a downward trend affecting viability of the species; or 2) the species depends on specialized or unique habitat on BLM-managed lands, and there is evidence that such areas are threatened with alteration to a point that the species viability is at risk (BLM 2010a). All federal candidate species, proposed species, and delisted species in the 5 years following delisting will be conserved as BLM sensitive species.

BLM Manual 6840 (Special Status Species Management; BLM 2008a) provides policies on the management of sensitive wildlife species on BLM-managed land. The BLM also manages other sensitive species, including fish and other aquatic organisms, using the following BLM manuals for guidance: BLM Manual 6500 Wildlife and Fisheries Management; BLM Manual 6720 Aquatic Resources Management; and BLM Manual 6780 Habitat Conservation Management Planning. The purpose of these manuals is to provide guidance for the conservation of BLM special status species and the ecosystems upon which they depend. In addition, 50 CFR 402 (Wildlife and Fisheries) directs each federal agency to confer or consult with the USFWS to ensure actions do not jeopardize proposed or listed species or proposed or designated critical habitat. BLM policy and BLM Manual 6840 require the BLM to confer with the USFWS on actions that may adversely affect proposed species or proposed critical habitat.

3.10.2 Issues Identified for Analysis

- Would there be a temporary displacement of sensitive species during active operations?
- What is the potential mortality due to herbicide spill, overspray, or overland flow?
- Would there be a potential loss of migratory birds from loss of active nests?
- What would be the impacts on special-status plants that are located within target areas from herbicides?
- How can you limit direct mortality of small animals caused by collisions with ATVs?
- Would there be any impacts to migratory bird prey?
- Would there be a minimal general disturbance to wildlife?
- Would there be a long-term positive benefit versus mowing and other methods of treatment?
- Would there be a potential impact on nesting habitat?
- Would there be changes in food sources, seed production, and invertebrates?
- Would there be improvements in habitat for some species and less compatible habitat changes for other species?

3.10.3 Affected Environment

The BLM Sensitive Species Lists of wildlife and plants was developed following criteria identified in BLM Instructional Memorandum No. AZ-2011-005 (BLM 2010a). The list of sensitive species classified by BLM contains 53 species with habitat present in the ROW, including 5 amphibians, 12 birds, 6 fish, 1 invertebrate, 10 mammals, 5 reptiles, and 14 plants (see Table 3-28 through Table 3-32). Additionally, Sonoran desert tortoise (*Gopherus morafkai*) is included in Table 3-23 as a sensitive species due to the removal of this species from the federal candidate list and implementation of the species candidate conservation agreement (USFWS 2015a and 2015b). The following analyses address potential impacts to BLM sensitive species, federal candidate species,

and delisted species and their habitats, within the ROW. A description of the 53 species is provided in Appendix E. Species groupings include: amphibians and reptiles, birds, fish and invertebrates, mammals, and plants.

Relevant scientific information for each species was reviewed by qualified biologists to gather information about the ecology and habitats of BLM sensitive species in Arizona. Biologists at BLM Arizona State office were contacted as a part of this review. Arizona Game and Fish Department Heritage Data Management System (HDMS), USFWS Environmental Conservation Online System, and other print and online sources were referenced for species life history information, including habitat preferences and distribution within BLM-managed lands in Arizona, and were referenced in developing the impacts analyses below. Species that do not occur within the ROW have been excluded from the analysis.

Table 3-28. BLM Sensitive Species Habitat Association within ROW – Amphibians and Reptiles

Common Name ***Scientific Name***	**Habitat** **Association**
Great Plains Narrow-mouthed Toad *Gastrophryne olivacea*	healthy grasslands
Lowland Burrowing Treefrog *Smilisca fodiens*	healthy grasslands
Lowland Leopard Frog *Lithobates yavapaiensis*	wetlands
Northern Leopard Frog *Lithobates pipiens*	wetlands
Sonoran Green Toad *Bufo retiformis*	healthy grasslands
Desert Ornate Box Turtle *Terrapene ornata*	healthy grasslands
Mohave Fringe-toed Lizard *Uma scoparia*	sand
Sonoran Desert Tortoise *Gopherus morafkai*	Rocky slopes and bajadas
Sonora Mud Turtle *Kinosternon sonoriense*	riparian
Yuman Desert Fringe-toed Lizard *Uma rufopunctata*	sand dune habitats

Source: BLM 2010a

Table 3-29. BLM Sensitive Species Habitat Association within ROW – Birds

Common Name ***Scientific Name***	**Habitat** **Association**
American Peregrine Falcon *Falco peregrinus anatum*	cliffs
Arizona Botteri's Sparrow *Peucaea botterii arizonae*	healthy grasslands
Arizona Grasshopper Sparrow *Ammodramus savannarum ammolegus*	healthy grasslands
Bald Eagle *Haliaeetus leucocephalus*	undisturbed foraging/nesting areas
Cactus Ferruginous Pygmy-Owl *Glaucidium brasilianum cactorum*	dense Sonoran scrub washes

Common Name *Scientific Name*	Habitat Association
Desert Purple Martin *Progne subis hesperia*	saguaro cacti
Ferruginous Hawk (breeding population only) *Buteo regalis*	healthy grasslands
Gilded Flicker *Colaptes chrysoides*	saguaro cacti
Golden Eagle *Aquila chrysaetos*	significant cliffs, large undeveloped areas
Le Conte's Thrasher *Toxostoma lecontei*	remote creosote scrub

Source: BLM 2010a

Table 3-30. BLM Sensitive Species Habitat Association within ROW – Fish and Invertebrates

Common Name *Scientific Name*	Habitat Association
Bluehead Sucker *Catostomus discobolus*	aquatic
Desert Sucker *Catostomus clarki*	aquatic
Flannelmouth Sucker *Catostomus latipinnis*	aquatic
Longfin Dace *Agosia chrysogaster*	aquatic
Sonora Sucker *Catostomus insignis*	aquatic
Speckled Dace *Rhinichthys osculus*	aquatic
Hydrobiid Springsnails all species in genus *Pyrgulopsis*	springs
Bluehead Sucker *Catostomus discobolus*	aquatic
Desert Sucker *Catostomus clarki*	aquatic
Flannelmouth Sucker *Catostomus latipinnis*	aquatic

Source: BLM 2010a

Table 3-31. BLM Sensitive Species Habitat Association within ROW – Fish and Mammals

Common Name *Scientific Name*	Habitat Association
Allen's Big-eared Bat *Idionycteris phyllotis*	caves, mines
Arizona Myotis *Myotis occultus*	caves, mines
Banner-tailed Kangaroo Rat *Dipodomys spectabilis*	healthy grasslands
California Leaf-nosed Bat *Macrotus californicus*	caves, mines
Cave Myotis	caves, mines

Common Name *Scientific Name*	Habitat Association
Myotis velifer	
Greater Western Mastiff Bat *Eumops perotis californicus*	caves, mines
Gunnison's Prairie Dog *Cynomys gunnisoni*	healthy grasslands
Mexican Long-tongued Bat *Choeronycteris mexicana*	caves, mines
Spotted Bat *Euderma maculatum*	caves, mines
Townsend's Big-eared Bat *Corynorhinus (=Plecotus)townsendii*	caves, mines

Source: BLM 2010a

Table 3-32. BLM Sensitive Species Habitat Association within ROW – Plants

Common Name *Scientific Name*	Habitat Association
Aravaipa Woodfern *Thelypteris puberula* var. *sonorensis*	few scattered springs
Bartram Stonecrop *Graptopetalum bartramii*	narrow range, rocky outcrops in canyons with Madrean Woodland
Blue Sand Lily *Triteleiopsis palmeri*	sand dunes and sandy soils
California Flannelbush *Fremontodendron californicum*	relict populations in shady canyons
Dalhouse Spleenwort *Asplenium* (=*Ceterach*) *dalhousiae*	cliff face seeps, Mule Mts, and Huachuca Mts
Kearney Sumac *Rhus kearneyi* ssp. *kearneyi*	relict species in shady canyons
Murphey Agave *Agave murpheyi*	low numbers, desert foothills, central AZ
Pima Indian Mallow *Abutilon parishii*	rocky slopes, good condition desert mountains
Pinto Beardtongue *Penstemon bicolor*	narrow range, desert washes, Black Mountains
Purple-spike Coralroot *Hexalectris warnockii*	few populations, leaf litter under Madrean Woodland
Round-leaf Broom *Errazurizia rotundata*	narrow range, Shinarump Hills, Holbrook area
Sand Food *Pholisma sonorae*	sand dunes, Yuma area
Scaly Sand Food *Pholisma arenaria*	sand dunes, Cactus Plain
Schott Wire-lettuce *Stephanomeria schottii*	sand dunes, sandy soils, Yuma area

Source: BLM 2010a

3.10.4 Standard Operating Procedures

MANUAL AND MECHANICAL TREATMENT METHODS

- Within the ROW, ATVs and vehicles may drive off-road if necessary with the implementation of relevant SOPs below.
  - ATVs and vehicles would be used only during dry conditions to avoid rutting, except under hazard vegetation maintenance situations.
  - ATVs and vehicles would avoid driving through rivers, standing water, and other water sources except on established roads.
  - ATVs and vehicles would be driven at low speeds (less than 10 miles per hour) when traveling off-road within the ROW.
  - ATVs and vehicles would only be operated during daylight hours, except under hazard vegetation maintenance situations.
- All areas with the potential for flowing water (e.g., culverts, ditches, and washes) would be kept free of slash, logs, and debris from vegetation removal operations.
- During manual vegetation treatment, the following methods of disposal would be used:
  - Lop and scatter: Limbs and logs of less than 9 inches in diameter would be lopped and scattered throughout the immediate area in a manner such that limbs and logs would be left no taller than 18-24 inches above the ground. Logs over 9 inches diameter would remain where felled and would be cut in sections to lay flush with the ground.
  - Chipping: Limbs and logs less than 9 inches in diameter would be chipped and broadcast on site with chips placed no deeper than four inches.
- Do not conduct work within 1 mile of the line of site of an active golden eagle nest during the golden eagle nesting season from February 1 to July 15.
- Do not conduct work within ¼ mile of occupied bald eagle nests during the bald eagle nesting season from October 1 to June 30.
- To protect the Sonoran desert tortoise, the following conservation measures are to be applied within ROW in Categories 1, 2, and 3 Sonoran Desert Tortoise Habitat:
  - Designate a Field Representative to ensure compliance with the following conservation measures.
  - Develop a training program that trains the Field Representative in avoidance and proper tortoise handling, relocation, and reporting protocols. This Field Representative shall provide herbicide crews training on the tortoise protocols described below and shall be the contact for field crews if a tortoise is encountered during work operations.
  - Field crews shall attempt to avoid any tortoise found within the ROW. If tortoise is found, attempt to delay operations until the tortoise has moved from the site and can be avoided. If the tortoise cannot be avoided, report the tortoise to the Field Representative and the Field Representative may remove the tortoise from the project site according to AGFD handling protocol.
  - Field crews shall conduct a search for tortoise under and around vehicles prior to moving vehicles. If a tortoise is found, follow conservation measure 3 above.
  - Field crews shall search under and around vegetation prior to spraying that vegetation for tortoise. If tortoise is found, follow conservation measure 3 above.

- If a Sonoran desert tortoise is seen, note the date and location of the tortoise, and if possible, take a photo. If the tortoise is relocated, note the date, location found and where it was relocated to. The Field Representative shall ensure this recorded information is compiled and sent to the BLM.
- Field crews shall maintain clean project sites and remove all trash to avoid subsidizing Sonoran desert tortoise predator populations such as ravens which prey on young tortoise.

- To protect sensitive plants as much as possible, the utilities shall coordinate with BLM biologists and/or botanists in identifying and avoiding known populations of sensitive plants prior to vegetation treatments. This may be done by providing work crews generalized or specific location information of the plant and photos and identification information of the plant for avoidance.

HERBICIDE TREATMENT METHODS

- Within riparian areas, wetlands, and aquatic habitats, conduct herbicide treatments only with herbicides that are approved for use in those areas.
- Within or near riparian areas, using glyphosate formulations that include R-11 would be avoided, and any formulations with polyoxyethylene tallow amine would be avoided or use the formulation with the lowest amount of polyoxyethylene tallow amine available.
- Within or near riparian areas, special care would be followed when transporting and applying 2,4-D, bromacil, clopyralid, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, tebuthiuron, and triclopyr.
- If there is a high probability (80 percent chance) of local, moderate rain (0.25 inch or less within 24 hours), then herbicide applications would only occur when it is anticipated that there would be sufficient time (at least 4 hours) for the application to dry before rainfall occurs.
- Within BLM-sensitive amphibian and reptile suitable habitats, glyphosate, hexazinone, imazapyr, metsulfuron, and triclopyr would be applied at the typical (rather than the maximum) application rate.
- Within aquatic amphibian habitat, the following buffers would be established within BLM sensitive amphibian and reptile habitats and at least 0.5 mile upstream or 300 feet downstream of the habitat area in any ephemeral to perennial contributing channel, tributary, or spring run :
  - Herbicides with a Class 0 toxicity rating in the Aquatic Amphibian, Aquatic Arthropod, and Terrestrial Arthropod toxicity groups require no buffer within BLM-sensitive amphibian and reptile habitats habitat. These herbicides include aminopyralid, chlorsulfuron, clopyralid, imazapic, and triclopyr – amine salt formulation.
  - Herbicides with a Class 1 toxicity rating in the Aquatic Amphibian toxicity group and as Class 2 or Class 3 toxicity ratings in the Aquatic Arthropod or Terrestrial Arthropod toxicity groups would not be used below the high water line of the species habitat or within 30 feet over land from the high water line of species habitat. These herbicides include bromacil, 2,4-D – all formulations, dicamba, diuron, fluroxypyr, glyphosate – non-aquatic formulation, hexazinone, metsulfuron methyl, picloram, sulfometuron methyl, and tebuthiuron.
  - Triclopyr – ester formulation, which has a Class 2 toxicity rating in the Aquatic Amphibian toxicity group would not be used below the high water line of BLM-sensitive amphibian and reptile habitats or within 50 feet over land from the high water line of species habitat.
- The following buffers would be implemented for BLM-sensitive birds' suitable habitat:
  - Herbicides with a Class 0 or Class 1 toxicity rating in the Small Avian toxicity group could be applied with no buffer. These herbicides would include all selected BLM-approved herbicides except for dicamba.

- Dicamba, a Class 2 toxicity rated herbicide in the Small Avian toxicity group, would not be applied within 10 feet of the edge of the specie's habitat.
- 2,4-D would not be applied within BLM-sensitive birds' suitable habitat

- 2,4-D, glyphosate, and imazapyr aquatic formulations would not be applied within BLM-sensitive fish suitable habitat; within at least 1 mile upstream from the habitat area in any contributing channel, tributary, or spring run; or within 300 feet downstream of the species habitat.
- The following buffers would be implemented for application of herbicides on land adjacent to waterbodies and wetlands that serve as BLM sensitive fish suitable habitats. Buffer zones would be used for the entire BLM sensitive fish habitat, which would include at least 1 mile upstream from the habitat area in any contribution channel, tributary, or spring run, or within 300 feet downstream from the habitat area.
  - Herbicides with Class 0 or Class 1 toxicity ratings in the Warm Water Fish toxicity group would not be applied within 10 feet of the edge of the waterbody or wetland of desert pupfish suitable habitat. These herbicides would include all selected BLM -approved herbicides except for 2,4-D aquatic and non-aquatic ester formulation and triclopyr ester formulation.
  - Herbicides with a Class 2 toxicity rating in the Warm Water Fish toxicity group would not be applied within 50 feet of the edge of the waterbody or wetland of desert pupfish suitable habitat. These herbicides would include 2,4-D aquatic and non-aquatic ester and triclopyr ester formulations.
- Do not apply dicamba within Sonoran desert tortoise habitat. Ensure that herbicide spray drift does not occur beyond the ROW by using herbicide sprays with coarse droplet sizes from a spray gun.
- Do not apply dicamba within ¼ mile of a golden eagle nest. This herbicide is rated as class 2 in the predatory avian toxicity group.
- Do not apply herbicides within ¼ mile of occupied bald eagle nests during the bald eagle nesting season from October 1 to June 30.
- Do not apply 2,4-D and dicamba within 0.5 mile of burrowing owl nests until birds have left the area. These herbicides rate as Class 2 and Class 3 in the Predatory Avian, Small Mammal, or Terrestrial Arthropod toxicity groups.
- To protect all other migratory birds, do not apply dicamba within the following buffers listed in table below for each bird category[36]. To achieve these buffers, a crew member may walk ahead of the spray crew and check for nests.

Dicamba Buffer for Migratory Birds

Species Category	Dicamba Buffer	Buffer Type
Falcons, kites, ospreys, owls, small hawks	300 feet	Occupied nests
Carrion eating birds (large hawks, caracaras, ravens, vultures, etc.)	1/8 mile	Occupied nests
Small avian seed and grit eating migratory birds (doves, finches, meadowlarks, sparrows, etc.)	30 feet	Occupied habitat
Geese	300 feet	Occupied nests
Waterfowl other than geese (ducks, grebes, loons, mergansers, etc.)	30 feet	Occupied habitat

[36] Insect eating small migratory birds such as flycatchers, swallows, warblers, woodpeckers, and wrens do not require buffers for spot application of solid and liquid formulations of herbicides.

- A qualified biologist or resource specialist would provide maintenance crew members with training on migratory bird nest reporting and nest avoidance: crews are to report active nests that occur on vegetation or on the ground internally per each Utilities' avian reporting procedures. Do not conduct herbicide treatments on the vegetation containing the nest and vegetation adjacent to ground nesting birds until after nesting is complete.

3.10.5 Environmental Consequences

AMPHIBIANS AND REPTILES

Direct and Indirect Effects of the No Action Alternative

Under the No Action Alternative, manual treatments, including DSAP maintenance, would be unlikely to affect most BLM sensitive reptile and amphibian species. The total treatment area within the DSAP maintenance program would impact approximately 3.03 acres of the 11,534.99 acres of the total ROW on BLM lands. And although DSAP would remove vegetation to bare ground, these species would be able to move away from treatment sites, or would be hidden in burrows or aquatic habitats that would not likely be disturbed during manual treatments. The treatment of the vegetation within the DSAP area would consist of manually treatments and would remove cut vegetation using rakes or other hand held tools. Maintenance using mechanical vegetation removal could result in disturbance to reptiles and amphibians including those seeking cover in shallow burrows and/or to terrestrial habitat by the use of heavy equipment and larger vehicles. Use of equipment may also crush invertebrates and vertebrates upon which certain species feed. However, mechanical mowers would not be used within riparian areas and wetlands. All vehicles within riparian areas and wetlands would remain on existing roads, minimizing individual and habitat impacts. Indirect effects to riparian species would not be detectable because treatments would be limited to the manually cutting of regrowth vegetation and pruning mature trees at the edge of the ROW. Mechanical treatments may increase the potential for erosion over the short term, resulting in some localized sediment inflow into aquatic habitats, which could cover eggs and larvae (2007 PEIS BA).

In the long-term, the frequency of routine vegetation maintenance disturbance in the No Action Alternative as compared to the Proposed Action would create more opportunity for BLM sensitive amphibians and reptiles to be impacted. However, SOPs would minimize any potential impacts to amphibians and reptiles. Lower growing shrubs, grasses, and forbs providing cover would remain untreated. Therefore, the No Action Alternative would result in direct and indirect, short- and long-term negligible, adverse impacts to BLM sensitive amphibians and reptiles because the potential for direct contact with the species would be unlikely and their habitat would not be measurably disturbed.

Direct and Indirect Effects of the Proposed Action

In addition to the effects associated with the No Action Alternative described above, the Proposed Action would also result in impacts on BLM sensitive amphibian and reptile species. It is highly unlikely that BLM sensitive amphibians would be directly sprayed with herbicide. Aquatic amphibians are most active and tend to travel between aquatic sites during summer monsoon storms (ADOT 2014). It is not a best practice to apply herbicides when it is raining or a storm event is likely within a few hours after application. Herbicides require exposure to the plant surface in order to be effective. The two terrestrial amphibians, the Great Plains Narrow-mouthed Toad and the Lowland Burrowing Treefrog, spend most of their time in crevices and burrows and would not be likely to be directly sprayed with herbicide.

Direct impacts from herbicide application to reptiles would also be unlikely. All species would generally retreat from the work environment during application and would not be directly sprayed. The Mohave and Yuman desert fringed-toed lizards occur in areas where very little to no herbicide treatment would be needed. An additional check for tortoise around vegetation to be treated would be conducted to look for tortoise resting under vegetation prior to herbicide application. The Sonora mud turtle is primarily aquatic, and herbicides would not be sprayed directly into aquatic environments.

BLM sensitive amphibians and reptiles may be impacted through contact with vegetation that has been sprayed. These sensitive species could contact treated vegetation when traveling in terrestrial habitat. Terrestrial amphibians and reptiles may be more prone to coming into contact with treated vegetation. Two herbicides, dicamba and triclopyr (ester formulation) are of higher toxicity to terrestrial and aquatic amphibians. Dicamba would rarely be used by the Utilities and only after review of special circumstances during the PUP process (see Section 2.3.8). The amine formulation of triclopyr would be a commonly used herbicide during project implementation. This herbicide is labelled for aquatic use with low toxicity to amphibians. The ester formulation of triclopyr is highly toxic to amphibians but is unlikely to be used; it is not labelled for aquatic use. Even if aquatic or terrestrial amphibians or reptiles come into contact with treated vegetation, it is unlikely the herbicide would have any effect on these sensitive species.

Herbicide treatments, including those near water sources, would be achieved by spot application to single plants or plant clusters using hand-operated backpack sprayers. The Proposed Action would not include the application of herbicides directly to standing water but only to the target terrestrial plants. Impacts from drift or runoff would be minimized by implementing SOPs. The SOPs include proper application methods and drift reduction agents to ensure that only target vegetation is treated and off target exposure to herbicide is minimized. In addition, Thinvert would be used as a carrier and would provide a measure of “rainfastness”, by adhering to the target plant or plant cluster. The chance that herbicides would leach or runoff into the environment is very low. Herbicides are only applied on vegetation previously cut or new growth vegetation. Grasses, forbs, and many smaller shrubs would remain untreated for the majority of the ROW with the exception of DSAP treatment areas, which occur at a small number of isolated poles.

The implementation of SOPs would substantially reduce potential impacts to BLM sensitive amphibian and reptile species. Herbicide toxicity is low (with the exception of dicamba which would only be used in pre-approved locations), and any reduction in plant cover would be small and localized. Therefore, the Proposed Action would result in direct and indirect, short-term, negligible, adverse impacts to BLM sensitive amphibian and reptile species because the potential for direct contact with the species would be unlikely and due to the effectiveness of SOPs when implemented. There would also be direct and indirect, long-term, negligible, beneficial impacts to these species because the frequency of routine vegetation maintenance would decrease, which would reduce the presence of workers and noise within suitable habitats.

BIRDS

Direct and Indirect Effects of the No Action Alternative

Under the No Action Alternative, manual and mechanical control methods would continue to be used to maintain vegetation within the ROW. There are 12 BLM sensitive bird species with suitable habitat within the ROW. The ROW has been regularly maintained in the past. No wide-scale removal of vegetation would occur in the No Action Alternative. Utility personnel and contractors who complete vegetation treatments in the ROWs are provided with training on appropriate nest avoidance measures and reporting requirements. A qualified biologist or resource specialist would provide the maintenance crew members with training on migratory bird nest reporting and nest avoidance. The maintenance crews would internally report active nests that occur on

vegetation or on the ground per the Utilities' avian reporting procedures and restrict treatments on the vegetation containing the nest until after nesting is complete. Maintenance crews do not conduct routine vegetation maintenance and DSAP treatments on the vegetation containing the nest and vegetation adjacent to ground nesting birds until after nesting is complete.

The acres of habitat affected would be relatively small because control methods involve removal of one tree or a small clump of trees and would not contribute to an overall decline of suitable habitat for BLM sensitive bird species. For species like the desert purple martin, gilded flicker, Le Conte's thrasher, and pinyon jay, these birds prefer breeding habitat that consists of mature vegetation. The ROWs are currently maintained, under existing authorization, free of mature vegetation using manual and mechanical methods. Arizona Botteri's sparrow and Arizona grasshopper sparrow prefer grasslands as breeding habitat. This type of habitat generally does not require manual or mechanical treatments except when trees or tall shrubs are interspersed with the grassland habitat. Predatory birds such as the American peregrine falcon and the bald eagle do not nest within or near the ROW but may forage there. The ferruginous hawk and western burrowing owl occur in grasslands, which generally do not require vegetation management actions, or if management action is needed, it would only target scattered trees or shrubs within the grassland habitat. Vegetation removal in riparian habitat would involve removal within the ROW only, and not along an entire reach of stream or river. Changes in vegetation composition affecting suitable habitat for BLM sensitive bird species are anticipated to be localized and these habitats would be slightly altered in the short-term. Direct contact with BLM sensitive bird species would be unlikely due to their ability of flight. Therefore, the No Action Alternative would result in direct and indirect, short- and long-term, negligible, adverse impacts to BLM sensitive bird species.

Direct and Indirect Effects of the Proposed Action

In addition to the effects associated with the No Action Alternative described above, the Proposed Action would also result in impacts on BLM sensitive bird species. Utility personnel and contractors who apply herbicide in the ROWs are provided with training on appropriate nest avoidance measures and reporting requirements. When applying herbicide on BLM-managed lands during the migratory bird nesting season crews would undergo the same training as discussed in the No Action Alternative and report active nests on vegetation or on the ground. All treatments on the vegetation containing the nest and vegetation adjacent to ground nesting birds would be delayed until after nesting is complete. Herbicide application would result in minimal impacts to BLM sensitive predatory bird species because:

- peregrine falcons and bald eagles are not likely to nest within the ROW and no direct impacts to breeding falcons and bald eagles are anticipated from the application of herbicides;
- herbicide application would be unlikely in the open habitat for ferruginous hawk and western burrowing owl;
- impacts to golden eagle nesting would be unlikely because these locations are typically sparsely vegetated and unlikely to require herbicide application; and
- impacts would be minimized for cactus ferruginous pygmy owl, which inhabits riparian areas, because the herbicides used are those of low toxicity to birds and travel is limited in these areas to only existing roads.

Small avian birds have the potential to come into contact with vegetation treated with herbicide. However, the only herbicide that is highly toxic to birds that is proposed is dicamba. This herbicide would be rarely used by the Utilities and only used outside of the buffers provided in the SOPs. Herbicide treatments could result in temporary noise and visual disturbances, but only while workers are present at a given location. Herbicide application would be relatively short in duration and not likely to result in any long term impacts on breeding or foraging birds.

Mature trees and shrubs are not targeted for foliar, cut stump, or DSAP herbicide applications under the Proposed Action where only seedling and resprouting vegetation would be treated. Mature trees may be treated during a basal herbicide application. However, this type of application would be disclosed and vetted through the PUP process and any tree treated using this method would be checked for nests and avoided if a nest is present. In the Proposed Action, routine vegetation maintenance would be carried out within the ROW to manage for low growing plant communities by targeted herbicide applications to individual plants. Thinvert would be used to minimize drift onto non-target plants. Therefore, the Proposed Action would result in direct and indirect, short-term, negligible, adverse impacts to BLM sensitive bird species because the potential for direct contact with the species would be unlikely and due to the effectiveness of SOPs when implemented. There would also be direct and indirect, long-term, negligible, beneficial impacts to these species because the frequency of routine vegetation maintenance would decrease, which would reduce the presence of workers and noise within suitable habitat.

FISHES AND INVERTEBRATES

Direct and Indirect Effects of the No Action Alternative

There are six BLM sensitive fish species and one invertebrate (hydrobiid springsnails) that could have suitable habitat in the ROW. These six fish species inhabit the Gila, Bill Williams, and Colorado River Basins. There are no ROWs that intersect Bill Williams River, but there are power lines within this river basin. Under the No Action Alternative, manual and mechanical control methods would be used to maintain vegetation within the ROW, though mechanical treatment would not occur within riparian areas and wetlands. There are no poles with equipment that can spark within wetland or riparian areas, therefore no DSAP maintenance treatments would occur. Vegetation management actions in riparian areas adjacent to aquatic fish habitat could reduce vegetation cover locally. The ROWs that cross over creeks or rivers have been continually maintained through manual and mechanical methods and the composition of tall vegetation is already sparse in comparison to riparian vegetation adjacent to the ROWs. Vegetation management actions would target vegetation previously maintained that has re-sprouted or young, new growth vegetation not previous cut. Any change in shade structure would be localized and unlikely to result in any change in water temperature. No direct effects would occur to BLM sensitive fish species from manual and mechanical vegetation treatments. Sedimentation could occur from the use of vehicles and ATVs near rivers and streams where BLM sensitive fish species could be present, though within riparian areas and wetlands, vehicles remain on existing roads. Because of the implementation of SOPs and conservation measures, the amount of sedimentation that could occur is expected to be minimal and unlikely to result in any detectable changes to rivers or streams adjacent to, or crossed by, the ROW. Therefore, the No Action Alternative would result in direct and indirect, short- and long-term negligible, adverse impacts to BLM sensitive fish and invertebrate species.

Direct and Indirect Effects of the Proposed Action

In addition to the effects associated with the No Action Alternative described above, the Proposed Action would also result in impacts on the six BLM sensitive fish species and the hydrobiid springsnails. Herbicides would be used within the ROWs that cross the Gila, Bill Williams, and Colorado River Basins. Conservation measures would be implemented for any herbicide application near bodies of water in order to minimize impacts to BLM sensitive species. Potential impacts to fish and invertebrates from the Proposed Action would be through exposure to herbicide that has drifted into the water or from herbicide runoff into the water. However, the implementation of SOPs would minimize the chance of herbicides reaching these aquatic habitats. If herbicides would reach aquatic habitats, the toxicity and the amount of herbicide used would be so small as to be unmeasurable in the water. Herbicides would be applied in a targeted manner (spot application) to individual plants or the target area for DSAP and would not be applied with broadcast or aerial applications. Thinvert

would help adhere the herbicide to the plant surface. Each spray droplet would be coated with a thin film of oil which would not evaporate while falling, reducing susceptibility to off-target movement (Waldrum Specialties 2016). In addition, herbicide applications would be limited only to times when probability of rain is low, further reducing the chance of runoff. The herbicides that would be used near aquatic areas would be restricted to those that are low in toxicity to aquatic and riparian species. In the unlikely event herbicides reach aquatic habitat or fish consume prey that has been in contact with herbicide treated vegetation, and fish are exposed to herbicide, the likelihood of any effects to fish would be low and not measurable. Therefore, the Proposed Action would result in direct and indirect, short-term, negligible, adverse impacts to BLM sensitive fish and invertebrate species because the potential for direct contact with the species would be unlikely and due to the effectiveness of SOPs when implemented. There would also be direct and indirect, long-term, negligible, beneficial impacts to these species because the frequency of routine vegetation maintenance would decrease, which would reduce the presence of workers and noise within suitable habitat.

MAMMALS

Direct and Indirect Effects of the No Action Alternative

Under the No Action Alternative, routine aerial and ground inspections would be conducted along with manual and mechanical vegetation treatment methods within the ROW. Seven of the eight BLM sensitive bats roost in caves, mines, manmade structures such as under bridges, and cliff cracks and crevices. The Arizona myotis is the only bat of the eight bats that roosts in large snags and tree cavities and crevices. There are two BLM sensitive rodent species that are known to or could occur within the ROW, and both the banner-tailed kangaroo rat and Gunnison's prairie dog occupy burrows.

Under the No Action Alternative, manual and mechanical control methods would be used to maintain vegetation within the ROW. Disturbance to bats from aerial and ground-based inspection and vegetation treatment activities would be unlikely because these bats actively forage in the evenings and at night, while the aerial and ground-based activities occur during the day. Localized impacts could occur if any Arizona myotis are day roosting in an area when vegetation management actions are being implemented; however, the impacts would be reduced or eliminated with the implementation of SOPs.

Both of the BLM sensitive rodent species inhabit grassland habitats. Grassland habitat would require very little to no vegetation management activities. Shrubs in sparse grassland vegetation are not generally targeted for removal unless they occur within the area around distribution line poles that may receive DSAP treatment. ATVs could drive over rodent burrows within the ROWs. This could crush a burrow, which would then need to be rebuilt by the rodent. Temporary impacts to localized populations could occur, but not to the extent of impacting survivability of an individual or colony of rodents.

Therefore, the No Action Alternative would result in direct and indirect, short- and long-term, negligible, adverse impacts to BLM sensitive mammals because the implementation of SOPs would be unlikely to result in measurable impacts to the species or their habitat.

Direct and Indirect Effects of the Proposed Action

In addition to the effects associated with the No Action Alternative described above, the Proposed Action would also result in impacts to BLM sensitive mammal species. None of the roost types for the eight bats would be targeted directly by herbicide. Because bats roost at night, and would not be out during the day during herbicide application, the bats would not be directly sprayed by herbicide. Disturbance to bats from aerial and ground-based inspection and vegetation treatment activities would be unlikely because these bats actively forage in the evenings and at night, while the aerial and ground-based activities occur during the day. Bats could come into

contact with vegetation that has been sprayed with herbicide. However, by the time bats are out at night foraging, the vegetation would be dry and thus, dermal contact is not likely.

Six of the eight BLM sensitive bats feed exclusively on insects, catching their prey in air, from the ground, and/or from vegetation. The Mexican long-tongued bat feeds on nectar, pollen, insects, and fruit of columnar cacti and flowers of agave. The California leaf-nosed bat feeds predominantly on flying insects but may also feed on fruits, including those of cacti (Hoffmeister 1986 in AGFD 2001e). It is unlikely that bats would ingest prey that has been sprayed with herbicide because of the limited and targeted nature of the herbicide applications. If this event where to occur, the only herbicide proposed for use that is highly toxic to bats is dicamba; this herbicide is rarely used and would only be used following review of treatment locations during the PUP process. It is unlikely that Mexican long-tongued bat and California leaf-nosed bat would ingest herbicide through cacti and agave plants because these plants are not typical target species for removal in ROWs.

Direct spray of herbicide on banner-tailed kangaroo rat and Gunnison's prairie dog or their burrows is not expected to occur. The rodents would flee from the area during herbicide application and retreat to their burrows. Because herbicide application is targeted spot application and includes measures to minimize drift, drip onto the ground, and runoff, it is highly unlikely that the area around burrow entrances would be exposed to herbicide. It is also highly unlikely that these rodents would come into contact with sprayed vegetation. The kangaroo rat is mostly nocturnal and herbicide would likely be dry by the time this species comes out at night. The prairie dog is active during the day, but because only very little vegetation would receive herbicide application in their habitat, the likelihood that they would come into contact with that vegetation while it is still wet is low. In addition, if these rodents were to come into contact with sprayed vegetation, the only herbicide proposed for use that is highly toxic to rodents is dicamba, and this herbicide would be rarely used and only be used following review of the treatment locations during the PUP process.

Impacts to BLM sensitive bats and rodents would be unlikely due to the nocturnal nature of the bats and rat, targeted spot application of the Proposed Action, limited nature of herbicide use in habitat for these species, and the herbicides proposed would be low in toxicity to the animals. Therefore, the Proposed Action would result in direct and indirect, short-term, negligible, adverse impacts to BLM sensitive mammal species because the potential for direct contact with the species would be unlikely and due to the effectiveness of SOPs when implemented. There would also be direct, long-term, negligible, beneficial impacts to these species because the frequency of routine vegetation maintenance would decrease, which would reduce the presence of workers and noise within suitable habitat.

PLANTS

Direct and Indirect Effects of the No Action Alternative

Under the No Action Alternative, routine inspection and manual, mechanical, and DSAP vegetation treatment methods would occur within the ROW. There are a total of 42 BLM sensitive plants in Arizona; 14 may occur within the ROW. Of these 14 species, there are two succulents, two ferns, four perennial herbaceous plants, one herbaceous annual, three perennial shrubs, and two parasitic root plants. The height of these plants varies from very small and low to the ground up to 26 feet tall. Vegetation management actions under both alternatives would not target any of the succulents, ferns, or herbaceous plants except potentially during DSAP treatment.

In the No Action Alternative, vegetation treatments would temporarily reduce vegetation cover and competition for resources in the immediate vicinity of treatment areas. Some sensitive plants located within the ROWs may benefit from reduced competition for space, light, water, and soil nutrient resources, potentially allowing them to propagate new plants, and possibly expand their ranges. For other plants that occur on steep slopes or shaded areas under rocks and in cracks, the vegetation management activities would not result in any change in

habitat. BLM would notify the Utilities of known populations of sensitive plants when reviewing manual and mechanical treatment work proposals and crews would be provided identification cards to avoid these plants. These types of SOPs would minimize potential impacts to sensitive plants; however, there may be populations of sensitive plants that are unknown to BLM that would go undetected. Potential direct effects include mortality of individuals, reduced vigor from trampling, and reduced seed production. The effects from manual and mechanical control would be minimal; however, mowing would have a greater effect to BLM sensitive plants due to a reduced ability to target specific plants requiring removal. Therefore, mowing is not normally used as a treatment method near BLM sensitive plant populations.

The ROW has been regularly maintained in the past. No wide-scale removal of vegetation would occur. The acres of habitat affected would be very small because vegetation maintenance methods would involve removal of one tree or a small clump of trees and would not contribute to an overall decline of the species. Some sensitive plants located within the ROWs may benefit from reduced competition for resources, potentially allowing them to propagate new plants, and possibly expand their ranges. Therefore, the No Action Alternative would result in direct and indirect, short- and long-term, negligible, adverse effects to BLM sensitive plants because the implementation of SOPs would be unlikely to result in measurable impacts to the species or their habitat.

Direct and Indirect Effects of the Proposed Action

In addition to the effects associated with the No Action Alternative described above, the Proposed Action would also result in potential impacts to BLM sensitive plant species. During all treatment besides DSAP, the application of herbicides consists of spot treatment of individual plants. These target plants have been maintained in the past during manual and mechanical treatments, except in the case of new growth target plants. The potential for drift or drip from the target plant to a non-target sensitive plant would be reduced by the use of low volume Thinvert application of the herbicide, and the resulting high degree of control and minimized off-target drift and runoff. This application method would virtually eliminate spray evaporation because each spray droplet is coated with a thin film of oil that would not evaporate, reducing susceptibility to off-target movement.

California flannelbush, Kearney sumac, and round-leaf broom, if present, may be treated with herbicide after regrowth from manual or mechanical treatment or new growth may be treated within the ROW. For all three species of shrubs, the Proposed Action could result in death of individual plants as these species are not compatible with the power lines. The ROWs are narrow corridors and if these shrubs are treated, the treatment would be isolated to a single or small number of plants and would not be expected to impact a population. Herbicide application may also target host plants used by the parasitic plants sand food and scaly sand food. Both of these species occur in sand dune habitat where very little vegetation occurs. This type of habitat generally would not require herbicide application so it would be unlikely that hosts for these plants would receive herbicide treatment.

DSAP treatment could result in removal of any of the sensitive plants in the ROW, excluding pinto beardtongue. Because DSAP treatment would be isolated to a small area within wildland urban interfaces around communities, and the vegetation around these treatment poles has been maintained in the past and is disturbed, the chance that these sensitive plants occur around poles where DSAP treatment may occur would be low. Individual plants could be impacted but in such a small, isolated areas that it would not be expected to impact a population.

While the Proposed Action may impact individual BLM sensitive plants, it is not expected to jeopardize populations at the local or landscape levels. Therefore, the Proposed Action is expected to result in localized, short-term, direct, minor, adverse impacts. By controlling or eliminating incompatible vegetation, over time

native habitat for some plants would be enhanced, thereby increasing the availability of suitable habitat for some sensitive plants. The Proposed Action would therefore also result in localized, long-term, direct and indirect, negligible, beneficial impacts.

3.10.6 Mitigation Measures

With the implementation of the SOPs, no mitigation measures are recommended.

3.11 Migratory Birds

3.11.1 Introduction

The majority of bird species in Arizona are protected by the Migratory Bird Treaty Act of 1918 (MBTA). The Bald and Golden Eagle Protection Act of 1940 (BGEPA) and the ESA offer additional protection to certain migratory bird species. Executive Order 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds) issued on January 17, 2001, directed agencies to take certain actions to further implement migratory bird conventions (MBTA, BGEPA, ESA, and other related statutes). Pursuant to Executive Order 13186, the BLM and USFWS entered into a Memorandum of Understanding to promote the conservation of migratory birds through enhanced collaboration between the two agencies (BLM 2010b).

3.11.2 Issues Identified for Analysis

- Would the loss of vegetation for forage, nesting, and cover impact wildlife?
- Would there be potential mortality impacts to migratory birds from loss of active nests during vegetation treatments?
- Would there be a potential loss of migratory birds from the loss of active nests?
- Would there be a possible direct disturbance of nest eggs, nesting birds, or their habitat?
- Would the Proposed Action change food sources and seed production?
- What would the potential changes be for birds?

3.11.3 Affected Environment

Migratory birds utilize varied habitats throughout Arizona as they travel between winter and summer ranges and many species both breed and nest within the state's boundaries. Suitable foraging habitat and, to a lesser extent, nesting habitat, likely occurs in most, if not all, of the ROWs. The Utilities have approximately 1,029.23 miles of existing power lines (11,534.99 acres of ROW) crossing BLM-managed lands, which represents 0.12 percent of the BLM-managed lands in Arizona. There are 12 power lines that intersect with five Important Bird Areas (IBAs)[37] on BLM-managed lands in the ROW (Table 3-33). The IBAs present in the ROW are found on the Hassayampa, Lower Sonoran, and Tucson field offices.

[37] According to the Arizona Important Bird Areas Program, "The purpose of the Important Bird Area Program is to identify a network of sites that maintain the long-term viability of wild bird populations while engaging the public to conserve those areas of critical habitat." The Arizona IBA Program was established in 2001 and is co-managed by Audubon Arizona and the Tucson Audubon Society. The AZ IBA Program works in partnership with the Arizona Game and Fish Department (through the Arizona Bird Conservation Initiative), the Sonoran Joint Venture, the Intermountain West Joint Venture, Arizona State Parks, U.S. Fish and Wildlife Service, U.S. Forest Service, BLM, and various non-governmental organizations, colleges, and universities. The Arizona IBA Program is an active, field-oriented, community-engaged, science-based and conservation-focused program to benefit Arizona's bird populations of greatest conservation concern, other native biodiversity, and their most critical habitats and sites. The Arizona IBA Program has identified 42 IBAs (8 of which have Global IBA Status) covering 3.38 million acres of habitat. IBAs are classified into three levels: State, Continental and Global. The state designation can only be assigned by a state committee of researchers and managers that determine if a site has significant numbers of a suite of species of conservation concern and restricted ranges.

Table 3-33. Important Bird Areas within the ROW

Important Bird Area (IBA)	BLM Field Office	Total BLM Field Office Acres	Total ROW Acres	Percent of Total ROW
Agua Fria NM Riparian Corridors IBA	Hassayampa	14,707.56	261.31	1.78%
Lower Salt and Gila Rivers Ecosystem IBA	Lower Sonoran	6,014.60	9.53	0.16%
Sonoran Desert Borderlands IBA	Lower Sonoran	32.30	0.01	0.04%
Lower San Pedro River IBA	Tucson	2,468.00	2.79	0.11%
San Pedro Riparian National Conservation Area IBA	Tucson	56,240.01	9.98	0.02%
Total		**79,462.46**	**283.63**	**0.36%**

Source: National Audubon Society 2012

3.11.4 Standard Operating Procedures

The Utilities are a part of the Avian Power Line Interaction Committee and work closely with this group to update the industry's Suggested Practices for Avian Protection on Power Lines and Reducing Avian Collisions with Power Lines. The Utilities, in partnership with the USFWS, have developed a comprehensive Avian Protection Plan and implemented new construction design standards that require the installation of avian-safe devices and coverings to minimize potential hazards for raptors and other birds. A comprehensive nest management program to protect birds that build their nests on electrical equipment resulted in the installation of nest platforms that can be installed on the pole in a safe place when the nest creates a hazard for the birds or the electrical equipment.

Specific SOPs relating to species protected under state or federal laws or regulations may also apply here. These species specific SOPs are found within the respective sections, including Sections 3.19 Federally Listed Species and 3.10 BLM Sensitive Species and therefore not repeated below. Some of the SOPs listed in this section of the EA have been incorporated from the species specific conservation measures identified in the draft BLM BA associated with this EA. The SOPs listed here have been edited to be more consistent with the terms and language of this EA; the prescription or intent of the SOPs have not been altered. The SOPs as written in the 2017 BA would take precedence if there are any perceived discrepancies.

MANUAL AND MECHANICAL TREATMENT METHODS

- Within the ROW, ATVs and vehicles may drive off-road if necessary with the implementation of relevant SOPs below.
    - ATVs and vehicles would avoid driving through rivers, standing water, and other water sources except on established roads.
    - ATVs and vehicles would be driven at low speeds (less than 10 miles per hour) when traveling off-road within the ROW.
    - ATVs and vehicles would only be operated during daylight hours, except under hazard vegetation maintenance situations.
- A qualified biologist or resource specialist would provide maintenance crew members with training on migratory bird nest reporting and nest avoidance: crews are to report active nests that occur on vegetation or on the ground internally per each Utilities' avian reporting procedures. Do not conduct

routine vegetation maintenance and DSAP treatments on the vegetation containing the nest and vegetation adjacent to ground nesting birds until after nesting is complete.

HERBICIDE TREATMENT METHODS

- Do not apply 2,4-D and dicamba within 0.5 mile of burrowing owl nests until birds have left the area. These herbicides rate as Class 2 and Class 3 in the Predatory Avian, Small Mammal, or Terrestrial Arthropod toxicity groups.
- When working in riparian areas, wetlands, and near other aquatic habitats, access work site only on existing roads, and limit all travel on roads when damage to the road surface would result or is occurring.
- Within riparian areas, wetlands, and aquatic habitats, conduct herbicide treatments only with herbicides that are approved for use in those areas.
- Within or near riparian areas, avoid using glyphosate formulations that include R-11, and either avoid using any formulations with polyethoxylated tallow amine, or seek to use the formulation with the lowest amount of polyethoxylated tallow amine available. A qualified biologist or resource specialist would provide maintenance crew members with training on migratory bird nest reporting and nest avoidance: crews are to report active nests that occur on vegetation or on the ground internally per each Utilities' avian reporting procedures. Do not conduct herbicide treatments on the vegetation containing the nest and vegetation adjacent to ground nesting birds until after nesting is complete.
- If there is a high probability (80 percent chance) of local, moderate rain (0.25 inch or less within 24 hours), then applications should only occur when it is anticipated that there shall be sufficient time (at least four hours) for the application to dry before rainfall occurs.
- Implement the following buffers for riparian, wetlands, and other aquatic habitats when applying herbicide[38].
    - Do not apply herbicides rated as class 2 within 50 feet of the waterbody or wetland to be protected and within 10 feet of riparian vegetation, if present. Herbicides that meet this criterion include: 2,4-D (aquatic and non-aquatic amine salt formulations), dicamba, diuron, and triclopyr (ester formulation).
    - Do not apply herbicides rated as class 3 within 100 feet of the edge of the waterbody or wetland to be protected and within 20 feet of riparian vegetation, if present. Herbicides that meet this criterion include: 2,4-D aquatic and non-aquatic ester formulations.
- To protect all other migratory birds, do not apply dicamba within the following buffers listed in the table below for each bird category[39]. To achieve these buffers, a crew member may walk ahead of the spray crew and check for nests.

[38] The list of herbicides provided under each toxicity level (Class 1, 2 or 3) was derived by listing out the toxicity for each proposed herbicide from the categories that are applicable to species that may occur in riparian area, wetlands, and other aquatic habitats. These categories included Small Avian, Reptile, Aquatic Amphibian, Terrestrial Amphibian, Cold Water Fish, Warm Water Fish, and Aquatic Arthropod. To determine the herbicide toxicity class of each herbicide, the highest toxicity number for all these categories was used. For example, triclopyr has a Class 0 or Class 1 herbicide toxicity in some categories but Class 2 in other categories, so this herbicide was included in the Class 2 buffer.

[39] Insect eating small migratory birds such as flycatchers, swallows, warblers, woodpeckers, and wrens do not require buffers for spot application of solid and liquid formulations of herbicides.

Dicamba Buffer for Migratory Birds

Species Category	Dicamba Buffer	Buffer Type
Falcons, kites, ospreys, owls, small hawks	300 feet	Occupied nests
Carrion eating birds (large hawks, caracaras, ravens, vultures, etc.)	1/8 mile	Occupied nests
Small avian seed and grit eating migratory birds (doves, finches, meadowlarks, sparrows, etc.)	30 feet	Occupied habitat
Geese	300 feet	Occupied nests
Waterfowl other than geese (ducks, grebes, loons, mergansers, etc.)	30 feet	Occupied habitat

3.11.5 Environmental Consequences

Direct and Indirect Effects of the No Action Alternative

Under the No Action Alternative, routine aerial and ground inspections would be conducted along with manual, mechanical, and DSAP vegetation maintenance treatment methods within the ROW. Aerial and ground inspections would not likely affect migratory birds because of the short duration of these activities. In addition, only manual treatments would be permitted in riparian areas, which would limit potential displacement of individual birds during treatment activities. The crew workers associated with ground inspections and manual and mechanical treatment of vegetation may temporarily displace birds present in the ROW. If birds are active in the ROWs during vegetation management activities, workers and their vehicles and/or equipment would create noise and visual disturbances that may cause birds to flush and leave the immediate area. Disturbance would be more frequent and longer in duration under the No Action Alternative compared to the Proposed Action. The ROW has been regularly maintained in the past therefore, no wide-scale removal of vegetation would occur in the No Action Alternative. Areas adjacent to the ROWs generally contain more vegetation than the ROWs, so a temporary flushing of birds from cover sites or food sources is not anticipated to impact migratory birds to any measurable degree. Additionally, vegetation management activities would benefit avian habitats within the ROW and in adjacent areas by replacing ladder fuels with low-growing, compatible vegetation. The ROW would act as a fire break and change the dynamics of wildland fire, thereby helping to reduce the potential for indirect impacts on avian habitat from catastrophic wildfire.

Some ground nests and nests in and on cacti, sapling trees, and bushes may occur in ROWs in any given year, and small numbers of undetected nests could be at risk from temporary disturbance while crews work in ROWs. The likelihood that a nest would be present in the ROWs where vegetation management activities would take place would be low because only smaller, re-sprouting vegetation, seedlings or stumps would be removed. Smaller re-sprouting shoots growing from stumps are rarely used for nesting sites but may be used during foraging, migration or as cover for ground dwelling birds. Additionally, the Utilities' Avian Protection Programs direct crews to avoid treating vegetation during the nesting season if a nest is found in target vegetation, thereby minimizing potential impacts. A qualified biologist or resource specialist would provide the maintenance crew members with training on migratory bird nest reporting and nest avoidance. The maintenance crews would internally report active nests that occur on vegetation or on the ground per the Utilities' avian reporting procedures and restrict treatments on the vegetation containing the nest until after nesting is complete. Maintenance crews do not conduct routine vegetation maintenance and DSAP treatments on the vegetation containing the nest and vegetation adjacent to ground nesting birds until after nesting is complete. Between vegetation maintenance cycles, small sapling vegetation would develop, but this vegetation would continue to be cut and would not be allowed to reach maturity within the ROW.

Routine vegetation maintenance treatments would not alter the availability of prey populations. Prey species such as small mammals may be affected by disturbance if their range is restricted to certain microhabitats. However, many small mammals live in burrows where they can retreat during disturbance by vehicles, equipment noise, and crew workers. Direct contact with migratory birds would be unlikely due to their ability of flight. Current and future Utility vegetation management activities would adhere to the Utility's Avian Protection Programs to mitigate potential impacts to migratory birds[40].

Five IBAs are present on three BLM field offices in the ROW; however, very little of each IBA is located within the ROW. All but one IBA have less than one percent of the portion of the IBA on BLM-managed lands and present within the ROW. The exception is the Agua Fria National Monument Riparian Corridors IBA, which only has 1.78 percent of the portion of the IBA on BLM-managed land present within the ROW. Overall, 0.36 percent of the portion of the IBAs present on BLM-managed land is present within the ROW. Therefore, a very small portion of these five IBAs could be impacted under the No Action Alternative. The frequency and duration of the impact would be greater under the No Action Alternative compared to the Proposed Action. Therefore, the No Action Alternative would result in short- and long-term, direct and indirect, negligible, adverse impacts to migratory birds.

Direct and Indirect Effects of the Proposed Action

In addition to the short-term effects associated with the No Action Alternative described above, the Proposed Action would also result in impacts on migratory birds from the use of herbicides as part of the management of incompatible vegetation within the ROW. Herbicide use within the ROW would be limited to spot applications for the control of incompatible vegetation within the ROWs. Similar to manual and mechanical methods, the herbicide application process involves people, vehicles, and equipment, which would result in localized, short-term noise and visual disturbances to migratory bird species in and adjacent to the ROWs. In the unlikely chance that a bird nest occurs within the ROW, the SOPs described above would require that applicators be trained on identifying and avoiding nests during migratory bird nesting season. This measure would ensure that nests and the vegetation the nest is on would not be targeted with herbicide until after the birds have fledged. Any birds in the ROW would more than likely fly away before crew workers could get close enough to inadvertently spray them with herbicide.

Migratory birds could come into contact with vegetation that has been sprayed by herbicides. However, even if birds were to come into contact with herbicides, only herbicides of low toxicity to birds would be used. The only herbicide that is highly toxic to migratory birds that is proposed is dicamba, and use of this herbicide is limited to areas outside of buffers noted in the SOPs. The potential for herbicide exposure resulting in detrimental impacts to migratory birds is unlikely.

Herbicides could be sprayed on insects that are, in turn, ingested by migratory birds. Targeted application of herbicides to only specific incompatible plants or re-sprouts limits the opportunity for insect prey species to be exposed. The use of low toxicity herbicides, establishment of buffers within or near suitable habitat, the application of targeted, short duration herbicide treatments, and the use of the drift and drip reduction agent, Thinvert, would reduce any potential direct effects to migratory birds by the Proposed Action. Therefore, the Proposed Action would result in direct and indirect, short-term, negligible, adverse impacts to migratory birds because the potential for direct contact with the species would be unlikely, the maintenance crew training, and due to the effectiveness of SOPs when implemented. There would also be direct and indirect, long-term, negligible, beneficial impacts to these species because the frequency of routine vegetation maintenance would decrease, which would reduce the presence of workers and noise within suitable habitat.

[40] APS and SRP have Avian Protection Programs which are voluntary programs established to allow each utility to address bird issues within their ROWs in response to federal laws protecting birds.

3.11.6 Mitigation Measures

No mitigation measures are recommended.

3.12 Fire and Fuel Management

3.12.1 Introduction

The BLM is responsible for fire management on public lands managed by the agency across Arizona. Their responsibilities include wildland firefighting for protection of natural resources, as well as using fire to improve the health of the land. The primary directive of the fire program is to provide for public and firefighter safety. Other emphasis areas for the BLM fire program in Arizona include conducting hazardous fuels treatment projects in the highest risk and highest priority areas and interagency cooperation (BLM 2016b).

Wildland fires are categorized in two categories 1) unplanned ignitions and 2) planned ignitions which are considered prescribed fires. Unplanned ignitions are associated with lightning strikes or unwanted and unplanned ignitions caused by human activity; both may be managed as a prescribed fire for resource benefit based on fire management objectives in the area as well as environmental factors associated with weather, topography, and fuel loads (WAPA 2012). The primary intent of the Utilities' vegetation management program is to prevent ignition starts under the electrical transmission lines and reduce surface, ladder, and canopy fuels through thinning and removal of vegetation.

Fire plays a critical role in shaping vegetative characteristics. Fire suppression practices of the 20th century have pushed some vegetative communities outside of their historic range of variability due to increased fuel accumulations, higher densities of trees and shrubs, and increased ladder fuels. As a result, these areas are prone to higher-intensity wildfires than historically experienced. Fuels are considered any type of combustible material or vegetation that is susceptible to sustaining fire. The primary objective of fuels reduction or vegetation treatments is to remove enough of combustible material to reduce the risk posed by wildfire to communities, infrastructure, and natural resources. Fuels treatments can lessen the severity of wildfire and consists of a number of methods which reduce combustible fuels. Treatments also aid in the maintenance of healthy forests, ecosystems, and watersheds through mechanical and chemical techniques.

Fuels treatments are intended to lower the risk of catastrophic wildfires by managing vegetation to modify/reduce hazardous fuels. The goal of fuel treatment projects is to modify fire behavior to reduce environmental damage and aid in suppressing wildfires. Benefits from fuel treatments include preventing loss of lives, reducing fire suppression cost, reducing private property losses, and protecting natural resources (control of unwanted vegetation, including invasive species, improvement of rangeland for livestock grazing, improvement of fish and wildlife habitat, enhancement and protection of riparian areas and wetlands, and improvement of water quality) from devastating wildfire (BLM 2016b).

3.12.2 Issues Identified for Analysis

- What is the potential to aid firefighting efforts and fuels management by providing fire breaks as part of vegetation management?
- What is the potential for vegetation management to reduce hazardous fuels within the ROW?
- Will annual reports document the acreages and locations of herbicide treatment?

3.12.3 Affected Environment

BLM Arizona's fire program is broken into distinctive fire management zones: Arizona Strip, Colorado River, Phoenix, and Gila. For this EA, the Colorado River, Phoenix, and Gila fire zones are each described briefly below. The fire zones correspond with field offices within each BLM District.

COLORADO RIVER DISTRICT FIRE ZONE

BLM's Colorado River District Fire Zone (Colorado River DFZ) encompasses the Kingman, Lake Havasu, and Yuma Field Offices located in western Arizona for a total of 11,934,355.08 acres, of which 5,014,593.52 are BLM managed. Approximately 98 percent of fires in the Colorado River DFZ are human caused and generally occur between the months of February and October. Most of these fires occur near main travel corridors and rivers. The 20-year annual average for all fire causes equates to 36 fires per year, burning an average of 3,000 acres per year (BLM 2017b). The vegetation in the Colorado River DFZ is predominately Sonoran Desert Scrub and Semi Desert Grassland with a mix of perennial and annual grasses and forbs. In the higher elevations of the Hualapai Mountains, Conifer Woodlands are present with a mix of pinyon and ponderosa pines which dominate the landscape. The Colorado River corridor itself is comprised of salt cedar, willows, cottonwoods, and other riparian vegetation (BLM 2016b). In general, fire characteristics in the Lower Colorado River Valley are influenced by the fine, very porous and continuous herbaceous fuels characteristic of the Sonoran Desert Scrub vegetation that have cured (dried) or nearly cured on the surface. Wildland fires in this vegetation community are typically surface fires that can move rapidly through the cured grass and associated materials depending on moisture content of fuels and time of year (Anderson 1982).

PHOENIX DISTRICT FIRE ZONE

The BLM's Hassayampa and Lower Sonoran Field Offices administer the Phoenix District Fire Zone (Phoenix DFZ) located in central and northern Arizona for a total of 33,154,995.33 acres, of which 2,383,444.66 acres are BLM managed. Fire season usually begins in mid-March and ends in early September within this zone, with an annual average of 61 wildfires, burning an average of 9,000 acres of BLM public lands each year (BLM 2017b). The vegetation in Phoenix DFZ in lower elevations consists of Sonoran Desert Scrub with a mix of Interior Chaparral (shrubs, cacti, and trees consisting of mesquite, palo verde, and ironwood), Semi Desert Grassland, and a perennial and annual grasses and forbs mixture similar to that of the Colorado River DFZ. In the higher elevation of the Mogollon Rim, Conifer Woodlands are present with a mix of pinyon and ponderosa pines which dominate the landscape (BLM 2016b). Fire characteristics associated with Interior Chaparral vegetation are typically fast-spreading fires with high flame length that involves the foliage and live and dead fine woody material as a nearly continuous fuel source. Besides flammable foliage, there is dead woody material that significantly contributes to the fire intensity (Anderson 1982).

GILA DISTRICT FIRE ZONE

The BLM's Tucson and Safford Field Offices administers the Gila District Fire Zone (Gila DFZ) located in eastern Arizona for a total of 14,819,645.89 acres, of which 2,039,648.18 acres are BLM managed. The vegetation in Gila DFZ is a variety of Sonoran and Chihuahuan Desert Scrub and Grasslands, with a mix of cacti, trees, perennial and annual grasses, and forbs. In the higher elevations of the Gila DFZ Conifer Forests and Evergreen Woodlands are present with a mix of pinyon and ponderosa pines which dominate the landscape. The Gila DFZ sees an average of 27 fires each year on BLM public lands, with approximately 3,000 acres consumed per year (BLM 2017b). A typical fire season runs from March through September. Lightning strikes cause 60 percent of the fires that occur within the zone (BLM 2016b). In the desert scrub grasslands vegetation communities, fire spreads primarily through the fine herbaceous fuels, either curing or dead. These are normally surface fires where the herbaceous material, besides litter and dead-down stemwood from the open shrub or timber overstory, contribute to the fire intensity (Anderson 1982).

3.12.4 Standard Operating Procedures

No fuel management SOPs are recommended.

3.12.5 Environmental Consequences

Direct and Indirect Effects of the No Action Alternative

All ROWs would continue to be routinely inspected by the Utilities, typically on an annual basis, to check the condition of the ROWs and status of vegetation. The Utilities would conduct routine vegetation maintenance using manual and mechanical treatment methods (see Sections 2.2.1 through 2.2.7) on a set maintenance schedule/cycle that would trim or remove new growth and/or regrowth since the last treatment. During routine vegetation maintenance, all woody vegetation (shrubs and trees) within a 10-foot radius around poles and 40-foot radius around transmission towers would be removed. Fuels modifications associated with the removal, or selective spacing, of all woody vegetation would reduce fuel loading within the ROW. The treatment schedule, ranging from every one to five years, would depend on the maintenance needs for each ROW based on the Utilities' routine inspections. On BLM-managed lands, vegetation within the ROWs has been, and would be, continually maintained in coordination with BLM fire management staff within each district. In addition DSAP maintenance would be part of the No Action Alternative to comply with the International Fire Code (International Code Council 2011a; Section A102.3.1). The objective is to remove vegetation from around the poles to reduce the risk of fire ignition from spark emitting electrical equipment and to reduce fuels/provide a fuel break around these poles to help protect them in the event of a wildland fire. These poles are generally located in the wildland-urban interface areas near residential development.

Under the No Action Alternative, fuel loads would constantly increase due to the re-growth and re-sprouting that is incompatible with the power line facilities. Surface[41], ladder[42], and canopy[43] fuels would be modified over the short-term, but brush and shrubs would constantly re-sprout from the roots and would perpetually need to be addressed in the ROWs. The No Action Alternative would modify the fuel characteristics[44] but not lower the fuel loads in the ROWs because the existing vegetation treatment methods would lead to dense re-growth of vegetation and not the removal of fuel. In the No Action Alternative, the Utilities would be limited to using manual and mechanical control methods to maintain vegetation in the ROWs. Therefore, the No Action Alternative would have short- and long-term, direct and indirect, negligible beneficial impacts on fuel management because the vegetation maintenance activities would alter the fire dynamics but the fuel loads would be maintained at current levels.

Direct and Indirect Effects of the Proposed Action

The use of herbicides would prevent fuel build-up that results from the rapid, dense re-growth and sprouting and then subsequent cut-back of undesired vegetation in the ROW. Over time, it is expected the post-treatment residue of vegetation debris would decline with the use of herbicides as compatible plant species become established in the ROW, and the use of herbicides would prevent re-sprouting and subsequent cutback. In the Proposed Action with the use of herbicides and overtime, the incompatible vegetation species would be

[41] Surface fuels are fuels that are lying on or near the surface of the ground, consisting of leaf and needle litter, dead branch material, downed logs, bark, tree cones, and low stature living plants (https://www.nwcg.gov/glossary/a-z).

[42] Ladder fuels are fuels which provide vertical continuity between strata, thereby allowing fire to carry from surface fuels into the crowns of trees or shrubs with relative ease. They help initiate and assure the continuation of crowning (https://www.nwcg.gov/glossary/a-z).

[43] Canopy fuels are the stratum containing the crowns of the tallest vegetation present (living or dead), usually above 20 feet (https://www.nwcg.gov/glossary/a-z).

[44] Fuel characteristics are factors that make up fuels such as compactness, loading, horizontal continuity, vertical arrangement, chemical content, size and shape, and moisture content (https://www.nwcg.gov/glossary/a-z).

removed and the compatible species would become more mature and established in the ROWs. This would reduce the need for constant fuels treatments and would substantially reduce residue build-up and fuel loads in the ROWs. The composition of flammable vegetation within the ROWs would be altered resulting in reduced fuel loads and subsequently reduce fire intensity within the ROW.

The use of herbicides would make permanent the selective removal of plant species that are most prone to canopy fires and would reduce the surface, ladder, and canopy fuels in the area directly beneath the power lines. The Proposed Action would also facilitate and prolong the selective thinning of the surface, ladder and canopy fuels in the ROW. Fuel modifications associated with the use of herbicides within the existing ROWs could reduce the intensity of a flaming front[45] of a crown fire as it enters the ROW by changing fire behavior characteristics associated with fuel breaks. The use of herbicides would more permanently establish the vegetation composition needed to create these conditions. Therefore, the Proposed Action would have short- and long-term, direct and indirect, moderate, beneficial impacts on fuel management because the use of herbicides would substantially reduce fuel loads and subsequently reduce fire intensity within the ROWs.

3.12.6 Mitigation Measures

No mitigation measures are recommended.

3.13 Special Management Areas

3.13.1 Introduction

The BLM manages certain lands that possess unique and important cultural, physical, and natural features such as undisturbed wilderness tracts, critical habitat, scenic landscapes, historic locations, cultural landmarks, and paleontologically rich regions. Special management areas are managed with the intent to preserve, protect, and evaluate these important components of our national heritage. Most special areas are either designated by an Act of Congress or by Presidential Proclamation, or are created under BLM administrative procedures (BLM 2007a).

The BLM's National Landscape Conservation System (NLCS) is the primary management framework for these specially designated lands. The NLCS designations include National Monuments, National Conservation Areas, and National Scenic and Historic Trails. Outside of the NLCS framework, the BLM manages other special areas, including ACECs, NRTs, lands with wilderness characteristics, and a variety of other area designations (BLM 2016a). The ROWs do not cross any wilderness areas, wilderness study areas, national natural landmarks, or wild, scenic, and recreational rivers.

3.13.2 Issues Identified for Analysis

- How would the use of herbicides affect special management areas like ACECs, National Historic Trails (NHT), and other areas of special designation such as monuments and national conservation areas?

3.13.3 Affected Environment

The special management designations that are crossed by the ROW are identified in Table 3-34 through Table 3-40.

[45] Flaming front is that zone of a moving fire where the combustion is primarily flaming. Behind this flaming zone combustion is primarily glowing or involves the burning out of larger fuels (greater than about 3 inches in diameter). Light fuels typically have a shallow flaming front, whereas heavy fuels have a deeper front (https://www.nwcg.gov/glossary/a-z).

LANDS WITH WILDERNESS CHARACTERISTICS

Under Section 201 of FLPMA (P.L. 94–579), BLM is required to continually maintain an inventory of all public lands, their resources, and overall values, which includes wilderness characteristics. Wilderness characteristics are defined in Section 2(c) of the Wilderness Act of 1964 and include the consideration of naturalness, solitude, and opportunities for primitive and unconfined recreation. There are approximately 384,220.24 acres of total lands with wilderness characteristics within the six BLM field offices throughout Arizona. Lands determined to have wilderness characteristics in the ROW are located in the Agua Fria National Monument, within the Hassayampa Field Office. As part of the Agua Fria National Monument RMP planning process (BLM 2010a), the entire 72,476.20 acres of the Monument were inventoried and 20,904.34 acres were determined to possess wilderness characteristics in the general area of Perry Mesa. The ROWs encompass a total of approximately 382.91 acres (1.83 percent) within lands with wilderness characteristics in the Perry Mesa area within the Monument.

Table 3-34. National Landscape Conservation System and Other Special Designation Areas within the ROW – Lands Managed for Wilderness Characteristics

Lands Managed for Wilderness Characteristics	BLM Field Office	Total Acres/Miles within BLM Field Office	Acres/Miles within ROW/Percent within BLM Field Office
Perry Mesa Area	Hassayampa	20,904.34 acres[a]	382.91 acres/1.83

Table Source: BLM 2012a; NPS/BLM 2014; BLM 2014; BLM 2015; NPS 1996; ATA 2012; BLM 2011.

[a] Perry Mesa area lands managed with wilderness characteristics lies within the Aqua Fria National Monument and are managed by the Monument.

NATIONAL MONUMENTS

The Antiquities Act of 1906 (P.L. 59–209, 34 Statute. 225, 16 U.S.C. § 431–433), grants the President authority to designate national monuments in order to protect "objects of historic or scientific interest." While most national monuments are established by the President, Congress also has occasionally established national monuments protecting natural or historic features. Within Arizona, there are five designated national monuments managed by BLM, totaling just over 2 million acres. Three of the five monuments, Agua Fria, Ironwood Forest, and Sonoran Desert National Monuments, are crossed by the ROW. The ROW includes a total of approximately 858.34 acres (0.11 percent) of the 758,436.71 acres of these three national monuments.

The 72,476.20 acre Agua Fria National Monument was established January 11, 2000, by Presidential Proclamation 7263 under the Antiquities Act of 1906 (34 Statutes 225, 16 USC 431–433) to protect an array of scientific, archaeological, historical, and biological objects that are described in the proclamation. The proclamation provides the principal direction for management of the Monument, including direction for how the provisions of FLPMA are to be applied. The Agua Fria National Monument RMP (BLM 2010a) fulfills the proclamation directives by guiding management activities and providing protection for the Monument's resources. The Monument is located east of Interstate 17 between Black Canyon City and Cordes Lakes, Arizona. Approximately 686.74 acres (0.95 percent) of lands covered by the Agua Fria National Monument RMP are within the ROW.

Table 3-35. National Landscape Conservation System and Other Special Designation Areas within the ROW – National Monuments

National Monuments	BLM Field Office	Total Acres/Miles within BLM Field Office	Acres/Miles within ROW/Percent within BLM Field Office
Agua Fria	Hassayampa	72,476.20 acres	686.74 acres/0.95
Ironwood Forest	Tucson	189,725.99 acres	68.41 acres/0.04
Sonoran Desert	Lower Sonoran	496,234.52 acres	103.19 acres/0.02
Agua Fria	Hassayampa	72,476.20 acres	686.74 acres/0.95

Table Source: BLM 2012a; NPS/BLM 2014; BLM 2014; BLM 2015; NPS 1996; ATA 2012; BLM 2011.

Under the authority provided in 16 USC 431, the Ironwood Forest National Monument was established by Presidential Proclamation 7320 in 2000 for the purpose of protecting biological, cultural, geological, and other resource values. The Monument is located in southern Arizona, 25 miles northwest of Tucson. The BLM Tucson Field Office has the responsibility of planning for and management of the Monument and recently completed the ROD and Approved RMP in February 2013 (BLM 2013a). The 189,725.99-acre Monument is named after one of the longest living trees in the Sonoran Desert. For the Proposed Action, the Ironwood Forest National Monument RMP applies to 68.41 acres (0.04 percent) of the Monument.

The Sonoran Desert National Monument is located in Maricopa and Pinal counties, Arizona, and contains approximately 496,234.52 acres of BLM-managed lands. Presidential Proclamation 7397 created this Monument in 2001 to ensure protection of biological resources and archaeological and historic sites. The Sonoran Desert National Monument RMP (BLM 2012b) includes broad land use plan decisions that provide overall direction for management of resources and resource uses within the Monument. For the Proposed Action, the Sonoran Desert National Monument RMP applies to 103.19 acres (0.02 percent) of the Monument.

NATIONAL CONSERVATION AREAS

National conservation areas are designated by Congress to conserve, protect, enhance, and manage public lands for the benefit and enjoyment of present and future generations. The BLM's National Conservation Lands include the Gila Box Riparian, Las Cienegas, and San Pedro Riparian National Conservation Areas in Arizona, totaling approximately 129,104.52 acres. The 58,257.04-acre San Pedro Riparian National Conservation Area contains approximately 10.16 acres (0.02 percent) of ROW; however the ROW predates the designation of the Conservation Area. The San Pedro Riparian area in the Tucson Field Office was designated by Congress in 1988 as the nation's first Riparian National Conservation Area and supports over 350 species of birds, 80 species of mammals, and 40 species of amphibians and reptiles (BLM 1989a). The resource management planning process for this national conservation area is currently being updated with an expected ROD by mid-2017.

Table 3-36. National Landscape Conservation System and Other Special Designation Areas within the ROW – National Conservation Areas

National Conservation Areas	BLM Field Office	Total Acres/Miles within BLM Field Office	Acres/Miles within ROW/Percent within BLM Field Office
San Pedro Riparian	Tucson	58,257.04 acres	10.16 acres/0.02

Table Source: BLM 2012a; NPS/BLM 2014; BLM 2014; BLM 2015; NPS 1996; ATA 2012; BLM 2011.

AREAS OF CRITICAL ENVIRONMENTAL CONCERN

The BLM designates ACECs where special management attention is needed to protect, and prevent irreparable damage to, important historical, cultural, and scenic values, fish, or wildlife resources or other natural systems or processes or to protect human life and safety from natural hazards (43 CFR 1610.7-2 and BLM Manual 1613). In Arizona there are 49 ACECs encompassing 782,300.53 acres in the six BLM field offices. The ROW crosses six ACECs in four field offices, which are described in more detail below.

Located in western Arizona, the Black Mountains ACEC within the Kingman Field Office provides outstanding habitat for desert bighorn sheep and wild burro in a very scenic Basin and Range topographic formation. In addition to having relatively undisturbed habitat for sensitive plant species, the Black Mountains contain several historic mining districts including Oatman-Goldroad, Union Pass, and Katherine districts. There are important cultural resources within the 119,023.95-acre ACEC with some of the best pictographs know to the resource area. In the Kingman Resource Area Proposed RMP and Final Environmental Assessment, BLM determined that wildlife, sensitive plant species, scenic, cultural, and high locatable mineral potential were values that needed to be protected to prevent irreparable damage (BLM 1993). The ROWs encompass a total of approximately 72.96 acres (0.06 percent) of the Black Mountains ACEC.

The Cuerda de Lena ACEC consists of 58,548.76 acres within the Lower Sonoran Field Office, near Ajo in southwestern Arizona. The ACEC provides protection to the endangered Sonoran pronghorn and also contains suitable and occupied habitat for other sensitive wildlife species. There is a strong cultural resource component associated with this area because it is part of the traditional Tohono O'odham Nation homeland and contains important information about prehistoric settlement and subsistence. In the Lower Sonoran ROD and Approved RMP, BLM determined that the values where special management attention is warranted are for wildlife and cultural resources (BLM 2012a). The ROW encompasses a total of approximately 2.53 acres (0.004 percent) of the Cuerda de Lena ACEC.

The trails and associated landscapes in the Gila River Terraces and Lower Gila Historic Trails ACEC have national relevance because they are part of an important story about the peoples that have lived in, traveled through, and influenced the trail area in both a historic and pre-historic context. Occupation and use of the Gila River terraces and trails spanned thousands of years evidenced by extensive prehistoric village sites and petroglyph sites, as well as associated canals, farmsteads, camp sites, and trails. At least 250 sites have been recorded within the 82,561.16-acre ACEC boundary. The ACEC encloses a historic travel corridor with portions of the Juan Bautista de Anza NHT Butterfield Overland Mail Route, Mormon Battalion Trail, and the Gila Trail following the same course along the Gila River floodplain. In the Lower Sonoran ROD and Approved RMP, BLM determined that archaeologic and historic resources were values that needed to be protected to prevent irreparable damage (BLM 2012a). The ROW encompasses a total of approximately 143.88 acres (0.17 percent) of the Gila River Terraces and Lower Gila Historic Trails ACEC.

The Saddle Mountain ACEC is a volcanic landscape containing unique archaeological sites, wildlife habitat, interpretive geology, and dramatic scenery. Recognized by travelers for thousands of years, Saddle Mountain is a distinctive landmark located 60 miles west of Phoenix. The mountain landform towers above the Harquahala Plain at an altitude of 3,037 feet above sea level. Cultural resources are found in higher densities than the surrounding areas and include important prehistoric petroglyph, rock shelter, and geoglyph sites. The volcanic upthrust of the mountain has created outstanding scenery and vistas of cliffs, spires, and buttes. The 48,514.18 acre ACEC provides habitat for BLM sensitive species, including the Sonoran desert tortoise and desert bighorn sheep in addition to approximately 162 other species. In the Lower Sonoran ROD and Approved RMP, BLM determined that the values where special management attention is warranted is for cultural, wildlife,

scenic, geology, and sensitive status species resources (BLM 2012a). The ROW encompasses a total of approximately 226.19 acres (0.47 percent) of the Saddle Mountain ACEC.

Formerly known as the Gila River Cultural Area ACEC, the Sears Point ACEC is located in southwestern Arizona and contains an archaeological district with extensive petroglyph displays, prominent basalt mesas, historic trail corridors, and important riparian vegetation. The 13,518.01-acre ACEC also contains a 3,700-acre core area that includes a high concentration of petroglyphs which are within a National Register of Historic Places-listed archaeological district (BLM 2010a). In the Yuma Field Office ROD and Approved RMP, BLM determined that the values where special management attention is warranted is for historic, archaeology, geology, and riparian resources (BLM 2010g). The ROW encompasses a total of approximately 2.27 acres (0.02 percent) of the Sears Point ACEC.

Tanner Wash ACEC was created in 1988 to help protect the population and suitable habitat for the federally endangered Peebles Navajo Cactus. This cactus is difficult to find because the plants are very small and during dry weather plants retract into the soil (USFWS 2008e). Approximately 2,336.52 acres of the ACEC is on BLM-managed lands within what is now the planning area for the Safford Field Office. When it was initially evaluated in the Phoenix RMP and Environmental Impact Statement (EIS), BLM determined that the values where special management attention is warranted is for sensitive status species resources (BLM 1988). The ROW encompasses a total of approximately 13.58 acres (0.58 percent) of the Tanner Wash ACEC.

Table 3-37. National Landscape Conservation System and Other Special Designation Areas within the ROW – ACECs

ACEC	BLM Field Office	Total Acres/Miles within BLM Field Office	Acres/Miles within ROW/Percent within BLM Field Office
Black Mountains	Kingman	119,023.95 acres	72.96 acres/0.06
Cuerda de Lena	Lower Sonoran	58,548.76 acres	2.53 acres/0.004
Gila River Terraces and Lower Gila Historic Trails	Lower Sonoran	82,561.16 acres	143.88 acres/0.17
Saddle Mountain	Lower Sonoran	48,514.18 acres	226.19 acres/0.47
Sears Point	Yuma	13,518.01 acres	2.27 acres/0.02
Tanner Wash	Safford	2,336.52 acres	13.58 acres/0.58

Table Source: BLM 2012a; NPS/BLM 2014; BLM 2014; BLM 2015; NPS 1996; ATA 2012; BLM 2011.

NATIONAL TRAILS

The National Trails System is the network of scenic, historic, and recreation trails created by the National Trails System Act of 1968 (16 USC 1241-51). These trails provide recreation needs, promote outdoor areas and historic resources, and encourage public access and citizen involvement. There are three types of trails identified in the Act:

1. National historic trails commemorate historic (and prehistoric) routes of travel that are of significance to the entire Nation. They must meet all three criteria listed in Section 5(b)(11) of the National Trails System Act and are established by Act of Congress.
2. National scenic trails are 100 miles or longer, continuous, primarily non-motorized routes of outstanding recreation opportunity and are established by Act of Congress.
3. National recreation trails are existing regional and local trails recognized by either the Secretary of Agriculture or the Secretary of the Interior upon application.

The Juan Bautista de Anza NHT (Anza NHT), the Arizona NST, and the Black Canyon NRT are located within four of the BLM field offices in Arizona; each pass through existing ROW. The Betty's Kitchen Interpretive NRT in the Yuma Field Office is not currently crossed by the ROW. The Anza NHT commemorates Spanish Commander Anza's route taken on the expedition to bring colonists to the San Francisco bay area from Tubac, Arizona, a length of approximately 1,200 miles in period from 1775-1776. Congress designated this trail through Public Law 101-365 in 1990 and is currently defined as a one-mile-wide corridor. Approximately 28.73 miles of the trail is located within the Lower Sonoran Field Office. The ROW currently crosses the Anza NHT at four locations and a total of approximately 0.06 miles of the trail are within the ROW.

The Omnibus Public Lands Management Act of March 30, 2009 (P.L.111-11) added the Arizona NST to the NLCS. The Arizona NST stretches approximately 815.5 miles across the state from Mexico to Utah and climbs and descends from one "sky island" mountain range to another and traversing landscapes ranging from desert to boreal forest. The BLM Tucson Field Office manages 27.92 miles of the trail, which includes the Tortilla Mountain passage. The Tortilla Mountains Passage (Passage #15) stretches approximately 27.92 miles from the Freeman Road Trailhead near Dudleyville to Kelvin-Riverside Bridge within the Tucson Field Office. From the Freeman Road Trailhead the trail passes through a remote area of Arizona through the Tortilla Mountains, crossing numerous drainages, granite boulder fields, and small canyons until reaching the Gila River (http://www.aztrail.org/at_about.html). A Utility ROW crosses the Arizona NST on Tucson Field Office lands at three locations; one crossing is on the Gila River Canyons passage on the north side of the Gila River, and two crossings south of the Gila River in the Tortilla Mountains. The Arizona NST is collocated on the Utility ROW service road for about a mile in the Tortilla Mountains Passage. Of the 27.92 miles of the Tortilla Mountains Passage, 6.37 miles is located on BLM-managed lands and 0.83 miles of the trail crosses the ROW.

The Black Canyon NRT was designated in June 2008 and is managed by the Hassayampa Field Office. This 81.49-mile long trail follows a route used by pre-historic Native American travelers and traders. In 1919, the USDI officially established the route as a livestock driveway, because it was used by woolgrowers from the Phoenix area to herd sheep to and from their summer ranges in the Bradshaw and Mingus Mountains. The trail stretches from the Carefree Highway, northward along the base of the Bradshaw Mountains to the Prescott National Forest (http://www.blm.gov/az/st/en/prog/recreation/hiking/blk-canyon.html). Of the 81.49 miles of the Black Canyon NRT on BLM lands, approximately 0.25 miles of the trail crosses the ROW.

Table 3-38. National Landscape Conservation System and Other Special Designation Areas within the ROW – National Historic Trails

National Historic Trail	BLM Field Office	Total Acres/Miles within BLM Field Office	Acres/Miles within ROW/Percent within BLM Field Office
Juan Bautista de Anza	Lower Sonoran	28.73 miles	0.03 miles/0.10

Table Source: BLM 2012a; NPS/BLM 2014; BLM 2014; BLM 2015; NPS 1996; ATA 2012; BLM 2011.

Table 3-39. National Landscape Conservation System and Other Special Designation Areas within the ROW – National Scenic Trails

National Scenic Trail	BLM Field Office	Total Acres/Miles within BLM Field Office	Acres/Miles within ROW/Percent within BLM Field Office
Arizona Tortilla Mountains Passage (Passage #15)	Tucson	6.37 miles	0.83 miles/13.03

Table Source: BLM 2012a; NPS/BLM 2014; BLM 2014; BLM 2015; NPS 1996; ATA 2012; BLM 2011.

Table 3-40. National Landscape Conservation System and Other Special Designation Areas within the ROW – National Recreation Trails

National Recreation Trail	BLM Field Office	Total Acres/Miles within BLM Field Office	Acres/Miles within ROW/Percent within BLM Field Office
Black Canyon	Hassayampa	81.49 miles	0.25 miles/0.31

Table Source: BLM 2012a; NPS/BLM 2014; BLM 2014; BLM 2015; NPS 1996; ATA 2012; BLM 2011.

3.13.4 Standard Operating Procedures

Prior to implementation of any vegetation treatment, the Utilities would initiate coordination the special management area's manager. Resource specific SOPs would be implemented depending on the protect values associated with a special management area and can be found in the respective resource sections in this Chapter.

MANUAL AND MECHANICAL TREATMENT METHODS

- Within the ROW, ATVs and vehicles may drive off-road if necessary with the implementation of relevant SOPs below.
  - ATVs and vehicles would be used only during dry conditions to avoid rutting, except under hazard vegetation maintenance situations.
  - ATVs and vehicles would avoid driving through rivers, standing water, and other water sources except on established roads.
  - ATVs and vehicles would be driven at low speeds (less than 10 miles per hour) when traveling off-road within the ROW.
  - ATVs and vehicles would only be operated during daylight hours, except under hazard vegetation maintenance situations.
  - ATVs and vehicles would avoid driving directly up slopes and other areas that may contain highly erodible soils.
- Stumps from tree removal would be cut within 6 inches of the ground or if possible stumps would be cut flush with the ground.
- All areas with the potential for flowing water (e.g., culverts, ditches, and washes) would be kept free of slash, logs, and debris from vegetation removal operations.
- Small chips produced during vegetation treatments would be broadcast across the ROW at a thickness no greater than four inches.
- During manual vegetation treatment, the following methods of disposal would be used:
  - Lop and scatter: Limbs and logs of less than 9 inches in diameter would be lopped and scattered throughout the immediate area in a manner such that limbs and logs would be left no taller than 18-24 inches above the ground. Logs over 9 inches diameter would remain where felled and would be cut in sections to lay flush with the ground.
  - Chipping: Limbs and logs less than 9 inches in diameter would be chipped and broadcast on site with chips placed no deeper than four inches.

HERBICIDE TREATMENT METHODS

- Prior to herbicide application in Tanner Wash ACEC, pretreatment surveys for Peebles Navajo cactus would be conducted. Biologists or other professionals experienced in the identification and survey of this cactus would survey the ROW area to be treated and would locate and flag all Peebles Navajo cacti within or immediately adjacent to the area. In an effort to be conservative, all other similar looking cacti would be flagged and avoided.
- Herbicide applicators would be educated on the avoidance of Peebles Navajo cactus prior to scheduled work in potential habitat. The training of applicators would involve one or more applicators, crew foreman, or utility employee overseeing work and include: education on appearance of Peebles Navajo cactus; reference materials to assist in avoidance in the field; field visit, if needed, for refinement of search image; and procedures on avoiding cacti not found during survey.
- Prior to herbicide application, under the targeted plant would be checked for Peebles Navajo cactus prior to applying herbicide to identify cacti that may have been missed during the pretreatment survey. If a cactus is found, appropriate conservation measures would be implemented to avoid the cactus.
- Vehicles would only be driven on existing roads to access the ROW and ATVs would not be driven off-road within the ROW in the Tanner Wash ACEC.
- A 20-foot buffer would be established around each flagged Peebles Navajo cactus or clump of cacti. No herbicide treatments would occur within the 20-foot buffer.
- 2,4-D, diuron, bromacil, hexazinone, picloram and tebuthiuron would not be applied within Peebles Navajo cactus occupied habitat.

3.13.5 Environmental Consequences

The potential effects to vegetation, wildlife habitat, cultural resources, visual resources, and sensitive plant species values associated with ACECs can also be found in the respective resource sections in this Chapter. Associated SOPs are not repeated here but instead can be found in their respective sections.

Direct and Indirect Effects of the No Action Alternative

Vegetation management activities under the No Action Alternative would include hazard vegetation removal, routine vegetation maintenance, and DSAP maintenance based on aerial and ground inspections. Vegetation removal and disposal activities would include the use of tracked or wheeled vehicles, field crews, and hand and machine equipment. This assessment of impacts assumes that the SOPs for manual and mechanical treatment methods designed to reduce potential unintended impacts to special management areas would be followed for all vegetation management activities in the No Action Alternative.

The overall effect of treatments on special management areas would depend on whether the end condition of the treatment site (considering both long-term benefits and short-term effects) altered that area's special resource qualities that were the basis for their designation. Manual and mechanical treatments as well as DSAP maintenance treatments would reduce fuel loads within the ROW, create fire breaks, and decrease the risk of high intensity wildland fires. These efforts to help minimize the excessive loss of vegetation would have an indirect effect on special management areas by preventing the effects to the resources from catastrophic wildfires (refer to Section 3.12 Fire and Fuel). In addition, removal of any invasive or noxious weeds species such as tamarisk from managed natural areas would be beneficial (BLM 2007e).

In the No Action Alternative, *manual methods* would be the least obtrusive method for use in special management areas. Because this method of vegetation maintenance is very selective, damage to non-targeted

vegetation would be minimized. Activities including cutting down trees and shrubs, the presence of work crews, equipment, and vehicles, and the increased in noise levels when motorized hand equipment is used would result in a detectable short-term change in the natural appearance of the landscape of the treated area. The removal or cutting of vegetation could also have detectable effect on the landscape until the vegetation has regrown. Outstanding solitude opportunities such as in Perry Mesa on the Agua Fria National Monument, would also be directly affected in the short-term when treatments are being implemented because of presence of crew works, equipment, and vehicles. Vegetation maintence using manual methods would require repeated treatments to treat the regrowth of the incompatible vegetation and disturbances from crews, vehicles, and equipment noise would recur on average every three to five years.

Mechanical methods would be used infrequently in special management areas and would be carefully planned to maintain the quality of specially designated area. Mechanical methods would result in similar effects to manual treatment methods. The direct, short-term impacts would be greater because of the larger types of vegetation removed by mechnical means, the increased number of work crews, equipment, and vehicles, and the higher noise levels when the larger motorized equipment is used as compared to manual treatment activities. Thinning treatments in areas that are managed primarily for recreational purposes, such as NHTs, would not likely result in a loss of quality as long as their recreational assets were left intact; impacts to the visual setting would be short-term and reduced as vegetation grows back.

The *DSAP maintenance* activities associated with the No Action Alternative would consist of manually removing all combustible vegetation within the 10-foot radius of poles with equipment that can spark. There are a total of 15 poles (1.34 acres of treated area) requiring DSAP maintenance activities - one in Perry Mesa; three in the Agua Fria National Monument, seven in the Gila River Terraces and Lower Gila Historic Trails ACEC, three in the Saddle Mountain ACEC, and one in the Sears Point ACEC. The effects of these maintenance activities within special management areas would be associated with the localized visual impact from removal of all vegetation and the need for repeated treatments, typically every three years. The special management areas would be affected by the presence of work crews, equipment, and vehicles, and the increased in noise levels when motorized hand equipment is used.

The No Action Alternative is anticipated to result in localized disturbance to special management areas from manual and mechanical treatments and DSAP maintenance activities. The unique characteristics of these areas would be considered when preparing plans for treatment activities. Over the long-term, the routine vegetation maintenance requirements in terms of the number of acres to be treated, the density of vegetation to be removed, and the number of work crew members, equipment, and vehicles required are anticipated to be relatively the same for each work cycle. The regrowth of vegetation within the ROW would occur between work cycles and any adverse effects related to the manual, mechanical, and/or DSAP maintenance treatment activities would be reduced. Therefore, the No Action Alternative would have short- and long-term, direct minor adverse impacts and short-term indirect minor adverse impacts on special management areas because the intensity and duration of treatments and regrowth of vegetation would be localized and the special values and qualities of the areas would be maintained. Additionally, the No Action Alternative would have long-term, indirect, moderate, beneficial impacts on special management areas by decreasing the risk of high intensity wildland fires and the removal of invasive and noxious weed species, as appropriate.

Direct and Indirect Effects of the Proposed Action

In addition to the short-term effects associated with the No Action Alternative described above, the Proposed Action would also result in impacts on special management areas from the use of herbicides as part of the management of incompatible vegetation within the ROW. The 2007 and 2016 Herbicide PEISs provided detailed analysis of potential special management area impacts associated with the application of herbicides including

their fate and transport of herbicides in soils (pages 4-155 through 4-159 [BLM 2007a] and pages 4-77 through 4-80 [BLM 2016a]). Additional analysis on effects of vegetation treatment including manual, mechanical, and herbicide treatments are also presented in the 2007 Herbicide PER on pages 4-114 through 4-118 (BLM 2007e). The detailed discussion of the analyses is not repeated in this EA and is instead incorporated by reference and summarized in this document. In the Proposed Action, only BLM-approved herbicides would be used, which would also include the application of herbicides approved for pre-emergent use by the BLM for DSAP treatments. The activities associated with herbicide application in the Proposed Action were analyzed in the 2007 and 2016 Herbicide PEISs and in the 2007 Herbicide PER. There are no greater or new short-term direct or indirect impacts on special management areas from the Proposed Action that have not been disclosed in these prior environmental documentations.

Use of herbicides to treat incompatible vegetation could potentially affect the "naturalness" of special management areas with the removal and/or cutting of vegetation. In addition, there may be unintentional killing non-target native vegetation through imprecise application and/or drift in area. Some special areas would support resources that are more sensitive to exposure to herbicides than the resources in other areas. There may also be human health risks involved with using certain types of herbicide application in special areas that are managed to support recreational activities. The use of herbicides would have detectable visual effects in the form of physical changes to targeted species (i.e., texture and color change). Outstanding opportunities for recreation and solitude could be adversely affected during the time when treatments are being implemented. Resource values associated with special management areas would not be impaired long-term and any effects would be short-term and localized.

The use of IVM techniques under the Proposed Action would reduce the frequency of future mechanical and manual treatments, subsequently reducing potential impacts to special management areas. The impact reduction is based on successful use of herbicides that would prevent a species from returning for approximately eight years. Long-term, indirect impacts would be based on the successful use of herbicide and establishment of low-growing vegetation as a result of the reduced frequency of vegetation management treatments.

In comparison to the Proposed Action, the manual and mechanical treatment methods associated with the No Action Alternative would result in a greater number of treatments over the long-term, which would mean an increase in the number of ground vehicles, equipment, and crew workers. The No Action Alternative routine vegetation maintenance requirements are anticipated to be the same for each work cycle. Conversely, with the Proposed Action, the routine vegetation maintenance requirements would substantially decrease over time within the ROW. Therefore, the Proposed Action would have short–term, direct and indirect minor adverse impacts on special management areas from the initial manual and/or mechanical vegetation treatment. Additionally, the Proposed Action would have long-term, direct and indirect, moderate, beneficial impacts on special management areas by the reduced frequency and intensity of vegetation management treatments as compared to the No Action Alternative, by allowing low-growing native compatible vegetation, and by decreasing the risk of high intensity wildland fires within the ROW in these special areas.

3.13.6 Mitigation Measures

No mitigation measures specific to special management areas are proposed.

3.14 Cultural Resources

3.14.1 Introduction

NEPA requires federal agencies to consider the impacts of their actions on not only the physical and natural environment but also on historic and cultural aspects of our nation's heritage as an element of the social environment. The term "cultural resources" as used in this document refers to any location of human activity, occupation, or use identifiable through inventory, historical documentation, or oral evidence. The term includes archaeological, historical, or architectural sites, landscapes, buildings, structures, objects, and places that possess historic and/or cultural significance as well as places with important public and scientific uses, and may include definite locations (sites or places) of traditional cultural or religious importance to specified social and/or cultural groups. Cultural resources may be but are not necessarily eligible for the National Register of Historic Places (National Register). Historic properties are defined as any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the National Register. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria.

To be eligible for the National Register, properties must be at minimum 50 years old (unless they have exceptional historical importance) and have national, state, or local significance in American history, architecture, archaeology, engineering, or culture (36 CFR 60). They also must possess sufficient integrity of location, design, setting, materials, workmanship, feeling, and association to convey their historical significance, and meet at least one of four criteria:

- Criterion A - are associated with events that have made a significant contribution to the broad patterns of our history;
- Criterion B - are associated with the lives of people significant in our past;
- Criterion C - embody distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or possess high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction; or
- Criterion D - have yielded or may be likely to yield information important in prehistory or history.

In conjunction with assessing impacts on the cultural environment pursuant to NEPA, BLM is concurrently addressing the closely related requirements of Section 106 of the NHPA, as recommended by the Council on Environmental Quality (CEQ) and Advisory Council on Historic Preservation (2013). Section 106 of the NHPA of 1966, as amended (36 CFR Part 800), sets forth national policy and procedures for the identification, evaluation, effect assessment, and treatment of cultural resources in consultation with the State Historic Preservation Office (SHPO) and other interested parties. Should consultation result in a finding of adverse effect to historic properties, the federal agency must develop a plan to avoid, minimize, or mitigate impacts. Implementing regulations for Protection of Historic Properties (36 CFR 800) stipulate requirements for federal agencies to consult with SHPOs or Tribal Historic Preservation Officers (THPO) and other interested parties as they consider effects on cultural resources listed in or eligible for inclusion in the National Register (referred to as historic properties). Further, archaeological resources and sites located on federal public lands are safeguarded under the Archaeological Resources Protection Act of 1979 (ARPA), which requires issuance of a permit prior to excavation or removal of those resources.

On lands managed by the BLM, the agency is responsible for the study, evaluation, protection, management, stabilization, and inventory of paleontological, historical, and archeological resources. The processes for

identifying and managing cultural resources are addressed in USDI BLM manuals 8100 (The Foundations for Managing Cultural Resources), 8110 (Identifying and Evaluating Cultural Resources), 8120 (Tribal Consultation under Cultural Resource Authorities), 8130 (Planning for Uses of Cultural Resources), 8140 (Protecting Cultural Resources), and Handbook H-8120-1 (Guidelines for Conducting Tribal Consultation).

3.14.2 Issues Identified for Analysis

- Would there be gaps in survey coverage and potential Traditional Cultural Properties?
- Would there be the need for programmatic design criteria?
- Would there be a potential disturbance to cultural resources from ATV usage?
- Would there be indirect impacts to cultural resources from erosion?
- Would herbicides potentially damage or remove prehistorically planted crops/plants?
- Would there be a potential for waxy consistency of herbicide to affect rock art, features where burning occurred, pollen counts, etc.?
- Would a Class I records search be completed?
- Would this action result in any cultural impacts other than those addressed in 17 Western States Environmental Impact Statement (EIS) and individual ROW grants?
- Would there be potential impacts to sites that are located outside original treatment areas, but are still in ROW areas?
- Would there be a potential positive effect with reduction of fuel loading at historic sites?
- Would there be a need for tribal consultation?

3.14.3 Affected Environment

The existing Utilities ROW areas on BLM land are located throughout Arizona and cross multiple distinct ecological zones. The only exception being that there is limited presence of transmission lines on the Colorado Plateau in the northeastern quadrant of the state. Historic-age linear sites such as roads and transmission lines are not associated with any specific landform or biotic community because they pass through multiple zones and across multiple landforms. The landform and biotic community of 134 non-linear sites were recorded, and are located within nine distinct biotic communities. Almost half of the sites (64) are located within Sonoran Desert Scrub-Arizona Uplands biotic community, and Sonoran Desert Scrub-Colorado River Valley biotic community (33) is the next most common environment in which sites are located. The remainder of the sites are found in the Southwestern (Arizona) Interior Chaparral (13), Great Basin Desert Scrub (10), Mohave Desert Scrub (4), Plains Grassland (3), Great Basin Shrub-Grassland (3), Great Basin Conifer Woodland (2), and Plains Grassland-Shortgrass communities (1). The biotic community of one site was unknown.

Between 2007 and 2010 Class III cultural resources inventories were conducted for 25 APS transmission line ROWs, specifically for lines of 69-kilovolt (kV) in size and greater. Survey efforts were completed as part of APS' efforts to survey all transmission lines 69kV or larger. Class III inventories include 344.33 linear miles (6,130 acres) of APS transmission line ROW, of which 6.93 linear miles (190 acres) were not surveyed due to vegetation or topography that prevented access. These inventories for APS represent 67 percent of the total acreage for the entire APS transmission and distribution system, and 74 percent of the total acreage of the APS transmission line system ROWs located on BLM lands. A total of 20 surveys were previously conducted within the SRP transmission line ROWs between 1974 and 2005, resulting in a 100 percent survey of the existing SRP transmission line ROW. Between the Utilities, approximately 80 percent of the total acreage of both Utilities'

transmission line systems and approximately 73 percent of both Utilities' entire transmission and distribution systems on BLM lands has been surveyed.

Known non-linear sites are located on 21 different landforms. Ridgetops and ridge slopes (23), slopes (16), mesa tops (14), terraces (14), benches (11), bajadas (11), valley floors (11), and flats (10) are the most common landforms on which sites are located. Other landforms include sand dunes (3), draws (3), bedrock (3), washes (2), floodplains (2), base of a hill (1), canyon rim (1), escarpment (1), hill (1), pass (1), rock shelter (1), saddle (1), and sinkhole (1). The landform of three sites was not recorded.

Because of the statewide extent of the ROW, widespread and diverse types of cultural resources may be present within the Utilities ROWs. A total of 188 sites were identified and recorded within the surveyed area of potential effect (APE)[46] between the 1970s and early 2010. These include sites associated with various prehistoric indigenous cultures, historic-age Euro-American sites, multicomponent sites with both prehistoric indigenous culture and historic Euro-American components, and proto-historic indigenous culture sites. A summary of the National Register-eligibility status of the sites within the Utilities' ROW is found in Table 3-32. Nine sites containing rock art were identified within the ROWs.

Table 3-32. Cultural Resource Sites Recorded within ROW

National Register Eligibility Site Type	Determined Eligible	Recommended Eligible	Recommended not Eligible	Not determined	Total Number of Sites/Percent of Sites by Type
Historic Euro-American	13	35	8	22	78/41%
Prehistoric	5	51	11	31	98/52%
Proto-historic	-	3	-	-	3/2%
Multicomponent prehistoric/historic	-	7	1	1	9/5%
Total Sites/Percent Eligible within ROW	18/10%	96/51%	20/11%	54/29%	188

3.14.4 Standard Operating Procedures

Manual and Mechanical Treatment Methods

- The Utilities would provide cultural resource sensitivity training for herbicide applicators and instruction on how to avoid the relatively rare types of archaeological structural features that are most sensitive to disturbance by vehicle traffic (rock walls, rock alignments, etc.). The training would (1) educate their employees and contractors about antiquities laws, (2) inform them that violations of those laws are not tolerated and would be grounds for disciplinary actions or dismissal, and (3) oversee field activities to ensure that archaeological sites are not affected by unauthorized collection or inadvertent impact to artifacts.
- Within the ROW, ATVs and vehicles may drive off-road if necessary with the implementation of relevant SOPs below.
    - ATVs and vehicles would be used only during dry conditions to avoid rutting, except under hazard vegetation maintenance situations, as approved by BLM.
    - ATVs and vehicles would avoid driving through rivers, standing water, and other water sources except on established roads.

[46] The area of potential effect (APE) for this project is the Utilities ROW.

- ATVs and vehicles would be driven at low speeds (less than 10 miles per hour) when traveling off-road within the ROW.
- ATVs and vehicles would only be operated during daylight hours, except under hazard vegetation maintenance situations.
- ATVs and vehicles would avoid driving directly up slopes and other areas that may contain highly erodible soils.

Herbicide Treatment Methods

- Follow standard procedures for compliance with Section 106 of the NHPA as implemented through the *Programmatic Agreement among the Bureau of Land Management, Arizona State Historic Preservation Officer, Arizona Public Service Company, and Salt River Project Agricultural Improvement and Power District* (BLM 2017 *Pending*) regarding the manner in which BLM would meet its responsibilities under the NHPA and state protocols or 36 CFR Part 800, including necessary consultations with SHPO and interested tribes.

3.14.5 Environmental Consequences

Of the 188 previously documented cultural resource sites examined, 18 have been determined eligible for listing in the National Register; 96 have been recommended eligible for listing in the National Register; 20 sites have been recommend not eligible for listing in the National Register; and 54 sites are of indeterminate National Register eligibility. For the purposes of this project all sites will be treated as eligible.

Direct and Indirect Effects of the No Action Alternative

Under the No Action Alternative, vegetation within the ROW would be subject to the same impacts of ongoing manual and mechanical vegetation maintenance. For the No Action Alternative, BLM reviews each vegetation maintenance work proposal as discussed in Section 2.2.6. Those reviews involve a check of records of prior cultural resource studies and recorded cultural resources in areas that could be affected, and decisions are made about the need for additional consideration in accordance with procedures defined by the BLM *Programmatic Agreement among the Bureau of Land Management, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers* regarding the manner in which the BLM will meet its responsibilities under the NHPA (Nationwide Programmatic Agreement [PA]) and the 2014 *State Protocol Agreement Between The Bureau of Land Management, Arizona and The Arizona State Historic Preservation Office Regarding the Manner in Which The Bureau of Land Management, Arizona Will Meet Its Responsibilities Under the National Historic Preservation Act and The National Programmatic Agreement* (BLM Statewide Protocol).

Under the No Action Alternative, vegetation treatment activities would be completed in conjunction with the Incompatible Vegetation Maintenance Work Proposal, where BLM would ensure the activities undergo Section 106 compliance for cultural resources or are in accordance with the Nationwide PA. The use of manual and mechanical equipment, as well as ATVs, in the ROW has the potential to travel across potential unidentified cultural resources sites or impact (damage or removal) of prehistorically planted crops or plants. Additionally, the removal and disposal of vegetation within the ROW could also expose or move remnants of unknown cultural resources sites. Any effects to cultural resources would be avoided or mitigated to the extent possible. Therefore the No Action Alternative is anticipated to have short- and long-term, negligible, adverse effects from the No Action Alternative.

Direct and Indirect Effects of the Proposed Action

In addition to the manual and mechanical treatments associated with the No Action Alternative, the Proposed Action would employ the use of herbicides to augment current manual and mechanical methods of vegetation maintenance within the Utility's ROW. The BLM PEIS (2007a) identified two general sources of potential impacts on cultural resources: (1) effects of herbicide chemicals on archaeological materials and plants used by traditional cultures, and (2) impacts of herbicide application methods. While some herbicide treatments have the capacity to affect buried cultural resources, because of the targeted plant application and small quantities of herbicides that would be used there is little potential that the herbicide applications would contaminate buried archaeological deposits. No concerns were raised by the consulted tribes regarding the gathering of traditional plants.

Because of the small quantity of herbicide that would be applied and the fact that applications would only target specific plants, issues regarding cultural resources such as soil acidity degrading various types of artifacts, petroglyphs and masonry ruins being sprayed with herbicide, or artifacts on the surface of the ground being sprayed inadvertently, would most likely not occur. If artifacts on the surface of the ground were sprayed, the active herbicide ingredients and inert adjuvants would dissipate and are not expected to adversely affect artifacts. Further, if petroglyphs or masonry structures were sprayed, the chemicals are not anticipated to affect the surface of exposed artifacts and can generally be removed without damage. The greatest risk to rock art would be in areas where incompatible vegetation is adjacent to instances of rock art. Fortunately, every known instance of rock art within the Utilities authorized ROW are areas devoid of incompatible vegetation.

The BLM Herbicide PEIS (2007a) identified use of vehicles to apply herbicides as a potential source of impacts because the vehicles could crush artifacts on the ground surface and disturb exposed archaeological deposits and features, and personnel applying herbicides could collect artifacts without authorization. The proposed use of herbicides would involve application by backpack sprayers in rugged terrain, which has little potential to disturb archaeological sites, and more commonly with sprayers mounted on ATVs. The ATVs would be used to travel overland within the Utilities ROWs to access the plants targeted for herbicide applications as discussed in Section 2.2.1. With the implementation of the Proposed Action, vegetation maintenance activities would be in compliance with the stipulations of the PA. The Utilities would prepare a PUP and BLM staff would either conduct or review a Class I cultural resources inventory of the area covered by each PUP to determine whether it has been subject to previous Class III cultural resources inventory and whether that inventory meets current BLM and Secretary of Interior Standards. Additionally, BLM would determine if any historic properties are present, determine whether any properties included within the Long Term Monitoring Plan (see Appendix F, Stipulation IV) are located within the ROWs, and verify that the application methods described in the PUP comply with the stipulations of this PA. If it is determined that the area covered by a PUP, or a portion of an area covered by a PUP, has not been subject to previous Class III cultural resources inventory, or the previous inventory does not meet current standards, and the respective Utility wants to proceed with application of herbicide within the area covered by the PUP using ATVs, then the BLM would ensure that a Class III cultural resources inventory was completed prior to authorization of herbicide application using ATVs/UTVs (pursuant to Stipulation II of the PA). Therefore the application methods as proposed are not expected to adversely impact cultural resources.

The Proposed Action and use of herbicides would make permanent the selective removal of plant species that are most prone to canopy fires and would reduce the surface fuels in the area directly beneath the power lines. This would indirectly benefit historic sites by the subsequent reduction of fire intensity within the ROWs.

The PA defines the SOPs outlined in Section 3.14.4 the methods through which the BLM would identify historic properties, monitor properties for impacts, and resolve any adverse effects for each phase of the Project. The Proposed Action would not include any activities associated with herbicide application different from those analyzed in the 2007 Herbicide PEIS. Consequently, there is no potential for new or greater impacts on cultural resources from the Proposed Action that have not been disclosed in prior environmental documentation.

The BLM will be providing an opportunity for the public to comment on the draft PA with the review of this EA (refer to Appendix F). The BLM will consider any comments received from the public on the draft PA. Table 3-41 lists the parties that were invited to participate in the development of the draft PA and their status. The BLM would continue to consult with Tribes in accordance with NHPA, implementing regulations at 36 CFR 800, and the PA. If, however, the BLM identified potential impacts to cultural resources, those would be avoided and/or mitigated in accordance with the PA (refer to Appendix F).

Therefore, with the execution of the PA, including the preparation and implementation of the Long Term Monitoring Plan (see Appendix F, Stipulation IV), the Proposed Action is anticipated to have short- and long-term, negligible, beneficial effects to cultural resources.

Table 3-41. PA Consulting Parties

Agencies, Tribes, and Individuals	Status
Advisory Council on Historic Preservation	Not Participating
Bureau of Land Management	Signatory
State Historic Preservation Officer	Signatory
Arizona Public Service Company	Invited Signatory
Salt River Project Agricultural Improvement and Power District	Invited Signatory
Ak-Chin Indian Community	Concurring Party
Chemehuevi Indian Tribe	Concurring Party
Cocopah Indian Tribe	Concurring Party
Colorado River Indian Tribes	Concurring Party
Fort McDowell Yavapai Nation	Concurring Party
Fort Mojave Indian Tribe	Concurring Party
Fort Yuma-Quechan Tribe	Concurring Party
Gila River Indian Community	Concurring Party
Havasupai Tribe	Concurring Party
Hopi Tribe	Concurring Party
Hualapai Tribe	Concurring Party
Kaibab Band of Paiutes	Concurring Party
Navajo Nation	Concurring Party
Pascua Yaqui Tribe	Concurring Party
Salt River Pima-Maricopa Indian Community	Concurring Party
San Carlos Apache Tribe	Declined to Participate
San Juan Southern Paiute	Concurring Party
Tohono O'odham Nation	Concurring Party

Agencies, Tribes, and Individuals	Status
Tonto Apache Tribe	Concurring Party
White Mountain Apache Tribe	Concurring Party
Yavapai-Apache Nation	Concurring Party
Yavapai Prescott Indian Tribe	Concurring Party
Pueblo of Zuni	Concurring Party

3.14.6 Mitigation Measures

- No herbicide treatments would occur within the ROW until the BLM informs the Utilities that the activities described in the approved PUP are in accordance with the stipulations of the executed PA.

PAGE INTENTIONALLY LEFT BLANK

CHAPTER 4
CUMULATIVE IMPACTS

A cumulative effect is defined under NEPA as "the change in the environment which results from the incremental impact of the action, decision, or project when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other action". "Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (40 CFR Part 1508.7). Past, present, and reasonably foreseeable future actions that incrementally add to the potential adverse or beneficial cumulative impacts of the Proposed Action and No Action Alternatives are considered in this EA. The resource protection measures considered in the 2007 Herbicide PEIS cumulative effects analysis (BLM 2007a:4-201 to 4-202) and the 2016 Herbicide PEIS cumulative effects analysis (BLM 2016a:4-104 to 4-114) are considered in the current analysis. They include SOPs, monitoring measures, and mitigation provided in the 2007 PEIS and PER (BLM 2007e: Chapter 2; BLM 2007c: Chapter 2).

4.1 Geographic and Temporal Scope of Analysis

The BLM NEPA Handbook H-1790-1 (2008a) recommends that geographic (spatial) and time (temporal) boundaries be established for cumulative effects analysis. There is one cumulative effects study area (CESA) for the No Action Alternative and Proposed Action. Due to the linear nature of the power line ROWs and the diverse landscape that the power lines cross throughout Arizona, the No Action Alternative and Proposed Action "footprints," or the CESA boundary for individual resources has been identified as the Utilities ROWs throughout Arizona and across all land jurisdictions. Although the ROW widths vary, a 300-foot corridor has been determined to be the appropriate corridor width (150 feet either side of the power line centerline) for the cumulative impact analysis. The Utilities ROW within BLM-managed lands is approximately 1.42 percent of the total CESA. Table 4-1 provides the line miles and acres of the CESA by land jurisdiction or ownership (refer to Figure 4-1).

Table 4-1. Cumulative Effects Study Area (CESA)[a]

Land Jurisdiction/Ownership	Total Miles of Electrical Lines within CESA[b]	Acres of CESA	Percent of Total CESA
Federal	3,173	115,381.82	14.21%
Private	15,895	578,020.66	71.17%
State	1,937	70,436.36	8.67%
Tribal	1,331	48,400.00	5.96%
Total	22,336	812,218.18	

Source: APS and SRP May 2017

[a] The acres of Utilities ROW within private and state lands include urban areas and paved surfaces. Subsequently, the calculations for areas subject to vegetation management are overestimated in the table for the CESA.

[b] The miles in this table represents a total mileage for the Utilities (calculations provided in May 2017).

4.2 Timeframe of Effects

Short-term cumulative effects would occur during individual treatment implementation, which could occur systematically over multiple years. Treatments may occur over several weeks depending on the treatment size and complexity of terrain and access. Long-term cumulative effects would be expected to occur from ten years to up to two decades after implementation of treatments in specific locations as compatible vegetation becomes reestablished.

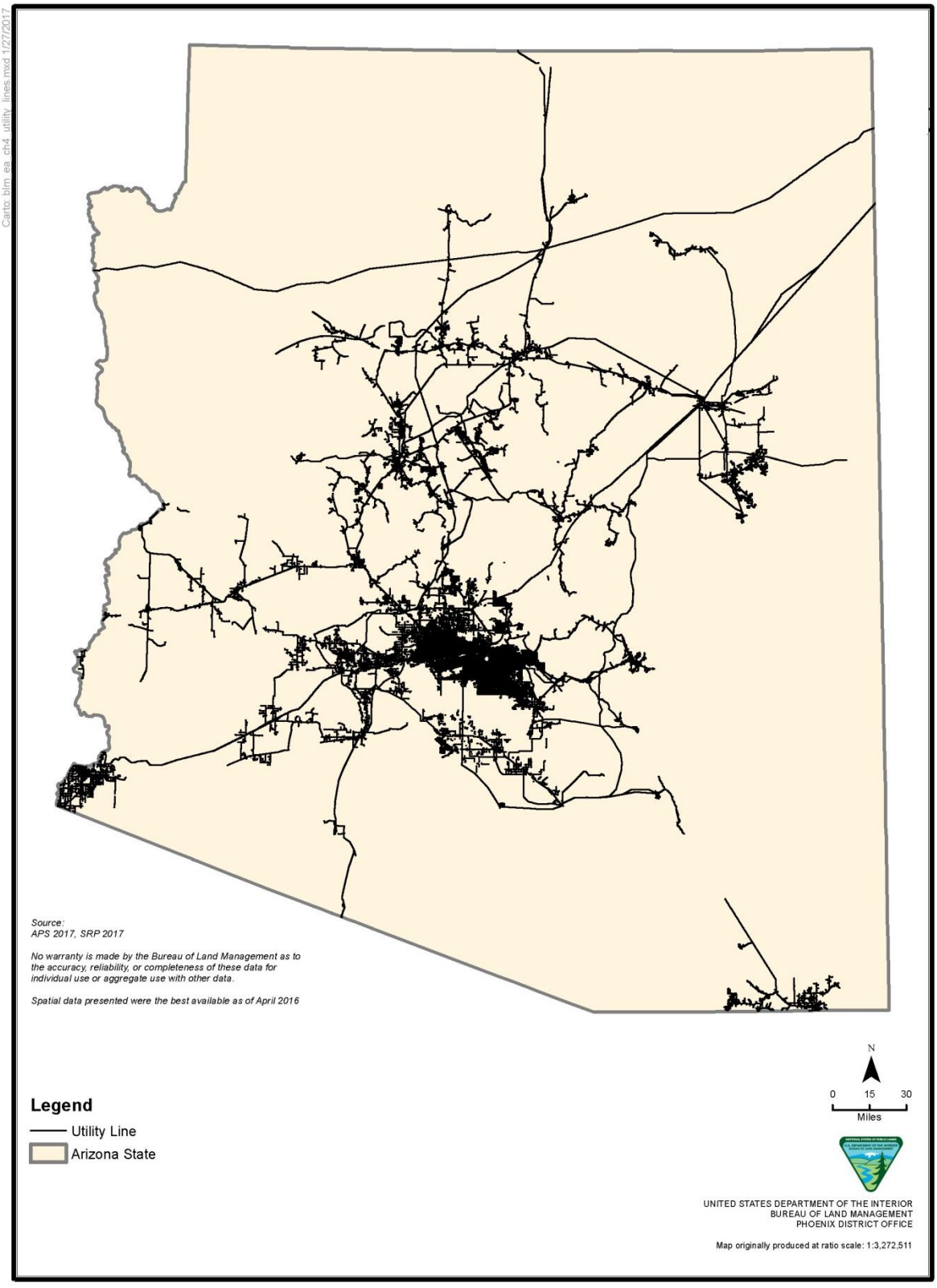


Figure 4-1. Power Lines in Arizona – Cumulative Effects Study Area

4.3 Past and Present Actions

In order to understand the contribution of past actions to the cumulative effects of the No Action Alternative and the Proposed Action, this analysis relies on current environmental conditions as a proxy for the impacts of past actions. Existing conditions reflect the aggregate impact of prior human actions and natural events that have affected the environment and could contribute to cumulative effects. The cumulative effects analysis does not attempt to quantify the effects of past human actions by adding up all prior actions on an action-by-action basis. By looking at current conditions, the residual effects of past human actions and natural events are captured, regardless of which particular action or event contributed those effects. The CEQ issued an interpretive memorandum on June 24, 2005 regarding analysis of past actions, which states, "agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions".

4.4 Reasonably Foreseeable Future Actions

Reasonably foreseeable future actions are actions that have existing decisions, funding, or formal proposals or that are highly probable. These actions are not connected to the No Action Alternative or the Proposed Action. They are projections being made so that future effects, cumulative and otherwise, can be estimated, as required by NEPA. Anticipated future actions include the continuation of grazing activities, general use activities such as off-highway vehicle (OHV) use, wildlife viewing, and recreation, and the maintenance of existing Utility facilities. Arizona Department of Transportation has recently been approved to use herbicides within and adjacent to the authorized roadway ROWs to control or eradiate invasive species and noxious weeds. In certain locations ADOT ROW does cross (estimated 148 crossings), and in some cases includes the Utilities ROWs, therefore invasive species treatment using herbicide would occur as part of ADOT's vegetation maintenance program.

4.5 Cumulative Impacts on Resources

For this analysis, cumulative resource impacts for the CESA are the combined direct and indirect effects of the present and reasonably foreseeable future actions, plus the direct and indirect impacts of the No Action Alternative and the Proposed Action. The levels of direct and cumulative impacts are categorized as major, moderate, or minor based on the same thresholds defined in Section 3.1. In addition, if the direct or indirect impacts were considered to be none or negligible as a result of the No Action Alternative or the Proposed Action, there would be no contribution to the resources' cumulative impacts.

The No Action Alternative and the Proposed Action would both result in long-term, direct and indirect, adverse and beneficial impacts to resources within the ROW. Both the No Action Alternative and the Proposed Action would employ SOPs to reduce adverse impacts to the extent possible. Adaptive practices would be employed to change and modify practices in annual plans and specific treatment plans if issues are identified. This would further help to minimize potential impacts or contributions to cumulative impacts.

Based on the analysis of direct and indirect impacts, neither the No Action Alternative or the Proposed Action would have minor, moderate, or major direct or indirect effects on cultural resources, BLM sensitive wildlife and plant species or on migratory birds within the ROW. There would be no incremental contribution to the resources respective cumulative impacts; therefore there is no cumulative effects analysis for these resources. The analysis of impacts from the No Action Alternative and the Proposed Action are provided in Chapter 3; refer to the specific resource subsection for detailed information including tables providing specific data by field office.

4.6 Soils

Reasonable Foreseeable Future Actions Cumulative Impacts Common to Both Alternatives

Cumulative impacts on soils are a result of vegetative maintenance activities, including the use of herbicides, within ROW. They are predominantly associated with renewable energy development, grazing, road construction, timber harvesting, OHV and other recreation use, wildland fire, and natural disturbances. The Utilities can potentially incorporate herbicide treatments as part of their maintenance regime on over 19,000 miles of ROW on privately-owned land (over 70 percent of their network), state trust land, and tribal lands. Where used, herbicides have decreased the frequency of vegetative maintenance activities in most areas, resulting in decreased ground disturbance, which can adversely impact soils, damage biological soil crusts, and increase soil erosion potential.

Adverse cumulative effects to soil would be offset by watershed-level restoration treatments designed and implemented by the federal and state agencies with landholdings with the CESA. Federal, state, and local land management entities have proposed numerous policies, programs, and initiatives have been proposed to restore soil productivity and improve the health of ecosystems. A watershed-level restoration example currently underway is the 4 Forest Restoration Initiative that involves the Apache-Sitgreaves, Coconino, Kaibab, and Tonto national forests and over 30 stakeholders. This project is an accelerated restoration program to restore watershed health and function and fire-adapted ecosystems. All efforts to reduce the spread of invasive vegetation and to reduce the risk of wildland fire are expected to help maintain soil productivity and function. Reasonably foreseeable future actions could cumulatively result in short-term, minor adverse impacts to soil resources from increased soil disturbance, erosion, and reduced biological crust cover. Implementing SOPs, mitigation measures, and conservation measures would reduce the potential for cumulative adverse effects from reasonably foreseeable future actions. Beneficial cumulative impacts may result as soil productivity is expected to increase over time with the decreased frequency of treatments, and as the CESA becomes more established with compatible low growing vegetation (BLM 2007a).

No Action Alternative Contribution to Cumulative Impacts

The No Action Alternative is anticipated to result in short-term, localized disturbance to soil resources from manual and mechanical treatments and DSAP maintenance activities. Over the long-term, the routine vegetation maintenance requirements in terms of the number of acres to be treated, the density of vegetation to be removed, and the number of work crew members, equipment, and vehicles required are anticipated to be relatively the same for each work cycle. The regrowth of vegetation within the ROW would occur between work cycles and any detrimental effects to soil quality and erosion susceptibility from treatment activities would be reduced. Clearing the DSAP totally of vegetation would directly disturb the soil and any micro- and macro-organisms in addition to the removal of the root system of any vegetation within the 10-foot radius as well. The disturbed soil would be vulnerable to increased erosion, soil productivity and soil quality would be reduced, and cleared area would be susceptible to invasive species establishment. Based on the analysis of potential effects in this EA, the No Action Alternative would have direct and indirect short-term minor adverse impacts and long-term indirect, minor, beneficial impacts as well as long-term, indirect, minor, beneficial impacts. Cumulatively, effects of the No Action Alternative, when combined with past, present, and reasonably foreseeable future actions, would result in short-term, minor, adverse cumulative impacts and long-term, minor, beneficial cumulative impacts on the soil resources within the CESA. The No Action Alternative would have a negligible contribution to the cumulative effects on soil resources because the ROW on BLM-managed land is a very small portion (1.42 percent) of the CESA.

Proposed Action Contribution to Cumulative Impacts

In addition to the short-term effects associated with the No Action Alternative described above, the Proposed Action would also result in impacts on soil and soil organisms from the use of herbicides as part of the management of incompatible vegetation within the ROW. Some amount of disturbance to soils and biological soil crusts would occur during the cycle of manual/mechanical and herbicide treatments with the Proposed Action. The amount of soil loss or erosion, or changes in soil characteristics would be minor and localized. Because the approved herbicides that would be used have not been shown to substantially decrease soil microbial activity, only short-term and localized minor adverse impacts would be expected on soil productivity until native species become prolific within the ROWs. The use of IVM techniques under the Proposed Action would reduce the frequency of future mechanical and manual treatments, subsequently reducing potential impacts to soils. The impact reduction is based on successful use of herbicides that would prevent incompatible vegetation from returning for approximately eight years; generally disturbing less soil for most areas. Long-term, indirect impacts would be based on the successful use of herbicide and establishment of low-growing vegetation, which would result in the reduced frequency of vegetation management treatments. Based on the analysis of potential effects in this EA, the Proposed Action would have direct and indirect, short-term, minor adverse impacts to soil resources and direct and indirect, long-term, moderate beneficial impacts. Cumulatively, effects of the Proposed Action, when combined with past, present, and reasonably foreseeable future actions, would result in short-term, minor, adverse cumulative impacts and long-term minor, beneficial cumulative impacts on the soil resources within the CESA. The Proposed Action would have a negligible contribution to the cumulative effects on soil resources because the ROW on BLM-managed land is a very small portion (1.42 percent) of the CESA.

4.7 Water Resources and Quality

Reasonable Foreseeable Future Actions Cumulative Impacts Common to Both Alternatives

Soil erosion, which can be caused by loss of vegetation in areas of sheet flow near water bodies, on banks and floodplains of perennial and intermittent stream beds, and in streams with increased stream flows, can impact surface waters. The federal agencies within the CESA allow for the use of public lands for a variety of activities under their respective travel management plans, recreational permits, and mineral and grazing leases. These federally permitted actions and as well, activities on private, state, and tribal lands related to motor vehicle use, mining, and cattle grazing are commonly associated with potential soil erosion and the deterioration of surface waters. These actions can also affect the amount of available groundwater due to pumping; however, maintenance and management goals of affected areas minimize potential cumulative impacts to water resources. Water quality monitoring is conducted by state and federal agencies, local governments, tribes, and others, among which there is wide variance in the extent and types of monitoring. Additionally, the nature of the resource presents challenges because the effects of both natural and man-made contaminants vary greatly according to specific water conditions (BLM 2007a).

The use of herbicides for the reduction of vegetation is currently occurring on lands within the CESA. Additionally, permitted activities by federal and state agencies include those related to transportation, recreation, mineral extraction, and grazing, are expected to continue and are commonly associated with increased likelihood for turbidity as a result of erosion adjacent to and within surface waters. Each of these activities cumulatively would create a minor adverse impact on water resources and water quality (BLM 2007a).

No Action Alternative Contribution to Cumulative Impacts

The No Action Alternative would result in short-term, localized effects on water resources from the soil disturbance and associated potential for runoff from manual, mechanical, and DSAP maintenance activities. Over the long-term, the routine vegetation maintenance requirements are anticipated to be relatively the same for each work cycle. The regrowth of vegetation within the ROW would occur between work cycles. Any detrimental effects to surface and groundwater quality from incompatible vegetation treatment activities would be reduced because of the decreased erosion potential with vegetation regrowth. Based on the analysis of potential effects in this EA, the No Action Alternative would have short-term, direct, minor adverse impacts to water resources and water quality. Cumulatively, effects of the No Action Alternative, when combined with past, present, and reasonably foreseeable future actions, would result in minor adverse cumulative impacts on the water resources and water quality within the CESA. The No Action Alternative would have a negligible contribution to the cumulative effect on water resources and water quality because the ROW on BLM-managed land is a very small portion (1.42 percent) of the CESA.

Proposed Action Contribution to Cumulative Impacts

The use of IVM techniques under the Proposed Action would reduce the frequency of future mechanical and manual treatments, subsequently reducing potential impacts to water resources and water quality. With the Proposed Action, the routine vegetation maintenance requirement would decrease over time resulting in less area needing treatment and a reduction in the number of vehicles, field crews, and pieces of equipment within the ROW. Based on the analysis of potential effects in this EA, the Proposed Action would have short-term, direct, minor, adverse impacts and direct and indirect, long-term, moderate beneficial impacts to water resources and water quality. Therefore, the incremental effect of the Proposed Action, when added to the past, present, and reasonably foreseeable future actions, would result in short-term, minor, adverse impacts and long-term, minor, beneficial cumulative impacts on the water resources and water quality within the CESA. The Proposed Action would have a negligible contribution to the cumulative effect on water resources and water quality because the ROW on BLM-managed land is a very small portion (1.42 percent) of the CESA.

4.8 Wetlands and Riparian Areas

Reasonable Foreseeable Future Actions Cumulative Impacts Common to Both Alternatives

The specifics of the reasonably foreseeable future actions and present actions, such as the footprint, design, alignment, surface disturbance, are not known at this time. The number of stream crossings and the proximity of disturbance to riparian areas of any present actions or reasonably foreseeable future actions are also not known. Ongoing efforts to protect wetlands and riparian areas have reduced the level of impact of natural and human factors that degrade these habitats. Additionally, vegetation treatment programs by the federal and state agencies, along with restoration efforts by private landowners and tribes, continue to improve the condition of degraded wetland and riparian habitats. Efforts to improve water quality are ongoing, including goals by the BLM for percent of water bodies meeting state water quality standards, which increase each year. The BLM and other land management agencies also continue programs to restore degraded wetland/riparian areas, which includes vegetation treatment programs. Activities that would contribute to cumulative impacts to wetlands and riparian areas in the CESA include recreation, agricultural land uses and runoff associated with agricultural practices, road projects, water diversions, and livestock grazing. With effective implementation of design features and mitigation and conservation measures associated with these types of activities, cumulative adverse effects on wetlands and riparian areas are anticipated to be minor (BLM 2007a).

No Action Alternative Contribution to Cumulative Impacts

Vegetation removal and disposal activities in the No Action Alternative would include only manual methods using tracked or wheeled vehicles, field crews, and hand equipment in wetland and riparian areas. The No Action Alternative is anticipated to have undetectable effects on wetlands and riparian areas from manual treatment activities because ground disturbance would be limited and non-targeted vegetation would not be impacted. Over the long-term, the routine vegetation maintenance would help control the spread of tamarisks and reduce the risk of wildland fire that could destroy compatible riparian and forested wetland vegetation. Based on the analysis of potential effects in this EA, the No Action Alternative would have short-term, direct and indirect, negligible, adverse impacts and long-term, direct and indirect, minor beneficial impacts to wetlands and riparian areas. Cumulatively, effects of the No Action Alternative, when combined with past, present, and reasonably foreseeable future actions, would result in a minor beneficial cumulative impacts on wetlands and riparian areas within the CESA. The No Action Alternative would have a negligible contribution to the cumulative effect on wetlands and riparian areas because the ROW on BLM-managed land is a very small portion (1.42 percent) of the CESA.

Proposed Action Contribution to Cumulative Impacts

Herbicide applications could reduce plant cover, leading to a potential increase in erosion, sedimentation, nutrient loading, and water temperature. Risks to wetlands and riparian areas from surface runoff would be influenced by precipitation rates, soil types, and proximity to the application area. Some herbicides (e.g., sulfometuron methyl) that adsorb into soil particles could be carried off-site. These potential impacts would be localized and considered short-term effects. Thinvert would be used to minimize drift onto non-target plants and potential effects to riparian vegetation would be very small in scale. Successful control of incompatible vegetation in wetlands and riparian areas would lead to improved conditions in these habitats over the long-term. The eventual growth of compatible vegetation in treated areas would buffer the input of sediment and herbicides from runoff and promote bank stability in riparian areas. Ongoing efforts by the BLM to enhance wetland and riparian vegetation would also help to increase the acres of wetlands that are in proper functioning condition. Based on the analysis of potential effects in this EA, the Proposed Action would have short-term, direct and indirect, negligible, adverse impacts and long-term, direct and indirect, moderate beneficial impacts to wetlands and riparian areas. Cumulatively, effects of the Proposed Action, when combined with past, present, and reasonably foreseeable future actions, would result in minor, beneficial cumulative impacts on the wetlands and riparian areas within the CESA. The Proposed Alternative would have a negligible contribution to the cumulative effect on wetlands and riparian areas because the ROW on BLM-managed land is a very small portion (1.42 percent) of the CESA.

4.9 Noxious Weeds and Invasive Species

Reasonable Foreseeable Future Actions Cumulative Impacts Common to Both Alternatives

Many of the same human and grazing activities that have altered native plant communities in the past would continue to do so in the future. The extent of noxious weeds and invasive species is expected to continue to increase, but the rate of expansion is projected to slow down. As populations of invasive species spread, altered disturbance regimes would continue to have the potential to cause wildland fires that further alter vegetation in the CESA. The Utilities do not directly target noxious and invasive weeds as part of their routine vegetation management. Treatments by the BLM, Forest Service, and other entities to remove hazardous fuels and control invasive species would help offset these adverse effects. Multiple treatments would favor the establishment of compatible vegetation in targeted areas. The use of ever greater amounts of herbicides by other agencies and entities to control invasive species and their repeated use may result in weed populations that develop a resistance to a particular herbicide over time. The number of resistant plants could increase in the population

until the herbicide no longer effectively controls the weed and there would be a cumulative loss of native vegetation function. Over the long term, treatments should restore compatible vegetation and natural fire regimes that would slow the loss of native vegetation function (BLM 2007a and BLM 2016a).

Native ecosystems adjacent to the CESA may also suffer when invasive plants spread from the Utilities ROW. When noxious weeds and invasive species are identified by the BLM, the Utilities have worked cooperatively with the BLM in addressing this issue. Adjacent landowners may control these plants with less environmentally friendly methods or products, or by using more herbicides to combat invading plants than would be needed if all ownerships were participating. Adverse effects may occur near property lines, and landscape-scale values such as watershed or wildlife values may be degraded by the need to compensate for poor control of invasive plants. In addition, native and other compatible plants including crops on adjacent lands can suffer irreparable damage when uncontrolled invasive plants from the CESA move across property lines (BLM 2010d).

No Action Alternative Contribution to Cumulative Impacts

The No Action Alternative would not treat noxious weeds or invasive species with herbicides. The frequency of maintenance would require continued use of manual and mechanical equipment with the potential to introduce noxious and invasive species seeds on equipment and personnel, which could increase over time, resulting in long-term minor adverse impacts. The Utilities have BMPs in place to reduce the likelihood of transporting invasive species (i.e., vehicle washing). Tamarisk is extremely difficult to control through manual treatment methods alone and is capable of resprouting easily from cut stumps. A partial removal of trees using mechanical treatments would result in only a short-term benefit. Similar to manual treatments, repeated mechanical treatments could adversely affect compatible vegetation by altering species composition. Without reducing the frequency of manual or mechanical maintenance, the No Action Alternative would not be successful at promoting the establishment of compatible vegetation and therefore the frequency and intensity of treatments may increase due to resprouting. The continued frequent disturbances and routine vegetation maintenance cycles would increase the effects of previous disturbance by disrupting the reestablishing vegetation and posing a continued risk for the introduction or allowing the continued spread of noxious or invasive weeds. Based on the analysis of potential effects in this EA, the No Action Alternative would have short-term, direct, minor, beneficial impacts and short- and long-term, direct and indirect, moderate adverse impacts on the spread of noxious weeds and invasive species. Cumulatively, effects of the No Action Alternative, when combined with past, present, and reasonably foreseeable future actions, would result in a minor beneficial cumulative impacts on the spread of noxious and invasive species within the CESA. The No Action Alternative would have a negligible contribution to the cumulative effect on the spread of noxious and invasive species because the ROW on BLM-managed land is a very small portion (1.42 percent) of the CESA.

Proposed Action Contribution to Cumulative Impacts

The short-term impacts would be the same as the No Action Alternative, resulting in short-term minor direct beneficial effects to noxious and invasive vegetation by treating noxious and/or invasive weeds within the ROW where they are incompatible with the Utilities set goals and objectives. Long-term major beneficial impacts are anticipated as herbicide treatments are more effective in controlling incompatible vegetation and treating noxious and invasive weeds, assisting with compatible vegetation community transition. Although the Proposed Action does not directly target noxious and invasive weeds unless the weed is also an incompatible plant (e.g. tamarisk), the longer duration between treatment cycles would mean less site disturbance and less likelihood of transporting noxious or invasive weed and the seed establishing and/or spreading.

Based on the analysis of potential effects in this EA, the Proposed Action would have short-term, direct, minor, beneficial impacts and short- and long-term, direct and indirect, moderate adverse impacts. Cumulatively, effects of the Proposed Action, when combined with past, present, and reasonably foreseeable future actions, would result in a minor beneficial cumulative impacts on the spread of noxious and invasive species within the CESA. The Proposed Action would have a negligible contribution to the cumulative effect on the spread of noxious and invasive species because the ROW on BLM-managed land is a very small portion (1.42 percent) of the CESA.

4.10 General Vegetation

Reasonable Foreseeable Future Actions Cumulative Impacts Common to Both Alternatives

Treatments that remove hazardous fuels from public lands would be expected to benefit the health of plant communities in which natural fire cycles have been altered. Any treatments that restore and maintain fire-adapted ecosystems, through the appropriate use of mechanical thinning, fire, and other vegetation treatment methods, would decrease the effects of wildfire on plant communities and improve ecosystem resilience and sustainability. There are and would be activities in the reasonable foreseeable future within the CESA that contribute to cumulative effects to vegetation including a variety of vegetation management practices such as firewood harvest, riparian and reforestation projects, brush control and reseeding, and prescribed burning. Mechanical and chemical treatments are among the methods prescribed for vegetation management in the RMPs to control noxious weeds and for fire management, which the BLM conducts periodically. Many of the same human activities that have altered native plant communities in the past would continue to do so in the future. Populations of invasive species and noxious weeds would continue to spread. Treatments by the BLM, Forest Service, and other entities to remove hazardous fuels and control invasive species and noxious weeds would help offset these adverse effects, although multiple treatments followed by restoration would be necessary to recover native communities and restore disturbance regimes in targeted areas (BLM 2007a).

No Action Alternative Contribution to Cumulative Impacts

Impacts from mechanical treatment methods generally have the greatest effect on woody plant species, which typically take about 10 years or longer to recover and regain their dominance, depending on the effectiveness of control and the reproductive success of the species (BLM 2007a). Herbaceous plants would typically be more resilient to top-removal treatment methods, as many of these species die back annually. Growth of herbaceous plants often increases after mechanical treatments as a result of reduced competition with woody species for light, nutrients, and water. Treatments occurring during the growing period and prior to seed maturation and dispersal would have the greatest potential effects on herbaceous species. Mechanical methods are effective in removing thick stands of vegetation, although requires routine treatments to maintain. Continued frequent disturbances and routine vegetation maintenance cycles would increase the effects of previous disturbance by disrupting the reestablishing vegetation and pose a continued risk for the introduction of noxious or invasive weeds. Based on the analysis of potential effects in this EA, the No Action Alternative would have short- and long-term, direct and indirect, moderate, adverse impacts on general vegetation. Cumulatively, effects of the No Action Alternative, when combined with past, present, and reasonably foreseeable future actions, would result in a minor adverse cumulative impacts on general vegetation within the CESA. The No Action Alternative would have a negligible contribution to the cumulative effect on general vegetation because the ROW on BLM-managed land is a very small portion (1.42 percent) of the CESA.

Proposed Action Contribution to Cumulative Impacts

Effects to non-target plants would be minimal since the Proposed Action accounts for the implementation of the SOPs and would apply herbicides by spot treatment targeting only incompatible vegetation. Additionally, while columnar cacti and agave are sometimes treated using manual methods, the Proposed Action does not include treatment of agave or columnar cacti with herbicide. Indirect spray through drift could impact these plants. Thinvert would be used to minimize drift onto non-target plants and potential effects to vegetation would be very small in scale. Herbicides offer an effective and often resource efficient means of treating and managing unwanted vegetation. The use of herbicides would benefit plant communities by decreasing the growth, seed production, and competitiveness of target plants, thereby relieving competitive pressures (e.g., water, nutrient, and space availability) to low-growing compatible vegetation. The success of treatments would depend on numerous factors, and could require the use of a combination of methods to combat incompatible vegetation. The Proposed Action would have localized impacts from the changes in the structure and composition of the vegetation in the ROW, a reduction in frequency and intensity of vegetation management treatments as compared to the No Action Alternative, establishment of low-growing vegetation communities, and a reduction in the risk of future high-severity wildfire. Based on the analysis of potential effects in this EA, the Proposal Action would have short-term, direct and indirect, moderate adverse impacts and long-term, direct and indirect moderate beneficial impacts to general vegetation. Cumulatively, effects of the Proposed Action, when combined with past, present, and reasonably foreseeable future actions, would result in minor adverse cumulative impacts on general vegetation within the CESA. The Proposed Action would have a negligible contribution to the cumulative effect on general vegetation because the ROW on BLM-managed land is a very small portion (1.42 percent) of the CESA.

4.11 General Fish and Wildlife

Reasonable Foreseeable Future Actions Cumulative Impacts Common to Both Alternatives

Future effects to wildlife would include the loss, modification, and fragmentation of habitat, which would increase the likelihood of local extirpations of wildlife populations and loss of species diversity. Actions to protect sensitive species and their habitats, restore compatible plant communities and disturbance regimes, control the spread of invasive species and noxious weeks, and reduce the risk of catastrophic wildfire are all expected to help offset some of the adverse impacts to wildlife and their habitats. Aquatic wildlife species may be impacted cumulatively by activities, such as groundwater pumping, water diversions, livestock operations, and OHV use, which could degrade aquatic habitat. These activities can cause erosion, removal of substrates that serve as habitat for fish and their prey, and cause habitat vegetation loss. Introduction of non-native species, such as bullfrogs, crayfish, and spiny-rayed fish, can adversely impact aquatic species and their prey base. Terrestrial wildlife species may be impacted cumulatively by habitat loss, fragmentation, and degradation due to urban development and agricultural operations; illegal hunting; illegal collection; road mortality; barrier development; wildfire; habitat degradation from livestock grazing; and human encroachment (BLM 2007a).

No Action Alternative Contribution to Cumulative Impacts

Treatments that remove hazardous fuels from public lands, reduce the spread of noxious or invasive vegetation, and restore compatible vegetation would benefit wildlife habitat. Although the intent is not to specifically target noxious or invasive weeds by the vegetation treatments, treatments would help to restore natural succession and disturbance processes to which native wildlife have adapted. In addition, treatments would increase plant diversity across landscapes, and in turn increase the number and types of wildlife that can be supported. Removal of vegetation as part of vegetation management treatments would create areas vulnerable to erosion and stormwater runoff, which in turn could increase sedimentation to surface waters. Fragmentation has isolated some animal populations and reduced the ability of populations to disperse across the landscape.

Treatments that promote low-growing vegetation in disturbed areas should reduce fragmentation and reestablish connectivity among blocks of similar habitat. Treatments that thin vegetation to reduce hazardous fuels could create openings in dense forest stands that would promote development of understory vegetation, benefiting ground- and shrub-dwelling birds and other wildlife. The No Action Alternative would affect general wildlife because of the localized vegetation treatments, potential habitat disturbance, and associated potential for runoff from manual and mechanical treatments and DSAP maintenance activities. Based on the analysis of potential effects in this EA, the No Action Alternative would have long-term, direct and indirect, minor adverse impacts to general wildlife and aquatic species. Cumulatively, effects of the No Action Alternative, when combined with past, present, and reasonably foreseeable future actions, would result in minor adverse cumulative impacts on general wildlife and aquatic species within the CESA. The No Action Alternative would have a negligible contribution to the cumulative effect on general wildlife and aquatic species because the ROW on BLM-managed land is a very small portion (1.42 percent) of the CESA.

Proposed Action Contribution to Cumulative Impacts

It is highly unlikely that any wildlife species would be directly sprayed with herbicide, though species could come in contact with vegetation that has been sprayed. The BLM-approved herbicides selected for use in the Proposed Action are non-toxic to slightly or moderately toxic to most fish and wildlife species. Vegetation in the ROW is currently managed manually and mechanically, and continued management under the Proposed Action would not constitute a large scale modification of habitat. Forested areas currently managed to prevent development of tree canopies would potentially provide shrubland habitat following years of successful treatment. BLM lands outside the ROW would provide available suitable habitat for general wildlife species both during and after herbicide treatments. The addition of herbicide treatments under the Proposed Action would reduce, over time, the frequency and intensity of manual and mechanical treatment. As frequency of disturbance decreases, the need for wildlife to disperse from the area in response to disturbance would also decrease. This in turn reduces situational stress on individuals and populations, stabilizes wildlife movement patterns, and increases site fidelity. Herbicide treatments can be used to manage incompatible vegetation in a manner that is less intrusive than the current manual and mechanical methods. Control of incompatible vegetation through the judicious use of herbicides following manual and mechanical vegetation treatment assists in the establishment of low-growing, compatible vegetation within the utility authorized ROW. Low-growing, compatible vegetation can extend maintenance periods and therefore substantially minimize the time and cost required for subsequent vegetation management operations. Indirectly, the elimination of invasive and unwanted woody vegetation promotes the growth of native grasses and other native ground cover preferred by many wildlife species. Based on the analysis of potential effects in this EA, the Proposed Action would have long-term, direct and indirect, moderate beneficial impacts to general wildlife and aquatic species. Cumulatively, effects of the Proposed Action, when combined with past, present, and reasonably foreseeable future actions, would result in minor adverse cumulative impacts on general wildlife and aquatic species within the CESA. The Proposed Action would have a negligible contribution to the cumulative effect on general wildlife and aquatic species because the ROW on BLM-managed land is a very small portion (1.42 percent) of the CESA.

4.12 Threatened, Endangered, or Candidate Species and Habitat

There would be no contribution to cumulative impacts on the Chiricahua leopard frog , California condor, Yuma clapper rail, desert pupfish, Gila chub, Gila topminnow, lesser long-nosed bat, ocelot, Sonoran pronghorn, Arizona hedgehog cactus, Huachuca-water umbel, and Peebles Navajo cactus because the No Action Alternative and the Proposed Action would have negligible adverse impacts. As a result, these species are not analyzed for cumulative impacts.

Reasonable Foreseeable Future Actions Cumulative Impacts Common to Both Alternatives

As noted in the general wildlife resource discussion on reasonably foreseeable future actions above, future effects to the southwestern willow flycatcher, yellow-billed cuckoo, and northern Mexican gartersnake would include the loss, modification, and fragmentation of habitat, which would increase the likelihood of local extirpations of individuals. These federally listed species would have protection under the ESA on lands within the CESA to help offset some of the adverse impacts to the species and their habitats. Habitat fragmentation on and off public lands would continue, increasing the likelihood of potential impacts to sensitive species. These risks are greatest on privately-owned lands, which comprise over 70 percent of the CESA. Non-federal activities that could impact sensitive species within the CESA include: various forms of recreation; agricultural land uses and runoff; road projects; water diversions; and, livestock grazing. Introduction of non-native species such as bullfrogs, crayfish, and spiny-rayed fish on non-public lands can negatively impact northern Mexican gartersnake and their prey base within the CESA. Degradation and dewatering of aquatic habitats, livestock operations, and OHV use on non-public lands could also adversely affect northern Mexican gartersnake habitat. Treatments that reduce the risk of catastrophic fire and the spread of noxious weeds and invasive species would result in more continuous stands of similar vegetation and a reduced likelihood that islands of good habitat would be surrounded by less compatible habitat. Federally listed species as well as general wildlife would continue to be at risk for exposure to these chemicals. Identifying and restricting use of active ingredients with the greatest toxicological risks to sensitive species in favor of active ingredients with lower risks would help reduce cumulative effects associated with exposure to these chemicals (BLM 2007a and BLM 2017).

State, private, local, or tribal actions off of public lands could affect adjacent populations of acuña cactus. Mining, mineral exploration, and road construction off of public lands could affect acuña cactus populations. Actions that spread noxious and invasive weeds into adjacent habitats (such as OHV use and livestock grazing) may lead to the spread of these weeds onto lands within the CESA. Recreational activities, e.g., hiking, horseback riding, mountain biking, or OHV use, could result in adverse effects to individual cacti as well as to the species population as a whole. In addition, border security actions could also result in negative effects to acuña cactus populations. Treatments by the federal agencies and other entities to remove hazardous fuels and control noxious weeds and invasive species would help offset these adverse effects (BLM 2017).

No Action Alternative Contribution to Cumulative Impacts

Routine vegetation maintenance would be conducted outside the nesting season and would have no direct effect on breeding southwestern willow flycatchers or yellow-billed cuckoo, if present near the ROW. For foraging and migrating flycatchers and cuckoos, only manual treatments would be permitted in riparian areas, which would limit potential displacement of individual flycatchers and cuckoos during treatment activities. The crew workers associated with ground inspections and manual treatment of vegetation may temporarily displace any birds present in the ROW. Direct disturbance to the two federally listed bird species from manual treatment of vegetation would be unlikely due to implementation of conservation measures and nesting season timing restrictions. As a result, the No Action Alternative would not likely have any measureable consequences to individual flycatcher or cuckoo or their respective populations as a whole on BLM-managed lands. Direct contact with flycatchers or cuckoos would be unlikely due to their ability of flight and implementation of timing restrictions to avoid work during the nesting season. Between maintenance cycles, small sapling vegetation would develop, but this vegetation would continue to be cut and would not be allowed to reach maturity in the riparian vegetation within the ROW containing designated flycatcher critical and suitable habitat, respectively and to the cuckoo's proposed critical habitat as well.

Only a portion of the ROW in designated critical habitat for the acuña cactus is covered by vegetation and some of that vegetation would be targeted for manual treatment. In the No Action Alternative, the native tree that typically provide protection to the cactus would remain (in some circumstances, limited pruning may be needed of the nurse plant). However, native plant species would be removed that are not already protecting acuña cacti and indirect effects may result from the loss of future nurse plants within the cacti critical habitat.

It is unlikely that ground inspections and vegetation management treatments in upland habitats would result in the crushing of northern Mexican gartersnake by vehicles injuring or killing individuals. Herbicides may be used high on ridges above the Agua Fria River where habitat is not suitable for northern Mexican gartersnake. Vehicle use in areas of gartersnake suitable habitat would be restricted to existing roads as described in the conservation measures. Human presence and use of chainsaws could temporarily displace gartersnakes near the work area, though this effect would be short in duration, generally only lasting a day or less where work occurs locally. Upland and riparian vegetation has been continually maintained within the ROW and in the No Action Alternative, no wide-scale removal of vegetation is proposed. The removal and treatment of vegetation may result in minor local changes to northern Mexican gartersnake riparian and upland habitat. Important components for cover, such as woody debris would be maintained. Effects to the organic structural complexity of streamside habitat may be expected, though impacting a relatively small amount of riparian vegetation components of critical habitat.

Based on the analysis of potential effects in this EA, the No Action Alternative would have short and long-term, indirect, minor, adverse impacts on the southwestern willow flycatcher, yellow-billed cuckoo, acuña cactus, and northern Mexican gartersnake and their respective habitats. Cumulatively, effects of the Proposed Action, when combined with past, present, and reasonably foreseeable future actions, would result in a moderate adverse cumulative impacts on these four federally listed species and their habitat within the CESA. The No Action Alternative would have a minor contribution to the cumulative effect on the southwestern willow flycatcher, yellow-billed cuckoo, acuña cactus, and northern Mexican gartersnake and their respective habitats because the ROW on BLM-managed land is a very small portion (1.42 percent) of the CESA.

Proposed Action Contribution to Cumulative Impacts

In addition to the indirect impacts noted in the No Action Alternative, potential impacts to breeding southwestern willow flycatchers and yellow-billed cuckoos would likely occur from presence of crew workers during application of targeted herbicides from backpack sprayers within the ROW. Motorized vehicles would not be used near suitable habitat during the nesting season of either bird, and herbicide application would be limited during the nesting season within suitable habitat. During other times of the year, any birds in the ROW would more than likely fly away before crew workers could get close enough to inadvertently spray them with herbicide. The use of low toxicity herbicides would minimize potential direct effects on prey species due to toxicity.

As noted in the No Action Alternative, vegetation maintenance is proposed on 2.83 acres of ROW that occurs within critical habitat for southwestern willow flycatcher. In the Proposed Action, routine vegetation maintenance would be carried out within this ROW to manage for low growing plant communities by targeted herbicide applications to individual plants. Thinvert would be used to minimize drift onto non-target plants and potential effects to riparian vegetation with the designated critical habitat would be very small in scale. Long-term indirect effects to the riparian vegetation within the ROW would occur because this portion of the ROW would not be allowed to develop into suitable breeding habitat for flycatchers.

The Proposed Action treatments would be limited to select manual removal of vegetation and spot application to individual plants and defensible space treatments around select power poles over a very small portion of acuña cactus critical habitat. Any adverse effects to acuña cactus critical habitat would be relatively small in

scale and localized. Some native vegetation would continue to be removed though nurse plants of existing acuña cactus would remain untreated or pruned.

Direct effects to northern Mexican gartersnakes from contact with herbicides would be minimized by using approved low-toxicity herbicides within and near gartersnake habitat. The Proposed Action may introduce very minimal quantities of herbicide into the aquatic habitat through runoff or drift. Herbicide treatments would be limited to spot applications to individual plants within the ROW. The quantity of vegetation treated over the ROW area is low with grasses, forbs, and lower growing shrubs remaining untreated. Changes in vegetation composition affecting northern Mexican gartersnake suitable and occupied habitat due to herbicide application could be expected.

Based on the analysis of potential effects in this EA, the Proposed Action would have short and long-term, indirect, minor, adverse impacts on the southwestern willow flycatcher, yellow-billed cuckoo, acuña cactus, and northern Mexican gartersnake and their respective habitats. Cumulatively, effects of the Proposed Action, when combined with past, present, and reasonably foreseeable future actions, would result in a moderate adverse cumulative impacts on these four federally listed species and their habitat within the CESA. The Proposed Action would have a minor contribution to the cumulative effect on southwestern willow flycatcher, yellow-billed cuckoo, acuña cactus, and northern Mexican gartersnake and their respective habitats because the ROW on BLM-managed land is a very small portion (1.42 percent) of the CESA.

4.13 Fire and Fuel Management

Reasonable Foreseeable Future Actions Cumulative Impacts Common to Both Alternatives

Under the Proposed Action, by converting ROW vegetation to compatible low-growing plant species and reducing fuel loads, wildland fire would likely be smaller in scale, natural fuel breaks would be enhanced, and native vegetative communities would be more resilient and capable of successful post-fire response as a result of reduced fire severity. Overall cumulative effects for fire management would be moderately beneficial. Large wildland fires provide the opportunity for the replacement of native species with non-natives or weeds, which is a long-term adverse cumulative effect.

No Action Alternative Contribution to Cumulative Impacts

There would be no contribution to cumulative impacts to fire and fuel management because the No Action Alternative would have negligible impacts. As a result, fire and fuel management for the No Action Alternative are not analyzed for cumulative impacts.

Proposed Action Contribution to Cumulative Impacts

The use of herbicides would prevent fuel build-up that results from the rapid, dense re-growth and sprouting and then subsequent cut-back of undesired vegetation in the ROW. Over time, it is expected the post-treatment vegetation debris would decline with the use of herbicides as compatible plant species become established in the ROW, and the use of herbicides would prevent re-sprouting and subsequent cutback. In the Proposed Action with the use of herbicides over time, the incompatible vegetation species would be removed and the compatible species would become more mature and established in the ROWs. This would reduce the need for repeated fuels treatments and would substantially reduce cut vegetation build-up and fuel loads in the ROWs. The composition of vegetation within the ROWs would be altered resulting in reduced fuel loads and subsequently reduce fire intensity within the ROW. Fuel modifications associated with the use of herbicides within the existing ROWs could reduce the intensity of a flaming front of a crown fire as it enters the ROW by changing fire behavior characteristics associated with fuel breaks. The use of herbicides would more permanently establish the vegetation composition needed to create these conditions. Based on the analysis of potential effects in this

EA, the Proposed Action would have direct, moderate, beneficial impacts to fire and fuel management. Cumulatively, effects of the Proposed Action, when combined with past, present, and reasonably foreseeable future actions, would result in a moderate beneficial cumulative impacts on fire and fuel management within the CESA. The Proposed Action would have a negligible contribution to the cumulative effect on fire and fuel management because the ROW on BLM-managed land is a very small portion (1.42 percent) of the CESA.

4.14 Special Management Areas

Reasonable Foreseeable Future Actions Cumulative Impacts Common to Both Alternatives

Throughout the CESA, there are lands that possess unique and important cultural, physical, and natural features such as lands with wilderness characteristics, critical habitat, scenic landscapes, historic locations, cultural landmarks, and unique geologic features. Vegetation management to treat incompatible vegetation could potentially affect the "naturalness" of special management areas with the removal and/or cutting of vegetation. The use of IVM techniques collective throughout the CESA would reduce the frequency of future mechanical and manual treatments and impacts to the natural settings and subsequently reducing potential adverse cumulative impacts to special management areas. Increases in human population and overuse of these special management areas may result in degradation of the unique resources. Additionally, pressure to utilize protected areas for resource extraction may result in future loss or degradation of these areas. Actions by conservation groups and other entities to protect these areas may also help offset or slow some of the factors that degrade the unique qualities of special management areas.

No Action Alternative Contribution to Cumulative Impacts

The No Action Alternative is anticipated to result in localized disturbance to special management areas from manual and mechanical treatments and DSAP maintenance activities. The unique characteristics of these areas would be considered when preparing plans for treatment activities. Over the long-term, the routine vegetation maintenance requirements in terms of the number of acres to be treated, the density of vegetation to be removed, and the number of work crew members, equipment, and vehicles required are anticipated to be relatively the same for each work cycle. Between work cycles, any adverse effects related to the manual, mechanical, and/or DSAP maintenance treatment activities would be reduced as the vegetation is re-established and the work crew members, equipment, and vehicles are no longer present in the special management areas. Based on the analysis of potential effects in this EA, the No Action Alternative would have direct and indirect, short-term, minor adverse impacts to special management areas and indirect, long-term, moderate beneficial impacts. Cumulatively, effects of the No Action Alternative, when combined with past, present, and reasonably foreseeable future actions, would result in direct and indirect, minor adverse cumulative impacts on special management areas within the CESA. The No Action Alternative would have a negligible contribution to the cumulative effects on special management areas because the ROW on BLM-managed land is a very small portion (1.42 percent) of the CESA.

Proposed Action Contribution to Cumulative Impacts

The use of IVM techniques under the Proposed Action would reduce the frequency of future mechanical and manual treatments, subsequently reducing potential impacts to special management areas. The impact reduction is based on successful use of herbicides that would prevent incompatible species from returning for approximately eight years. Long-term, indirect impacts would be based on the successful use of herbicide and establishment of low-growing vegetation as a result of the reduced frequency of vegetation management treatments.

Based on the analysis of potential effects in this EA, the Proposed Action would have direct, moderate beneficial impacts to special management areas. Cumulatively, effects of the Proposed Action, when combined with past, present, and reasonably foreseeable future actions, would result in direct and indirect, minor adverse cumulative impacts on special management areas within the CESA. The Proposed Action would have a negligible contribution to the cumulative effects on special management areas because the ROW on BLM-managed land is a very small portion (1.42 percent) of the CESA.

CHAPTER 5
LIST OF PREPARERS AND REVIEWERS

5.1 List of Preparers and Reviewers

The following individuals were involved in the preparation and/or review of this EA:

Name	Organization	Title	Project Expertise
Eddie Arreola	BLM Arizona State Office	Supervisory Project Manager RECO Team	Energy Lead and Compliance
Lisa Thornley	BLM Arizona State Office	State Lead Invasive & Noxious Weeds	Herbicides, noxious and invasive weeds
Matt Basham	BLM Arizona State Office	Archaeologist & State Deputy Preservation Officer	Cultural resources
Nancy Favour	BLM Arizona State Office	State Lead NEPA & ePlanning	NEPA Compliance
Susanne Rowe	BLM Arizona State Office	Archaeologist & State Deputy Preservation Officer	Cultural resources, State PA, and Nationwide PA
Tim Hughes	BLM Arizona State Office	State Lead Threatened & Endangered Species	Biological resources
Brian Buttazoni	BLM-Phoenix District Office	District Planning and Environmental Specialist	NEPA Compliance
Codey Carter	BLM-Phoenix District Office	Wildlife Biologist	General Wildlife, BLM Sensitive Species (Animals), Migratory Birds, Vegetation
Gloria Tibbetts	BLM-Phoenix District Office	Planning and Environmental Coordinator	Reviewer
Lisa Thornley	BLM-Phoenix District Office	Invasive and Noxious Weeds Program Lead	Herbicides, Noxious and Invasive Weeds
Michael Rice	BLM-Phoenix District Office	Project Manager	Lands, Reality, ROW Agreements
Sara Ferland	BLM-Phoenix District Office	Archaeologist	Cultural Resources and Native American Religious Concerns
Amanda James	BLM – Hassayampa Field Office	Agua Fria National Monument Manager	Reviewer
Casey Addy	BLM – Hassayampa Field Office	Rangeland Management Specialist	Reviewer
David Eddy	BLM – Hassayampa Field Office	Geologist	Reviewer
James Holden	BLM – Hassayampa Field Office	Rangeland Management Specialist	Reviewer
Jim Andersen	BLM – Hassayampa Field Office	Realty Specialist	Reviewer
Josh Tibbetts	BLM – Hassayampa Field Office	Fuels Specialist	Reviewer

Name	Organization	Title	Project Expertise
Mary Skordinski	BLM – Hassayampa Field Office	Outdoor Recreation Planner	Reviewer
Steve Bird	BLM – Hassayampa Field Office	Biologist	Reviewer
Rebecca Peck	BLM – Kingman Field Office	Biologist	Reviewer
Cheryl Blanchard	BLM – Lower Sonoran Field Office	Archaeologist	Reviewer
Ron Tipton	BLM – Lower Sonoran Field Office	Biologist	Reviewer
Dan McGrew	BLM – Safford Field Office	Archaeologist	Reviewer
Dave Arthun	BLM – Safford Field Office		Reviewer
Jason Martin	BLM – Safford Field Office	Rangeland Management Specialist	Reviewer
Jeff Conn	BLM – Safford Field Office	Natural Resource Specialist	Reviewer
Larry Thrasher	BLM – Safford Field Office	Geologist	Reviewer
RJ Estes	BLM – Safford Field Office	Rangeland Management Specialist	Reviewer
Roberta Lopez	BLM – Safford Field Office	Reality Specialist	Reviewer
Tim Goodman	BLM – Safford Field Office	Biologist	Reviewer
Todd Murdock	BLM – Safford Field Office	Outdoor Recreation Planner	Reviewer
Amy Sobiech	BLM – Tucson Field Office	Archaeologist	Reviewer
Frank Bergwall	BLM – Yuma Field Office	Geologist	Reviewer
John Hall	BLM – Yuma Field Office	Rangeland Management Specialist	Reviewer
Ron Morfin	BLM – Yuma Field Office	Recreation and Wilderness Specialist	Reviewer
Tom Jones	BLM – Yuma Field Office	Assistant Field Manger/Archaeologist	Reviewer
Dan Quintana	BLM – Gila District Office	Fire Management Specialist	Reviewer
Andrew Rable	Arizona Public Service Company	Manager Forestry and Special Programs	Herbicide, Vegetation Management

Name	Organization	Title	Project Expertise
Chris Watkins	Arizona Public Service Company	Natural Resource Specialist	Cultural Resources, Native American Religious Concerns, Lands
Conor Flynn	Arizona Public Service Company	Natural Resource Specialist	Biological Resources, General Wildlife
Lisa Young	Arizona Public Service Company	Natural Resource Specialist	Biological Resources, General Wildlife, BLM Sensitive Species, Migratory Birds
Nicole Rodriguez	Arizona Public Service Company	Natural Resource Specialist	Biological Resources, Migratory Birds
Tracy Moore	Arizona Public Service Company	Supervisor, Forestry Northwest Division	Herbicide, Vegetation Management
Amanda Hodges	Salt River Project Agricultural Improvement and Power District	GIS Analyst	Cartographic and GIS Analysis
Brian Colson	Salt River Project Agricultural Improvement and Power District	Senior IT Systems Analyst	Cartographic and GIS Analysis
Colleen Spakowski	Salt River Project Agricultural Improvement and Power District	Business Analyst 2	Vegetation Management
Heather English	Salt River Project Agricultural Improvement and Power District	Senior Environmental Scientist	Biology
Jennifer Wennerlund	Salt River Project Agricultural Improvement and Power District	GIS/Business Analyst	Cartographic and GIS Analysis
Lesly Swanson	Salt River Project Agricultural Improvement and Power District	Senior Environmental Scientist	Biology/Environmental
Lori Jones	Salt River Project Agricultural Improvement and Power District	Manager, Maintenance Services	Vegetation Management
Rick Anduze	Salt River Project Agricultural Improvement and Power District	Senior Environmental Scientist	Cultural Resources/Environmental
Ruth Valencia	Salt River Project Agricultural Improvement and Power District	Manager, Biological & Cultural Resource Services	Biology/Environmental

Name	Organization	Title	Project Expertise
Shea Meyer	Salt River Project Agricultural Improvement and Power District	GIS Analyst	Cartographic and GIS Analysis
Chris Bockey	Logan Simpson	Senior Environmental Planner	Fire and Fuels Management and Special Management Areas
Chris Garraty	Logan Simpson	Principal Investigator	Cultural Resources
David Bustoz	Logan Simpson	Archaeologist	Cultural Resources
Diane Simpson-Colebank	Logan Simpson	Senior Environmental Planner	Project Principal, NEPA Compliance, Cumulative Impacts
Erick Laurila	Logan Simpson	Director of Cultural Resources	Cultural Resources, State PA, and Nationwide PA
Ian Tackett	Logan Simpson	Senior Biologist	Biological Resources, Noxious and invasive weeds
Jeremy Casteel	Logan Simpson	Senior Clean Water Act Permitting	Water Resources
Kay Nicholson	Logan Simpson	Senior Biologist	Biological Resources, General Wildlife, BLM Sensitive Species, Federally-listed Species, and Migratory Birds
Marshall Hayes	Logan Simpson	Environmental Planner	NEPA Compliance and Administrative Assistance
Patricia R. McCabe	Logan Simpson	Senior Environmental Planner	NEPA Compliance
Patricia Silverberg	Logan Simpson	Technical Editor	Editor and 508-compliance
Roy Baker	Logan Simpson	Senior GIS Analyst	GIS Analysis
Samatha Vaughn	Logan Simpson	Biologist	Biological Resources and General Wildlife
Vicki Casteel	Logan Simpson	Environmental Planner	Wetlands and Riparian Areas

CHAPTER 6
CONSULTATION AND COORDINATION

The BLM consulted the following public agencies and officials, tribes and non-BLM persons during the development of this EA:

Government Officials and Agencies

- Apache County
- Apache Junction Fire District
- Apache Junction School District
- Arizona Department of Agriculture
- Arizona Department of Corrections
- Arizona Department of Emergency & Military Affairs
- Arizona Department of Environmental Quality
- Arizona Department of Public Safety
- Arizona Department of Public Safety
- Arizona Department of Public Safety Facility Management
- Arizona Department of Transportation
- Arizona Department of Water Resources
- Arizona Director of Community Colleges
- Arizona Game and Fish Commission
- Arizona Game and Fish Department
- Arizona National Guard
- Arizona State Land Department
- Arizona State Parks
- Arizona Western College
- BLM AZ Strip District Office
- Bureau of Prisons
- Bureau of Reclamation, Phoenix Area Office
- Central AZ College
- City of Apache Junction
- City of Coolidge
- City of Goodyear
- City of Mesa
- City of Peoria
- City of Phoenix
- City of Prescott
- City of San Luis
- City of Yuma
- Clark County Flood Control
- Clark County School District
- Cochise County

Government Officials and Agencies

- Cochise County Board of Supervisors
- Cochise Emergency
- Department of Defense, Fort Huachuca
- Federal Highways Administration
- Florence Flood Control
- Gadsden School District
- Gila County
- Gila County Board of Supervisors
- Glendale High School
- La Paz County
- La Paz County Board of Supervisors
- Littlefield School District
- Maricopa County Communications
- Maricopa County Department of Transportation
- Maricopa County Flood Control
- Maricopa County Government Relations
- Maricopa County Parks & Recreation
- Maricopa County Solid Waste Management
- Maricopa County Supervisors
- Mayer Fire District
- Mesa Public Schools
- Mesa Public Schools
- Mohave County
- Mohave County Board of Supervisors
- Mohave County Flood Control District
- Mohave County Public Works
- Mohave County Sheriff's Office
- Moon Valley High School
- Navajo County
- Navy
- Nevada Bureau of Mines and Geology
- NPS - Intermountain Region
- Pima Association of Governments
- Pima County Air Quality
- Pima County Manager's Office
- Pima County Parks
- Pima County Property Division
- Pima County Transportation Department
- Pinal County Air Quality
- Pinal County Board of Supervisors
- Pinal County Flood Control
- Pinal County Highway Department
- Pinal County Manager's Office
- Prescott College

Government Officials and Agencies

- Queen Valley Fire District
- Santa Cruz County
- Town of Florence
- Town of Fredonia
- Town of Gilbert
- Town of Kearny
- Town of Parker
- Town of Quartzsite
- Town of Wickenburg
- Union Pacific Railroad
- US Army Air Corps
- US Army Elect Proving Grounds
- US Army Engineering District
- US Army Yuma Proving Ground
- US Border Patrol
- US Customs & Border Protection
- US Department of Agriculture, Natural Resources Conservation Service
- US Fish & Wildlife
- US Fish and Wildlife Refuge Complex
- US Fish and Wildlife Service, Office of the Regional Director
- US Forest Service – Southwest Region
- US Forest Service, Apache and Sitgreaves National Forests
- US Forest Service, North Kaibab Ranger District
- US Geological Survey
- US Postal Service
- Washington County
- Yavapai County Administrator's Office
- Yavapai County Board of Supervisors
- Yavapai County Board of Supervisors
- Yavapai County Engineer
- Yavapai County Public Works
- Yavapai County Road Department
- Yuma County Library District
- Yuma County Public Works
- Yuma County Sheriff

Tribes

- Ak-Chin Indian Community
- Chemehuevi Tribe
- Cocopah Tribe
- Colorado River Indian Tribes
- Fort McDowell Yavapai Nation
- Fort Mojave Tribe

- Fort Yuma Quechan Indian Tribe
- Gila River Indian Community
- Havasupai Tribe
- Hopi Tribe
- Hualapai Tribe
- Kaibab Paiute Tribe
- Navajo Nation
- Pascua Yaqui Tribe
- Pueblo of Zuni
- Salt River Pima-Maricopa Indian Community
- San Carlos Apache Tribe
- Tohono O'odham Nation
- Tonto Apache Tribe
- White Mountain Apache Tribe
- Yavapai-Apache Tribe
- Yavapai-Prescott Tribe

Others

A complete scoping contact list is available upon request.

Public Contacts

A complete scoping contact list is available upon request.

Government Officials and Agencies Coordination

BLM has coordinated with numerous agencies (listed above), including the SHPO as required under Section 106 of the NHPA and the USFWS as required under Section 7 of the ESA. Coordination with the SHPO regarding the preparation of the PA and with the USFWS regarding the BA and Biological Evaluation is ongoing. Issues identified through consultation with the tribes and other agencies are addressed in detail in the respective resource sections in Chapter 3 of this EA. A scoping postcard was distributed in January 2015, to agencies, organizations, special interest groups, and general public. Five responses were received from agencies or government official. The USDA, NRCS responded February 19, 2015, and stated that the existing ROW on BLM-managed lands do not include prime or unique farmland as designated by the NRCS Soil Survey and therefore, the project is exempt from the Farmland Protection Policy Act requirements. Arizona Department of Transportation responded in a letter dated February 17, 2015, requesting prior notice or coordination regarding foliar applications of herbicide and combustible free space treatments in areas where the Utilities are co-located in or adjacent to ADOT easements on federal land. This would be to notify ADOT personnel of treatment areas and timeframes, avoid duplication of efforts, minimize the amount of herbicides applied, and reduce the chance for development of herbicide resistance in these areas. The Bureau of Reclamation responded in an email dated January 27, 2015, requesting that work being completed in the Flat-tailed Horned Lizard Management Area (MA) include conservation measures listed in the Flat-tailed Horned Lizard Rangewide Strategy and any activities proposed on Reclamation lands in the Yuma Area should be coordinated with the Yuma Area Office. The Cochise County Board of Supervisors (letter dated January 22, 2015) and Western Area Power Administration (email dated January 23, 2015) responded with no concerns or objections to the use of herbicides by the Utilities.

Tribal Coordination

Government-to-government tribal consultation was initiated on February 2, 2015 with letters to the above referenced 22 tribes. The letters described the Proposed Action to be evaluated under the programmatic EA, requested specific comments/information about potential issues or concerns, and encouraged the tribes to enter into Section 106 consultation by providing comments no later than March 3, 2015. Eleven responses were received between February 11 and July 8, 2015, four of which expressed general concerns about vegetation maintenance by the Utilities. Another two responses requested to be notified and that work cease in the event of inadvertent discoveries of cultural resources. Several requests were made for continued consultation and an opportunity to review the completed EA. Copies of these letters and responses can be found in the administrative record for this project located at the BLM Phoenix District Office.

A second round of letters repeating the offer of tribal coordination regarding the project was sent on October 14, 2016. The second round of letters informed the tribes that the EA had been changed from a programmatic EA to a project specific EA, provided additional details about the Proposed Action, and requested that tribes concur with the BLM's finding of "No Adverse Effect" to cultural resources. The following tribes responded with their concurrence: Tonto Apache Tribe, Hopi Tribe, Ak-Chin Indian Community, Cocopah Indian Tribe, and the Navajo Nation; although the Hopi Tribe also recommended that work should cease in the immediate vicinity of any inadvertent discoveries of cultural resources and proper notification should occur. Six additional tribal responses were received, four of which expressed no specific comments or concerns about the project. Several requests were made for continued consultation, an opportunity to review the completed EA, and/or notification and work stoppages in the event of inadvertent discoveries of cultural resources. Copies of these letters and responses can be found in the administrative record for this project located at the BLM Phoenix District Office.

Tribal consultation continued with a third round of letters distributed on May 1, 2017 providing tribes with an updated scope of the undertaking and informing them that a PA would be developed following consultation with the SHPO. The tribes' assistance was requested in the development of the PA. Three responses (Appendix G) were received indicating concurrence with the project and/or deferring to the SHPO and other interested tribes for the preparation of the PA; with the stipulation that work would cease and proper notification would occur in the event of inadvertent discoveries of cultural resources.

Public Coordination

Postcards describing the proposed action and direction to readers to obtain more information or provide comments were mailed to over 1,400 private individuals and groups; and local, state, tribal and federal officials and agencies.

Through the scoping process, a total of 25 comments were received. A complete list of responses received is contained in the project file.

PAGE INTENTIONALLY LEFT BLANK

CHAPTER 7
REFERENCES

Alley et al. 1999. Alley, W.M., T.E. Reilly, and O.L. Franke. 1999. *Sustainability of Ground-water Resources.* U.S. Geological Survey Circular 1186. Available at: http://water.usgs.gov/pubs/circ/circ1186/index.html

American National Standards Institute. 2006. American National Standard for Tree Care Operations — *Tree, Shrub, and Other Woody Plant Maintenance — Standard Practices (Integrated Vegetation Management a. Utility Rights-of-way)*. ANSI A300, Part 7. International Society of Arboriculture, Champagne, Illinois.

Arizona Center for Nature Conservation – Phoenix Zoo. 2016. Springsnail (online species account). http://phoenixzoo.org/conservation/local-conservation/springsnail/. Accessed June 22, 2016.

Arizona Department of Agriculture. 2017. Noxious Weeds Regulated and Restricted Noxious Weeds (R3-4-244). Web interface. https://agriculture.az.gov/pests-pest-control/agriculture-pests/noxious-weeds. Accessed August 17, 2017.

Arizona Department of Environmental Quality. 2016. 2012/14 Status of Water Quality Arizona's Integrated 305(b) Assessment and 303(d) Listing Report. Electronic document, http://legacy.azdeq.gov/environ/water/assessment/download/appc.pdf . Accessed June 28, 2016.

_____. Arizona Water Atlas, September 2010.

_____. 2016. http://www.azwater.gov/azdwr/gis/ . Groundwater Subbasins.

Arizona Department of Transportation. 2014. Biological Assessment of ADOT Herbicide Treatment Program on Bureau of Land Management Lands in Arizona. NEPA No. DOI-BLM-AZ-0000-2013-0001-EA. Submittal 4. December 24.

Arizona Department of Water Resources. 2011. *Water Resources Development Commission Environmental Working Group Arizona's Inventory of Water-Dependent Natural Resources.* Water Resources Development Commission Final Report: Volume II Committee Reports.

Arizona Game and Fish Department. 1999a. Blue sand lily (*Triteleiopsis palmeri*). Unpublished abstract compiled and edited by the Heritage Data Management System, 4 pp., Arizona Game and Fish Department, Phoenix.

____. 1999b. Scaly sand food (*Pholisma arenaria*). Unpublished abstract compiled and edited by the Heritage Data Management System, 3 pp., Arizona Game and Fish Department, Phoenix.

____. 1999c. Sonoran mud turtle (*Kinosternon sonoriense sonoriense*). Unpublished abstract compiled and edited by the Heritage Data Management System, 3 pp., Arizona Game and Fish Department, Phoenix.

____. 2000a. Giant sedge (*Carex spissa var. ultra*). Unpublished abstract compiled and edited by the Heritage Data Management System, 4 pp., Arizona Game and Fish Department, Phoenix.

____. 2000b. Pima Indian mallow (*Abutilon parishii*). Unpublished abstract compiled and edited by the Heritage Data Management System, 6 pp., Arizona Game and Fish Department, Phoenix.

____. 2001a. Allen's big-eared bat (*Idionycteris phyllotis*). Unpublished abstract compiled and edited by the Heritage Data Management System, 4 pp., Arizona Game and Fish Department, Phoenix.

____. 2001b. Bartram stonecrop (*Graptopetalum bartramii*). Unpublished abstract compiled and edited by the Heritage Data Management System, 4 pp., Arizona Game and Fish Department, Phoenix.

____. 2001c. Cactus ferruginous pygmy-owl (*Glaucidium brasilianum cactorum*). Unpublished abstract compiled and edited by the Heritage Data Management System, 6 pp., Arizona Game and Fish Department, Phoenix.

____. 2001d. California leaf-nosed bat (*Macrotus californicus*). Unpublished abstract compiled and edited by the Heritage Data Management System, 7 pp., Arizona Game and Fish Department, Phoenix.

____. 2001e. Fish creek fleabane (*Erigeron piscaticus*). Unpublished abstract compiled and edited by the Heritage Data Management System, 5 pp., Arizona Game and Fish Department, Phoenix.

____. 2001f. Flannelmouth sucker (*Catostomus latipinnis*). Unpublished abstract compiled and edited by the Heritage Data Management System, 7 pp., Arizona Game and Fish Department, Phoenix.

____. 2001g. Grand Wash springsnail (*Pyrgulopsis bacchus*). Unpublished abstract compiled and edited by the Heritage Data Management System, 4 pp., Arizona Game and Fish Department.

____. 2001h. Houserock Valley chisel-toothed kangaroo rat (*Dipodomys microps leucotis*). Unpublished abstract compiled and edited by the Heritage Data Management System, 6 pp., Arizona Game and Fish Department, Phoenix.

____. 2001i. Kanab ambersnail (*Oxyloma haydeni kanabensis*). Unpublished abstract compiled and edited by the Heritage Data Management System, 4 pp., Arizona Game and Fish Department, Phoenix.

____. 2001j. Little Colorado sucker (*Catostomus* sp.3). Unpublished abstract compiled and edited by the Heritage Data Management System, 4 pp., Arizona Game and Fish Department, Phoenix.

____. 2001k. Mexican gray wolf (*Canis lupus baileyi*). Unpublished abstract compiled and edited by the Heritage Data Management System, 7 pp., Arizona Game and Fish Department, Phoenix.

____. 2001l. Purple-spike coralroot (*Hexalectris warnockii*). Unpublished abstract compiled and edited by the Heritage Data Management System, 4 pp., Arizona Game and Fish Department, Phoenix.

____. 2001m. Virgin spinedace (*Lepidomeda mollispinis mollispinis*). Unpublished abstract compiled and edited by the Heritage Data Management System, 6 pp., Arizona Game and Fish Department, Phoenix.

____. 2001n. Western burrowing owl (*Athene cunicularia hypugaea*). Unpublished abstract compiled and edited by the Heritage Data Management System, 7 pp., Arizona Game and Fish Department, Phoenix.

____. 2002a. American peregrine falcon (*Falco peregrinus anatum*). Unpublished abstract compiled and edited by the Heritage Data Management System, 6 pp., Arizona Game and Fish Department, Phoenix.

____. 2002b. Aravaipa sage (*Salvia amissa*). Unpublished abstract compiled and edited by the Heritage Data Management System, 4 pp., Arizona Game and Fish Department, Phoenix.

____. 2002c. California black rail (*Laterallus jamaicensis coturniculus*). Unpublished abstract compiled and edited by the Heritage Data Management System, 5 pp., Arizona Game and Fish Department, Phoenix.

____. 2002d. Cave myotis (*Myotis velifer*). Unpublished abstract compiled and edited by the Heritage Data Management System, 7 pp., Arizona Game and Fish Department, Phoenix.

_____. 2002e. Colorado pikeminnow (*Ptychocheilus Lucius*). Unpublished abstract compiled and edited by the Heritage Data Management System, 6 pp., Arizona Game and Fish Department, Phoenix.

____. 2002f. Desert sucker (*Catostomus clarkii*). Unpublished abstract compiled and edited by the Heritage Data Management System, 4 pp., Arizona Game and Fish Department, Phoenix.

____. 2002g. Golden eagle (*Aquila chrysaetos*). Unpublished abstract compiled and edited by the Heritage Data Management System, 4 pp., Arizona Game and Fish Department, Phoenix.

____. 2002h. Greater western mastiff bat (*Eumops perotis californicus*). Unpublished abstract compiled and edited by the Heritage Data Management System, 6 pp., Arizona Game and Fish Department, Phoenix.

____. 2002i. Longfin dace (*Agosia chrysogaster*). Unpublished abstract compiled and edited by the Heritage Data Management System, 5 pp., Arizona Game and Fish Department, Phoenix.

____. 2002j. Northern leopard frog (*Lithobates pipiens*). Unpublished abstract compiled and edited by the Heritage Data Management System, 6 pp., Arizona Game and Fish Department, Phoenix.

____. 2002k. Sonora sucker (*Catostomus insignis*). Unpublished abstract compiled and edited by the Heritage Data Management System, 5 pp., Arizona Game and Fish Department, Phoenix.

____. 2002l. Speckled dace (*Rhinichthys osculus*). Unpublished abstract compiled and edited by the Heritage Data Management System, 5 pp., Arizona Game and Fish Department, Phoenix.

____. 2003a. Bylas springsnail (*Pyrgulopsis arizonae*). Unpublished abstract compiled and edited by the Heritage Data Management System, 4 pp., Arizona Game and Fish Department, Phoenix.

____. 2003b. Kingman springsnail (*Pyrgulopsis conica*). Unpublished abstract compiled and edited by the Heritage Data Management System, 4 pp., Arizona Game and Fish Department, Phoenix.

____. 2003c. Lowland burrowing treefrog (*Smilisca fodiens*). Unpublished abstract compiled and edited by the

____. 2003d. Mohave fringed-toed lizard (*Uma scoparia*). Unpublished abstract compiled and edited by the Heritage Data Management System, 5 pp., Arizona Game and Fish Department, Phoenix.

____. 2003e. Murphey agave (*Agave murpheyi*). Unpublished abstract compiled and edited by the Heritage Data Management System, 7 pp., Arizona Game and Fish Department, Phoenix.

____. 2003f. Pinto beardtongue (*Penstemon bicolor*). Unpublished abstract compiled and edited by the Heritage Data Management System, 5 pp., Arizona Game and Fish Department, Phoenix.

_____. 2003g. Relict leopard frog (*Lithobates Onca*). Unpublished abstract compiled and edited by the Heritage Data Management System, 6 pp., Arizona Game and Fish Department, Phoenix.

____. 2003h. Slevin's bunchgrass lizard (*Sceloporus slevini*). Unpublished abstract compiled and edited by the Heritage Data Management System, 4 pp., Arizona Game and Fish Department, Phoenix.

____. 2003i. Spotted bat (*Euderma maculatum*). Unpublished abstract compiled and edited by the Heritage Data Management System, 9 pp., Arizona Game and Fish Department, Phoenix.

____. 2003j. Townsend's big-eared bat (*Corynorhinus townsendii pallescens*). Unpublished abstract compiled and edited by the Heritage Data Management System, 6 pp., Arizona Game and Fish Department, Phoenix.

____. 2003k. Yuman desert fringed-toed lizard (*Uma rufopunctata*). Unpublished abstract compiled and edited by the Heritage Data Management System, 4 pp., Arizona Game and Fish Department, Phoenix.

____. 2004a. Aquarius milkvetch (*Astragalus newberryi* var. *aquarii*). Unpublished abstract compiled and edited by the Heritage Data Management System, 4 pp., Arizona Game and Fish Department, Phoenix.

____. 2004b. Aravaipa woodfern (*Thelypteris puberula* var. *sonorensis*). Unpublished abstract compiled and edited by the Heritage Data Management System, 4 pp., Arizona Game and Fish Department, Phoenix.

____. 2004c. Dalhouse spleenwort (*Asplenium dalhousiae*). Unpublished abstract compiled and edited by the Heritage Data Management System, 4 pp., Arizona Game and Fish Department, Phoenix.

____. 2004d. Desert Springsnail (*Pyrgulopsis deserta*). Unpublished abstract compiled and edited by the Heritage Data Management System, 4 pp., Arizona Game and Fish Department, Phoenix.

____. 2004e. Kofa Mt. barberry (*Berberis harrisoniana*). Unpublished abstract compiled and edited by the Heritage Data Management System, 4 pp., Arizona Game and Fish Department, Phoenix.

____. 2004f. Niobrara ambersnail (*Oxyloma haydeni haydeni*). Unpublished abstract compiled and edited by the Heritage Data Management System, 4 pp., Arizona Game and Fish Department, Phoenix.

____. 2004g. Sand food (*Pholisma sonorae*). Unpublished abstract compiled and edited by the Heritage Data Management System, 7 pp., Arizona Game and Fish Department, Phoenix.

____. 2005a. California flannelbush (*Fremontodendron californica*). Unpublished abstract compiled and edited by the Heritage Data Management System, 6 pp., Arizona Game and Fish Department, Phoenix.

____. 2005b. Grand Canyon rose (*Rosa stellata* var. *abyssa*). Unpublished abstract compiled and edited by the Heritage Data Management System, 5 pp., Arizona Game and Fish Department, Phoenix.

____. 2005c. Kearny sumac (*Rhus kearneyi* spp. *kearneyi*). Unpublished abstract compiled and edited by the Heritage Data Management System, 5 pp., Arizona Game and Fish Department, Phoenix.

____. 2005d. Parish's phacelia (*Phacelia parishii*). Unpublished abstract compiled and edited by the Heritage Data Management System, 4 pp., Arizona Game and Fish Department, Phoenix.

____. 2005e. Parish wild onion (*Allium parishii*). Unpublished abstract compiled and edited by the Heritage Data Management System, 5 pp., Arizona Game and Fish Department, Phoenix.

____. 2005f. Round-leaf broom (*Errazurizia rotundata*). Unpublished abstract compiled and edited by the Heritage Data Management System, 5 pp., Arizona Game and Fish Department, Phoenix.

____. 2005g. Silverleaf sunray (*Enceliopsis argophylla*). Unpublished abstract compiled and edited by the Heritage Data Management System, 4 pp., Arizona Game and Fish Department, Phoenix.

____. 2005h. Schott wire-lettuce (*Stephanomeria schottii*). Unpublished abstract compiled and edited by the Heritage Data Management System, 5 pp., Arizona Game and Fish Department, Phoenix.

____. 2005i. Sonoran green toad (*Bufo retiformis*). Unpublished abstract compiled and edited by the Heritage Data Management System, 5 pp., Arizona Game and Fish Department, Phoenix.

____. 2006a Lowland leopard frog (*Lithobates yavapaiensis*). Unpublished abstract compiled and edited by the Heritage Data Management System, 10 pp., Arizona Game and Fish Department, Phoenix.

____. 2006b Mexican long-tongued bat (*Choeronycteris mexicana*). Unpublished abstract compiled and edited by the Heritage Data Management System, 7 pp., Arizona Game and Fish Department, Phoenix.

____. 2006c. San Pedro River wild buckwheat (*Eriogonum terrenatum*). Unpublished abstract compiled and edited by the Heritage Data Management System, 4 pp., Arizona Game and Fish Department, Phoenix.

____. 2008a Desert ornate box turtle (*Terrapene ornata*). Unpublished abstract compiled and edited by the Heritage Data Management System, 4 pp., Arizona Game and Fish Department, Phoenix.

____. 2010. Arizona grasshopper sparrow (*Ammodramus savannarum*). Unpublished abstract compiled and edited by the Heritage Data Management System, 7 pp., Arizona Game and Fish Department, Phoenix.

____. 2011a. Arizona myotis (*Myotis occultus*). Unpublished abstract compiled and edited by the Heritage Data Management System, 6 pp., Arizona Game and Fish Department, Phoenix.

____. 2011b. Bald eagle (*Haliaeetus leucocephalus*). Unpublished abstract compiled and edited by the Heritage Data Management System, 9 pp., Arizona Game and Fish Department, Phoenix.

_____. 2011c. Chiricahua Leopard Frog (*Lithobates (Rana) chiricahuensis*). Unpublished abstract compiled and edited by the Heritage Data Management System, 11 pp., Arizona Game and Fish Department, Phoenix.

____. 2013a. Bluehead sucker (*Catostomus discobolus*). Unpublished abstract compiled and edited by the Heritage Data Management System, 6 pp., Arizona Game and Fish Department, Phoenix.

____. 2013b. Ferruginous hawk (Buteo regalis). Unpublished abstract compiled and edited by the Heritage Data Management System, 6 pp., Arizona Game and Fish Department, Phoenix.

____. 2013c. Great Plains narrow-mouthed toad (*Gastrophryne olivacea*). Unpublished abstract compiled and edited by the Heritage Data Management System, 6 pp., Arizona Game and Fish Department, Phoenix.

____. 2013d. Northern goshawk (*Accipiter gentilis*). Unpublished abstract compiled and edited by the Heritage Data Management System, 8 pp., Arizona Game and Fish Department, Phoenix.

____. 2013e. Plains leopard frog (*Lithobates* (Rana) *blairi*). Unpublished abstract compiled and edited by the Heritage Data Management System, 4 pp., Arizona Game and Fish Department, Phoenix.

____. 2014. Banner-tailed kangaroo rat (*Dipodomys spectabilis baileyi*). Unpublished abstract compiled and edited by the Heritage Data Management System, 5 pp., Arizona Game and Fish Department, Phoenix.

____. 2015. Sonoran desert tortoise (*Gopherus morafkai*). Unpublished abstracts compiled and edited by the Heritage Data Management System, 10 pp., Arizona Game and Fish Department, Phoenix.

____. 2016a. Arizona Bat Information. Arizona Game and Fish Department. http://www.azgfd.gov/w_c/bat_conserv_az_bats.shtml. Accessed July 5, 2016.

____. 2016b. Arizona's Native Mollusks. Arizona Game and Fish Department, Phoenix. http://www.azgfd.gov/w_c/nongameandendangeredwildlifeprogram/invertebrates.shtml. Accessed June 22, 2016.

_____. 2016c. Heritage Data Management System. Dataset provided January 20, 2016.

_____. 2016d. Sport Fish Species Page: Apache Trout (*Oncorhynchus Apache*). Arizona Game and Fish Department online. http://www.azgfd.gov/h_f/fish_apache_trout.shtml.

____. 2016e. Status Definitions. Arizona Game and Fish Department. Heritage Data Management System, Phoenix. http://www.azgfd.gov/w_c/edits/documents/StatusDefinitions_rev_3-18-2015_000.pdf. Accessed June 24, 2016.

Arizona Native Plant Society. 2015. Schott wire-lettuce (*Stephanomeria schottii*). Unpublished species abstract. 2pp. http://www.aznps.com/. Accessed 6/22/2015.

Arizona Land Resource Information Service. 2014. Public Land Ownership. October 2014.Arizona State Legislature. 2017. Arizona Revised Statutes, Chapter 2, Article 1, Section 3-201. Available at http://www.azleg.gov/viewdocument/?docName=http://www.azleg.gov/ars/3/00201.htm.

Arizona Riparian Council. 2004. *Fact Sheet Number 1 Riparian*.

Arizona State University 2016. Arizona State Climate Office, Arizona Average Monthly Precipitation Maps https://azclimate.asu.edu/weather/state-tempprecip/. Accessed June 28, 2016.

Ballotpedia. 2016. Endangered species in Arizona. https://ballotpedia.org/Endangered_species_in_Arizona. Accessed June 24, 2016.

Bright, J. L., and J. J. Hervert. 2003. Sonoran pronghorn 2002 aerial survey summary. Arizona Game and Fish Department Nongame and Endangered Wildlife Program Technical Report 236. Arizona Game and Fish Department. Phoenix, Arizona.

Boyd, Michael W. 2008. Personal observation of cactus ferruginous pygmy-owl (*Glaucidium brasilianum cactorum*) in North Scottsdale, Arizona. http://www.libertywildlife.org/email/2008/aug/. Accessed June 24, 2016

Brady, N.C., and R.R. Weil. 1999. The Nature and Properties of Soils (12th Edition). Prentice Hall, 1999 Inc. Upper Saddle River, New Jersey.

Brown, David Earl. 1994. Biotic Communities: Southwestern United States and Northwestern Mexico. University of Utah Press (Originally published in 1982 by the Boyce Thompson Southwestern Arboretum 1982).

Brown, D. E., Lowe, C.H. and Pase, C.P. 1979. *A digitized classification system for the biotic communities of North America, with community (series) and association examples for the Southwest.* Journal of the Arizona-Nevada Academy of Science.

Bureau of Land Management. 1988. *Chemical Pest Control*. H-9011-1. U.S. Department of the Interior, BLM, Washington, D.C.

_____. 1989a. Record of Decision for the San Pedro River Riparian Management Plan and Environmental Impact Statement. Safford Field Office, Arizona. August.

_____. 1989b. Final Environmental Impact Statement Record of Decision for the Phoenix Resource Management Plan. Phoenix District, Arizona. October.

_____. 1991a. Final Environmental Impact Statement Vegetation Treatment on BLM Lands in Thirteen Western States. BLM Wyoming State Office. Casper, Wyoming.

_____. 1991b. *Safford District Resource Management Plan*. U.S. Department of the Interior, BLM, Safford Field Office, Arizona. September.

_____. 1992a. *Partial Record of Decision for the Approval of the Safford District Resource Management Plan*. U.S. Department of the Interior, BLM, Safford Field Office, Arizona. September. http://www.blm.gov/style/medialib/blm/az/pdfs/nepa/library/resource_management/safford.Par.31924.File.dat/ROD.pdf.

_____. 1992b. *Integrated Weed Management*. Manual Section 9015. U.S. Department of the Interior, BLM, Washington Office, Washington, D.C. December 2. http://www.blm.gov/ca/st/en/prog/weeds/9015.html.

_____. 1992c. Procedures for Ecological Site Inventory. Tech. Ref. 1737-7.

_____. 1994. *Partial Record of Decision for the Approval of the Safford District Resource Management Plan Environmental Impact Statement II*. U.S. Department of the Interior, BLM, Safford Field Office, Arizona. July. http://www.blm.gov/style/medialib/blm/az/pdfs/nepa/library/resource_management/safford.Par.31924.File.dat/ROD.pdf.

_____. 1995. *Record of Decision for the Approval of the Kingman Resource Area Resource Management Plan*. U.S. Department of the Interior, BLM, Kingman Field Office, Arizona. March 7. http://azmemory.azlibrary.gov/cdm/ref/collection/feddocs/id/483.

_____. 1996. Partners Against Weeds: An Action Plan for the Bureau of Land Management. Washington, D.C.

_____. 2000a. *Safety*. Manual Section 1112. U.S. Department of the Interior, BLM, Washington, D.C. June 16. https://www.blm.gov/sites/blm.gov/files/uploads/mediacenter_blmpolicymanual1112.pdf.

_____. 2000b. Strategic Plan FY 2000-2005. Washington, D.C.

_____. 2000c. Public Rewards from Public Lands 2000 – Great Basin Restoration. Washington, D.C.

_____. 2001a. Rangeland Health Standards. H-4180-1. U.S. Department of the Interior, BLM, Washington, D.C. January 19. https://www.blm.gov/sites/blm.gov/files/uploads/Media_Library_BLM_Policy_h4180-1.pdf.

_____. 2001b. Safety and Health Management. BLM Manual H-1112-1. Denver, CO. 57 pp.

_____. 2003. Visual Resource Contrast Rating (H-8431-1). U.S. Department of the Interior. Washington, D.C. January.

_____. 2004. *Proposed Arizona Statewide Land Use Plan Amendment for Fire, Fuels and Air Quality Management Finding of No Significant Impact (FONSI) and Environmental Assessment*. U.S. Department of the Interior, BLM, Arizona State Office, Phoenix. March. https://www.webharvest.gov/peth04/20041031201336/http://www.az.blm.gov/LUP/fire/ea/fire_ea.pdf.

_____. 2005a. *Approved Amendment to the Lower Gila North Management Framework Plan and the Lower Gila South Resource Management Plan and Decision Record*. Phoenix Field Office, Arizona.

_____. 2005b. Injury Breakout. All Injuries Report Breakout by Cause. Washington, D.C.

_____. 2006. Sonoran Desert Tortoise Suitable Habitat. Digitized vector data of desert tortoise suitable habitat in Arizona.

_____. 2007a. *Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement*. Final. U.S. Department of the Interior, BLM, Washington Office, Washington, D.C. https://ia801206.us.archive.org/5/items/programmaticenvi01unit/programmaticenvi01unit.pdf (referred to in this EA as the "2007 Herbicides PEIS")

_____. 2007b. *Record of Decision and Lake Havasu Field Office Approved Resource Management Plan*. U.S. Department of the Interior, BLM, Lake Havasu Field Office, Arizona. May. h https://ia801207.us.archive.org/27/items/recordofdecision00lake/recordofdecision00lake.pdf.

_____. 2007c. *Record of Decision: Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement*. U.S. Department of the Interior, BLM, Washington Office, Washington, D.C. September. https://ia601209.us.archive.org/9/items/recordofdecision00weed/recordofdecision00weed.pdf.

____. 2007d. Vegetation Treatments on BLM Lands in 17 Western States Final Biological Assessment. Reno, Nevada.

_____. 2007e. *Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Report*. Final. June. https://eplanning.blm.gov/epl-front-office/projects/nepa/70300/94231/113731/Title_Page_(June_2007).pdf (referred to in this EA as the "2007 Herbicides PER").

_____. 2007f. *Instructions for Implementing the Final Programmatic Impact Statement (Final PEIS) Record of Decision*. Instruction Memorandum No. 2008-030. U.S. Department of the Interior, BLM, Washington, D.C. November 13. https://www.blm.gov/policy/im-2008-030.

____. 2008a. BLM Manual 6840 (*Special Status Species Management*). Washington, D.C.: Department of the Interior, Bureau of Land Management. December 12.

_____. 2008b. *Integrated Vegetation Management Handbook*. H-1740-2. U.S. Department of the Interior, BLM, Washington, D.C. March 25. https://www.blm.gov/sites/blm.gov/files/uploads/Media_Library_BLM_Policy_Handbook_H-1740-2.pdf.

_____. 2008c. *National Environmental Policy Act Handbook*. H-1790-1. U.S. Department of the Interior, BLM, Washington, D.C. January 30. https://www.blm.gov/sites/blm.gov/files/uploads/Media_Library_BLM_Policy_Handbook_h1790-1.pdf.

_____. 2009. *Approved Resource Management Plan Amendments/Record of Decision (ROD) for Designation of Energy Corridors on Bureau of Land Management-Administered Lands in the 11 Western States*. U.S. Department of the Interior, BLM, Washington, D.C. January. http://corridoreis.anl.gov/documents/docs/Energy_Corridors_final_signed_ROD_1_14_2009.pdf.

_____. 2010a. Final Draft EIS Vegetation Treatments Using Herbicide on BLM Lands in Oregon. Volume 1.

_____. 2010b. *Bradshaw-Harquahala Record of Decision and Approved Resource Management Plan*. U.S. Department of the Interior, BLM, Hassayampa Field Office, Phoenix, Arizona. April. https://eplanning.blm.gov/epl-front-office/projects/lup/1350/13345/13413/Bradshaw-Harquahala_Record_of_Decision_and_Approved_Resource_Management_Plan_pdf.pdf.

_____. 2010c. Agua Fria National Monument Record of Decision and Approved Resource Management Plan. U.S. Department of the Interior, BLM, Hassayampa Field Office, Phoenix, Arizona. April. https://eplanning.blm.gov/epl-front-office/projects/lup/4507/101438/123606/AFNM_Approved_Record_of_Decision_and_Resource_Management_Plan.pdf.

____. 2010d. Instruction Memorandum No. AZ-2011-005. Updated Bureau of Land Management Sensitive Species List for Arizona. December 22, 2010. Phoenix, AZ. Retrieved from https://www.blm.gov/policy/im-az-2011-005.

_____. 2010e. Memorandum of Understanding between the US Department of the Interior Bureau of Land Management and the US Fish and Wildlife Service to Promote the Conservation of Migratory Birds. BLM Memorandum of Understanding WO-230-2010-04.

____. 2010f. Memorandum of Understanding between the U.S. Department of the Interior Bureau of Land Management and the U. S. Fish and Wildlife Service To Promote the Conservation of Migratory Birds. BLM Memorandum of Understanding WO 230-2010-04 Issued April 12, 2010. https://www.blm.gov/policy/ib-2010-110. Accessed July 27, 2016.

_____. 2010g. *Yuma Field Office Record of Decision and Approved Resource Management Plan*. Yuma Field Office, Yuma, Arizona. U.S. Department of the Interior, BLM, Yuma Field Office, Arizona. January. https://eplanning.blm.gov/epl-front-office/projects/lup/68418/87826/105161/Yuma-ROD-all.pdf.

_____. 2010h. *Vegetation Treatments Using Herbicides on BLM Lands in Oregon Final Environmental Impact Statement*. Available at https://permanent.access.gpo.gov/gpo2685/gpo2685/www.blm.gov/or/plans/vegtreatmentseis/documents.php.htm.

_____. 2012a. *Lower Sonoran Record of Decision and Approved Resource Management Plan*. U.S. Department of the Interior, BLM, Lower Sonoran Field Office, Phoenix, Arizona. September. https://eplanning.blm.gov/epl-front-office/projects/lup/11856/40127/42156/01-LSDA_ROD-ARMP_FINAL_2012-09-19_web-with-Links_sans-map-pages.pdf.

_____. 2012b. S*onoran Desert National Monument Record of Decision and Approved Resource Management Plan*. U.S. Department of the Interior, BLM, Lower Sonoran Field Office, Phoenix, Arizona. September. https://eplanning.blm.gov/epl-front-office/projects/lup/11856/40128/42157/01-SDNM_ROD-ARMP_FINAL_2012-09-19_web-with-Links_sans-map-pages.pdf.

_____. 2012c. *Programmatic Agreement among the Bureau of Land Management, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers Regarding the Manner in Which the BLM Will Meet Its Responsibilities under the National Historic Preservation Act*. U.S. Department of the Interior, BLM, Washington, D.C. February.

_____. 2013a. *Ironwood Forest National Monument Record of Decision and Approved Resource Management Plan*. U.S. Department of the Interior, BLM, Tucson Field Office, Arizona. February.

_____. 2013b. *Chemical Pest Control*. Manual Section 9011. U.S. Department of the Interior, BLM, Washington Office, Washington, D.C. October 24. http://www.blm.gov/ca/st/en/prog/weeds/9011.html.

_____. 2013c. Fire Management Units Phoenix District.

_____. 2014. Water Quality: Water Resources Program (Part of Soil, Water, and Air). Electronic document, http://www.blm.gov/wo/st/en/prog/more/soil2/water/water_quality0.print.html, accessed December 2014.

_____. 2014a. Information Bulletin No. 2014-069. Updating List of Approved Herbicide Formulations and Adjuvants.

_____. 2015a. Biological Assessment for Vegetation Treatments Using Aminopyralid, Fluroxypyr, and Rimsulfuron on Bureau of Land Management Lands in 17 Western States. Bureau of Land Management, Washington D.C. April 2015.

_____. 2015b. *Environmental Assessment and Section 4(f) Evaluation: ADOT Herbicide Treatment Program on Bureau of Land Management Lands in Arizona*. U.S. Department of the Interior, BLM, Arizona State Office, Phoenix. April.

_____. 2015c. Phoenix District Integrated Weed Management Biological Assessment. Bureau of Land Management, Phoenix District Office. July 2015.

_____. 2016a. *Final Programmatic Environmental Impact Statement for Vegetation Treatments Using Aminopyralid, Fluroxypyr, and Rimsulfuron on Bureau of Land Management Lands in 17 Western States*. U.S. Department of the Interior, BLM, Washington Office, Washington, D.C. January. https://ia601200.us.archive.org/34/items/finalprogrammati00unit/finalprogrammati00unit.pdf (referred to in this EA as the "2016 Herbicides PEIS")

_____. 2016b. *Programs: Arizona Fire and Aviation Program*. https://www.blm.gov/programs/public-safety-and-fire/fire-and-aviation/regional-info/arizona. Accessed 10/31/16.

_____. 2017a. *Biological Assessment for Integrated Vegetation Management within Authorized Power Line Rights-of-way on Bureau of Land Management Lands in Arizona*. Prepared by APS, SRP, and Logan Simpson.

_____. 2017b. Programs: Arizona Fire and Aviation Program. https://www.blm.gov/programs/public-safety-and-fire/fire-and-aviation/regional-info/arizona. Accessed on August 15, 2017.

_____.2017c. Data provided by communication with J. Cockman. Provided August 2017.

California Dept. of Fish and Game (CADFG). 2005. CA Interagency Wildlife Task Group. California Wildlife Habitat Relationship System (*sterna antillarum browni*). California Department of Fish and Game. https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentVersionID=17813.

Carroll Electric Cooperative. 2010. *Cost Analysis for Integrated Vegetation Management Plan*. Finley Engineering, Lamar, Missouri. April 20.

Carter, Codey. 2015. "BLM Review of Draft Biological Evaluation." Email. November 2.

Center for Invasive Plant Management. 2012. Protect Our Nation's Public Lands. In cooperation with the USDI Bureau of Land Management. Available at: http://www.weedcenter.org/services/documents/ProtectOurNationsPublicLands_english_reduced.pdf.

Chambers, J.C., Roundy, B.A., Blank, R.R., Meyer, S.E., Whittaker, A., 2007. What makes Great 2007 Basin sagebrush ecosystems invasible by Bromus tectorum? Ecol. Monogr. 77, 117–145.

Comer, P., P. Crist, M. Reid, J. Hak, H. Hamilton, D. Braun, G. Kittel, I. Varley, B. Unnasch, S. Auer, M. Creutzburg, D. Theobald, and L. Kutner. 2013. *Mojave Basin and Range Rapid Ecoregional Assessment Report*. Prepared for the U.S. Department of the Interior, Bureau of Land Management. 173 pp + Appendices.

Corman, T. E., and R. T. Magill. 2000. "Western Yellow-billed Cuckoo in Arizona: 1998 and 1999 Survey Report. Nongame and Endangered Wildlife Program Technical Report 150". Arizona Game and Fish Department, Phoenix.

Cornell Lab of Ornithology. 2015. Arizona Botteri's sparrow (*Peucaea botterii arizonae*). Unpublished species abstract. www.birds.cornell.edu. Accessed June 22, 2016.

Crosswhite, F. S., W.R. Feldman & E.W. Minch. 1995. Impact of herbicides on cacti. Desert Plants 11(4): 9-31.

Desert Renewable Energy Conservation Plan. 2012. Species profile for gilded flicker (Colaptes chrysoides). http://www.drecp.org. Accessed June 22, 2016.

Durst, S.L., M.K. Sogge, S.D. Stump, S.O. Williams, B.E. Kus, and S.J. Sferra. 2007. Southwestern Willow Flycatcher Breeding Site and Territory Summary – 2006. U.S. Geological Survey Open File Report 2007-1391. http://pubs.usgs.gov/of/2007/1391.

Ellis, L. A., D. M. Weddle, S. D. Stump, H. C. English, and A. E. Graber. 2008. Southwestern willow flycatcher final survey and monitoring report. Arizona Game and Fish Department, Research Technical Guidance Bulletin #10, Phoenix, Arizona.

ENSR. 2002. Scoping Comment Summary Report for the Vegetation Treatments Programmatic Environmental Impact Statement. Prepared for the U.S. Department of the Interior Bureau of Land Management, Nevada State Office, Reno, Nevada.

Environmental Protection Agency. 2016. Human Health Risk Assessment website: https://www.epa.gov/risk/human-health-risk-assessment. Last Updated October 3, 2016. Accessed May 2017.

Falk, M., P. Jenkins, et al; Arizona Rare Plant Committee. 2001 Arizona Rare Plant Guide. Published by a collaboration of agencies and organizations. Pages unnumbered.

Federal Energy Regulatory Commission (FERC). 2004. *Utility Vegetation Management and Bulk Electric Reliability Report from the Federal Energy Regulatory Commission*. U.S. Department of Energy, FERC, Washington, D.C. September 7.

_____. 2007. *Mandatory Reliability Standards for the Bulk-Power System*. Final Rule. Order 693 (Docket No. RM06-16-000; 18 CFR 40). March 16. U.S. Department of Energy, FERC, Washington, D.C.

_____. 2013. *Generator Requirements at the Transmission Interface*. Final Rule. Order 785 (Docket No. RM12-16-000; 18 CFR 40). U.S. Department of Energy, FERC, Washington, D.C. September 19.

Felsot, A.S. 2001. *Assessing the Safety of Herbicides for Vegetation Management in the Missoula Valley Region: A Question and Answer Guide to Human Health Issues.* Prepared on behalf of the Missoula Valley Weed Managers, Missoula, Montana. Food and Environmental Quality Laboratory, Washington State University, Richland, Washington.

FERC. 2013. FERC Order 785. Office of Electric Reliability, Division of Reliability Standards and Security. Issued Sept. 19. http://www.ferc.gov/whats-new/comm-meet/2013/091913/E-4.pdf. Accessed June 27, 2016.

Flessner, T.R. 1979. Status Report on *Pediocactus peeblesianus* var. *peeblesianus*. Unpublished Report on File at the USDA Forest Service, Region 3. Albuquerque, New Mexico.

Forest Guardians. 2004. Petition to the U.S. Fish and Wildlife Service to List the Gunnison's Prairie Dog as an Endangered or Threatened Species Under the Endangered Species Act, 16 U.S.C. § 1531 et Seq. (1973 as amended), and to Designate Critical Habitat. Santa Fe, New Mexico. February 23. https://www.fws.gov/mountain-prairie/species/mammals/gunnisonprairiedog/petition.pdf. Accessed June 23, 2016.

Goodfellow, J.W., and H. Holt. 2011. *Field Guild to Closed Chain of Custody for Herbicides in the Utility Vegetation Management Industry*. Utility Arborist Association Best Management Practices. International Society of Arboriculture, Champagne, Illinois.

Hall, E. R. 1981. The Mammals of North America. Second edition, John Wiley & Sons, New York. 1181 pp.

Halterman, M.D. 1991. Distribution and habitat use of the yellow billed cuckoo (*Coccyzus americanus occidentalis*) on the Sacramento River, California, 1987-90. M.S. Thesis, California State University, Chico, CA. 49 pp.

Halterman, M., M.J. Johnson, J.A. Holmes and S.A. Laymon. 2015. A Natural History Summary and Survey Protocol for the Western Distinct Population Segment of the Yellow-billed Cuckoo: U.S. Fish and Wildlife Techniques and Methods, 45 p.

Hoffmeister, D. F. 1986. Mammals of Arizona. The University of Arizona Press, Tucson, Arizona.

Hughes, Tim. 2015. "BLM Review of Draft Biological Evaluation." Email. November 17.

____. 2016. Personal communication via telephone. June 29 and 30.

____. 2016. Endangered Species Coordinator, Bureau of Land Management, Arizona State Office. Personal Communication.

Institue of Electrical and Electronics Engineers. 2011. *National Electrical Safety Code*. 2012 ed., Standard C2-2012. IEEE (Institute of Electrical and Electronics Engineers) Standards Association, New York, New York. http://ieeexplore.ieee.org/xpl/articleDetails.jsp?arnumber=5967877&filter=AND(p_Publication_Number:5967875) Accessed June 27, 2016.

International Code Council. 2011a. 2012 *International Wildland-Urban Interface Code*. International Code Council, Country Club Hills, Illinois. April.

_____. 2011b. 2012 *International Fire Code*. International Code Council, Country Club Hills, Illinois. May.

Invasive Species Compendium. 2016. *Alhagi maurorum* (camelthorn). http://www.cabi.org/isc/datasheet/4215. Modified September 9, 2015.

Jennings, J. 2011. Southwestern Willow Flycatcher Survey Report 230-16 Power Line at the Gila River. Logan Simpson Design, Tempe, Arizona.

Jenny, H. 1980. The Soil Resource: Origins and Behavior. Ecological Studies, Volume 37. Springer-Verlag. New York, New York.

Johnstone, R. 2008. Integrated Vegetation Management. *Utility Arborist Association Quarterly* 2008 (Summer): 5–17.

Laack, L.L. 1991. Ecology of ocelot (*Felis pardalis*) in south Texas. Unpublished M.S. thesis, Texas A&I University, Kingsville, Texas, 113pp.

McDaniel, K. C., and J. P. Taylor. 2003. *Saltcedar Recovery after Herbicide-Burn and Mechanical Clearing Practices*. Journal of Range Management 56(5): 439–445.

Miller, R.F., Tausch, R.J., 2001. The Role of Fire in Pinyon and Juniper Woodlands; A Descriptive Analysis. Tall Timbers Research Station Miscellaneous Publication No. 11, pp. 15-30.

Miller, R. H. 2013. *Integrated Vegetation Management*. 2nd edition. Special companion publication to ANSI A300, Part 7. Utility Arborist Association Best Management Practices. International Society of Arboriculture, Champaign, Illinois.

Money, Nelson R. 2010. *Closed Chain of Custody for Herbicide Use in the Utility Vegetation Management Industry: Creation of an Industry Best Management Practice*. California Licensed Professional Forester, California Department of Forestry and Fire Protection. NRM-VMS, INC Grass Valley, California.

Money, Pamela. 2000. 2000 PG&E's Integrated Vegetation Management Program: Proceedings of the California Weed Science Society (Volume 52). http://www.cwss.org/uploaded/media_pdf/1728-Money074-081.pdf. Accessed on June 1, 2017.

Moyle, P.B. 2002. Inland Fishes of California (Revised and Expanded). London, United Kingdom: University of California Press Ltd.

Nash, L. 1993. *Water Quality and Health*. Pages 25-39 in Water in Crisis: A Guide to the World's Fresh Water Resources (P.H. Gleick, ed.). Oxford University Press. New York, New York.

Nash, L. 1993. *Water Quality and Health*. Pages 25-39 in Water in Crisis: A Guide to the World's Fresh Water Resources (P.H. Gleick, ed.). Oxford University Press. New York, New York.

National Academy of Sciences (NAS). 1968. Principles of Plant and Animal Pest Control, Volume 2: Weed Control. Washington, D.C.

National Audubon Society. 2012. *National Audubon Society BirdLife International Partner*. Audubon_iba_2012_jun_26Comp_1.

NatureServe. 2015a. Magazine mountain shagreen (Inflectarius magazinensis). NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1 NatureServe, Arlington, Virginia. http://explorer.natureserve.org/servlet/NatureServe?searchName=Inflectarius+magazinensis. Accessed June 29, 2016.

_____. 2015b. Virginia flying squirrel (*Glaucomys sabrinus fuscus*). NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1 NatureServe, Arlington, Virginia. http://explorer.natureserve.org/servlet/NatureServe?searchName=Glaucomys+sabrinus+fuscus. Accessed June 29, 2016.

_____. 2015c. Concho Watersnake (*Nerodia paucimaculata*). NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1 NatureServe, Arlington, Virginia. http://explorer.natureserve.org/servlet/NatureServe?searchName=Nerodia+paucimaculata. Accessed June 29, 2016.

_____. 2015d. Lake Erie Water Snake (*Nerodia sipedon insularum*). NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1 NatureServe, Arlington, Virginia. http://explorer.natureserve.org/servlet/NatureServe?searchName=Nerodia+sipedon+insularum. Accessed June 29, 2016.

_____. 2015e. Lanai Saw Sedge (*Gahnia lanaiensis*). NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1 NatureServe, Arlington, Virginia. http://explorer.natureserve.org/servlet/NatureServe?searchName=Gahnia+lanaiensis. Accessed June 29, 2016.

_____. 2015f. Tennessee Coneflower (*Echinacea tennesseensis*). NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1 NatureServe, Arlington, Virginia. http://explorer.natureserve.org/servlet/NatureServe?searchName=Echinacea+tennesseensis. Accessed June 29, 2016.

_____. 2015g. Maguire's Daisy (*Erigeron maguirei*). NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1 NatureServe, Arlington, Virginia. http://explorer.natureserve.org/servlet/NatureServe?searchName=Erigeron+maguirei. Accessed June 29, 2016.

New Mexico Avian Conservation Partners. 2016. http://www.nmpartnersinflight.org. Accessed June 21, 2016.

New Mexico Department of Game and Fish (NMGFD). 2015. Gunnison's prairie dog (*Cynomys gunnisoni*). Unpublished abstract compiled and edited by the BISON-M System, New Mexico Department of Game and Fish, Albuquerque, New Mexico. http://www.bison-m.org/booklet.aspx?id=050206. Accessed June 23, 2016.

North American Electric Reliability Corporation. 2004. *Technical Analysis of the August 14, 2003, Blackout: What Happened, Why, and What Did We Learn?* Final NERC report to the Board of Trustees. North American Electric Reliability Corporation (formerly, "Council") Steering Group, Princeton, New Jersey. July 13.

_____. 2013. *Transmission Vegetation Management*. FAC-003-3. NERC Standards Committee, Atlanta, Georgia/Washington, D.C. Approved September 19, 2013; enforced July 1, 2014. http://www.nerc.net/standardsreports/standardssummary.aspx.

Office of the Federal Register. 2006. Endangered and Threatened Wildlife and Plants: Notice of Finding on a Petition to Delist the Morelet's Crocodile the List of Threatened and Endangered Species. https://federalregister.gov/a/E6-10149. Accessed June 29, 2016.

Pellant, M., Abbey, B., Karl, S., 2004. Restoring the Great Basin Desert, USA: integrating science, management and people. Environ. Monit. Assess. 99, 169–179.

Penn State College of Agricultural Sciences. 2017.*Weed Management: Herbicides.* Accesses on June 3, 2017. http://extension.psu.edu/pests/weeds/control/introduction-to-weeds-and-herbicides/herbicides.

Peregrine Fund. 2016. Retrieved from https://www.peregrinefund.org/explore-raptors-species/California_Condor. Accessed February 11, 2016.

Peterson, W., R. Johnstone, D. Ellsworth, and M. Colopy. 2015. Pollinators and Rights-of-Way. *Arborist News* April: 36–39.

Prescott, Brian G. 2016. Le Conte's thrasher (*Toxostoma lecontei*) species account. USDI Bureau of Land Management. https://www.blm.gov/ca/pdfs/cdd_pdfs/lecontes1.PDF. Accessed June 22, 2016.

Purple Martin Conservation Association (PMCA). 2016. Desert purple martin (*Progne subis hesperia*). Unpublished species abstract compiled. www.purplemartin.org. Accessed June 22, 2016.

Robson and Banta 1995. Robson, S.G., and E.R. Banta. 1995. Ground Water Atlas of the United States: Arizona, Colorado, New Mexico, Utah. HA 730-C. Available at: http://capp.water.usgs.gov/gwa/.

Romero, Ron. 2016. Personal communication regarding duration of herbicide application, email dated June 6, 2016.

Snyder et al. 1986. Nest-site biology of the California Condor. Condor 88: 228-241. http://sora.unm.edu/sites/default/files/journals/condor/v088n02/p0228-p0241.pdf . Accessed June 27, 2016.

Tamarisk Coalition. 2008. *Riparian Restoration: Assessment of Alternative Technologies for Tamarisk Control, Biomass Reduction and Revegetation*. Grand Junction, Colorado. July. http://www.tamariskcoalition.org/resource-center/woody-invasives.

Taylor, M.A. 2008. Habitat used by Peebles Navajo Cactus, *Pediocactus peeblesianus* var. *peeblesianus*. Memorandum to Field Supervisor, U.S. Fish and Wildlife Service, Arizona Ecological Services Field Office. 25 Nov 2008; In Reply Refer to: 6840 (AZ-932).

Terrestrial Mollusc Tool. 2016. *Succineidae* fact sheet (online). http://idtools.org/id/mollusc/factsheet.php?name=Succineidae. Accessed June 22, 2016.

Tu, M., C. Hurd, and J. M. Randall. 2001. Weed Control Methods Handbook: Tools & Techniques for Natural Areas. The Nature Conservancy. Available at http://www.invasive.org/gist/handbook.html.

Ulev, Elena D. 2006. Pinyon jay (*Gymnorhinus cyanocephalus*) in Fire Effects Information System [online]. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fire Sciences Laboratory (producer). https://www.fs.fed.us/database/feis/animals/bird/gycy/all.html. Accessed June 22, 2016.

U.S. Department of Agriculture. 2004. USDA National Resources Conservation Service, 2004. Soil Quality – Soil Biology Technical Note No. 4. Soil Biology and Land Management, January 2004. http://soils.usda.gov/sqi

_____. 2012. USDA Natural Resources Conservation Service, 2012. Soil Survey of Lake County, Northern Part.

_____. 2015 USDA Glossary of Soil Survey Terms. October 2015.

U.S. Department of the Interior and U.S. Department of Agriculture (USDI/USDA). 2000. *Managing the Impact of Wildfires on Communities and the Environment: A Report to the President in Response to the Wildfires of 2000* (known as the "National Fire Plan"). USDI and USDA, Washington, D.C. September 8, 2000.

U.S. Department of Agriculture, University of Florida, Extension Service, Florida A & M University Cooperative Extension Program, and Boards of County Commissioners Cooperating. 2015. *Herbicide Application Techniques for Woody Plant Control.* From a series of the Agronomy Department, UF/IFAS Extension, Gainesville, Florida.

U.S. Environmental Protection Agency. 2016a. Office of Water, Data Basin Dataset, 303(d) Listed Impaired Waters, Arizona (streams) 2008.

_____. 2016b. Office of Water, Data Basin Dataset, 303(d) Listed Impaired Waters, Arizona (streams) 2008.

_____.2016c. https://www.epa.gov/dwssa/map-sole-source-aquifer-locations. Accessed May 2016

U.S. Fish and Wildlife Service. 1982. Endangered and Threatened Wildlife and Plants; Endangered Status for U.S. Population of the Ocelot. Federal Register 47(140): 31670-31673.

_____. 1983. Endangered and Threatened Wildlife and Plants; Final Rule to Determine Senecio Franciscanus (San Francisco Peaks Groundsel) to be a Threatened Species and Determination of its Critical Habitat. Federal Register 48(226): 52743-52747.

_____. 1985. Endangered and Threatened Wildlife and Plants; Final Rule to Determine Erigeron Rhlzomatus to be a Threatened Species. Federal Register 50(81): 16680-16682.

_____. 1986. Determination of Endangered Status and Critical Habitat for the Desert Pupfish. Federal Register 51(61): 10842-10852.

_____. 1988. Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for Two Long-Nosed Bats. Federal Register 53(190): 38456-38461.

_____. 1990a. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Endangered Mount Graham Red Squirrel (*Tamiasciurus hudsonlcus grahamensis*). Federal Register 55(4): 425-429.

_____. 1990b. Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for the Plant *Astragalus cremnophylax* var. *cremnophylax* (sentry milk-vetch). Federal Register 55(234): 50184-50187.

_____. 1992. Endangered and threatened wildlife and plants, final rule to list the Kanab ambersnail as endangered. Federal Register 57 (75): 13657-13661.

_____. 1993. Desert Pupfish Recovery Plan. Phoenix, AZ. 129 pp.

_____. 1995a. Endangered and Threatened Species: Southwestern Willow Flycatcher; Final Rule Federal Register 60(38): 10694-10715.

_____. 1995b. Lesser Long-nosed Bat Recovery Plan. Albuquerque, New Mexico. 60 pp.

_____. 1996. California Condor Recovery Plan, Third Revision. Portland, Oregon. 74 pp.

_____. 1998a. Final revised Sonoran pronghorn recovery plan. US Fish and Wildlife Service, Albuquerque.

_____. 1998b. Formal Consultation on the Reintroduction of Gila Topminnow and Desert Pupfish into Three Tributaries of the Agua Fria River. AESO/SE 2-21-99-F-031. 29 pp.

_____. 1998c. Razorback sucker (*Xyrauchen texanus*) Recovery Plan. Denver, CO: Mountain-Prairie Region. 81 pp.

_____. 1999a. Draft Gila Topminnow Revised Recovery Plan. Albuquerque, NM. 89 pp.

_____. 1999b. Endangered and threatened wildlife and plants; designation of critical habitat for the Huachuca water-umbel, a plant; Final Rule. Federal Register 64(132), 37441-37453.

_____. 2000a. General Species Information: Pima Pineapple Cactus (*Coryphantha scheeri* var *robustispina*). Arizona Ecological Services Field Office. https://www.fws.gov/southwest/es/arizona/Documents/Redbook/Pima%20Pineapple%20cactus%20RB.pdf.

_____. 2000b. General Species Information: Black-Footed Ferret (*Mustela nigripes*). Arizona Ecological Services Field Office. https://www.fws.gov/southwest/es/arizona/Documents/Redbook/Blackfooted%20Ferret%20RB.pdf.

_____. 2000c. General Species Information: Jaguar (*Panthera onca*). Arizona Ecological Services Field Office. http://www.fws.gov/southwest/es/arizona/Documents/Redbook/Jaguar%20RB.pdf.

_____. 2000d. USFWS Species Assessment and Listing Priority Assignment Form. Arizona Cliffrose (*Purshia subintegra*). Arizona Ecological Services Field Office. https://www.fws.gov/southwest/es/arizona/Documents/Redbook/Arizona%20Cliffrose%20RB.pdf.

_____. 2000e. General Species Information: Jones' Cycladenia (*Cycladenia humilis* var. *jonesii*). Arizona Ecological Services Field Office. https://www.fws.gov/southwest/es/arizona/Documents/Redbook/Jones%20Cycladenia%20RB.pdf.

_____. 2001a. General Species Information: Kearney's Blue Star (*Amsonia kearneyana*). Arizona Ecological Services Field Office. https://www.fws.gov/southwest/es/arizona/Documents/Redbook/Kearney%27s%20blue%20star.pdf.

_____. 2001b. General Species Information: Sonora Tiger Salamander (ambystoma tigrinum stebbinsi). Arizona Ecological Services Field Office. http://www.fws.gov/southwest/es/arizona/Documents/Redbook/Sonora%20Tiger%20Salamander%20RB.pdf.

_____. 2001c. General Species Information: Beautiful Shiner (cyprinella formosa). Arizona Ecological Services Field Office. http://www.fws.gov/southwest/es/arizona/Documents/Redbook/Beautiful%20Shiner.pdf.

_____. 2001d. General Species Information: Canelo Hills Ladies' Tresses (*Spiranthes delitescens*). Arizona Ecological Services Field Office. https://www.fws.gov/southwest/es/arizona/Documents/Redbook/Canelo%20Hills%20Ladies%27%20tresses%20RB.pdf.

_____. 2002a. General Species Information: Cochise Pincushion Cactus (*Corypthantha robbinsorum*). Arizona Ecological Services Field Office. https://www.fws.gov/southwest/es/arizona/Documents/Redbook/Cochise%20Pincushion%20cactus%20RB.pdf.

_____. 2002b. General Species Information: Nichol Turk's Head Cactus (*Echinocactus horizonthalonius* var. *nicholii*). Arizona Ecological Services Field Office. https://www.fws.gov/southwest/es/arizona/Documents/Redbook/Nichol%20Turk%27s%20head%20cactusRB.pdf.

_____. 2002c. General Species Information: Siler Pincushion Cactus (*Pediocactus sileri*). Arizona Ecological Services Field Office. https://www.fws.gov/southwest/es/arizona/Documents/Redbook/Siler%20Pincushion%20Cactus.pdf.

_____. 2002d. USFWS Species Assessment and Listing Priority Assignment Form. New Mexico Ridge-Nosed Rattlesnake (*Crotalus willardi obscurus*). Arizona Ecological Services Field Office. https://www.fws.gov/southwest/es/arizona/Documents/Redbook/New%20Mexico%20Ridgenose%20Rattlesnake%20RB.pdf.

_____. 2002e. General Species Information: Humpback chub (*Gila cypha*). Arizona Ecological Services Field Office. http://www.fws.gov/southwest/es/arizona/Documents/Redbook/Humpback%20Chub%20RB.pdf.

_____. 2002f. General Species Information: Sonora chub (*Gila ditaenia*). Arizona Ecological Services Field Office. http://www.fws.gov/southwest/es/arizona/Documents/Redbook/Sonora%20Chub%20RB.pdf.

_____. 2003. Gila Trout Recovery Plan, 3rd revision: Gila Trout (*Oncorhynchus gilae*). Arizona Ecological Services Field Office. https://ecos.fws.gov/docs/recovery_plan/030910.pdf.

_____. 2005a. Life History Information: Masked Bobwhite (*Colinus virginianus* ssp. *ridgwayi*). Arizona Ecological Services Field Office. https://ecos.fws.gov/ecp0/profile/speciesProfile.action?spcode=B00Z.

_____. 2005b. Endangered and threatened wildlife and plants: Listing the Gila chub as endangered with critical habitat; Final Rule. Federal Register, 70(211), 66664-66721.

_____. 2006a. General Species Information: Headwater chub (*Gila nigra*). Arizona Ecological Services Field Office. https://www.fws.gov/southwest/es/arizona/Documents/Redbook/Headwater%20Chub%20RB.pdf.

_____. 2006b. Yuma Clapper Rail 5-Year Review: Summary and Evaluation. Phoenix, AZ.

_____. 2006c. Endangered and Threatened Wildlife and Plants; Establishment of a Nonessential Experimental Population of Northern Aplomado Falcons in New Mexico and Arizona. 50CFR Par 17. Federal Register Vol. 71, No. 143. https://www.fws.gov/southwest/es/arizona/Documents/SpeciesDocs/Aplomado/Final10jRuleFedReg.pdf.

_____. 2007a. General Species Information: New Mexico Meadow Jumping Mouse (*Zapus hudsonius luteus*). Arizona Ecological Services Field Office. https://www.fws.gov/southwest/es/arizona/Documents/Redbook/NM%20meadow%20jumping%20mouse.pdf.

_____. 2007b. Chiricahua Leopard Frog Final Recovery Plan. Albuquerque, NM. 429 pp.

_____. 2007c. Lesser Long-Nosed Bat 5-Year Review: Summary and Evaluation. Phoenix, AZ.

_____. 2008a. General Species Information: Mexican Spotted Owl (*Strix occidentalis lucida*). Arizona Ecological Services Field Office. http://www.fws.gov/southwest/es/arizona/Documents/Redbook/Mexican%20Spotted%20Owl.pdf.

_____. 2008b. General Species Information: Little Colorado Spinedace (*Lepidomeda vittata*). Arizona Ecological Services Field Office. http://www.fws.gov/southwest/es/arizona/Documents/Redbook/Little%20Colorado%20Spinedace%20RB.pdf.

_____. 2008c. 5-Year Review: Summary and Evaluation: The Virgin River Fishes; Woundfin (*Plagopterus argentissimus*) Virgin River Chub (*Gila seminuda*). Arizona Ecological Services Field Office. https://ecos.fws.gov/docs/five_year_review/doc1909.pdf.

_____. 2008d. General Species Information: Mexican gray wolf (*Canis lupus baileyi*). Arizona Ecological Services Field Office. https://www.fws.gov/southwest/es/arizona/Documents/Redbook/Mexican%20Gray%20Wolf%20RB.pdf.

_____. 2008e. Peebles Navajo Cactus (*Pediocactus peeblesianus* var. *peeblesianus*) 5-Year Review: Summary and Evaluation. Phoenix, AZ. 22 pp.

_____. 2009a. General Species Information: Bonytail Chub (*Gila elegans*). Arizona Ecological Services Field Office. https://www.fws.gov/southwest/es/arizona/Documents/Redbook/Bonytail%20RB.pdf.

_____. 2009b. General Species Information: Woundfin (*Plagopterus argentissimus*). Arizona Ecological Services Field Office. https://www.fws.gov/southwest/es/arizona/Documents/Redbook/Woundfin%20RB.pdf.

_____. 2009c. Yuma Clapper Rail Recovery Plan, Draft First Revision. U.S. Fish and Wildlife Service, Southwest Region, Albuquerque, NM. 73 pp.

_____. 2010a. U.S. Fish and Wildlife Service 5-Year Review of the Desert Pupfish (*Cyprinodon macularius*). Phoenix, AZ. 43 pp.

_____. 2010b. General Species Information: Roundtail chub Lower Colorado River Distinct Population Segment (DPS) (*Gila robusta*). Arizona Ecological Services Field Office. https://www.fws.gov/southwest/es/arizona/Documents/Redbook/Roundtail%20Chub%20RB.pdf.

_____. 2010c. General Species Information: Yaqui Catfish (*Ictalurus pricei*). Arizona Ecological Services Field Office. https://www.fws.gov/southwest/es/arizona/Documents/Redbook/Yaqui%20Catfish%20RB.pdf.

_____. 2010d. General Species Information: Yaqui Chub (*Gila purpurea*). Arizona Ecological Services Field Office. https://www.fws.gov/southwest/es/arizona/Documents/Redbook/Yaqui%20Chub%20RB.pdf.

_____. 2010e. Ocelot (*Leopardus pardalis*) Recovery Plan; Draft First Revision. Albuquerque, NM. 185 pp.

_____. 2011a. Chiricahua Leopard Frog (*Lithobates* [*Rana*] *chiricahuensis*) 5-Year Review: Summary and Evaluation. Phoenix, AZ. 39 pp.

_____. 2011b. Endangered and Threatened Wildlife and Plants; Establishment of a Nonessential Experimental Population of Sonoran Pronghorn in Southwestern Arizona; Final Rule. Federal Register 76(87). May 5, 2011. Retrieved from http://www.fws.gov/southwest/es/arizona/Documents/SpeciesDocs/SonoranPronghorn/SOPH_10(j)_FR_5-5-11.pdf.

_____. 2012a. General Species Information: Loach Minnow (*Tiaroga cobitis*). Arizona Ecological Services Field Office. http://www.fws.gov/southwest/es/arizona/Documents/Redbook/Loach_Minnow_RB.pdf.

_____. 2012b. General Species Information: Spikedace (*Meda fulgida*). Arizona Ecological Services Field Office. https://www.fws.gov/southwest/es/arizona/Documents/Redbook/Spikedace_RB.pdf.

_____. 2012c. General Species Information: San Bernardino Springsnail (*Pyrgulopsis bernardina*). Arizona Ecological Services Field Office. https://www.fws.gov/southwest/es/arizona/Documents/Redbook/San%20Bernardino%20Springsnail%20RB.pdf.

_____. 2012d. General Species Information: Holmgren Milk-Vetch (*Astralgalus holmgrenorium*). Arizona Ecological Services Field Office. https://www.fws.gov/southwest/es/arizona/Documents/Redbook/Holmgren%20Milk-Vetch%20RB.pdf.

_____. 2012g. News Release: Jaguar and Ocelot Recently Photographed by Monitoring Cameras in Southern Arizona. December 20, 2012. Retrieved from https://www.fws.gov/southwest/es/arizona/Documents/SpeciesDocs/Jaguar/fNR-jaguar-pics_Dec_2012B.docx.pdf.

_____. 2012h. Endangered and Threatened Wildlife and Plants; Determination of Endangered Status for Three Forks Springsnail and Threatened Status for San Bernardino Springsnail Throughout Their Ranges and Designation of Critical Habitat for Both Species. April 17, 2012. Federal Register 77(74): 23060-23092.

_____. 2013a. General Species Information: Fickeisen Plains Cactus (*Pediocactus peeblesianus* var. *fickeiseniae*). Arizona Ecological Services Field Office. https://www.fws.gov/southwest/es/arizona/Documents/Redbook/Fickeisen_Plains_Cactus_RB.pdf.

_____. 2013b. General Species Information: Gierisch Mallow (*Sphaeralcea gierischii*). Arizona Ecological Services Field Office. https://www.fws.gov/southwest/es/arizona/Documents/Redbook/Gierisch%20Mallow%20RB.pdf.

_____. 2013c. Endangered and Threatened Wildlife and Plants; Endangered Species Status for *Echinomastus erectocentrus* var. *acunensis* (Acuña Cactus) and *Pediocactus peeblesianus* var. *fickeiseniae* (Fickeisen Plains Cactus) Throughout Their Ranges. Federal Register 78(190): 60608-60652.

_____. 2013d. Final Biological and Conference Opinion for the Rosemont Copper Mine, Pima County, Arizona. US Fish and Wildlife Service, Phoenix, AZ. 506 pp.

_____. 2013e. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Northern Mexican Gartersnake and Narrow-Headed Gartersnake; Proposed Rule. Federal Register 78(132): 41550–41608. Retrieved from https://www.fws.gov/southwest/es/arizona/N-HGartersnake.htm.

_____. 2013f. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Southwestern Willow Flycatcher (Empidonax traillii extimus); Final Rule. Federal Register 78(2): 344-534. Retrieved from http://www.fws.gov/southwest/es/arizona/SWWF_revisedCH_2013.htm.

_____. 2014a. USFWS Species Assessment and Listing Priority Assignment Form. Narrow-headed Gartersnake (*Thamnophis rufipunctatus*). Arizona Ecological Services Field Office. https://www.fws.gov/southwest/es/arizona/Documents/Redbook/Narrow%20headed%20gartersnake%20RB.pdf.

_____. 2014b. Biological Opinion for the Oak Flat-Miami US 60 Roadway Enhancement Project. US Fish and Wildlife Service, Phoenix, AZ. 20 pp.

_____. 2014c. Huachuca Water-Umbel 5-Year Review: Summary and Evaluation. Tucson, AZ. 60 pp.

_____. 2014d. Endangered and Threatened Wildlife and Plants; Threatened Status for the Northern Mexican Gartersnake and Narrow-Headed Gartersnake: Final Rule. Federal Register 79(130): 38678-38746.

_____. 2014e. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Western Distinct Population Segment of the Yellow-Billed Cuckoo; Proposed Rule. Federal Register 79(158): 48548-48652.

_____. 2014f. Endangered and Threatened Wildlife and Plants; Determination of Threatened Status for the Western Distinct Population Segment of the Yellow-billed Cuckoo (Coccyzus americanus); Final Rule. Federal Register 79(192): 59992-60038.

_____. 2014g. Navajo sedge (*Carex specuicola*): 5-Year Review, Summary and Evaluation. Arizona Ecological Services Field Office, Phoenix, AZ. https://www.fws.gov/southwest/es/arizona/Documents/SpeciesDocs/NavajoSedge/5YrReview_Carexspecuicola.pdf.

_____. 2014h. Endangered and Threatened Wildlife and Plants; Endangered Species Status for Zuni Bluehead Sucker; Final Rule. Federal Register 79(142): 43132-43161.

____. 2015a. Candidate Conservation: Candidate Notice of Review for the Desert Sucker. (online). December 24. https://www.fws.gov/southwest/es/arizona/Documents/Redbook/desert%20sucker.pdf. Accessed June 29, 2016.

____. 2015b. Candidate conservation agreement for the Sonoran desert tortoise (Gopherus morafkai). May 2015. U.S. Fish and Wildlife Service, Southwest Region, Phoenix, AZ.

_____. 2015c. Draft Gila Chub (Gila intermedia) Recovery Plan. Albuquerque, NM. 129 pp.

_____. 2015d. Endangered and Threatened Wildlife and Plants; Removing the Hualapai Mexican Vole from the Federal List of Endangered and Threatened Wildlife. Federal Register 80(107): 31875-31881.

_____. 2015e. News Release: Endangered Fish Rediscovered in Santa Cruz River. Retrieved from http://www.fws.gov/southwest/es/arizona/Gila_Top.htm.

_____. 2015f. Draft Recovery Plan for the Sonoran Pronghorn (Antilocapra americana sonoriensis), Second Revision. Albuquerque, NM. 320 pp.

____. 2015g. Species status assessment for the Sonoran desert tortoise. Version 1.0, September 2015. U.S. Fish and Wildlife Service, Southwest Region, Albuquerque, NM.

____. 2016a. Delisting Report. Environmental Conservation Online System (ECOS). https://ecos.fws.gov/tess_public/reports/delisting-report. Accessed June 29, 2016.

_____. 2016b. Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the Acuña Cactus and the Fickeisen Plains Cactus; Final Rule. Department of the Interior, Fish and Wildlife Service. 50 CFR Part 17. https://www.fws.gov/southwest/es/arizona/Documents/SpeciesDocs/AcunaCactus/2_AZ_cacti_fCH_Fed_Reg_8-18-2016.pdf.

_____. 2016c. Endangered and Threatened Wildlife and Plants; Endangered Species Status for Sonoyta Mud Turtle. Federal Register 81(183): 64829-64843.

_____. 2016d. General Species Information: Welsh's Milkweed (*Asclepias welshii*). https://www.fws.gov/southwest/es/arizona/Documents/Redbook/Welsh%27s%20Milkweed%20RB.pdf.

____. 2016e. Species account for desert sucker (*Catostomus clarkii*). https://www.fws.gov/southwest/es/arizona/Documents/Redbook/desert%20sucker.pdf. Accessed June 22, 2016.

_____. 2016f. Species Status Assessment for the Lesser Long-Nosed Bat (Leptonycteris yerbabuenae). December 2016. U.S. Fish and Wildlife Service, Southwest Region, Albuquerque, NM. Arizona Ecological Services Office, Phoenix, Arizona. Retrieved from: https://www.fws.gov/southwest/es/arizona/Documents/SpeciesDocs/LLNB/Lesser%20Long-Nosed%20Bat.Final%20SSA.12_16_16.pdf.

_____. 2016g. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Department of the Interior, Fish and Wildlife Service, Washington, DC. FWS/OBS-79/31

U.S. Fish and Wildlife Service and National Marine Fisheries Service. 1998. Consultation Handbook. Procedures for Conducting Consultation and Conference Activities Under Section 7 of the Endangered Species Act.

U.S. Forest Service. 1982. USDA Forest Service. Aids to Determining Fuel Models for Estimating Fire Behavior. Ha E. Anderson. April 1982.

____. 2004. Revised Biological Assessment and Evaluation for the Arizona Department of Transportation and and the Federal Highway Administrationto Use Approved Herbicides for Vegetation Management. http://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsbdev3_021389.pdf https://www.fs.usda.gov/main/r3/landmanagement/projects. Accessed July 1, 2016.

____. 2012. Biological Assessment/Evaluation of the Integrated Treatment of Noxious or Invasive Plant Program for the Tonto National Forest. U.S. Forest Service Southwestern Region, Tonto National Forest, AZ. 94 pp.

U.S. Geological Survey. 1995. Groundwater Atlas of the United States: Segment 2 Arizona, Colorado, New Mexico, Utah. Reston, Virginia 1995.

_____. 2011. National Hydrography Dataset. http://nhd.usgs.gov/.

_____. 2014. Ecoregions of Arizona. Accessed from https://pubs.usgs.gov/of/2014/1141/pdf/ofr2014-1141_front.pdf.

_____. 2016a. Standards for National Hydrography Dataset: Reston, Virginia, U.S. Geological Survey. Hydrologic Unit Code. http://nhd.usgs.gov/. Accessed April 22, 2016.

_____. 2016b. Standards for National Hydrography Dataset: Reston, Virginia, U.S. Geological Survey. NHDFlowline. http://nhd.usgs.gov/. Accessed April 22, 2016.

_____. 2016c. Standards for National Hydrography Dataset: Reston, Virginia, U.S. Geological Survey. NHDWaterbody. http://nhd.usgs.gov/. Accessed April 22, 2016.

University of Arizona (UA). 1993. Journal of the Arizona Academy of Science', Volume 9, supplement 2, Appendix F, published May 1974 using a classification scheme developed by David E. Brown and Charles H. Lowe. The University of Arizona digitized the gfveg manuscript during 1992 and 1993.

Waldrum Specialties. 2002. Thinvert: General Information. http://www.waldrumspecialties.com/thinvert/index.html. Waldrum Specialties, Inc. Published March 16, 2002.

Water Resources Development Commission Final Report Volume II Committee Reports, October 1, 2011.

Westbrooks, R. 1998. *Invasive plants, changing the landscape 1 of America: Fact Book*. Federal Interagency Committee for the Management of Noxious Weeds and Exotic Weeds (FICMNEW), Washington, D.C.

Whisenant, Steven G. 1990. *Changing Fire Frequencies on Idaho's Snake River Plains: Ecological and Management Implications*. Presented at the Symposium on Cheatgrass Invasion, Shrub Die Off, and Other Aspects of Shrub Biology and Management, Las Vegas, NV, April 5-7, 1989.

White, J. Allen. 2007. *Recommended Protection Measures for Pesticide Applications in Region 2 of the U.S. Fish and Wildlife Service*. Environmental Contaminants Program, Region 2, U.S. Fish and Wildlife Service, Austin, Texas. https://www.fws.gov/southwest/es/arizona/Documents/ECReports/RPMPA_2007.pdf. Accessed June 28, 2016.

Xu, Jiaquan, Sherry L. Murphy, Kenneth D. Kochanek, Brigham A. Bastian. 2016. *Deaths: Final Data for 2013. National Vital Statistics Reports Volume 64, Number 2. February 16, 2016*. Centers for Disease Control and Prevention, National Center for Health Statistics, Washington, D.C.

PAGE INTENTIONALLY LEFT BLANK