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ADOT Herbicide Treatment Program on Bureau of Land Management Lands in Arizona

Environmental Assessment

Bureau of Land Management

ADOT

U.S. Department of Transportation
Federal Highway Administration

U.S. DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Environmental Assessment and

Section 4(f) Evaluation

ADOT Herbicide Treatment Program on Bureau of Land Management Lands in Arizona

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ACRONYM LIST

AASHTO – American Association of State Highway and Transportation Officials

ACEC – Areas of Critical of Environmental Concern

ADEQ – Arizona Department of Environmental Quality

ADOT – Arizona Department of Transportation

AHAS – acetohydroxyacid synthase

AIM – Assessment, Inventory, and Monitoring

ALS – acetolactate synthase

ATV – all-terrain vehicles

AZPDES – Arizona Pollutant Discharge Elimination System

BEE – butoxyethyl ester

BGEPA – Bald and Golden Eagle Protection Act

BLM – Bureau of Land Management

BMP – best management practices

C – Candidate

CA – Conservation Agreement

CFR – Code of Federal Regulations

CH – Designated Critical Habitat

Corps – US Army Corps of Engineers

CWA – Clean Water Act

D – Delisted

EA – Environmental assessment

EO – *Executive Order*

EPA – US Environmental Protection Agency

ERA – Environmental Risk Assessments

ESA – Endangered Species Act

FAHP – Federal Aid Highway Program

FHWA – Federal Highway Administration

FIFRA – Federal Insecticide, Fungicide and Rodenticide Act

FLPMA – Federal Land Policy and Management Act of 1976

FPPA – Farmland Protection Policy Act

HMA – Herd Management Areas

IAC – Interagency Committee

LE – Listed Endangered

LT – Listed Threatened

LWCFA – Land and Water Conservation Fund Act

MBTA – Migratory Bird Treaty Act

MFP – Management Framework Plan

MOU – Memorandum of Understanding

NEPA – National Environmental Policy Act

NHPA – National Historic Preservation Act

NHTSA – National Highway Traffic Safety Administration

NPDES – National Pollutant Discharge Elimination System

NPS – National Park Service

NRC – National Response Center

NRCS – Natural Resource Conservation Service

OSHA – Occupational Safety and Health Act

PCH – Proposed Critical Habitat.

PE – Proposed Endangered

PEIS – *Programmatic Environmental Impact Statement*

PGP – Pesticide General Permit

PL – Public Law

POEA – Polyethoxylated tallow amine

PPE – personal protective equipment

PR – Petitioned for Relisting

PRA – public road authorities

PT – Proposed Threatened

PUP – pesticide use proposals

RMP – Resource Management Plans

ROW – rights-of-way

S – Bureau of Land Management Sensitive Species

SDS –Safety Data Sheets

SHPO – State Historic Preservation Office

SOP – standard operating procedures

TCP – Traditional Cultural Properties

TEP – Threatened. Endangered, and Proposed

THPO – Tribal Historic Preservation Office

US – United States

USC – United States Code

USDI – US Department of the Interior

USDOT – US Department of Transportation

USFWS – US Fish and Wildlife Service

VRM – Visual Resource Management

XN – Experimental Nonessential Population

SECTION 1 – PROPOSED ACTION, PURPOSE AND NEED, AND BACKGROUND INFORMATION

1.1 Introduction

The Bureau of Land Management (BLM), Arizona Department of Transportation (ADOT), and Federal Highway Administration (FHWA) believe there is a need to be proactive in controlling hazardous vegetation as well as noxious weed and invasive plant infestations along public roadways in Arizona. Furthermore, federal agencies are required to control these plants by *Executive Order* (EO) *13112* and resulting agency policies. While the BLM manages 12.2 million acres within the state of Arizona, ADOT is responsible for maintaining the hundreds of miles of interstates and highways within rights-of-way (ROWs) across BLM-managed lands (Figure 1.1). Each highway or interstate ROW not only contains paved surfaces and features such as concrete box culverts, bridges, guardrails, and wire fencing, but often contains areas with relatively undisturbed natural vegetation. In some areas the natural vegetation is being impacted by noxious weeds or invasive plants. In order to address these issues within ADOT ROW, the BLM and ADOT have agreed to prepare an environmental assessment (EA) to address issues related to the use of herbicides for treatment of undesirable vegetation within ADOT's authorized ROWs on BLM-administered lands.

Often, the terms "noxious weeds" or "invasive plants" are used to apply to the same plants, but these terms are not considered to be synonymous in this document. Generally, a weed is an unwanted plant that grows or spreads aggressively. The term "noxious" has legal ramifications for states that have noxious weed laws or regulations. An invasive plant is one that grows and spreads rapidly, replacing desirable native plants. *Executive Order 13112* defines an invasive weed as an alien species. This EA uses the term "undesirable vegetation" to encompass invasive species, noxious weeds, and undesirable plants, as well as native species exceeding size limitations within the recovery zone (the area adjacent to a roadway where an errant vehicle could leave the paved road surface and potentially recover).

ADOT maintains areas within their ROWs to be consistent with both the Highway Safety Act (*The Highway Safety Act of 1966*; Public Law [P.L.] 89-564, 80 Statute 731) and their mission to provide a safe, efficient, and cost-effective transportation system. This maintenance includes the control of undesirable vegetation to protect adjacent resources on neighboring lands. Early detection and treatment of infestations along the sides of roads could prevent them from spreading onto public land administered by the BLM, adversely affecting resource values and uses. Section 302(b) of the *Federal Land Policy and Management Act of 1976* (FLPMA) directs the BLM to "take any action necessary to prevent unnecessary or undue degradation of the [public] lands" (43 United States Code [USC] 1732). Supplementing this mandate is Section 2(b)(2) of the *Public Rangelands Improvement Act of 1978* in which Congress reaffirms a national policy and commitment to "manage, maintain, and improve the condition of public rangelands" (43 USC 1711). In response to the threats of wildfire and invasive vegetation and noxious weeds, the president and Congress have directed the U.S. Department of the Interior (USDI)

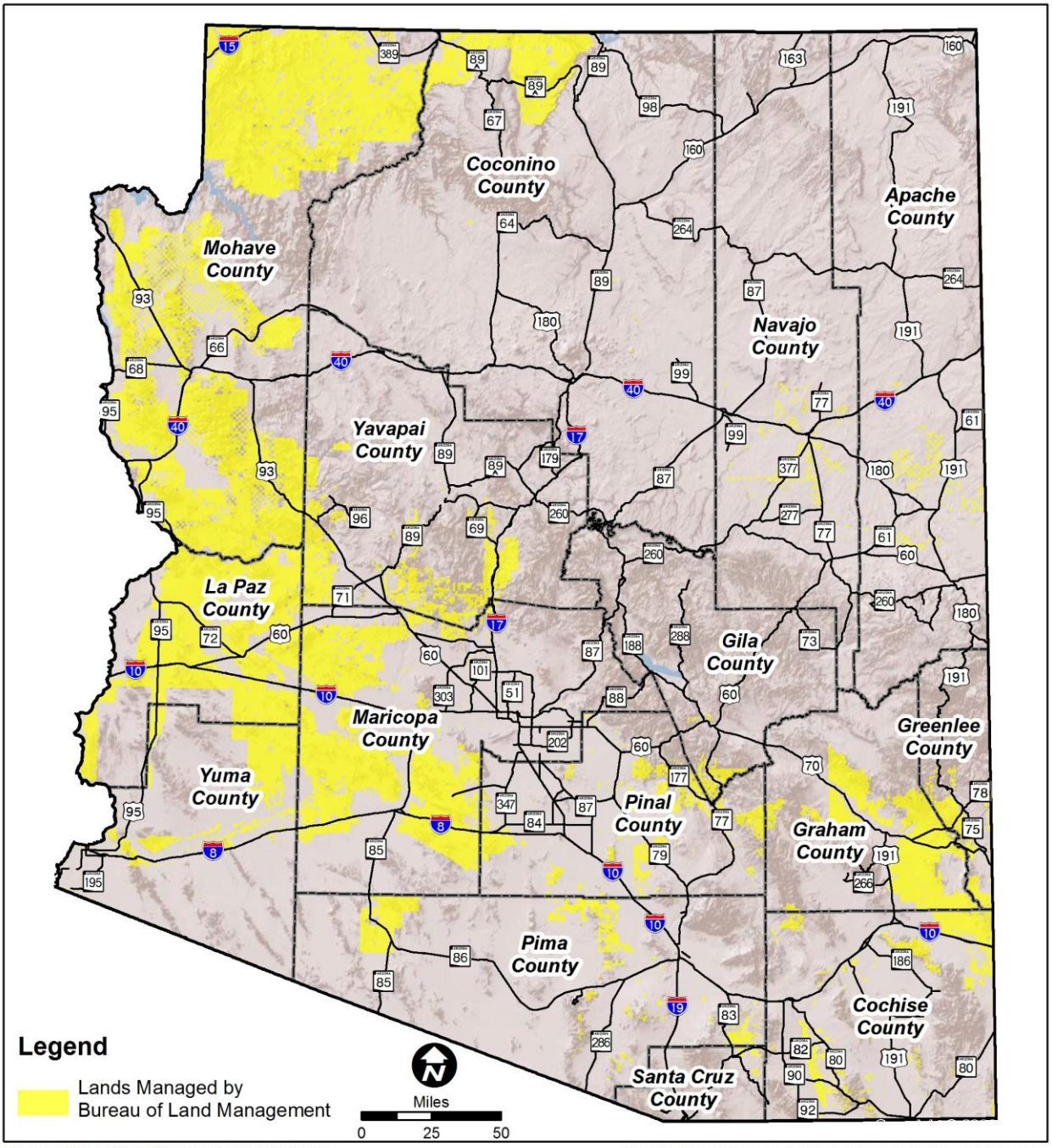


Figure 1.1. BLM-managed lands within the state of Arizona.

and BLM, through implementation of the *National Fire Plan of 2000* (USDOI/USFS, 2000) and the *Healthy Forests Restoration Act of 2003*, to take more aggressive actions to reduce catastrophic wildfire risk on public lands. The actions would be taken to protect life and property, and to manage vegetation in a manner that provides for long-term economic sustainability of local communities, improved habitat and vegetation conditions for fish and wildlife, and other public land uses.

FHWA has the authority to approve herbicide use within ROW for US Department of Transportation (USDOT) easements crossing federal lands. The interagency working relationship between the BLM, ADOT, and FHWA is set forth by Memorandum of Understanding (MOU) AZ-931-039, Amendment #4 (November 19, 2008). FHWA consults with the BLM prior to herbicide applications within USDOT ROW on land managed by the BLM. These applications are normally done on a project-by-project basis and do not involve annual maintenance treatments.

The BLM completed the *Final Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement* (PEIS) in 2007. The PEIS analyzed the effects of using herbicides for treating vegetation on public lands in the western US and identified impacts on the natural and human environment associated with herbicide use and known public concerns and issues. The Record of Decision for this PEIS (09/27/2007) approved the herbicide active ingredients assessed and analyzed under the Preferred Alternative (Alternative B) in the PEIS for use on public lands administered by the BLM in 17 western states, and approved the protocol for consideration of the use or non-use of herbicides by the BLM. The PEIS provides a broad, comprehensive background source of information to which any necessary subsequent environmental analyses can be tiered. Tiering allows local offices to prepare more specific environmental documents without duplicating relevant portions of the PEIS. In general, the National Environmental Policy Act (NEPA) process is implemented at multiple scales depending on the scope of the proposal. This document will tier off the PEIS and will define the parameters for use of herbicides within ADOT easements on BLM-managed lands.

1.2 Proposed Action Overview

The BLM proposes to authorize ADOT to conduct annual herbicide treatment programs to contain, control, or eradicate undesirable vegetation that pose safety hazards or threaten native plant communities on road easements. The BLM also proposes to authorize FHWA and ADOT to utilize herbicides within the ROW on construction and maintenance projects. The herbicide applications would be consistent with the methods analyzed for use in the BLM PEIS (BLM 2007).

The proposed action would be implemented in accordance with the PEIS by using herbicides to treat ROW within the state of Arizona to reduce the incidence and spread of undesirable vegetation. Although the proposed action is externally generated by ADOT and FHWA, it is considered to be supportive of BLM goals regarding undesirable vegetation on public lands. It is expected that the proposed action would, over time, benefit public lands by 1) reducing hazardous fuels, and improving ecosystem health by controlling weeds and invasive species,

and 2) manipulating vegetation to benefit fish and wildlife habitat, improving riparian and wetlands areas, and improving water quality in priority watersheds. Additional benefits accruing from implementation of the proposed action directly relate to restoration of fish and wildlife habitat and improvement of forest and ecological conditions, which 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) to improve the health of the nation's forests and rangelands.

1.3 Purpose and Need for Action

The purpose of the action is to respond to requests by ADOT and FHWA to apply herbicides to ADOT ROWs on BLM-administered lands and to describe the conditions and limitations that apply to their use. The need for the action is to reduce the incidence of undesirable vegetation within ROW maintained by ADOT across lands administered by the BLM.

1.3.1 Undesirable Vegetation

Invasive vegetation and noxious weeds are highly competitive and can often out-compete native vegetation, especially on recently disturbed sites. Invasive vegetation and noxious weeds are the dominant vegetation on an estimated 35 million acres of public lands (BLM 2000a). It has been estimated that noxious and exotic weeds now infest over 100 million acres in the continental US, with an additional 3 million acres being infested annually. On federal lands, these weeds are spreading at an average rate of over 5,000 acres per day (Westbrooks 1998). 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). The total cost to the US economy is estimated at over $40 billion every year. Weed infestations can become permanent if left untreated.

Noxious weed infestations in Arizona are at a lower level compared to other western states but the potential for spread and the disruption of native plant communities and associated environmental and social impacts are still a concern. Approximately 8.3 million acres of "weed infestations" occur on BLM-managed lands within the state of Arizona (BLM 2007). Excluding exotic grasses, over half of the noxious weed infestations in central and southern Arizona occur along roadways. Movement of plant parts and seeds on vehicles along roadway corridors is a significant vector for the introduction of new noxious and invasive weed species both to Arizona from adjoining states and to new sites within the state.

Roadside environments can be harsh sites for native plant life due to soil disturbances during construction, such as stripping of topsoil and subsequent continued soil compaction by vehicles. These disturbances often make it impossible for native vegetation to reestablish and, as a result, favor the infestation by invasive species. Rainfall and snowmelt shunted off pavement provide additional moisture that improves the conditions for these unwanted species. Continued disturbances on roadway shoulders provide ideal conditions favoring the

introduction of noxious weed species from seeds or plant parts carried by vehicles. Once established, infestations can spread to adjacent forest and rangeland ecosystems.

When first introduced to a site, it is usually difficult to foresee any threat from noxious vegetation. Initially, only a few plants show up in an area that often go unnoticed. When they are identified, most people are unconcerned with the presence of "a few plants." Occasionally, people find the flowers of some noxious weeds to be attractive, and they are gathered and used as ornamentals. People generally don't get concerned until weeds become widespread, aggressive, and environmentally damaging. By then, it is often too late to implement effective prevention and eradication programs.

1.3.2 Invasive Plant Infestations

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; reduce opportunities for hunting, fishing, camping, and other recreational activities; 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 2010). Arizona has 55 officially designated noxious weeds (Arizona Department of Agriculture 2012). Noxious weeds commonly found along roadways include various thistle-like flowering plants (*Centaurea* spp.), buffelgrass (*Pennisetum ciliare*), and Dalmatian toadflax (*Linaria dalmatica*). Camelthorn (*Alhagi maurorum*) often infiltrates pavement cracks, which can speed the deterioration of roadways.

However, invasive plants that are not classified as noxious, and not regulated by law, can and do exist along ROW and other disturbed areas 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 roadsides and adjacent lands at the expense of 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. Examples include saltcedar, *Tamarix ramosissima* can infest riparian areas, Russian thistle can block culverts (e.g.,), and kochia can obscure highway safety features such as signs, guardrails, and delineators.

Because the threat of invasive plants to native ecosystems and public safety rivals that of noxious weeds, public road authorities (PRA) and their personnel control invasive vegetation in conjunction with noxious weed and hazardous vegetation. This is done with the intention of preventing many invasive plant species from reaching the point of needing government restrictions.

1.3.3 Hazardous Vegetation

Hazardous vegetation is any plant that poses a threat to drivers, roads, biotic communities, or adjacent lands. The threat can be in the form of collision hazards, such as vehicles hitting trees that are too close to the road; sight distance impediments, such as drivers being unable to see wildlife approaching the roadway, around curves in passing zones, signs and safety features because of tall vegetation; vegetation encroachment into the travel lanes; fire hazards; and degradation of the roadbed.

Any plant species can be considered hazardous vegetation depending on its abundance and its location in the ROW. Species, such as paloverde (*Parkinsonia* spp.), mesquite (*Prosopis* spp.), and pine (*Pinus* spp.), that establish themselves adjacent to the road with trunk diameters of 6 inches or greater at a height of 4 or more inches above the ground pose a collision hazard to motorists who lose control of their vehicles according to the American Association of State Highway and Transportation Officials (AASHTO) Roadside Design Guide (AASHTO, 2011a). ADOT may develop guidelines that are more stringent than the AASHTO guidance. Trees and brush species, like skunkbrush (*Rhus* spp.), that populate the area adjacent to the pavement edge have branches that extend into the roadway, causing drivers to swerve out of their lane to avoid them. Junipers (*Juniperus* spp.), acacia (*Acacia* spp.), Johnsongrass (*Sorghum halepense*), and other tree, brush, or grass species can be hazardous when they grow in front of and around road signs and guardrails preventing drivers from seeing them. Plants like sunflowers (*Helianthus* spp.) and kochia grow over 6 feet tall. They obscure culverts and safety features such as delineators, guardrails, and signs. Dense stands of any of these species, and many others, hide the presence of wildlife along the ROW. Wildlife, especially ungulate species, often congregate in dense roadside vegetation as it may provide security (hiding) and/or thermal cover. Animals may bed in dense vegetation or hide in it in anticipation of crossing the roadway, while some smaller species (e.g., rabbits) reside and breed in high densities in dense roadside vegetation (partly due to reduced impact from predators). The growth of plants in pavement cracks is very destructive to the roadbed. The roots of plants enlarge these fissures and allow water to funnel under the pavement, thereby undermining the integrity of the roadbed.

Regardless of the species, hazardous vegetation can exist in a variety of places within the ROW, in medians, on shoulders, along guardrails, and in the pavement itself. Each plant in each location presents a different threat to the safety of motorists, the integrity of the roadbed, and the preservation of native plant communities. Because of the multifaceted danger of hazardous vegetation, control for these plants, whether native, invasive, or noxious, remains a priority for PRA and land-managing agencies.

1.3.4 Roadway Right-of-Way Maintenance

Undesirable plants can impact the roadbed of a highway or out-compete landscaping plants in highway ROW. Following are brief discussions of these issues:

Roadway Integrity: Vegetation growing in pavement cracks and joints, as well as on the edge of roads, can threaten roadbed integrity. Vegetation in pavement cracks and joints funnels water underneath roadbeds, causing softening and destabilization of the roadbed. Vehicle travel damages these weakened areas, causing potholes to form. Pavement cracks and joints can be enlarged by root growth and frozen water, and they cannot be sealed if vegetation is present. Plants like camelthorn, which is a noxious weed, have the capacity to grow through 6 inches of pavement.

Appearance and Protection of Landscape Plantings: The retention of vegetation along highway ROW, especially native grasses, is beneficial, but some plants must be controlled to protect landscape plantings in urban settings. In addition, some vegetation is considered to be unattractive, although most highway managers do not control plants based on their appearance. Insect- and disease-infested trees within ROW can pose a threat of infestation to adjoining areas.

1.3.4 Driver Safety

Vegetation growing adjacent to public highways and roads require maintenance to ensure construction and safety features are not negated. Following are some of the maintenance and safety issues at risk:

Visibility: Unobstructed views of road features, designated passing zones, road edges, traffic, highway facilities, and livestock and wildlife movement are essential to highway safety.

Drainage: Ensuring the water drainage from pavement areas is critical for suitable tire performance as well as roadbed integrity. Undesirable vegetation along pavement edges can cause ponding of sheet flow on the roadway. Vegetation in drainage ditches can impede water flow, particularly in ditches with gentle grades, and subsequently contribute to ponding in the ditch and on the roadway. Water ponding in the ditch can result in saturated and weakened subgrades and pavement failure. Water ponding on the pavement may cause vehicles to hydroplane, and drivers may lose control.

Fire Hazard Reduction: Vehicle passengers throwing away burning objects, like cigarettes, can ignite dry vegetation along pavement edges. Hot catalytic converters on vehicles travelling or parking off-pavement can cause fires, which can quickly move to bordering wildlands and threaten homes and other structures. Smoke from wildfires obscures highway visibility. Fuel loads and the potential for fire spread vary depending on climate and vegetation type. Exotic grasses in the Sonoran Desert are especially subject to burning and resulting fires can favor the formation of monotypic (pure) stands of such grasses, which could permanently modify desert plant communities.

Clearance: Branches from trees and shrubs can encroach into the space above roadways, thereby impeding the space required for safe passage of trucks and other large vehicles. Snowplows operating along road edges often require even greater clearance of vegetation to ensure adequate safety during snow removal operations.

Snow and Ice Melt: Trees and tall shrubs in forested areas can substantially reduce the amount of thermal energy reaching the road surface in winter. The resulting patches of ice and snow present a safety hazard to motorists.

Control of Erosion: Native vegetation plays an important role in protecting soils from erosion. Soil erosion along roadways can adversely affect aquatic ecosystems through sedimentation. Sediments can accumulate on roadways and clog drainage facilities. Extreme erosion can induce instability in cutbanks and fills, thereby raising the risk of slope failure during wet periods. Several exotic plants have taproots, and solid stands of such plants can intensify soil erosion on the road shoulder causing small erosion channels that can pose a safety problem. Maintaining soil stability is especially important when overstory trees are removed for forestry and safety purposes.

Hazard Tree Reduction: Dead or dying trees and large shrubs must be removed if they are an immediate threat of falling or blowing into the clear zone or onto the roadway or shoulders, either striking vehicles directly or placing an obstacle on the roadway. The hazard is worse during windstorms, heavy rain, and snow events.

Designed Vehicle Recovery Areas: The recovery area is the area along the side of a road, including the shoulder, which is available for recovery of an out-of-control vehicle. The width of this area varies depending on the design speed for the road, road curvature, steepness of slopes, and environmental considerations. Recovery areas are intended to be clear of 1) individual trees with a diameter greater than 6 inches measured 4 inches above the surrounding ground, 2) small trees or other woody vegetation with multiple trunks that have a combined cross section greater than 28 square inches when they are less than 8 feet apart, 3) large rocks that are loose and over 4 inches in height, and 4) solid tree stumps over 6 inches in diameter and over 4 inches in height (AASHTO, 2011a). ADOT may develop guidelines that are more stringent than the AASHTO guidance. Essentially, any object in a recovery area can be considered to be hazardous if it could cause a vehicle to abruptly stop, cause penetration of the passenger compartment, or cause a vehicle to become unstable resulting in a spin, vault, or rollover. In addition, maintaining a recovery area allows motorists to see wildlife such as deer and elk in the highway or approaching the highway. However, it should be noted that clearing the vegetation opens up the canopy and can result in a flush of forage vegetation that in turn attracts wildlife to the highway ROW.

Palatable Vegetation: Vegetation adjacent the pavement that is considered desirable for forage by either livestock or wildlife would attract them to spend more time adjacent the roadway, increasing the risk of vehicle strikes.

BLM officials realize there is a need to better respond to the increasing undesirable vegetation problems in Arizona. Since roadways are a primary factor influencing the introduction of

noxious weeds, agency officials also are concerned about the effectiveness of control options to protect native plant communities and resource values and uses. Delays that prevent ADOT and other PRA from being able to control weeds along roadways will contribute to the rapid expansion of noxious weed infestations and require increasingly larger funding for control. In addition, it is reasonable to expect that infestations of new species will be discovered, and they could pose an additional threat to resource values and uses.

The presence of healthy plant communities along roadsides and on BLM-managed lands is considered to be desirable. Most plant communities, especially those composed of native species, stabilize roadside soils against erosion, provide a visible boundary at the pavement edge, and offer aesthetic appeal.

With regard to the public safety along public roadways, the National Highway Traffic Safety Administration (NHTSA), USDOT, released a report entitled *Traffic Safety Facts 2000, A Compilation of Motor Vehicle Crash Data from the Fatality Analysis Report System and the General Estimates System* in which they documented about 3,000 motorists a year are killed as a result of running off the road and striking a tree, shrub, or clump of brush. Also, safety studies by the Transportation Research Board indicate that about 30 percent of vehicle fatalities are the result of run-off-the-road type accidents involving striking trees, shrubs, or other roadside obstacles or overturning.

1.4 Decision to be Made

The responsible official is the BLM Arizona State Director. Based on the information, data, and analysis included in the EA, the Arizona State Director will approve, approve with modifications, or not approve the Proposed Action. In doing so the Director will:

- Determine if significant environmental effects would result from implementing the proposed use of herbicides, which would require the preparation of an environmental impact statement.
- Determine if the proposed action, using selected herbicides to manage undesirable vegetation, has acceptable environmental consequences that, individually or cumulatively, are not considered to be significant, resulting in a finding of no significant impact (FONSI).
- Determine if additional mitigation measures should be applied.
- Determine not to allow the use of herbicides for management of undesirable vegetation.

The completed EA will provide the responsible official with the basis upon which to make an informed decision. The decision will outline the requirements necessary to authorize the proposed use of herbicides for noxious weed and hazardous plant management. The BLM State Weed Coordinator, BLM District Managers, and the BLM Deputy State Director are responsible for reviewing and approving or disapproving the herbicides proposed for use in the annual treatment plans, maintenance projects, and construction projects and consequent pesticide use

proposals (PUPs) submitted to the BLM for the use of herbicides to control undesirable vegetation.

1.5 Documents Incorporated by Reference

The contents and application of herbicides along public roads proposed in this EA includes by reference the PEIS (BLM 2007). Other documents including the BLM Tucson Field Office *Programmatic Vegetation Treatment Environmental Assessment* dated November 2010 (BLM 2010), *Recommended Protection Measures for Pesticide Applications in Region 2 of the US Fish and Wildlife Service* dated April 2007 (USFWS, 2007), and the *Environmental Assessment for Management of Noxious Weeds and Hazardous Vegetation on Public Roads on National Forest System Lands in Arizona* (USFS 2003) provided guidance and information to be used with respect to application of herbicides near sensitive areas including perennial waters and/or areas containing sensitive plant or animal species.

1.6 Relationship to Statutes, Regulations, and Policies

Public roads are under the jurisdiction of, and maintained by, a public authority and are open to public travel (23 USC 101). PRA are those federal, state, county, town or township, Indian tribe, municipal or other local government or instrumentality with authority to finance, build, operate, or maintain toll or toll-free highway facilities (23 Code of Federal Regulations [CFR] 460.2(b)). In this proposal, the public roads are interstates, US highways, and state highways that cross public lands administered by the BLM. They are further identified by PRA and BLM records as being under state operation and maintenance jurisdiction and suitable for passenger car travel.

Awareness of noxious weeds and invasive plants has been slowly increasing over the past 30 years, until it has now reached a level where more emphasis and funding is available to attempt to reduce the threat and impact from these plants. Table 1.1 summarizes applicable laws and regulations as they pertain to the project; this list may not be inclusive.

Table 1.1. Summary of Applicable Laws and Regulations.

Law / Regulation	Applies to
American Indian Religious Freedom Act (1978)	Native American interests and heritage resources
Antiquities Act of 1906	Native American interests and heritage resources
Archaeological Resources Protection Act of 1979	Native American interests and heritage resources

Table 1.1. Summary of Applicable Laws and Regulations.	
Law / Regulation	Applies to
Bald and Golden Eagle Protection Act (1940)	Protection of eagles
Carlson-Foley Act of 1968	Noxious weeds
Clean Air Act (1963)	Air pollution prevention and control Emission levels of regulated pollutants
Clean Water Act (1972)	Surface water quality Discharge or dredge or fill materials into jurisdictional waters of the US
Endangered Species Act of 1973 (ESA)	Threatened and endangered species
Executive Order 11593 (1971)	Native American interests and heritage resources
Executive Orders 11988/11990 (1977)	Floodplains and wetlands
Executive Order 12898 (1994)	Environmental justice
Executive Order 13007 (1996)	Native American interests and heritage resources
Executive Order 13112 (1999)	Noxious weeds
Executive Order 13175 (2000)	Native American interests and heritage resources
Executive Order 13186 (2001)	Responsibilities of federal agencies to protect migratory birds
Executive Order 13212 (2001)	Energy policy
Farmland Protection Policy Act of 1981 (FPPA)	Prime and unique farmlands
Federal Land Policy and Management Act of 1976 (FLPMA)	Management of public lands
Federal Noxious Weed Act (1974)	Noxious weeds
Highway Safety Act of 1966	Highway design and maintenance
Migratory Bird Treaty Act (MBTA) of 1918	Protection of selected bird species

Table 1.1. Summary of Applicable Laws and Regulations.	
Law / Regulation	Applies to
National Environmental Policy Act of 1969 (NEPA)	Federal undertakings / NEPA regulations
National Historic Preservation Act of 1966 (NHPA)	Native American interests and heritage resources
Native American Graves Protection and Repatriation Act of 1990	Native American interests and heritage resources
Noxious Weed Control Act of 2004	Noxious weeds
Occupational Safety and Health Act of 1970 (OSHA)	Health and safety standards
Plant Protection Act (2000)	Plant pests and noxious weeds
Pollution Prevention Act of 1990	Reducing pollution through source reduction
Public Rangelands Improvement Act of 1978	Management of public lands
Religious Freedom Restoration Act (1993)	Native American interests and heritage resources
Resource Conservation and Recovery Act of 1976 (RCRA)	Generation, management and disposal of solid and hazardous wastes
Secretarial Order 3206 (1997)	Endangered Species Act and tribal trust responsibilities

The BLM coordinates closely with state and federal resource management agencies on issues involving the management of public lands; the protection of fish and wildlife populations, including federal- and state-listed threatened and endangered species; invasive and noxious weeds; fuels and wildland fire management; and herbicide application. Herbicide applications also are coordinated with state and local water quality agencies to ensure treatment applications are in compliance with applicable water quality standards, and do not result in unacceptable surface or ground water contamination.

Control of hazardous vegetation along public roads is required by the *Highway Safety Act of 1966* and other federal safety standards. AASHTO consolidated these standards into *A Policy on Geometric Design of Highways and Streets* (2011b). AASHTO is an amalgamation of state and federal transportation agencies that develop and adopt uniform standards for highway construction, operation, safety, and maintenance. These standards are based on traffic studies,

research, and accident statistics and are the minimum criteria used by ADOT to provide for motorist and public safety. For ADOT roadways on BLM-managed lands, the *ADOT Guidelines for Highways on Bureau of Land Management and US Forest Service Lands* dated 2008 (ADOT, 2008) provides information on roadside vegetation and clear zone requirements.

1.7 Plan Conformance

Within Arizona, the following Resource Management Plans (RMP), Management Framework Plan (MFP), and land-use plan amendments are approved for areas where ADOT ROW occurs on BLM-managed lands. The proposed action is in conformance with these plans. The project as proposed will not preclude attainment of any other resource goals, objectives, or desired resource conditions, or otherwise interfere with carrying out other resource decisions contained in any of these plans. These determinations were made based on coordination and internal scoping with BLM Field Office staff as described in Section 5. The applicable plans and the section of those plans which show conformance of the Proposed Action are listed below:

- Lower Sonoran Record of Decision & Approved Resource Management Plan (September 2012) - Section 2.2.6 Vegetation Resources, page 2-33; Section 2.2.13 Lands and Realty, page 2-72
- Sonoran Desert Monument Record of Decision and Approved Resource Management Plan (September 2012) - Section 2.2.6 Vegetation Resources, page 2-32; Section 2.2.12 Lands and Realty, page 2-62
- Agua Fria National Monument Record of Decision and Approved Resource Management Plan (April 2010) – 2.1.7.3.1. Transportation Agencies page 22; Section 2.2.1.3 Vegetation and Riparian Management page 33; Section 2.2.5 Lands and Realty Management page 45
- Bradshaw-Harquahala Record of Decision and Approved Resource Management Plan (April 2010) - Section 2.1.7.3.1. Transportation Agencies, page 22; Section 2.3.1.4 Vegetation and Riparian Management, page 33; Section 2.3.5 Lands and Realty Management, page 44
- Yuma Field Office Record of Decision & Approved Resource Management Plan (January 2010) - Section 1.7.1 Cooperating Agencies, page 1-21; Section 2.5.5 Invasive Non-Native Plants, page 2-49; Section 2.18 Lands and Realty Management, page 2-164
- Vermilion Cliffs National Monument Record of Decision & Approved Resource Management Plan (February 2008) - Relationship to BLM and NPS Policies, Plans, and Programs, pages 1-14 and 1-15
- Arizona Strip Field Office Record of Decision & Approved Resource Management Plan (February 2008) - Chapter 1: Relationship to BLM Policies, Plans and Programs, page 1-13; Chapter 1: Intergovernmental, Interagency, and Tribal Relationships, page 1-15; Table 2.3: Vegetation and Fire and Fuels Management, pages 2-12 and 2-15
- Lake Havasu Field Office Record of Decision & Approved Resource Management Plan (May 2007) - Cooperating Agencies, page 7; Invasive or Noxious Species Management, page 25; Lands and Realty Program, page 37

- Kingman Resource Area Resource Management Plan & Record of Decision (March 1995) - ROD Resource Access Travel Management, page 5
- Approved Las Cienegas Resource Management Plan and Record of Decision (July 2003) - General Management Actions, page 28
- Phoenix Resource Management Plan and Record of Decision (1998) - Land Use Authorizations, page 14
- Safford District Resource Management Plan and Record of Decision (September 1992 & July 1994) - Management Concern 2: Lands and Realty, page 22
- San Pedro River Riparian Management Plan and Record of Decision (August 1989) - Chapter 2, The Alternatives: Lands Section, page 22; Vegetation, page 22
- Lower Gila North Management Framework Plan (March 1983) - Objective WL-5, page 296; Objective WL-6, page 320

1.8 Key Issues

Key issues were identified through comments received from internal scoping of the various BLM Field Offices, technical leads, and through letters distributed to interested parties including any responses received from the availability of the scoping letter and information on the BLM website (see Section 5). The key issues are incorporated in the sections on resources analyzed in detail in Section 3, Affected Environment and Environmental Consequences and include the following:

- Biological Resources
- Water Quality
- Land Management
- Recreation
- Fuels/Fire Management
- Human Health and Safety
- Soils
- Visual Quality and
- Cultural Resources.

Two additional analyses were requested by FHWA to facilitate adoption of this document following approval by BLM and are also included in Section 3 of this document:

- Resources protected under Section 4(f) of the US Department of Transportation Act of 1966 (as amended) and
- Resources protected under Section 6(f) of the Land and Water Conservation Fund Act.

SECTION 2 – ALTERNATIVES

2.1 Proposed Action

The BLM proposes to allow the use of approved herbicides under the PEIS Record of Decision (USDI BLM 2007) to reduce the incidence and spread of undesirable vegetation within ADOT ROWs. Areas within ADOT ROWs would be treated as part of federally funded projects under the Federal-Aid Highway Program (FAHP) and during routine state-funded maintenance work.

ADOT would provide the necessary information to complete Pesticide Use Proposals (PUPs) describing proposed activities and chemicals to be used within the ADOT ROWs. Only federally registered and BLM-approved herbicides will be used. Herbicides and adjuvants will be used in accordance with product labeling and the respective Safety Data Sheet (SDS). Herbicide application will occur in accordance with BLM guidance on the use of herbicides as found the following documents: Integrated Vegetation Management H-1740-2, Chemical Pest Control Handbook H-9011-1, Chemical Pest Control Manual M-9011, Integrated Pest Management Manual M-9220, Integrated Weed Management Manual M-9015, as well as the recommended protection measures based on Pesticide Ecotoxicity Ratings for various species in Region 2 of the USFWS (USFWS, 2007). ADOT would coordinate at least annually with the BLM State Pesticide Coordinator to evaluate the procedure for developing, reviewing and submitting PUPs for herbicide use within ADOT ROWs.

Herbicides and adjuvants proposed for use are incorporated by reference into this document and a list is included in Appendix A. Generic herbicides and adjuvants with the same chemical properties under a different name could be utilized. Future approved herbicides added under the PEIS can be proposed for use on ADOT ROWs on BLM-managed lands after appropriate analysis.

Herbicides would primarily be sprayed on areas to be treated. Spraying equipment used may include vehicle-mounted boom sprayers on water tank trucks (Photo 1) or ¾-ton trucks (Photo 2), small booms or hand wand sprayers mounted on all-terrain vehicles (ATV) (Photo 3), or backpack sprayers. A backpack sprayer would also be used for spot treatment in areas where invasive species occur in proximity to non-target species.

When appropriate, the herbicide mixture would include an inert marker dye to ensure complete coverage and confirm that non-target species were not sprayed. Appropriate sized nozzles and tips would be used to minimize overspray onto non-target vegetation. All information and instructions on the herbicide label would be strictly followed. The herbicide would be mixed strictly according to labeled instructions and used as stipulated. All herbicide containers would show the product label and would be leak-and spill-resistant. All application equipment and chemicals would be held in appropriate storage facilities. Safety Data Sheets (SDS) would be maintained on-site. All personnel applying pesticides would have appropriate State of Arizona or BLM pesticide applicator's certification, calibrate equipment, maintain records of calibration, maintain records of actual application quantities, and track incidents of impacts on non-target organisms.

Photo 1. 2500-gallon spray truck.

Photo 2. 4x4 3/4-ton truck with high boom sprayer.

Photo 3. 4x4 3/4-ton truck with low boom sprayer.

Photo 4. ATV with sprayer.

The following are design features that would be utilized and incorporated into the process for utilizing herbicides on ADOT ROW on BLM-managed lands. These design features were considered in describing potential effects on the environmental resources in Section 3.

2.1.1 General Standard Operating Procedures

Pre-Treatment

- Prepare operational and spill contingency plan in advance of treatment.
- Select only approved herbicides that are least damaging to the environment while providing the desired results.
- Select herbicide products carefully to minimize additional impacts from degradates, adjuvants, inert ingredients, and tank mixtures.
- All pretreatment special status species surveys shall be conducted by a qualified biologist.
- Consider site characteristics, environmental conditions, and application equipment in order to minimize damage to non-target vegetation.
- Vehicles and equipment used during treatment activities shall be washed prior to arriving at a new treatment location.
- Establish buffer zones where special conditions must be followed based on herbicide-specific conservation measures
- Establish 30 foot buffer zones (or greater if specified in the species or herbicide-specific conservation measures) around perennial water courses, or wetland and riparian areas.
    - Do not directly apply herbicides to open water or aquatic habitats.
    - Use only manual application methods
    - Use only herbicides that are approved for use in riparian areas, wetlands and aquatic habitats within the buffer zones.
- Within designated buffer zones:
    - Use only specified approved herbicides.
    - Use specified application methods.
    - Do not use vehicle or off highway vehicle equipment off of established roads.
- Use only herbicides that have been approved in the BLM PEIS (2007)
- Habitat conservation measures must be followed based on special conditions in aquatic and terrestrial habitats
- Apply for appropriate permits, such as submittal of Notice of Intent if discharging to Waters of the US classified as aquatic and wildlife or within 2.5 miles of an effluent-dependent water.

During Treatment

- Apply the least amount of herbicide needed to achieve the desired result.
- Follow herbicide product label for use and storage.
- Have licensed applicators apply herbicides.
- Use only EPA-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 pesticide risks to the environment and provides practical ways to avoid harm to organisms or to the environment.
- Minimize the size of application area, when feasible.
- Comply with herbicide-free buffer zones to ensure that drift will not affect crops or nearby residents/landowners.
- Keep a copy of SDSs at work sites.
- Keep records of each application, including the active ingredient, formulation, application rate, date, time, and location.
- Avoid accidental direct spray and spill conditions to minimize risks to resources.
- Take precautions to minimize drift by not applying herbicides when winds exceed 10 mph, or a serious rainfall event is imminent.
- Use drift control agents and low volatile formulations.
- Turn off applied treatments at the completion of spray runs and during turns to start another spray run.
- Vehicles and equipment used during treatment activities shall be washed prior to leaving the equipment storage facility.
- All attached plant/vegetation and soil/mud debris shall be removed from vehicles and equipment prior to leaving a treatment location.
- Vehicles and equipment used during treatment activities shall be washed prior to arriving at a new treatment location.
- Do not conduct herbicide treatment within designated avoidance areas.
- Calibrate equipment, maintain records of actual application quantities, and track incidents of impacts on non-target organisms.

Post Treatment

- Survey to see how effective treatment was and if any follow up treatment may be needed.

2.1.2 Best Management Practices

Pre-spray BMPs

- Determine the necessity for weed management by surveying the area for weed density.
- The BLM recognizes the significance of protecting Native American ethno-botany locations, and each Field Office will coordinate and consult with interested tribes to protect the integrity of sites where native plants may be collected.
- Use herbicides only when they will provide the most effective control relative to the cost and potential hazard of other management techniques.
- Choose the most effective approved herbicide that requires the least number of applications.
- Choose the lowest effective rate of application.
- Survey the area and identify sensitive situations like residential structures, campgrounds that will be used by the public, etc.
- Survey any suitable habitat for threatened, endangered, or sensitive species to find any previously unknown populations.
- Plan to leave an appropriate buffer zone (at least 30 feet on relatively level ground) around bodies of water, and adjacent sensitive areas, and populations of threatened, endangered, or sensitive species. Buffer zones will be marked as needed to guide herbicide applicators.
- Buffer zones will be marked around any populations of threatened, endangered, or proposed (TEP) plant species, and undesirable plant control in buffer zones will include spraying with selective herbicides that will not affect these plants, or spot applications of individual weeds with backpack sprayers, daubing, or hand grubbing with no herbicide use.

Herbicide Spraying BMPs

- Ensure meteorological conditions are favorable (low-wind speed, low chance for precipitation, etc.).
- Do not spray areas if pedestrians or stopped vehicles are present.
- Post information regarding herbicide treatment areas on public traffic information sites (AZ511.com) and place signs on spray vehicles listing the herbicide being used.
- Use the lowest pressure, largest droplet size, and largest volume of water permitted by the label to obtain adequate treatment success.
- Use the lowest spray boom and release height possible consistent with operator safety.
- Spot applications of triclopyr, glyphosate, imazapic, and imazapyr may be done to the edge of some bodies of water in compliance with label requirements.

- Broadcast applications of glyphosate and other broad spectrum herbicides would not be conducted where threatened, endangered, and sensitive plant species are known to occur.
- Within designated buffer zones:
    - Do not broadcast spray.
    - Use only selective herbicides.
    - Use only hand spray application methods.
    - Do not use vehicle or off highway vehicle equipment off of established roads.
- All herbicide applicators are required to use appropriate personal protective equipment (PPE) as indicated by the product label.
- Only those herbicides labeled for use to the edge of bodies of water or with aquatic labeling shall be used within buffer zones and aquatic situations.

<u>Herbicide Post-Spray BMPs</u>

- Periodically survey treated areas to assess efficacy.
- Monitor populations of threatened, endangered, or sensitive species to ensure there were no adverse effects.

2.1.3 Resource Specific Mitigation Measures

Resource	Mitigation Measure
Biological Resources	• Survey for special status species before treating an area. • Avoid treating areas with suitable habitat that have not been recently surveyed • Consider effects to special status species when designing herbicide treatment programs. • Use a selective herbicide and a wick or backpack sprayer to minimize risks to special status plants when spraying in special status species habitat. • Avoid treating vegetation during time-sensitive periods (e.g., nesting and migration, sensitive life stages) for special status species in area to be treated.
Migratory Birds, Non-Sensitive Wildlife, and Vegetation	• Use herbicides of low toxicity to wildlife, where feasible. • Use spot applications or low-boom (20 inches or less) broadcast operations where possible to limit the probability of contaminating non-target food and water sources, especially non-target vegetation over areas larger than the treatment area. • Use timing restrictions (e.g., do not treat during critical wildlife breeding or staging periods) to minimize impacts to wildlife. • Minimize treatments near fish-bearing water bodies during periods when fish are in life stages most sensitive to the herbicide(s) used, and use spot rather than broadcast or aerial treatments. • Use appropriate application equipment/method near water bodies if the potential for off-site drift exists. • 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 damage to desirable vegetation and aquatic organisms, and 3) follow water-use restrictions presented on the herbicide label. • Applicators will avoid directly spraying ungulate carcasses with chemicals toxic to birds.

Resource	Mitigation Measure
Invasive Species/Noxious Weeds	• Vehicles and equipment used during treatment activities shall be washed prior to leaving the equipment storage facility. • All attached plant/vegetation and soil/mud debris shall be removed from vehicles and equipment prior to leaving a treatment location. • Vehicles and equipment used during treatment activities shall be washed prior to arriving at a new location.
Livestock Grazing and Rangeland Health	• Whenever possible and whenever needed, schedule treatments when livestock are not present adjacent to the treatment area. • Design treatments to take advantage of normal livestock grazing rest periods, when possible. • As directed by the herbicide product label, remove livestock from areas adjacent to treatment sites prior to herbicide application, where applicable. • Use herbicides of low toxicity where feasible. • Take into account the different types of application equipment and methods, where possible, to reduce the probability of contamination of non-target food and water sources. • Avoid use of diquat near a riparian pasture while pasture is being used by livestock. • Notify permittees of the herbicide treatment project to improve coordination and avoid potential conflicts and safety concerns during implementation of the treatment. • Notify permittees of livestock grazing, feeding, or slaughter restrictions, if necessary.
Wild Horses and Burros	• Minimize use of herbicides in areas grazed by wild horses and burros. • Use herbicides of low toxicity where feasible. • Take into account the different types of application equipment and methods, where possible, to reduce the probability of contaminating non-target food and water sources.
Water Quality	• Establish appropriate (herbicide specific) buffer zones to potential Waters of the US. • Consider climate, soil type, slope, and vegetation type when developing herbicide treatment programs near waterways. • Select herbicide products to minimize impacts to water. This is especially important for application scenarios that involve risk from active ingredients in a particular herbicide, as predicted by risk assessments. • Use local historical weather data to choose the month of treatment. Considering the phenology of the target species, schedule treatments based on the condition of the water body, and existing water quality conditions. • Plan to treat between weather fronts (calms) and at appropriate time of day to avoid high winds that increase water movements, and to avoid potential stormwater runoff and water turbidity. • Review hydrogeologic maps of proposed treatment areas. Note depths to groundwater, areas of shallow groundwater, and areas of surface water and groundwater interaction. • Minimize treating areas with high risk for groundwater contamination. • Conduct mixing and loading operations in an area where an accidental spill would not contaminate an aquatic body. • Do not rinse spray tanks in or near water bodies. Do not broadcast pellets where there is danger of contaminating water supplies. • 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.

Resource	Mitigation Measure
Water Quality, continued	• Minimize the potential effects to surface water quality and quantity by stabilizing terrestrial areas as quickly as possible following treatment. • Calibrate equipment, maintain records of actual application quantities, and track incidents of impacts on non-target organisms. • Apply for appropriate permits, such as submittal of Notice of Intent if discharging to Waters of the US with special classifications within 2.5 miles of an effluent dependent water.
Wetlands/Riparian Zones	• Survey for special status aquatic and riparian plant species before treating an area. • Use drift reduction agents to reduce the risk of drift hazard. • Use a selective herbicide and a wick or backpack sprayer. • Use an appropriate herbicide-free buffer zone for herbicides not labeled for aquatic use.
Recreation	• Schedule treatments to avoid peak recreational use times, while taking into account the optimum management period for the targeted species. • Adhere to entry restrictions identified on the herbicide product label for public and worker access. • Use herbicides during periods of low human use, where feasible.
Human Health and Safety	• Where a leak, spill, or other release containing a hazardous substance or oil in an amount equal to or in excess of a reportable quantity established under either 40 CFR Part 110, 40 CFR Part 117, or 40 CFR Part 302 occurs in any 24-hour period, the National Response Center (NRC) must be notified immediately at 800-424-8802. Contact information must be posted in locations that are readily accessible and available in the area where the spill, leak, or other unpermitted discharge may occur. • Applicators would be required to wear appropriate personal protective equipment as required on the label. • All requirements in a Safety and Spill Plan would be followed. • Establish a 100-foot buffer between treatment areas and human residences unless a written waiver is granted. • Observe restricted entry intervals specified by the herbicide label. • Have a copy of SDSs at work site. • Notify local emergency personnel of proposed treatments. • Contain and clean up spills and request help as needed. • Secure containers during transport. • Follow label directions for use and storage. • Dispose of unwanted herbicides promptly and correctly.
Soils	• Minimize treatments in areas where herbicide runoff is likely, such as steep slopes when heavy rainfall is expected.

Resource	Mitigation Measure
Native American Cultural or Religious Concerns	• Do not exceed the typical application rate of any herbicide in known areas with plants of cultural or religious importance to tribes. • Avoid applying bromacil or tebuthiuron in known areas with plants of cultural or religious importance to tribes. • Limit diquat applications to areas away from areas with plants of cultural or religious importance to tribes. • If Traditional Cultural Properties (TCPs) or areas with plants of cultural or religious importance are identified, they should be avoided. If avoidance is not possible State Historic Preservation Office (SHPO) / Tribal Historic Preservation Office (THPO) and Tribal Section 106 consultation will be conducted by the BLM. For projects funded under the Federal-Aid Highway Program (FAHP), FHWA as the federal lead agency, will conduct Section 106 consultation. • Within the boundaries of cultural resources that are or may be eligible for inclusion on the National Register, the application of herbicides would be conducted from vehicles with booms operating on the pavement or by hand-spraying using backpack sprayers or hoses. No off-pavement vehicle travel is authorized within site boundaries.

2.2 No Action Alternative

Under this alternative ADOT would continue to implement annual herbicide treatment programs on about 6,000 miles of roadways outside BLM-administered lands and USDOT ROW crossing BLM-administered lands. Any treatment on BLM-administered lands would be performed under FHWA authority and conducted on a project-by-project basis. Prior to herbicide applications within USDOT ROW, FHWA would consult with the BLM. These applications are normally done on a project-by-project basis and do not involve annual maintenance treatments. Also, control of existing weed populations, using mechanical, manual, and site rehabilitation, is already authorized and would continue. ADOT's vegetation management projects would occur within the existing USDOT ROW. The BLM would continue to manage lands adjacent to the easement in accordance with established policies and procedures.

SECTION 3 – AFFECTED ENVIRONMENT AND CONSEQUENCES

3.1 Resources That Would Not Be Affected

The following were not considered for further evaluation because they are not present in the project area or no measurable impacts would occur.

Woodland / Forestry

Forestry resources within the ADOT ROW would not be affected by the proposed action. Marketable timber that creates a roadside hazard would be removed through mechanical methods and not through the use of herbicides. These actions would be coordinated with the BLM as separate actions.

Floodplains

EO 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 ADOT 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.

Access

The proposed action is limited to the application of herbicides on roadway ROW and would not impact any access to adjacent properties.

Socioeconomics and Environmental Justice

There are no residences located within ADOT ROW on BLM-managed lands. Adjacent tracts of private land may include residences. The project would not require the displacement of any residents or businesses. Standard operating procedures, best-management practices, and mitigation measures would be utilized to minimize the chance for migration of chemical substances off of ADOT ROW through BLM-managed lands. No measureable socioeconomic effects or effect on protected populations are expected.

Waste, Hazards, or Solids

Any waste generated by this project would be disposed of properly and in conformance with all appropriate laws, rules, and regulations dealing with waste at approved disposal sites.

Geology / Mineral Resources / Energy Production

The BLM has or is in the process of permitting numerous solar and wind energy projects on public lands. In addition electrical transmission and other utility lines cross BLM-managed lands and ADOT ROW. No mining activities or energy production projects occur within ADOT ROW through BLM-managed lands. Permitted activities may be present on areas adjacent to

roadways. The application of herbicides within roadway ROW would not result in effects on these nearby uses.

Air Quality

The EPA has established National Ambient Air Quality Standards (NAAQS) (40 CFR Part 50) for pollutants considered harmful to public health and the environment. Six principal pollutants (carbon monoxide, nitrogen dioxide, ozone, particulate matter, sulfur dioxide, and lead), referred to as the criteria pollutants, were set under NAAQS, which placed limits on acceptable ambient concentrations.

Under the proposed alternatives, atmospheric concentrations of herbicides (predicted by particle size) resulting from spray drift would be temporary in nature. Chemical volatilization is temporary in nature, and none of the herbicides proposed for use are likely to result in substantial volatilization from soils.

Farmlands (Prime or Unique)

Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, and other agricultural crops. Unique farmland is land other than prime farmland that is used for the production of specific high-value food and fiber crops. Designation of prime or unique farmland is made by the USDA. There is no active farming within ADOT ROW or BLM-managed lands. Adjacent parcels may be utilized for farming; however, the proposed action would not result in the conversion of any lands currently used for agriculture to other uses.

3.2 Biological Resources

This section describes biological resources that may be affected by implementation of the proposed action assuming use of the design features discussed in Section 2.1. It discusses vegetation, wildlife, threatened and endangered species, other special-status species, protected native plants, and invasive species.

3.2.1 Federally Listed Species

Background

The Endangered Species Act (ESA) was passed by Congress in 1973 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 US Fish and Wildlife Service (USFWS) for terrestrial and freshwater organisms (USFWS and National Marine Fisheries Service 1998).

Existing Conditions

The USFWS list of threatened, endangered, and proposed species for Arizona was obtained from the Arizona Ecological Services Field Office website (USFWS 2014) and reviewed by a qualified biologist to determine species potentially present in the ROW. Species with no potential to occur within ADOT ROW, based on the species' current range and habitat requirements, were excluded from further evaluation because the project will have no effect to those species. Of the 67 species on the Arizona list, six threatened species and 18 endangered species were determined to potentially occur in ADOT ROW on BLM-managed land (see Table 3.1). These include one amphibian, four birds, four fish, two mammal, ten plants, and three reptiles. In addition, 15 species have designated or proposed critical habitat near the ROW. The ROW intersects designated critical habitat for five species and proposed critical habitat for two species. The amphibian, bird, mammal, and reptile species could occur incidentally in the ROW while moving or foraging, whereas the plant species are likely to occupy or be located directly adjacent to the ROW. The 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 occur within the ROW, none of the species are known to exclusively occupy the ROW.

Table 3.1. USFWS Species Potentially Occurring Within ADOT ROW on BLM-Managed Land.

Species	Status[1]	Habitat Requirements	Effect Determination
Plants			
Arizona cliffrose (*Purshia subintegra*)	ESA LE	White limestone soils derived from tertiary lakebed deposits below 4,000 feet.	May affect, not likely to adversely affect
Arizona hedgehog cactus (*Echinocereus triglochidiatus* var. *arizonicus*)	ESA LE	Ecotone between interior chaparral and madrean evergreen woodland from 3,200 to 5,200 feet.	May affect, not likely to adversely affect
Brady pincushion cactus (*Pediocactus bradyi*)	ESA LE	Benches and terraces in Navajo desert near Marble Gorge between 3,850 and 4,500 feet.	May affect, not likely to adversely affect
Fickeisen plains cactus (*Pediocactus peeblesianus* var. *fickeiseniae*)	ESA LE PCH	Shallow soils derived from exposed layers of Kaibab limestone. Found on canyon margins, well drained hills in Navajoan Desert, or Great Plains Grassland between 4,200 and 5,950 feet.	May affect, not likely to adversely affect species or proposed critical habitat
Gierisch mallow (*Sphaeralcea gierischii*)	ESA LE DCH	Found only on gypsum outcrops associated with the Harrisburg member of the Kaibab Formation below 4,000 feet.	May affect, not likely to adversely affect species or designated critical habitat

Table 3.1. USFWS Species Potentially Occurring Within ADOT ROW on BLM-Managed Land.			
Species	Status[1]	Habitat Requirements	Effect Determination
Holmgren (Paradox) milk-vetch (*Astragalus holmgreniorum*)	ESA LE DCH	Just under limestone ridges and along draws in gravelly clay hills from 2,700 to 2,800 feet.	May affect, not likely to adversely affect species or designated critical habitat
Huachuca water umbel (*Lilaeopsis schaffneriana ssp recurva*)	ESA LE DCH	Cienegas, perennial low gradient streams, and wetlands with an elevation range of 3,500 to 6,500 feet.	May affect, not likely to adversely affect species or designated critical habitat
Peebles Navajo cactus (*Pediocactus peeblesianus* var. *peeblesianus*)	ESA LE	Gravely soils of the Shinarump conglomerate of the Chinle formation from 5,400 to 5,600 feet.	May affect, not likely to adversely affect
Pima pineapple cactus (*Coryphantha scheeri* var. *robustispina*)	ESA LE	Sonoran desertscrub or semi-desert grassland communities from 2,300 to 5,000 feet.	May affect, not likely to adversely affect
Siler pincushion cactus (*Pediocactus sileri*)	ESA LT	Desertscrub transitional areas of Navajo, sagebrush and Mohave Deserts between 2,800 and 5,400 feet.	May affect, not likely to adversely affect
Fish			
Bonytail chub (*Gila elegans*)	ESA LE DCH	Warm, swift, turbid mainstem rivers of the Colorado River basin, reservoirs in lower basin below 4,000 feet.	May affect, not likely to adversely affect species or designated critical habitat
Razorback sucker (*Xyrauchen texanus*)	ESA LE DCH	Riverine and lacustrine areas, generally not in fast moving water and may use backwaters, at elevations below 6,000 feet.	May affect, not likely to adversely affect species or designated critical habitat
Virgin River chub (*Gila seminuda*)	ESA LE DCH	Deep swift waters but not turbulent, occurs over sand and gravel substrates in water less than 86 degrees Fahrenheit. Tolerant of high salinity and turbidity below 4,500 feet.	May affect, not likely to adversely affect species or designated critical habitat
Woundfin (*Plagopterus argentissimus*)	ESA LE DCH XN	Inhabits shallow, warm, turbid, fast-flowing water. Tolerates high salinity below 4,500 feet.	May affect, not likely to adversely affect species or designated critical habitat

Table 3.1. USFWS Species Potentially Occurring Within ADOT ROW on BLM-Managed Land.			
Species	Status[1]	Habitat Requirements	Effect Determination
Amphibians and Reptiles			
Chiricahua leopard frog (*Lithobates chiricahuensis*)	ESA LT DCH	Restricted to springs, livestock tanks, and streams in upper portion of watersheds that are free from nonnative predators or where marginal habitat for nonnative predators exists between 3,281 and 8,890 feet elevation.	May affect, not likely to adversely affect species or designated critical habitat
Mojave desert tortoise (*Gopherus agassizii*)	ESA LT DCH	Mohave desertscrub (north and west of the Colorado River) in basins and bajadas but also found on rocky slopes below 4,000 feet.	May affect, not likely to adversely affect species. No effect on designated critical habitat.
Narrow-headed gartersnake (Thamnophis rufipunctatus)	ESA LT PCH	Clear perennial streams exhibiting pool and riffle habitats with cover sites such as cobbles, boulders, and downed logs, and shrub- or sapling-sized trees such as alder, cottonwood, willow, or sycamore lining the banks	May affect, not likely to adversely affect species or proposed critical habitat
Northern Mexican gartersnake (Thamnophis eques megalops)	ESA LT PCH	Source area ponds and cienegas; lowland river riparian forests and woodlands; and upland stream gallery forests	May affect, not likely to adversely affect species or proposed critical habitat
Birds			
California condor (*Gymnogyps californianus*)	ESA LE XN	High desert canyon lands and plateaus at various elevations.	May affect, not likely to adversely affect species
Southwestern willow flycatcher (Empidonax traillii extimus)	ESA LE DCH	Cottonwood/willow and tamarisk vegetation communities along rivers and streams below 8,500 feet.	May affect, not likely to adversely affect species or designated critical habitat
Yellow-billed cuckoo (Coccyzus americanus)	ESA LT PCH	Below 6,500 feet in remaining large blocks of riparian habitat; particularly cottonwood-willow, mesquite, ash, sycamore, and tamarisk forests with dense understory foliage.	May affect, not likely to adversely affect species or proposed critical habitat

Table 3.1. USFWS Species Potentially Occurring Within ADOT ROW on BLM-Managed Land.			
Species	Status[1]	Habitat Requirements	Effect Determination
Yuma clapper rail (Rallus longirostris yumanensis)	ESA LE	Fresh water and brackish marshes, associated with dense emergent riparian vegetation below 4,500 feet.	May affect, not likely to adversely affect
Mammals			
Ocelot (*Leopardus pardalis)*	ESA LE	Humid tropical and sub-tropical forests, savannahs, and semi-arid thornscrub below 8,000 feet.	May affect, not likely to adversely affect
Sonoran pronghorn (*Antilocapra americana sonoriensis*)	ESA LE XN	Broad intermountain alluvial valleys with creosote-bursage and palo verde-mixed cacti associations from 2,000 to 4,000 feet.	May affect, not likely to adversely affect
[1] Status Definitions: LE=Listed Endangered, LT=Listed Threatened, XN=Experimental Nonessential Population, DCH= Designated Critical Habitat, PCH= Proposed Critical Habitat. *Sources:* US Fish and Wildlife Service list of threatened, endangered, proposed, candidate, and conservation agreement species for the State of Arizona. List Date: October 3, 2014 (http://www.fws.gov/southwest/es/arizona/).			

Impacts from the Proposed Action Alternative

For all 24 federally listed species that were evaluated, a finding of "may affect, not likely to adversely affect" was determined (see Table 3.1). Impacts from the proposed action to federally listed species include direct toxicological effect to the species and indirect effects from habitat alteration. Consultation with USFWS on both direct and indirect impacts of the proposed action was initiated on January 16, 2015 in accordance with the ESA. The USFWS concurred with the findings in the Biological Assessment on March 9, 2015.

Direct spray of the federally listed birds, mammals, and reptiles is unlikely due to the species mobility and the design features of the action, but exposure could result for individuals traveling through or foraging within the ROW. Similarly, direct spray of amphibians and fish are unlikely due to restricted treatment but exposure may occur from runoff or drift transporting herbicide to occupied aquatic habitats. Direct contact with herbicide would be infrequent, and the herbicide would be diluted per application directions if there is potential to contact a federally listed species. Furthermore, the proposed herbicides suppress undesirable vegetation by controlling actions that are unique to plants and thus are unlikely to have toxic effects on amphibians, birds, fish, mammals, and reptiles. Therefore, exposure to herbicide from dermal contact or consumption of herbicide treated vegetation at a toxic level is unlikely, and adverse effects to federally listed amphibians, birds, fish, mammals, and reptiles are not anticipated.

Conversely federally listed plants could be exposed by direct spray if plants are present within the ROW or by drift or run-off if plants are adjacent to or downgrade of the ROW. Direct exposure to herbicide could have an adverse effect to federally listed plant species; therefore, pre-treatment surveys and buffer zones based on guidelines from USFWS (USFWS, 2007) would be implemented to minimize the potential for federally listed plants to come into contact with herbicide. The potential for indirect exposure through drift or run-off would also be minimized through the implementation of standard operating procedures (SOPs), conservation measures, mitigation measures, and site specific instructions obtained through the PUP.

The proposed action may indirectly affect federally listed species through alteration of habitat. However, the majority of herbicide treatment would occur in highly disturbed areas adjacent to roadways that are currently dominated by undesirable vegetation and not suitable for federally listed species. Invasion and modification of habitat from undesirable vegetation is a leading threat to several of the federally listed species evaluated for this project. Implementation of the proposed action would control and eliminate the undesirable vegetation, thereby restoring more natural conditions to the treated areas and increasing habitat suitability for federally listed species. In addition, control or elimination of undesirable plants would reduce wildfire fuels and the risk of wildfire that could be detrimental to federally listed species, particularly those that have a limited distribution and are not fire-adapted. Thus, habitat alteration resulting from the proposed action would likely benefit federally listed species because it would restore the ROW to native more natural condition and function.

SOPs, conservation measures, and mitigation measures would be implemented to minimize impacts to federally listed species. These measures have been assumed to be implemented in determining the potential effects of the Proposed Action Alternative. Refer to Section 5 for herbicide-specific and species-specific conservation measures, avoidance areas and buffer zones, and herbicide application procedures that are recommended to reduce the effect of the proposed action on federally listed species.

Coordination at the programmatic level was initiated with the USFWS as a part of the *Vegetation Treatments on BLM Lands in 17 Western States Final Biological Assessment* (BLM 2007). In 2007, USFWS concurred with a determination of "may affect, but not likely to adversely affect" with the understanding that all SOPs and conservation measures included in the PEIS, Biological Assessment, and Environmental Risk Assessments (ERAs) would be implemented at the programmatic and local levels. All relevant SOPs and conservation measures are incorporated into this document by reference. Coordination was completed at the local level to address site-specific effects and actions. The USFWS concurred with findings of "no effect" or "may affect, not likely to adversely affect" for the potentially affected federally listed species on March 9, 2015.

Impacts from the No Action Alternative

Under the no action alternative, herbicide treatment would occur within the ROW only on a project-by-project basis. Existing undesirable vegetation within the ROW might remain untreated and the disturbed environments of roadways present apt conditions for weedy plants to thrive. Undesirable plant species are often well adapted to the environments they

invade, allowing them to outcompete native vegetation. Over time the spread of undesirable vegetation can threaten native biological potential at both macro and micro levels. Effects can include degraded habitat complexity, diversity, and composition; forage species with reduced nutrient levels or palatability; changed soil properties (e.g., pH); reduced water quality and quantity; and decreased suitability of an area for native wildlife. Federally listed species often have specific habitat requirements and occupy limited ranges. Alteration of habitats due to the expansion of undesirable vegetation could have long-term adverse effects to federally listed species.

Additionally, undesirable vegetation often increases the overall vegetative mass within an area. Dried plant matter, particularly invasive grasses along roadsides, provide an excess of fuels and pose a serious fire hazard. The federally listed species that occupy the ROW and their associated habitats in most of Arizona are not historically adapted to fire; as previously stated these species often have limited ranges. Continued existence and spread of undesirable vegetation within the vicinity of federally listed species present a continued threat of a potentially catastrophic wildfire.

3.2.2 BLM Sensitive Species

Background

Sensitive species are designated by BLM in accordance with existing law and the BLM multiple use mission in the FLPMA—to promote conservation of the species and their habitats and reduce the likelihood for future listing under the ESA. Per BLM Manual 6840 (BLM 2008a), "species designated as BLM sensitive must be native species found on BLM- administered lands for which the BLM has the capability to significantly affect the conservation status of the species through management, and either:

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

In addition to BLM-designated sensitive species, all federally listed candidate species, conservation agreement species, and delisted species (for five years following their delisting) are included on the list of BLM sensitive species.

Existing Conditions

In Arizona 113 species are listed as sensitive species by the BLM. Based on the species' current range and habitat requirements, 46 BLM sensitive species were determined to potentially occur within the ADOT ROW on BLM-managed land. These include four amphibians, eleven birds, six fish, one aquatic invertebrate, four mammals, six reptiles and fourteen plants. An evaluation of

BLM sensitive species can be found in Appendix B. Additionally the Sonoran Desert tortoise is a federal candidate species that is undergoing status review for potential proposed listing in 2015. The remaining species were excluded from further evaluation as the proposed action would have no impact on species that have no potential to occur within the ROW. No BLM sensitive species are known to exclusively occupy ADOT ROW. Individual BLM sensitive plants may occur within ADOT ROW although their populations are dispersed beyond, over a larger geographic area. Due to mobility, BLM sensitive animals are unlikely to solely remain within ADOT ROW but rather may temporarily occur within its limits while moving and foraging.

Impacts from the Proposed Action Alternative

Potential impacts to BLM sensitive species would be similar to those described in the preceding section for federally listed species. Direct impacts from the proposed action would be toxicological effects resulting from direct contact with herbicides and indirect impacts to BLM-sensitive species would develop over time from habitat alteration as result of control and eradication of undesirable vegetation.

Impacts to BLM Sensitive Amphibians

Due to having thin, permeable skin and gelatinous eggs without a protective shell, amphibians are highly susceptible to environmental toxins. Direct impacts may occur from exposure through direct spray or dermal contact. Dermal contact may occur in aquatic species or during aquatic life stages (e.g., eggs, tadpoles) from herbicide drift or runoff into water bodies. In terrestrial species and adult amphibians, exposure may occur from dermal contact with recently treated vegetation especially during summer monsoons when amphibians are more active and often travel between aquatic sites. However, SOPs, conservation measures, and mitigation measures for herbicide use in riparian zones and near aquatic sites would be implemented to minimize potential impacts to BLM sensitive amphibians and their habitats.

Indirect impacts such as a temporary increase in predation on amphibians may occur due to the reduced vegetative cover from the proposed action. However, ample suitable habitat is available adjacent to ADOT ROW for amphibians to disperse to and substantial impacts to amphibian populations are not anticipated. Additionally, alteration of habitat from the proposed action may indirectly impact BLM sensitive amphibians but would likely have a beneficial impact. Habitat loss and degradation of native habitat is a common threat to amphibians. Thus, containing or eliminating the encroachment of nonnative vegetation would restore aquatic habitats to their natural ecological function, rendering them more suitable for these species. The loss of undesirable vegetation would also reduce the risk of destructive wildfires within amphibian upland and aquatic habitats.

The proposed action may impact individual BLM sensitive amphibians, but is not likely to result in a trend toward federal listing or loss of viability.

Impacts to BLM Sensitive Birds

Direct herbicide contact with most birds is not anticipated due to their ability of flight. However, if nesting adults, eggs, or flightless young are present within the ROW during the

treatment period, direct exposure could occur and ground-nesting species are at a greater risk of exposure. Because ROW habitats are fragmented and experience higher levels of human disturbance than surrounding areas, it is unlikely that a large number of nests would be present within the ROW.

Depending on the habitat preference of a particular species, herbicide treatments would produce both negative and beneficial indirect impacts. Herbicide treatments would result in reduced vegetative cover, which could alter habitat suitability for species that prefer dense vegetation, such as grassland birds. Conversely, herbicides would limit woody shrub encroachment into grassland habitats, benefitting grassland species long-term. For species such as raptors that utilize open habitats to forage, reduced vegetation would be a benefit. Other indirect impacts to sensitive birds include a possible reduction in the availability and production of seeds, berries, plant material, or insects for forage. Due to the large expanses of BLM-managed lands available adjacent to the ROW, a temporary reduction in cover sites or food sources is not anticipated to greatly impact sensitive birds. Over time, native vegetation should regrow and reestablish, thus increasing foraging and breeding capabilities for many sensitive birds. Another beneficial impact of herbicide treatments would be the reduction in wildfire fuels, which have the capacity to destroy avian habitats on a large scale.

The proposed action may impact individual sensitive bird species, but is not likely to result in a trend toward federal listing or loss of viability.

Impacts to BLM Sensitive Aquatic Species (Fish, Invertebrates, and Reptiles)

Impacts to sensitive aquatic species could occur in the event of an accidental spray, spill, runoff, or drift of herbicide into an aquatic habitat. Eggs and larvae in shoreline and backwater habitats are particularly susceptible to exposure via these pathways. However, SOPs, conservation measures, and mitigation measures restricting the use of herbicide in riparian zones and near aquatic sites would be implemented to minimize potential for herbicides to enter an aquatic system and impact BLM sensitive aquatic species. If residual runoff or drift did occur, herbicides would likely be rapidly diluted within the water column, and toxic levels of herbicide resulting in a direct loss of aquatic organisms or an alteration in natural riverine processes are not anticipated.

Herbicide treatments conducted within riparian corridors or streamside habitats would temporarily reduce the amount of vegetation in the area. Potential impacts from a loss of streamside habitat used by to sensitive aquatic species include: a reduction in shade that may increase water temperature, killing aquatic species or leaving them susceptible to disease; a reduction in bank stabilization leading to increased erosion and sediment loads, which can change a river's morphology and structure by eliminating pool and riffle habitats, changing the width and depth of a system, and changing the flow velocity; an increase in runoff and pollutants entering the system; a loss of microhabitat features; and a temporary decrease in invertebrate prey. However, only spot treatments of undesirable vegetation would occur within riparian corridors and streamside habitats, and treatment would occur over a number of years. As such, vegetation removal would not occur suddenly or at a large scale. In the interim, native vegetation would have the opportunity to recolonize streamside habitats. Over time the

restoration of native vegetation and function of riparian corridors and streamside habitats would likely improve aquatic species habitats in terms of water quality and quantity, native invertebrate, and aquatic forage and microhabitat elements. Therefore, substantial indirect impacts to sensitive aquatic species are not anticipated.

The proposed action may impact individual BLM sensitive aquatic species, but is not likely to result in a trend toward federal listing or loss of viability.

Impact Analysis for BLM Sensitive Mammals

Direct spray of mammals is highly unlikely due to their ability to flee the ADOT ROW or retreat to burrows or tree cavities. Exposure to herbicides could occur through dermal contact with recently sprayed vegetation or via ingestion of contaminated food/prey items. Exposure to the point of death is highly unlikely, given the amount of contaminated food/prey that would need to be consumed for exposure levels to be toxic. However, exposure induced illness cannot be completely discounted.

Indirect impacts to sensitive mammals include a temporary loss of vegetative cover and forage especially for grassland mammals. The shrub-dependent sensitive mammals could experience localized population losses. Long-term herbicide treatments would benefit sensitive mammals by restoring native vegetation communities and food sources, and reducing the risk of wildfire.

The proposed action may impact individual sensitive mammals, but is not likely to result in a trend toward federal listing or loss of viability.

Impact Analysis for BLM Sensitive Reptiles

Direct impacts to sensitive reptiles could occur through direct spray, dermal contact with treated vegetation, or ingestion of prey that has been directly sprayed. Indirect impacts from the proposed action may include temporary reduction in vegetative cover within the ROW, which could increase predation on BLM sensitive reptiles due to a lack of protective cover. Species that depend on dense grass for cover and herbaceous plants and grasses for forage would likely experience the largest impact from a temporary decrease in vegetative cover. In addition, the reduction in ground cover may lead to temporary decline in insectivorous prey populations. However, due to the ample availability of suitable habitat adjacent to the ROW, substantial indirect impacts to reptile shelter locations and foraging opportunities are not anticipated.

Although temporary impacts may occur, the benefits of controlling or eliminating undesirable vegetation are long-term. Restoring native habitats would increase the amount of habitat available to sensitive reptiles. Furthermore, reducing the risk of wildfire protects the viability of habitat and reptile populations.

The proposed action may impact individual BLM sensitive reptiles, but is not likely to result in a trend toward federal listing or loss of viability.

Impact Analysis for BLM Sensitive Plants

Direct impacts to sensitive plants could occur from direct herbicide spray or drift onto sensitive plants or from off-site runoff into a plant's habitat. Wetland species would be particularly vulnerable to runoff accumulation. However, where suitable habitat within a sensitive plant's range overlaps the ROW, the suitable habitat would be avoided or pre-treatment surveys for that species would be conducted prior to herbicide application. Avoidance areas and buffer zones would be established around sensitive plants to eliminate the potential for direct application and minimize the potential for exposure to herbicide. In addition, implementation of SOPs, conservation measures, and mitigation measures would further reduce the potential for herbicide drift, on-site runoff, and treatment of non-target or BLM sensitive plants.

Herbicide treatments will temporarily reduce vegetation cover and competition for resources where it is conducted. Sensitive plants located within the treatment areas may directly benefit from reduced competition for space, light, water, and soil nutrient resources, potentially allowing them to propagate new plants and possibly expand their range. In addition, by controlling or eliminating undesirable vegetation, expansion of native vegetation is encouraged and over time native habitat would be restored, increasing the availability of suitable habitat for sensitive plants.

Therefore, the proposed action may impact individual BLM sensitive plants, but is not likely to result in a trend toward federal listing or loss of viability.

SOPs, conservation measures, and mitigation measures would be implemented to minimize impacts to BLM sensitive species. Refer to Section 5 for herbicide-specific and species-specific conservation measures, avoidance areas and buffer zones, and herbicide application procedures that are recommended to reduce the impact of the proposed action BLM sensitive species.

Impacts from the No Action Alternative

Under the no action alternative, potential impacts to BLM sensitive species would be similar to those described in the preceding section of federally listed species.

3.2.3 Migratory Birds and Eagle Protection

Background

Pursuant to EO *13186* issued on January 17, 2001, the BLM and USFWS entered into a MOU (BLM, 2010b) to promote the conservation of migratory bird populations through the implementation of the MBTA and the Bald and Golden Eagle Protection Act (BGEPA). Under the MBTA and BGEPA the taking, possession and commerce of alive or dead or any part of migratory birds and bald and golden eagles including any part of their nest or eggs is prohibited except under certain specified conditions.

Existing Conditions

The majority of bird species in Arizona are protected by the MBTA. Migratory birds utilize varied habitats throughout Arizona as they journey between winter and summer ranges and many species both breed and nest within the states boundaries. Suitable nesting habitat is present within ADOT ROW throughout Arizona and several bird species such as cliff swallows and barn swallows frequently nest on roadway structures. Bald and golden eagles are also known to occur, breed and nest throughout Arizona. Bald eagles could occur within ROW near large open bodies of water such as lakes, rivers and streams and golden eagles could occur within the ROW in mountainous terrain near large cliffs and canyons. Eagle use of the ROW is likely to be associated with foraging on road killed animals.

Impacts from the Proposed Action Alternative

Direct herbicide exposure to most migratory birds and bald and golden eagles is unlikely due to flight ability. Nesting adults, eggs and flightless young present within the ROW during broadcast spray treatments would be at risk and ground nesting species are at a greater risk. However, due to higher levels of human disturbance and the lower quality habitats present in ROWs, it is unlikely that a large number of nests would be present within the ROW.

Individual migratory birds or eagles that enter the ROW immediately following treatment may be exposed to herbicide through dermal contact or ingestion of recently treated vegetation or roadkill. However, large populations of migratory birds or eagles are unlikely to occur in the ROW during or immediately following treatment. Applicators will avoid directly spraying ungulate carcasses with chemicals toxic to birds to minimize potential exposure to eagles in order to avoid the need for eagle take permit under the BGEPA.

Accidental spray, spill, runoff, or drift of herbicide into aquatic habitats could result in direct exposure of raptors and could impact their prey base. However, SOPs, conservation measures, and mitigation measures restricting the use of herbicide in riparian zones and near aquatic sites would be implemented to minimize potential for herbicides to enter an aquatic system.

The proposed action would result in invasive species prevention and management which was identified as a benefit to migratory birds in the MOU between USFWS and BLM. Invasive species management promotes the reestablishment of native vegetation which will benefit migratory birds and bald and golden eagles in the long term. In addition, herbicide treatments would reduce wildfire fuels, which have the capacity to destroy avian nesting habitats on a large scale.

The proposed action may impact individual migratory birds, but impacts associated with the proposed action would not result in a loss of populations that would result in a trend toward federal listing. The likelihood of measurable impacts to bald or golden eagles as a result of the proposed action is remote.

Impacts from the No Action Alternative

Under the no action alternative, potential impacts to BLM sensitive species would be similar to those described in the preceding section of federally listed species.

3.2.4 Invasive Species/Noxious Weeds

Background

On February 3, 1999 Executive Order (EO) *13112* was issued to develop a federal response to the invasive species problem. Under the EO an invasive species is defined as a harmful non-native 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 legally designated and regulated harmful non-native species whose control and eradication is required by state law.

Existing Conditions

In Arizona, approximately 8.3 million acres of BLM-managed lands are infested with invasive weeds. Due to their disturbed nature, roadway ROWs are often vectors for the introduction and spread of invasive and noxious weeds. Noxious and invasive weeds occurring within the ROW include but are not limited to various thistle-like flowering plants (*Centaurea* spp.); Russian thistle; grasses such as buffelgrass; cheatgrass (*Bromus tectorum*); fountain grass; and Johnsongrass; Dalmatian toadflax; mullein (*Verbascum thapsus*); and camelthorn. The size, complexity, and intensity of infestation varies across the ROW.

Impacts from the Proposed Action Alternative

The proposed action would result in a reduction or elimination of invasive and noxious weeds within the ROW. Depending on the size and intensity of infestation, invasive weed control may require multiple or ongoing treatments over the course of several years. The proposed action would reduce non-native biomass in the ROW, allowing for the reestablishment of native vegetation and natural environmental processes, and decreasing the potential for wildfires.

Implementation of the proposed action would require the use of trucks, ATVs, and other equipment in infested areas, which have the potential to spread weeds to areas outside the ROW. However, mitigation measures and SOPs would be implemented to prevent spread or introduction to other locations.

Impacts from the No Action Alternative

Potential impacts as a result of the no action alternative would be similar to those described in the federally listed species section.

3.2.5 Non-Sensitive Wildlife and Vegetation

Background

Non-sensitive wildlife and vegetation occur in the ROW and, therefore, are included in the Affected Environment.

Existing Conditions

The ROW encompasses much of the state of Arizona, covering a varied landscape ranging from Sonoran desertscrub and grasslands to chaparral and Madrean evergreen woodland habitats below 6,500 feet elevation. ADOT ROWs can be described as linear, relatively narrow, roadside habitat. Roadside habitats are typically disturbed due to the creation of a habitat edge, human activity, and roadway/vehicle pollutants. However, native non-sensitive plant species grow within the ROW including various native grasses, annuals, and perennials; cacti; shrubs such as blackbrush (*Coleogyne ramosissima*), sagebrush (*Artemisia* spp.), and manzanita (*Arctostaphylos* spp.); desert trees such as mesquite (*Prosopis* spp.), paloverde (*Parkinsonia* spp.), and ironwood (*Olneya tesota*); and juniper (*Juniperus* spp.), oak (*Quercus* spp.), and pine (*Pinus* spp.). In areas where ephemeral or perennial water sources cross or parallel the ROW, xeroriparian, broadleaf riparian, and or wetland vegetation may be present.

As a roadside habitat, ADOT ROW does not promote permanent habitation for most wildlife species, and use of these areas as an animal travel corridor or opportunistic foraging site is more common. Animals that may inhabit the ROW include mammals such as woodrats (*Neotoma* spp.), ground squirrels (*Spermophilus* and *Ammospermophilus* spp.), and prairie dogs (*Cynomys gunnisoni*); and small birds such as mourning doves (*Zenaida macroura*) and verdins (*Auriparus flaviceps*) are often found nesting in ROWs. Any number of other wildlife species such as deer (*Odocoileus* spp.), javelina (*Tayassu tajacu*), raptors, lizards, and snakes may temporarily utilize the ROW over time.

Impacts from the Proposed Action Alternative

Direct herbicide exposure to non-target vegetation and resident wildlife would occur during broadcast spray applications. Due to the ability of movement, most wildlife could avoid direct exposure, although eggs or immobile young would be at risk. If wildlife enter the ROW immediately following treatment, animals may also be exposed through dermal contact with or ingestion of recently sprayed vegetation or roadkill. Impacts to wildlife would depend upon the species; for instance, amphibians are more susceptible to dermal absorption of herbicides. However, 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 and site specific analysis obtained through the PUP.

The proposed action could indirectly impact non-sensitive wildlife and vegetation due to exposure via herbicide drift or runoff, or from habitat alteration. SOPs would be implemented to minimize the possibility of drift or runoff to adjacent areas. Reduction of vegetation within ADOT ROW may alter the structure and composition of the habitat, reducing forage and cover,

and rendering the area less suitable for certain wildlife species. However, because the proposed action would only occur within the ROW, large-scale habitat modification to the point of unsuitability is unlikely. Additionally, adjacent BLM-managed lands are available for wildlife to utilize. Over time native vegetation would reestablish benefitting native wildlife and habitats in the long term. Therefore, impacts associated with the proposed action would not result in a loss of populations of wildlife or vegetation that would result in a trend toward federal listing.

Impacts from the No Action Alternative

Under the no action alternative, potential impacts to non-sensitive wildlife and vegetation would be similar to those described in the federally listed species section.

3.2.6 Livestock Grazing and Rangeland Health

Background

In Arizona, the BLM manages 11.5 million acres of public rangelands open to livestock grazing (Figure 3.1). Rangelands are managed in accordance with the Taylor Grazing Act of 1934 and the FLPMA, with the objective of maintaining and creating sustainable, productive, and healthy rangelands.

Existing Conditions

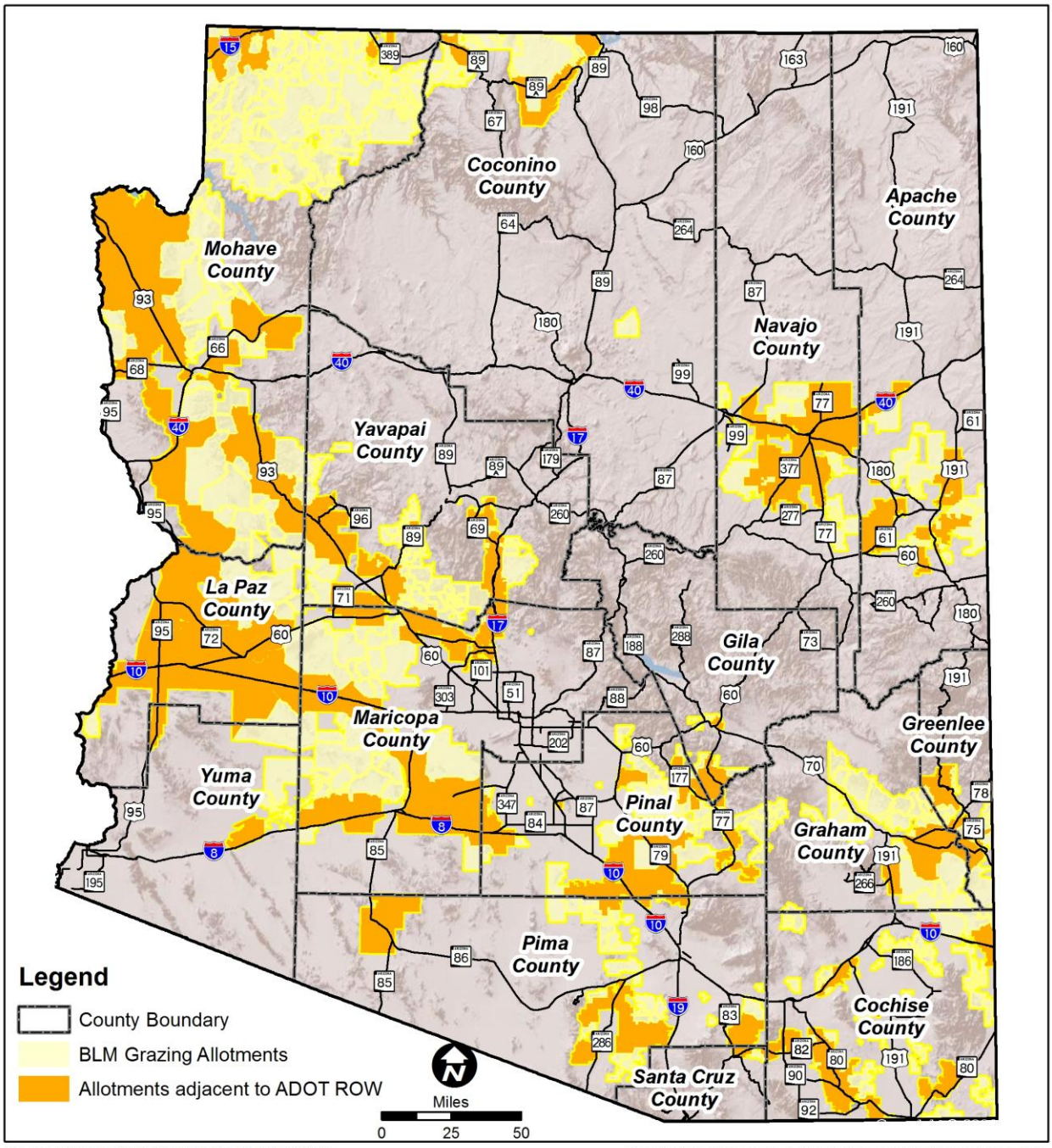
ADOT ROW is not designated as public rangeland. Approximately 284 allotments occur directly adjacent to ADOT ROW.

Impacts from the Proposed Action Alternative

Grazing allotments are not present within ADOT ROW, therefore, rangelands and livestock grazing would not be directly impacted by the proposed action.

Indirect impacts to allotments would occur in the event of herbicide drift or runoff from treated areas, which could result in a loss of vegetation. SOPs and conservation measures would be implemented to minimize the potential for drift or runoff. Therefore, if herbicides do enter allotments, herbicide concentrations are unlikely to be at levels that would reduce rangeland productivity or health.

Indirect impacts to livestock grazing include potential toxic exposure and loss of forage. Livestock may experience negative health effects if large amounts of contaminated vegetation are consumed; although given the small amount of vegetation likely to be contaminated compared to the total amount available to livestock as forage, negative health effects are improbable. As discussed, vegetative loss on adjacent allotments is likely to be minimal and would not impact foraging opportunities.



Source: ADOT ATIS (2010); BLM (2013); ESRI (2013)

Map Disclaimer: This map is intended for general siting purposes only.

Figure 3.1. BLM Grazing Allotments.

The proposed action would benefit rangelands and livestock grazing by reducing the spread of invasive and noxious weeds onto adjacent BLM-managed lands. Non-native grasses and plants are generally less palatable and less nutritious than native species. Native plant communities are also less damaging to the soil and promote natural ecological processes. Overall, the proposed action may increase the production and health of rangelands and grazing allotments.

Impacts from the No Action Alternative

Under the no action alternative, no annual program for herbicide treatment would be established and any treatments would occur on a project-by-project basis. Existing undesirable vegetation within ADOT ROW could remain untreated and the disturbed environments of roadways present favorable conditions for these plants. Undesirable vegetation is often well adapted to the environments it invades allowing them to outcompete native vegetation. If left untreated, undesirable vegetation currently located within ADOT ROW would likely expand to surrounding areas affecting the sustainability, productivity and health of BLM rangelands.

Additionally, undesirable vegetation often increases the overall vegetative mass within an area. Dried plant matter, specifically invasive grasses along roadsides, provide an excess of fuels and pose a serious fire hazard. Continued existence and spread of undesirable vegetation present a continued threat of a potentially catastrophic wildfire within rangelands.

Refer to Section 5 for SOPs and conservation measures regarding herbicide application rates and restrictions in or near rangelands.

3.2.7 Wild Horses and Burros

Background

The Wild Free-Roaming Horses and Burros Act was passed by Congress in 1971 to protect wild horses and burros from capture, branding, harassment, or death, and to manage and control these animals on public lands. Management of these living symbols and assurance that they thrive as healthy herds on healthy rangelands is part of the BLMs multiple-use mission under the FLPMA. Herd Management Areas (HMAs) have been designated by the BLM where enough food, water, cover, and space is present to sustain healthy and diverse populations of wild horses and burros over the long-term (Figure 3.2).

Existing Conditions

In Arizona the BLM manages approximately 502 horses, 3,194 burros, and the 8 HMAs they occupy (BLM 2013). The horses are in two herds that are located in the Cerbat Mountains, northwest of Kingman, and between the Cibola Wildlife Refuge and the US Army's Yuma Proving Ground north of Yuma, AZ. The wild burros roam public lands in HMAs throughout western Arizona from Lake Pleasant to the Colorado River. ADOT ROW is located throughoutthe range of both wild horses and burros in Arizona and within or adjacent to all eight HMAs in Arizona.

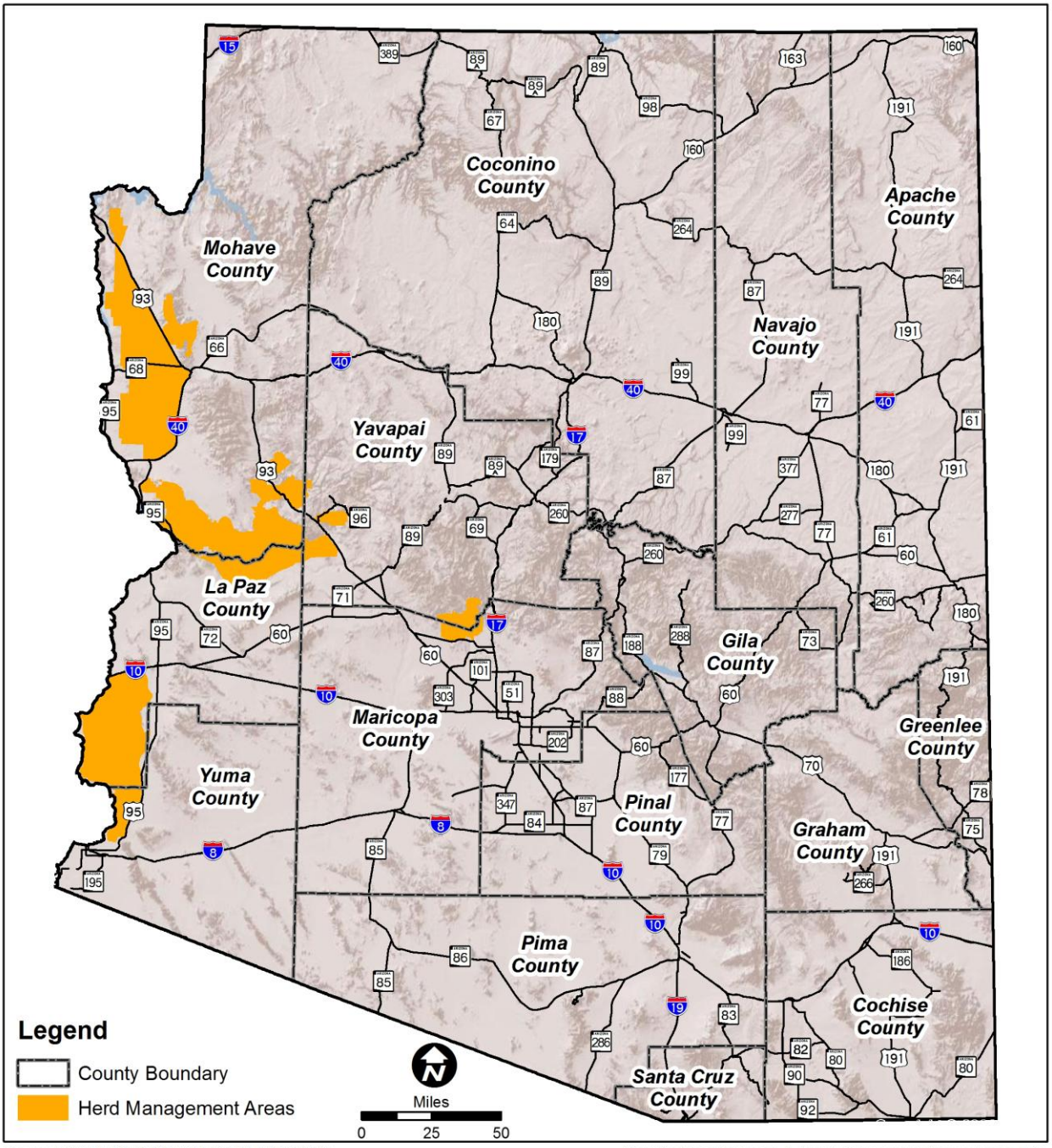


Figure 3.2. BLM Herd Management Areas.

Impacts from the Proposed Action Alternative

The extent of impacts of the proposed action to wild horses and burros would vary throughout the ROW based on site specific environmental conditions, the target species in the area, the herbicide used, and the application methods. Direct impacts from the proposed action would be toxicological effects resulting from direct contact with herbicides and indirect impacts from habitat alteration within the range of wild horses and burros.

Direct spray of wild horses and burros is unlikely due to the species mobility, but exposure to herbicide may occur through dermal contact with treated vegetation or ingestion of treated vegetation. Exposure at a toxic level could have adverse impacts on individual animals including damage to vital organs, reduction in body weight, decrease in healthy offspring, increased susceptibility to predation, and potentially death. However, due to the small amount of habitat that will be treated with herbicide compared to the substantial range of wild horses and burros and that horses and burros constantly graze while traversing large areas, occurrence within the ROW would be infrequent and dermal contact with or consumption of treated vegetation would be rare. If treated vegetation is consumed the herbicide concentrations would likely be diluted by the animals' consumption of ample non-treated vegetation and the toxicological effects would be rendered benign.

The indirect impacts of the proposed action on wild horses and burros could include reduction in forage quantity and diversity. However, undesirable plants are often unpalatable to horses and burros, and control or eradication of undesirable plants may allow more palatable native plants to reestablish. Over time, restoration of native vegetation would improve the quality of forage and improve the general habitat condition and function. Thus, the indirect impacts of the proposed action may have temporary adverse impacts on wild horse and burro habitat, but would likely improve the habitat over time and ultimately be beneficial to the animals.

Impacts from the No Action Alternative

Under the no action alternative, any herbicide treatment would occur only on a project-by-project basis. Due to a reduced amount of treatment, fewer direct impacts of herbicides on horses and burros would occur; however, existing undesirable vegetation within ADOT ROW could remain untreated. Undesirable plant species are often well adapted to the environments they invade allowing them to outcompete native vegetation. If left untreated undesirable vegetation currently located within the ADOT ROW would likely expand to surrounding areas affecting the sustainability, productivity, and health of BLM rangelands.

Additionally, undesirable vegetation often increases the overall vegetative mass within an area. Dried plant matter, specifically invasive grasses along roadsides, provide an excess of fuels and pose a serious fire hazard. Continued existence and spread of undesirable vegetation presents a threat of a potentially catastrophic wildfire within rangelands.

To protect wild horses and burros, refer to Section 5 for SOPs, conservation measures, and mitigation measures on herbicide application rates, techniques, location restrictions, and seasonal restrictions that apply to wild horses and burros.

3.3 Water Quality

3.3.1 Clean Water Act

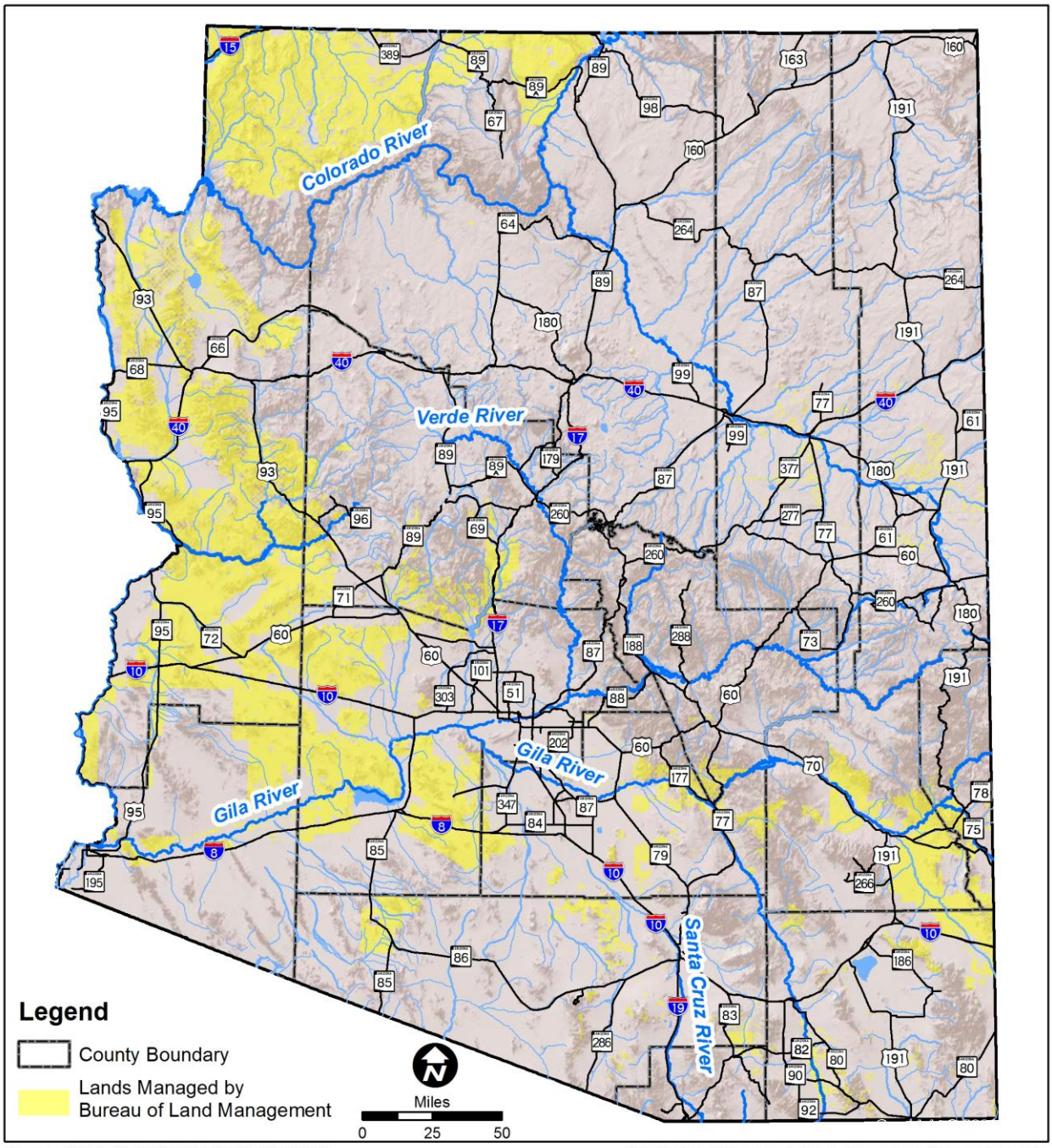
Background

The Clean Water Act (CWA) is the primary federal statute governing water quality within jurisdictional waters of the US. Waters of the US are defined in CFR 33 Part 328 as including watercourses susceptible for use in interstate or foreign commerce, intrastate waters susceptible to interstate commerce, impoundments of water, tributaries to waters of the US, territorial seas, and wetlands adjacent to waters of the US. Features that are not generally considered waters of the US include swales and erosional features such as gullies, rills, and small washes and non-connector ditches (including roadside ditches) excavated wholly in and draining only uplands. Section 404 of the CWA regulates the discharge of dredge or fill material into waters of the US, and authorizes the US Army Corps of Engineers (Corps) to issue permits regulating discharges of this nature. Section 401 of the CWA requires any applicant requesting a Section 404 permit to first obtain a Section 401 certification from the state in which the discharge originates. The Section 401 certification verifies the prospective permit complies with the state's applicable effluent limitations and water quality standards. The Section 404 permit is not issued until the Section 401 certification is obtained. The Arizona Department of Environmental Quality (ADEQ) administers water quality Section 401 certifications for activities in waters of the US on BLM-managed lands in Arizona.

Section 402 of the CWA formed the National Pollutant Discharge Elimination System (NPDES), which regulates pollutant discharges into waters of the US. In 2002, EPA authorized ADEQ to administer the NPDES program at the state level, called the Arizona Pollutant Discharge Elimination System (AZPDES). AZPDES permits authorize the discharge of pollutants into waters of the US under specified conditions. There are two types of AZPDES permits—individual permits that are tailored to a specific project and general permits that cover point sources from similar types of operations. 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 US 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 US for various activities including for weed, algae, and vegetation control.

Existing Conditions

There are approximately 90,373 miles of rivers, streams and washes within the state of Arizona. Approximately 94% of the water features are ephemeral or intermittent (Levick et al. 2008), with flows primarily occurring in response to major storm events. The major water features in Arizona are shown in Figure 3.3. Arid regions, such as much of the state of Arizona, lack highly developed soils due to the low annual precipitation levels, sparse upland vegetation, and sandy parent material providing conditions for flows to infiltrate more rapidly along drainages.



Source: ADOT ATIS (2010); BLM (2013); ESRI (2013)

Map Disclaimer: This map is intended for general siting purposes only.

Figure 3.3. Major Water Features.

Vegetation is often more abundant around stream systems, including ephemeral and intermittent drainages, due to a greater availability of groundwater where storm flows have infiltrated the stream bed.

ADOT's roadway network is bisected by waters of the US across the state, and the transportation system includes structural features such as culverts and stormwater channels that allow both perennial flowing streams and ephemeral storm flows to pass under the roadway and/or through the ADOT ROW. Undesirable vegetation has a greater chance of propagation in the vicinity of drainage systems dissecting the ADOT ROW given the greater availability of surface and groundwater in comparison to the surrounding uplands, and the potential for seed transport along the disturbed roadway corridor. Thus, ADOT currently applies herbicides in accordance with the AZPDES PGP to control undesirable vegetation over and near waters of the US within the ADOT ROW.

Impacts from the Proposed Action Alternative

The application of herbicides is unlikely to result in the discharge of dredge or fill material into waters of the US. Thus, a CWA Section 404 permit and Section 401 certification would not be applicable. However, following the procedures in the CWA Section 402 AZPDES PGP would be required under the proposed action. ADOT would continue to apply herbicides in and near waters of the US on BLM-managed lands in accordance with the AZPDES PGP.

Application of herbicides would not directly affect water quantity. Generally, the proposed action would have negligible, short-term, adverse impacts to water quality due to temporary surface collection of herbicidal residues and reduced vegetation causing temporary increases in erosion. Surface water could be affected by off-site movement of herbicides if runoff, leaching, drift, or misapplication/spills occur where specific site conditions such as soils with high adsorption are conducive to contamination. Groundwater could also be affected by leaching in areas conducive to high soil adsorption. However, as previously discussed, ADOT would follow the AZPDES PGP which requires minimization of discharges resulting from the application of pesticides to control weeds, algae, and vegetation, and requires all permittees to control discharges to meet surface water-quality standards.

The reduction of undesirable vegetation would lead to natural restoration of native plant communities. This would have positive effects on soil nutrient availability and cycling, water availability to native plants, and decreased soil erosion. Overall, the alternative will have negligible, short-term, adverse impacts, and long-term, beneficial impacts on the water quantity and quality.

Impacts from the No Action Alternative

Proliferation of undesirable vegetation can have long-term impacts to water quantity and quality when compared to areas containing native vegetation. For example, during dry, pre-monsoon periods, undesirable vegetation such as buffelgrass may be more susceptible to fire. Burned areas, particularly adjacent to waterways, are susceptible to major soil erosion, which can introduce heavy loads of sediment in watercourses.

3.3.2 Wetlands/Riparian Zones

Background

EO 11990, Protection of Wetlands, requires federal actions to conduct an evaluation of effects to wetlands and to minimize impacts to wetlands. Wetlands and riparian zones are an important natural resource that provide rare and rich wildlife habitat, serve as erosion-control buffers against heavy flows, and filter sediments from water thereby providing a cleansing mechanism increasing water quality.

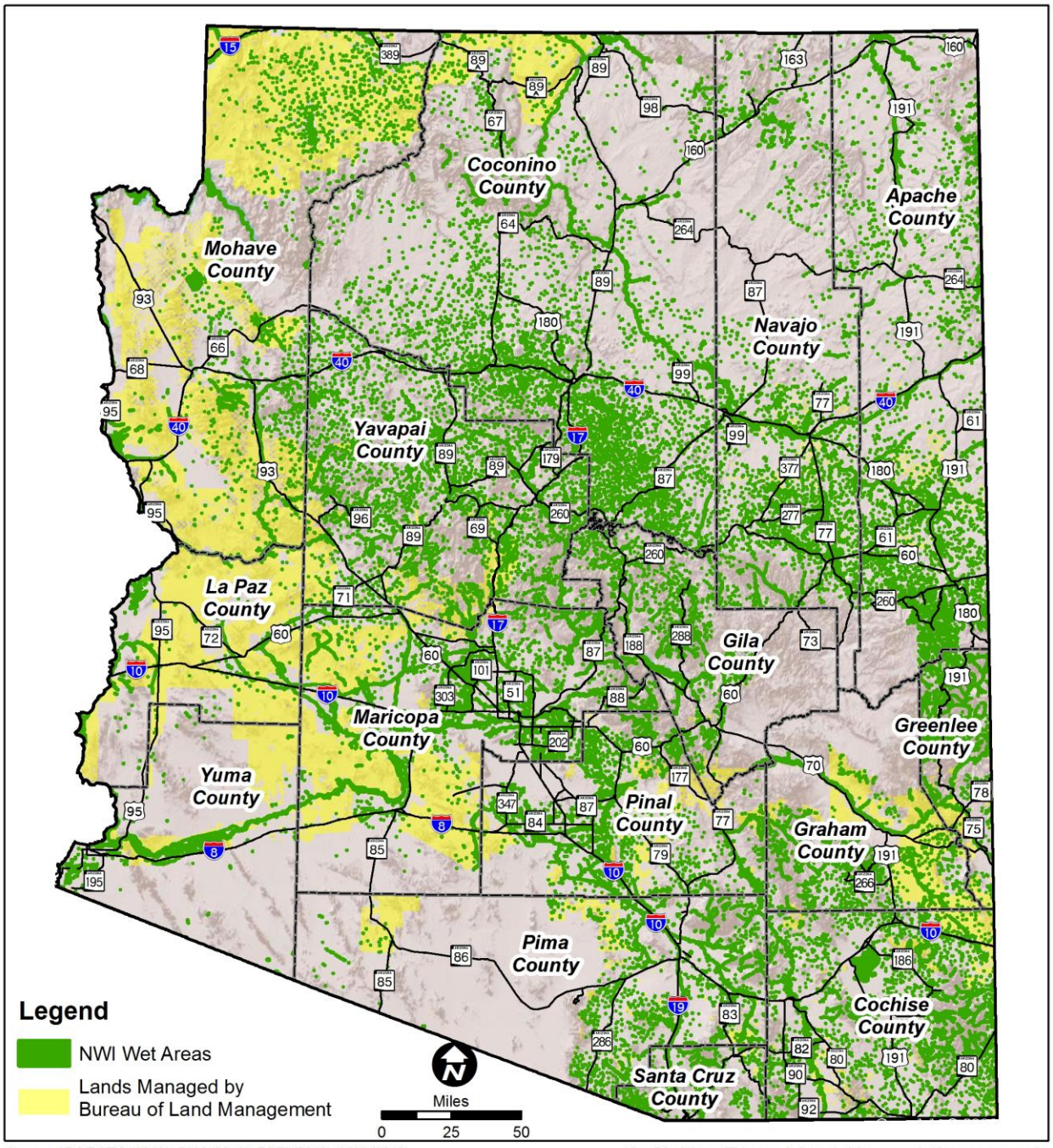
Existing Conditions

Riparian and wetland areas are fairly scarce in Arizona as these vegetation zones depend on perennial or semi-perennial water sources to thrive. Approximately 6% of the drainage systems in Arizona are perennial or semi-perennial providing conditions for potential wetlands and riparian vegetation to be present. The National Wetlands Inventory Program (NWI) produced by the USFWS is a nationwide inventory of US wetlands to provide its biologists and others with information on the distribution of wetlands to aid in wetland conservation efforts. The NWI wetland data is derived from aerial photography that varies greatly in scale, resolution, and time of acquisition. Thus, the wetland mapping available may differ in size and composition from the actual ground conditions. The NWI potential wetland areas within Arizona are shown in Figure 3-4.

The following chemicals are approved for use in aquatic systems by the EPA, including wetlands and riparian areas. Two of these chemicals (diquat and fluridone) are newly proposed for use on public lands: 2,4-D; diquat; fluridone; glyphosate; imazapyr; and triclopyr.

Impacts from the Proposed Action Alternative

Application of herbicides near waterways with wetland and riparian vegetation would not directly modify water quantity. However, water quantity could temporarily increase if the application of herbicides to remove unwanted aquatic vegetation reduced plant uptake of water, thereby increasing the amount of available water. Most aquatic herbicides are non-selective and could cause adverse impacts to non-target wetland and riparian species directly impacting individual plants. However, these native plants would have the opportunity to reestablish and could propagate in the place of undesirable vegetation as well. Impacts to wetlands from the upland application of herbicides that are not permitted for use in wetlands would be reduced through the use of SOPs, best management practices (BMP), and mitigation measures. Use of herbicides to control undesirable aquatic and riparian vegetation can improve habitat quality for fish and wildlife by providing natural habitat, improves hydrologic function by replacing undesirable vegetation with native species, and reduces soil erosion caused by fire-attractive undesirable vegetation. Overall, treatment of undesirable vegetation within ADOT ROW would be beneficial to the health and function of wetlands, as these species are replaced with native species and fish and wildlife habitat are improved.



Source: ADOT ATIS (2010); BLM (2013); ESRI (2013); NWI (2013)

Map Disclaimer: This map is intended for general siting purposes only.

Figure 3.4. Potential Wetland Areas.

Impacts from the No Action Alternative

Because herbicide treatments within ADOT ROW would occur on a project-by-project basis the risk of damage to individual wetland and riparian plants due to incidental application to non-target species would most likely be less than the proposed action alternative. This is due to the reduced area of treatment under the no action alternative. The benefits on the overall health of wetlands and riparian areas would be less than under the proposed action as the amount of undesirable vegetation replaced with natives would be smaller, threats of wildfire due to undesirable vegetation would likely still exist within wetland and riparian areas, and fish and wildlife habitat would not be improved.

3.3.3 Wild and Scenic Rivers

Background

The National Wild and Scenic Rivers System was created by Congress in 1968 (P.L. 90-542; 16 USC 1271 et seq.) to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. Rivers are classified as Wild, Scenic, or Recreational as follows:

Wild River Areas – Those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America.

Scenic River Areas – Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.

Recreational River Areas – Those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

Regardless of classification, each river in the national system is administered with the goal of protecting and enhancing the values that caused it to be designated.

Existing Conditions

There are approximately 90,373 miles of rivers, streams, and washes within the state of Arizona, of which 57.3 miles are designated as wild and scenic. These stream miles are located on the Verde River and Fossil Creek, which are on lands managed by the USFS and are not on BLM managed lands.

The BLM has identified potential additions to the National Wild and Scenic Rivers System through resource and management plans. The *Final Arizona Statewide Wild and Scenic Rivers Legislative Environmental Impact Statement* (BLM 1994) recommended 29 river segments in 14 river study areas as suitable for designation as Wild, Scenic, or Recreational (Figure 3.5).

Impacts from the Proposed Action Alternative

The proposed action would result in removal of undesirable vegetation that may threaten proper hydrologic and vegetative function of river and streams throughout Arizona. Direct impacts to existing designated Wild and Scenic Rivers would not occur as none are present in ADOT ROW through BLM-managed lands. ADOT roadways typically cross linear water features like rivers and washes at a perpendicular angle; therefore, the amount of area where ADOT ROW would intersect suitable areas for potential Wild and Scenic Rivers on BLM-managed lands is minute. The application of herbicide to remove undesirable vegetation from areas near potential Wild and Scenic Rivers would not change the river's outstandingly remarkable values or hinder them from being classified as Wild and Scenic Rivers in the future.

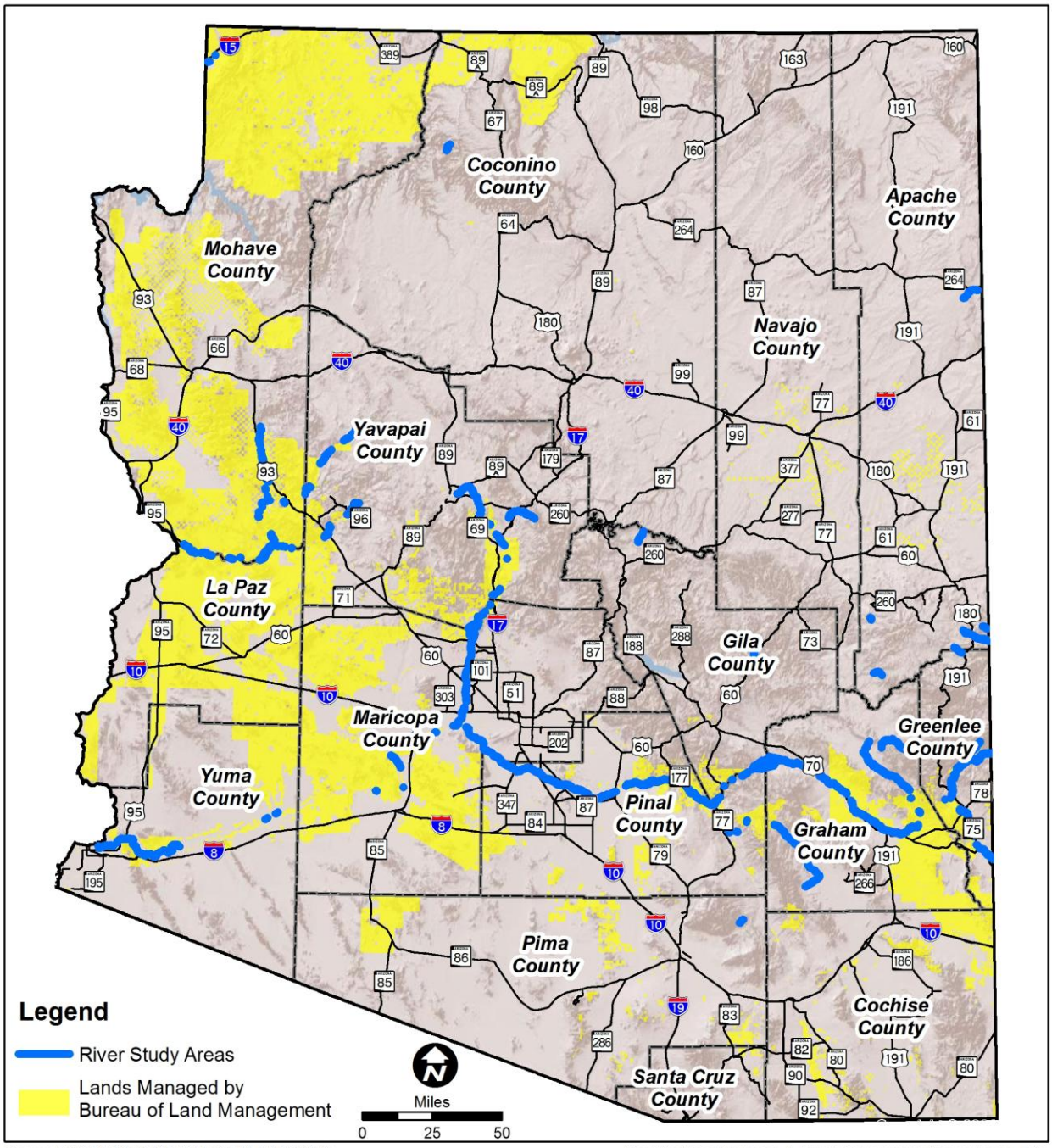
Impacts from the No Action Alternative

There would not be any adverse direct impacts to existing designated Wild and Scenic Rivers areas under this alternative. However, the potential for infestation of undesirable vegetation and the associated threats to wildlife, wildfire, and water quality would persist in and around rivers on BLM-managed lands that are identified as future candidates for the Wild and Scenic Rivers designation.

Table 3.2. BLM River Study Areas and Outstandingly Remarkable Values.

River Study Area	Scenic	Recreation	Fish and Wildlife Habitat	Cultural and Historic	Geologic	Hydrologic
Agua Fria River	X		X	X		
Aravaipa Creek		X	X			
Big Sandy River	X		X			
Bill Williams River	X	X	X			
Bonita Creek			X	X		
Burro Creek	X	X	X	X		
Cienega Creek			X			
Gila Box / Gila River	X	X	X	X	X	X
Gila Box / Lower San Francisco River	X	X	X	X	X	X
Middle Gila River	X		X			
Paria River	X	X	X	X	X	
Santa Maria River	X		X			
Virgin River	X	X	X			

Source: BLM (1994)



Source: ADOT ATIS (2010); BLM (2013); ESRI (2013)

Map Disclaimer: This map is intended for general siting purposes only.

Figure 3.5. BLM River Study Areas.

3.3.4 Groundwater Resources

Background

Generally, water below the earth's surface but commonly applied to water in fully saturated soils and geologic formations (ADWR 2014). Contamination of groundwater occurs when unwanted substances move through fractures or the soil profile to the saturated zone.

Pesticides that enter groundwater can come from either point sources or from non-point sources. Point sources are usually fixed discharges or other discrete sources such as pipes, tanks, mixing/loading sites at wellheads, containers, or spills. Non-point sources are broad, undefined areas in which pesticide residues are present such as agricultural fields.

Leaching is the movement of pesticides through the soil profile into the aquifer. The amount of leaching that could occur from treatment or a spill depends, in part, on the chemical and physical properties of the pesticide as well as soil factors including texture, organic matter and soil permeability.

The EPA's Sole Source Aquifer (SSA) Program was established under Section 1424(e) of the Safe Drinking Water Act (SDWA.) Since 1977, it has been used by communities to help prevent contamination of groundwater from federally funded projects. It has increased public awareness of the vulnerability of groundwater resources. The SSA program allows for EPA environmental review of any project which is financially assisted by federal grants or federal loan guarantees. These projects are evaluated to determine whether they have the potential to contaminate a sole source aquifer.

Existing Conditions

In Arizona, groundwater is the primary source of freshwater for drinking water supplies. About 43 percent of the state's water use comes from groundwater sources (ADWR 2014). Groundwater is also utilized extensively for agricultural and industrial uses.

In Arizona, two Sole Source Aquifers have been designated. They are the Upper Santa Cruz and Avra Basin SSA in the City Tucson and surrounding areas and the Naco Bisbee SSA in southeastern Arizona. There are areas in both SSAs where ADOT ROW occurs on BLM-managed lands.

Impacts from the Proposed Action Alternative

In general, herbicides approved for aquatic use have a low potential for leaching into groundwater as these substances bind with soil particles readily. Terrestrial use herbicides have a higher potential to leach into groundwater as many substances remain suspended in water and do not bind to soils. Adherence to SOPs, BMPs, and product labels regarding chemical selection and utilizing appropriate buffer areas from surface waters would prevent leaching from non-point sources to groundwater. Adherence to SOPs, BMPs, and product labels regarding mixing and storage would prevent many incidences that could result in contamination due to point sources.

Federally funded projects under the FAHP which occur within SSA boundaries would be evaluated in accordance with the current EPA/FHWA Memorandum of Understanding regarding SSA review pursuant to Section 1424(e) of the Safe Drinking Water Act. Areas to be treated by ADOT under state-funded annual treatment plans would not be subject to EPA review.

Impacts from the No Action Alternative

There would be no impacts to groundwater resources under the No Action Alternative.

3.4 Land Management

3.4.1 Wilderness Areas

Background

In 1964 Congress passed the Wilderness Act (P.L. 88-577 (16 USC 1131-1136), which established the National Wilderness Preservation System. As defined in this act, wilderness areas are "areas of undeveloped federal land retaining its primeval character and influence, without permanent improvements or human habitation, which is protected and managed so as to preserve its natural conditions and which (1) generally appears to have been affected primarily by the forces of nature, with the imprint of man's work substantially unnoticeable; (2) has outstanding opportunities for solitude or a primitive and unconfined type of recreation; (3) has at least five thousand acres of land or is of sufficient size as to make practicable its preservation and use in an unimpaired condition; and (4) may also contain ecological, geological, or other features of scientific, educational, scenic, or historical value."

Existing Conditions

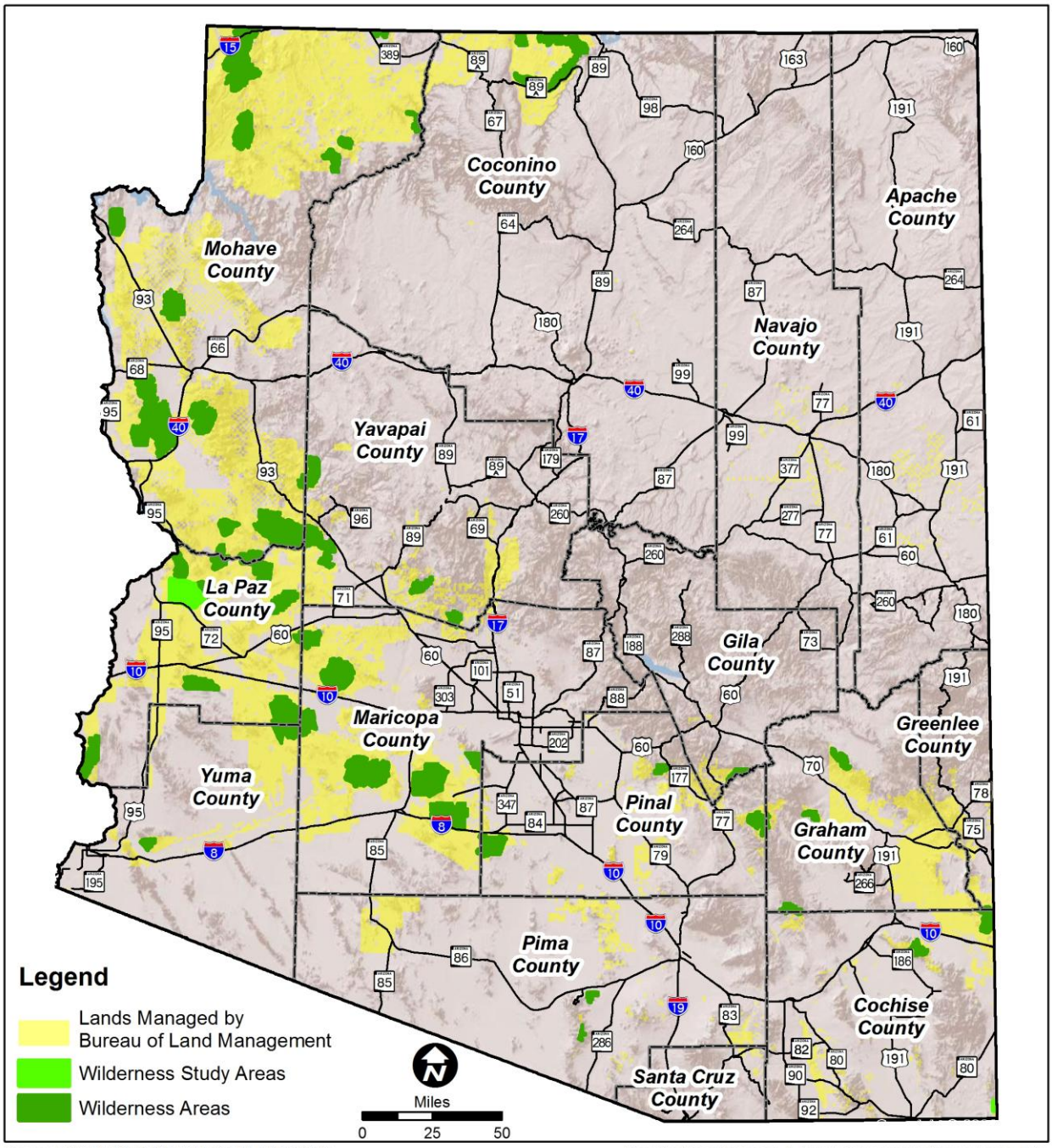
The Arizona BLM is responsible for 47 wilderness areas totaling 1.4 million acres (Figure 3.6). Congress established these areas through the Arizona Wilderness Act of 1984 and the Arizona Desert Wilderness Act of 1990. ADOT facilities do not traverse any wilderness areas; however, 11 of the 47 wilderness areas are located within one mile of ADOT managed roads.

Impacts from the Proposed Action Alternative

ADOT would not treat any area designated as wilderness since these areas are outside ADOT-managed ROW. Treatment of ADOT ROW would benefit designated wilderness areas since the spread of invasive species from roadway ROW could occur from seed transport. Additionally, the risk of fire spreading from ADOT ROW to wilderness areas would be reduced through treatment of the ROW.

Impacts from the No Action Alternative

The no action alternative would have no direct impacts on wilderness areas. The risk of seed transport and infestation of these areas would continue to be a threat. Additionally, the risk of wildfire also would be a continued threat.



Source: ADOT ATIS (2010); BLM (2013); ESRI (2013)

Map Disclaimer: This map is intended for general siting purposes only.

Figure 3.6. BLM Wilderness Areas.

3.4.2 Areas of Critical Environmental Concern

Background

Areas of Critical of Environmental Concern (ACEC) are special management areas designated by the BLM to protect significant historic, cultural, or scenic values; fish and wildlife resources; natural process or systems; and/or natural hazards that:

- Have more than locally significant qualities that give it special worth, consequence, meaning, distinctiveness, or cause for concern, especially compared to any similar resources.
- Have qualities or circumstances that make it fragile, sensitive, rare, irreplaceable, exemplary, unique, endangered, threatened, or vulnerable to adverse changes.
- Have been recognized as warranting protection to satisfy national priority concerns or to carry out the mandates of the FLMPA.
- Have qualities that warrant highlighting to satisfy public or management concerns about safety and public welfare; and/or poses a significant threat to human life and safety or to property.

Existing Conditions

Within Arizona, there are 59 ACECs. Of these 22 are located within one mile of an ADOT roadway (Figure 3.7).

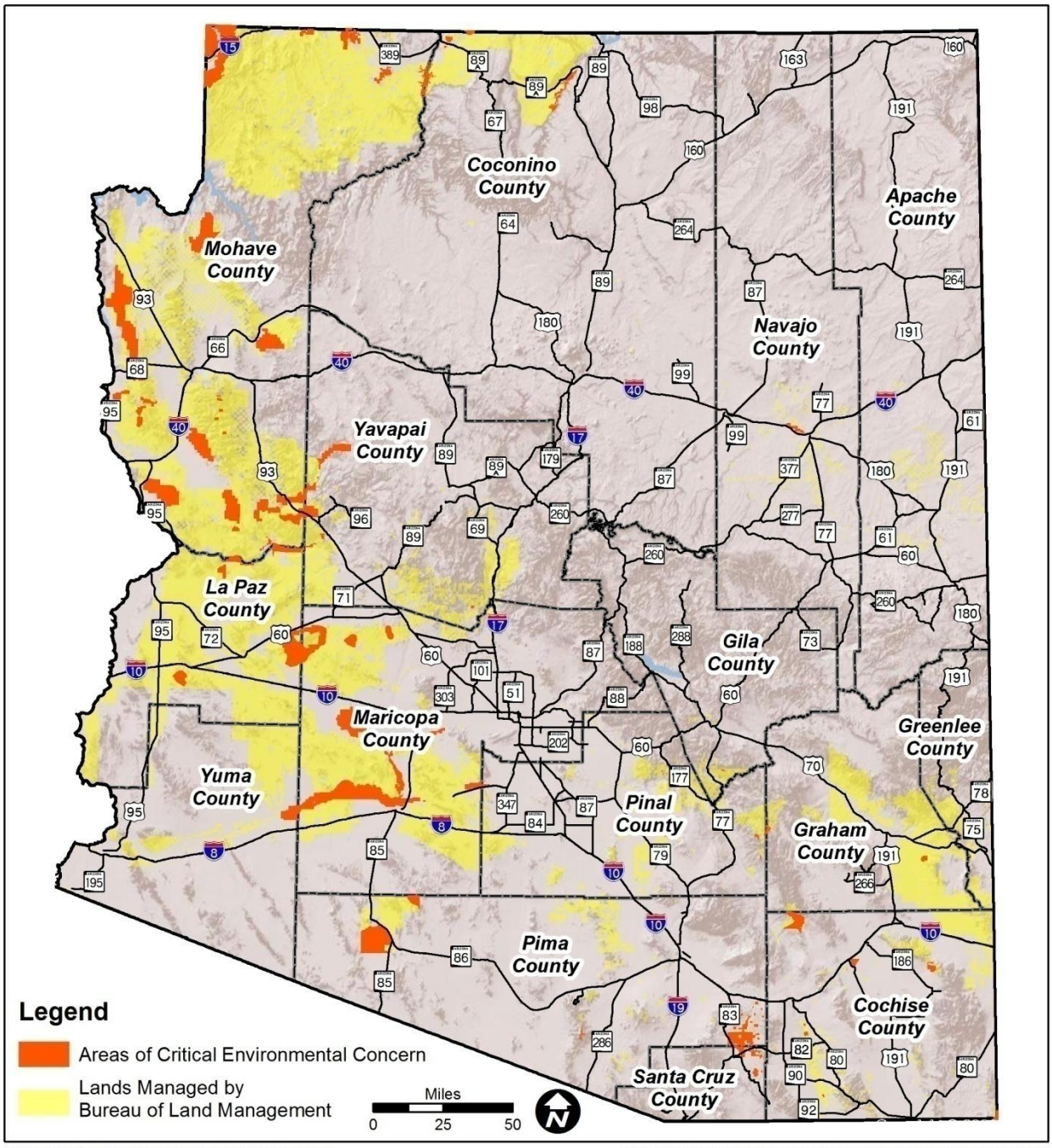
Impacts from the Proposed Action Alternative

Eradication, removal, or control of invasive species and noxious weeds is consistent with the goals and objectives of ACEC areas. Mitigation measures included for the protection of listed species, water quality, and cultural resources would ensure the protection of those resources for which the ACECs were established.

Treatment of ADOT ROW would benefit ACEC areas since the spread of invasive species from roadway ROW could occur from seed transport. Additionally, the risk of fire spreading from ADOT ROW to ACEC areas would be reduced through treatment of the ROW.

Impacts from the No Action Alternative

The no action alternative would have no direct impacts on ACEC areas. The risk of seed transport and infestation of these areas would continue to be a threat. Additionally, the risk of wildfire would also be a continued threat.



Source: ADOT ATIS (2010); BLM (2014); ESRI (2014)

Map Disclaimer: This map is intended for general siting purposes only.

Figure 3.7. Areas of Critical Environmental Concern.

3.4.3 National Monuments

Background

The Antiquities Act of 1906 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. Since 1906 the President and Congress have created more than 100 national monuments.

Existing Conditions

Within Arizona, there are five designated national monuments (Table 3-4 and Figure 3.8). All but the Ironwood National Monument are crossed by ADOT-managed roadways.

Table 3.3. National Monuments in Arizona.

Name	Size	Resources
Agua Fria National Monument	71,000 acres	450 prehistoric sites from the pueblo cultures dating from A.D. 1250 to 1450
Grand Canyon-Parashant National Monument	1,000,000 acres	Valuable geological resources are located within the monument boundaries, including relatively undeformed and unobscured Paleozoic and Mesozoic sedimentary rock layers and abundant fossils, which offer a clear view of the geologic history of the Colorado Plateau
Sonoran Desert National Monument	500,000 acres	Untrammeled desert landscape, presenting an extraordinary array of biological, scientific, and historic resources within a functioning desert ecosystem
Vermilion Cliffs National Monument	300,000 acres	The Vermilion Cliffs rise 3,000 feet above the Paria Plateau to form a spectacular sandstone-capped escarpment underlain by multicolored, actively eroding layers of shale and sandstone
Ironwood Forest National Monument	130,000 acres	Quintessential views of the Sonoran Desert's ancient legume and cactus forests

BLM, 2013

Impacts from the Proposed Action Alternative

Eradication, removal, or control of invasive species and noxious weeds is consistent with the goals and objectives in the management of national monuments. Mitigation measures included for the protection of listed species, water quality, and cultural resources would ensure the protection of these resources in the monuments.

Treatment of ADOT ROW would benefit national monuments since the spread of invasive species from roadway ROW could occur from seed transport. Additionally, the risk of fire

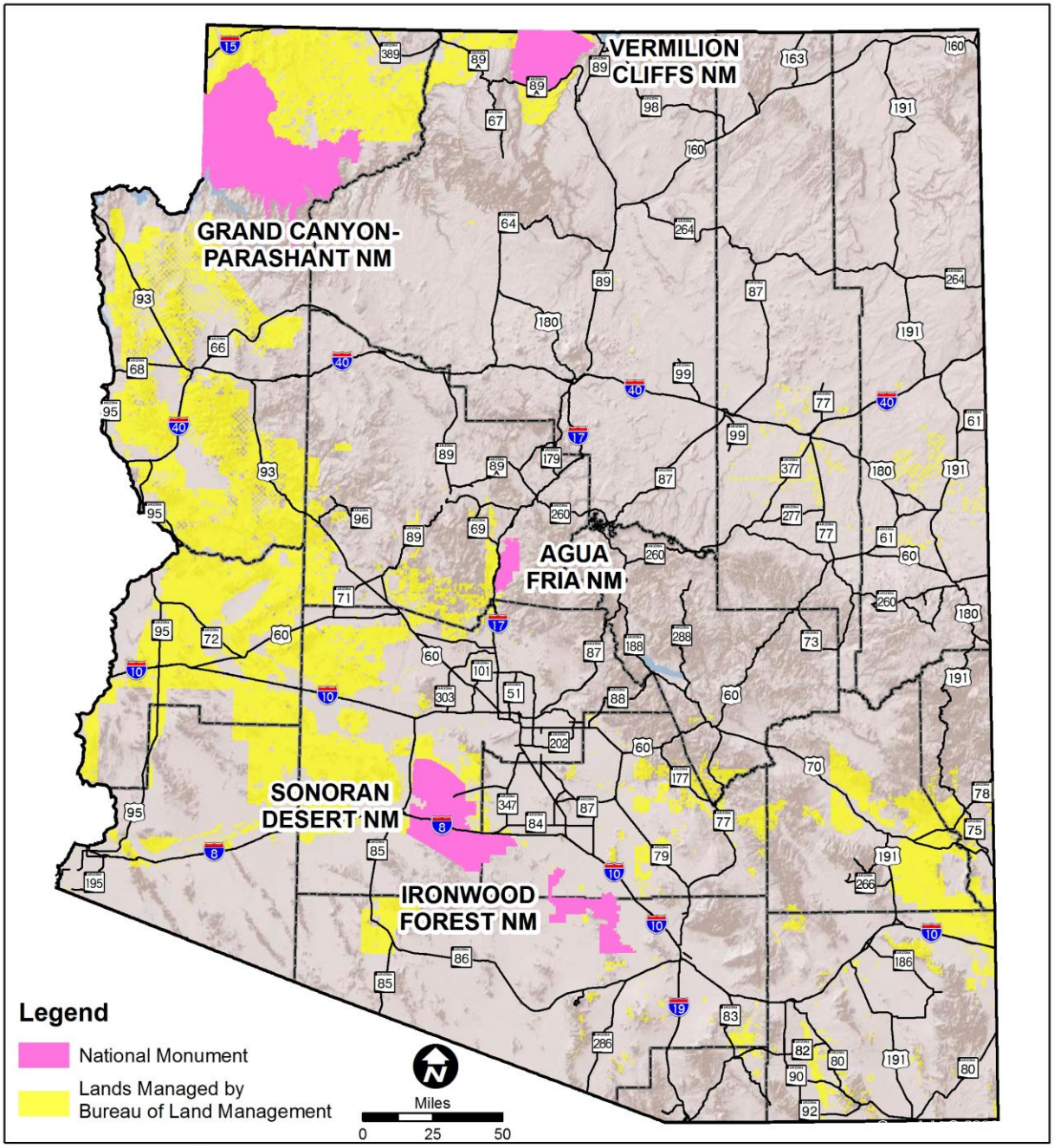


Figure 3.8. National Monuments.

spreading from ADOT ROW into national monuments areas would be reduced through treatment of the ROW.

Impacts from the No Action Alternative

The no action alternative would have no direct impacts on national monuments. The risk of seed transport and infestation of these areas would continue to be a threat. Additionally, the risk of wildfire would also be a continued threat.

3.5 Recreation

3.5.1 Background

Public lands provide visitors with a wide range of recreational opportunities including, but not limited to, hunting, fishing, camping, hiking, boating, off-road driving, mountain biking, birding, viewing scenery, and visiting natural and cultural heritage sites. In addition to the recreational opportunities afforded the public by wilderness and other special areas discussed earlier, the BLM administers 205,498 miles of fishable streams; 2.2 million acres of lakes and reservoirs; 6,600 miles of floatable rivers; over 500 boating access points; 300 Watchable Wildlife sites; 55 National Back Country Byways; 5,500 miles of National Scenic, Historic, and Recreational Trails; and thousands of miles of multiple-use trails used by motorcyclists, hikers, equestrians, and mountain bikers (BLM 2006).

The BLM's long-term goal is to provide opportunities to the public for environmentally responsible recreation.

3.5.2 Existing Conditions

Recreation activities on BLM-managed lands are described in the RMPs and through rules and regulations. Generally there would be little recreational use of ADOT managed ROW on BLM-managed lands beyond the roadway surface that would be used for scenic driving or bicycling. Recreational activities can bring noxious and invasive weeds into roadside areas on vehicles that have picked up seed in other areas.

3.5.3 Impacts from the Proposed Action Alternative

The use of herbicides in developed or designated recreation areas is of particular concern because these areas are more frequently visited by the public. These areas are more susceptible to invasive species and noxious weeds due to increase vehicular traffic that are a vector for seed dispersal.

Several BLM designated scenic drives occur on ADOT managed roadways. The reduction of weed and invasive species along these roadways would improve the visual character and scenic quality and would provide a more pleasurable experience for travelers.

3.5.4 Impacts from the No Action Alternative

Degradation of visual quality along ADOT managed ROW would result from the no action alternative.

3.6 Fuels/Fire Management

3.6.1 Background

The BLM is responsible for fire management on 12.2 million acres of public lands across Arizona. The primary directive of the fire program is to provide for public and fire fighter safety. Other emphasis areas for the BLM fire program in Arizona include conducting hazardous fuels projects in the highest risk and highest priority areas and interagency cooperation.

3.6.2 Existing Conditions

The increased amount of fine fuels alongside highways and roads coupled with the high amount of ignition sources in the form of vehicle traffic has led to 5,707 road side fires between 1980 and 2012. Roadside fires threaten life and property due to reduced visibility caused by smoke, puts fire fighters at an increased due to traffic, increases risk to the public due to delays during summer months, and disrupts interstate commerce due to road closures.

Buffelgrass (*Pennisetum ciliare*), a common grass planted for cattle forage in Mexico and southern Arizona; fountain grass (*Pennisetum setaceum*); and Bermuda grass (*Cynadon dactylon*) escaped landscape plantings and now present a fire hazard on road shoulders and surrounding natural areas. In addition, invasive annual grasses like wild oats (*Avena fatua*) and red brome (*Bromus rubens*) pose an extreme fire hazard in the Sonoran Desert when they infest roadsides. Highway travelers can cause these grasses to ignite through a variety of sources and create a wildfire in a habitat unaccustomed to the effects of fire. These fires cause severe damage to the native Sonoran Desert flora and fauna. Sonoran flora lack fire-adapted characteristics and recovery of species such as the saguaro (*Carnegiea gigantea*) and palo verdes is rare. The extreme fire danger due to invasive species is not limited to the Sonoran Desert, but also exists in many areas throughout the state.

3.6.3 Impacts from the Proposed Action Alternative

Under the proposed action the reduction in the amount and continuity of fine fuels would reduce the number of wildfires occurring within ROWs. The reduction in wildfires along ROWs would decrease the risk to life and property and increase public and firefighter welfare and safety.

3.6.4 Impacts from the No Action Alternative

Under the no action alternative the frequency to a wildfire in ROW's would remain unchanged. As a result the risk to life and property and public and firefighter safety would remain unchanged from the current condition.

3.7 Human Health and Safety

3.7.1 Background

Several federal laws govern herbicide use in the US. The Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) established procedures for the registration, classification, and regulation of all herbicides and pesticides. Before any herbicide may be sold legally, the EPA must register it. The EPA may classify an herbicide for general use if it determines that the substance is not likely to cause unreasonable negative effects to applicators or the environment. Alternatively a substance may be classified for restricted use if it must be applied by a certified applicator and in accordance with other restrictions.

Herbicides are comprised of both active and inert ingredients. Active ingredients are those chemicals that target or control the undesirable vegetation. Inert ingredients are those additional components that may help in the application of the active ingredient but may not focus on controlling the plant. The EPA has identified about 1,200 inert ingredients that are used in registered herbicides. These ingredients are reviewed for their effects on human health. This includes the review of existing laboratory studies, epidemiological studies, and activity and structure relationships. EPA categorized inert ingredients into one of four categories (EPA 1987):

Level 1 includes inert ingredients of toxicological concern.

Level 2 inert ingredients are potentially toxic and considered of high priority for further testing.

Level 3 inert ingredients are considered of "unknown toxicity." For these chemicals, the data is insufficient to classify them at a higher level or at a lower level of concern. It must be understood, however, that the chemicals on this list do have some toxicity information, but EPA has not made a decision as to their classification. A number of chemicals on this list are also used in commonly sold consumer products without incident (Felsot 2000). Level 3 inert ingredients that may be used in herbicide formulations include borax, carbon dioxide, castor oil, jojoba bean oil, orange oil, and coconut oil soap. Bear in mind that inclusion of a chemical on the Level 3 list does not mean the chemical is hazardous when it would be used in a prudent manner.

Level 4 inert ingredients are regarded by the EPA as being generally innocuous. Thus, the EPA indicates there should be no concern relative to adverse effects on public health or the environment when Level 4 compounds are used in herbicide formulations.

The BLM has conducted risk assessments on the herbicides proposed for use which supplement the EPA chemical registration process (BLM 1991, 2005; 2007; ESNR 2005;, USFS 1992; 2005). These assessments review available research and information on herbicides and then apply this information to conditions that will likely occur during application as well as conditions users may encounter on treated areas.

3.7.2 Impacts from the Proposed Action Alternative

All the herbicides evaluated in the proposed action are registered with the EPA, and all applicators that apply them on public lands (i.e., certified applicators) must comply with the herbicide label rates, uses, and handling instructions. No Level 1 or 2 inert ingredients as defined by the EPA would be used.

The use of herbicides involves potential risk or the perception of risk to workers and the general public. As part of the PEIS (BLM 2007), a Human Health Risk Assessment was prepared to evaluate the risk of harm to both workers applying the herbicides as well as various types of general public using the treated areas for a variety of purposes.

Based on the risk assessment conducted by the BLM as part of the PEIS, no toxic effects to public health are expected from the herbicides being considered for use. Routes and duration of exposure are important factors determining effect of toxins to human health. Exposure to the public would mainly come from skin contact with sprayed vegetation and, to a lesser extent, from consumption of sprayed vegetation and sprayed water. The chances of these exposures are low since individuals using roadways do not stop where spraying operations are being done. Importantly, herbicide labeling requires low application rates for ROWs. In addition, the target for spraying is the hazardous vegetation, invasive plants, and noxious weeds and not native vegetation. Thus, potential exposure levels to the general public — those who might have dermal contact with a dilute concentration of a small quantity of herbicide — would be well below the threshold of concern.

With respect to the herbicides identified for potential use, none pose a risk to public health for systemic or reproductive effects. None of the herbicides were found to pose greater than 1 in 1 million cancer risk. The risk assessment indicates all of the herbicides analyzed show little tendency for bioaccumulation, and the small amounts that could be absorbed through the skin are readily and completely eliminated from the body (Felsot 2000).

3.7.3 Impacts from the No Action Alternative

There could be increased human health consequences to taking a no action approach. The potential for public injury would come from accidents related to reduced sight distances and objects in the recovery area. These problems could make this alternative a greater threat to human health than the use of herbicides.

3.8 Soils

3.8.1 Background

Soil refers to the loose material composed of weathered rock and other minerals and partly decayed organic matter that covers large parts of land surfaces. Soil provides habitats for a great variety of organisms, functions as an essential component of terrestrial ecosystems, and is the essential medium for plant growth (Wild 1993). Healthy soil is fundamental to high functioning ecosystems, contains a diverse, thriving community of organisms, and functions to protect down gradient ecosystems by functioning as a physical and biological filter of chemicals in the environment.

Noxious weeds and other invasive vegetation can impact soil function. The amount of moisture in the soil can be altered if infiltration is reduced and runoff is increased on sites dominated by weeds (Lacey et al. 1989). Many noxious and invasive weeds have relatively sparse canopies, which allow for greater evaporation from the exposed soil than dense vegetative cover. Sites infested with weeds often have more extreme soil temperatures that can alter soil moisture regimes. Noxious and invasive weeds may alter soil nutrient availability for native species, alter the soil microbial community (e.g., soil fungi and bacteria), and slow the rate of natural plant succession (Olson 1999).

3.8.2 Existing Conditions

Information on the soils found within ADOT ROWs can be obtained through review of soil surveys conducted by the Natural Resource Conservation Service (NRCS). These can be accessed online at: http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm.

3.8.3 Impacts from the Proposed Action Alternative

Herbicide applications inevitably result in contact with soils, either intentionally for systemic treatments, or unintentionally as spills, overspray, spray drift, or windblown dust. In addition to direct application, transmission to soil may occur when an herbicide is transported through the plant from sprayed aboveground portions to roots, where it may be released into soil. Also, some herbicides remain active in plant tissue and can be released into the soil during plant decay and result in residual herbicide activity.

The use of herbicides would have both beneficial and adverse effects to soil. Of the herbicides approved by the BLM for use, chlorsulfuron, picloram, and tebuthiuron are persistent in soil for a year or more, while glyphosate and 2,4-D are relatively non-persistent in soil. None of these herbicides appears to result in severe adverse impacts to soil. 2,4-D, glyphosate, picloram, tebuthiuron, and other herbicides approved for use by the BLM could benefit soil by removing invasive species and other unwanted vegetation and allowing restoration of native vegetation.

3.8.4 Impacts from the No Action Alternative

Without the use of herbicides, it is likely that undesirable vegetation would continue to rapidly spread, resulting in dramatic and potentially irreversible effects on soil quality through changes in organic matter content, diversity and abundance of soil organisms, and nutrient and water availability. As discussed above, weeds and other undesirable vegetation can outcompete native vegetation and lead to widespread incidence of fire and other conditions that can result in increased rates of soil erosion and loss of soil productivity. Other treatment methods, including use of fire, machinery, and livestock can remove vegetation, but also disturb soil, leading to soil erosion and loss of soil quality. While the treatment of ADOT ROW would continue on a project-by-project basis, the amount of area that would benefit from treatment would be smaller under this alternative.

3.9 Visual Quality

3.9.1 Background

Visual resource inventories are performed and Visual Resource Management (VRM) classes are identified for public lands within BLM jurisdiction during the preparation of the RMPs.

There are three primary components to a visual resource inventory:

- Scenic quality evaluation
- Sensitivity level analysis
- Delineation of distance zones

Based on these three components, BLM-administered lands are placed into one of four Visual Resource Inventory Classes that represent the relative value of the visual resources. Classes I and II are the most valued, Class III represents a moderate value, and Class IV represents the least value.

- **Class I Objective:** To preserve the existing character of the landscape; the level of change to the characteristic landscape should be very low and must not attract attention
- **Class II Objective:** To retain the existing character of the landscape; the level of change to the characteristic landscape should be low
- **Class III Objective:** To partially retain the existing character of the landscape; the level of change to the characteristic landscape should be moderate

- **Class IV Objective:** To provide for management activities that require major modification of the existing character of the landscape; the level of change to the characteristic landscape can be high

Class I is generally assigned to special areas such as a national wilderness and other congressionally and administratively designated areas where decisions have been made to preserve a natural landscape. Without the special area designation, it is not possible for lands to rate as Class I through the inventory process.

VRM classes are assigned for all BLM-administered lands through the RMP process. The assignment of visual management classes is ultimately based on the management decisions made in RMPs, which must take into consideration the value of visual resources. During the RMP process, inventory class boundaries can be adjusted as necessary to reflect resource allocation decisions made in RMPs.

3.9.2 Existing Conditions

In general, roadway ROWs are classified as having an objective of Class III or IV. The scenic character the ADOT ROW is almost exclusively natural or rural but does vary greatly in scenic quality depending on topography and vegetation type.

3.9.3 Impacts from the Proposed Action Alternative

The proposed action would result in long-term positive impacts on visual resources as natural vegetation communities and landscapes are restored. The removal of undesirable vegetation would affect the visual qualities of treatment sites in the short-term by creating openings and other vegetation-free areas that provide a noticeable contrast to the surrounding areas. In addition, the use of herbicides could create visually distinct areas of discolored vegetation (i.e., areas where herbicides have killed vegetation), which could contrast markedly from surrounding areas of green vegetation.

Over the long term, vegetation treatments would likely improve visual resources on public lands. Treatments that aim to rehabilitate degraded ecosystems, if successful, would result in plant communities that are dominated by native species. Native-dominated communities tend to be more visually appealing than plant communities that have been overtaken by weeds.

3.9.4 Impacts from the No Action Alternative

This alternative could have major adverse, long-term impacts on aesthetic and visual resources. Reduced treatment of undesirable vegetation would result the increased displacement of native vegetation. The increased potential for removal of native vegetation by the threat of fire would continue to exist in many areas. Fire events would destroy the native habitat, and unwanted plants would replace the natural ecosystem.

3.10 Paleontological Resources

3.10.1 Background

Definitions and Applicable Regulations

Paleontological resources are any fossilized remains, traces, or imprints of organisms preserved in the Earth's crust. Fossils can be teeth, bones, shells, leaves, wood, or tracks that were buried in sedimentary deposits. These resources include the actual fossils as well as the sedimentary deposits that contain the fossils. Geological stratigraphy provides historical and environmental context for the fossils.

The BLM manages fossils as a natural heritage resource on the lands it administers under the general guidance of the FLPMA and NEPA. Fossils are managed to promote their use in research, education, and recreation, and paleontological localities are an important consideration in developing land-use management decisions.

The BLM has determined sensitivity levels based on the Potential Fossil Yield Classification (PFYC) system (Chirstensen 2007). The agency uses the PFYC system to predict the potential of geological deposits or strata to have paleontological resources. The PFYC system has a scale of 1 to 5 to classify geological units based on the known or expected abundance of vertebrate fossils and/or scientifically significant invertebrate and plant fossils. The PFYC classes are defined as follows:

Class 1 – Very Low. Areas with very low potential to have recognizable fossil remains. Precambrian age or older strata and most igneous or metamorphic deposits have low potential.

Class 2 – Low. Locations that have low potential for fossilized remains, except in rare circumstances. Examples include recent aeolian deposits, sediments that exhibit significant physical and chemical changes, and deposits less than 10,000 years old.

Class 3 – Moderate or Unknown. Sedimentary strata where fossil content varies in significance, abundance, and predictable occurrence. These geological units are often marine in origin with sporadic occurrence of fossils.

Class 4 – High. Geologic units with a high occurrence of significant fossils, which have been documented in the area but may vary in frequency and predictability. Surface-disturbing activities may adversely affect paleontological resources in this class.

Class 5 – Very High. Loci that consistently and predictably produce fossils and that are at risk of human-caused adverse impacts or natural degradation.

3.10.2 Existing Conditions

Paleontological resources are present throughout the state. The Colorado Plateau Province in northern Arizona has the highest number of known fossil-bearing geological units. These

resources are found primarily in Paleozoic and Mesozoic rocks. Resources in the Transition Zone Province of central Arizona occur most frequently in Cenozoic rocks. Paleontological resources in the Basin and Range Province of southern and western Arizona are found primarily in Mesozoic and Cenozoic rocks.

3.10.3 Impacts from the Proposed Action Alternative

Surface-disturbing actions may cause direct adverse impacts to paleontological resources through damage or destruction of fossils or the disturbance of the stratigraphic context in which they are located. Indirect adverse impacts may be created from increased accessibility to fossils, leading to looting or vandalism activities. However, under the proposed action alternative, herbicide treatments constitute surface-only activities. The proposed herbicide treatment activities are not anticipated to disturb any potentially fossil-yielding bedrock or alluvium or increase erosion. In addition, surface-disturbing activities in areas where paleontological resources are expected to be buried would not sustain a level of compression sufficient to impact buried fossilized remains. Within the boundaries of known paleontological resource areas, the application of herbicides would be conducted from vehicles with booms operating on the pavement or by hand-spraying using backpack sprayers or hoses. No off-pavement vehicle travel is authorized within these areas.

3.10.4 Impacts from the No Action Alternative

Impacts to paleontological resources under the no action alternative would be the same as those under the proposed action alternative and would be evaluated on a project-by-project basis.

3.11 Cultural Resources

3.11.1 Background

Definitions and Applicable Regulations

The term "cultural resources" as used in this document refers to prehistoric and historic archaeological resources, buildings and structures, and traditional cultural properties (TCPs). Historic properties are defined as archaeological sites, historic buildings, structures, or objects, and archaeological or historic districts included in or eligible for inclusion in the National Register of Historic Places (National Register). Three regulations apply to the actions proposed herein.

Regulations implementing NEPA stipulate that federal agencies consider the consequences of their undertakings on cultural resources (40 CFR 1502.16[g]).

Section 106 of the National Historic Preservation Act (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 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.

Archaeological resources and sites located on federal public lands are safeguarded under the Archaeological Resources Protection Act (ARPA) of 1979, which requires issuance of a permit prior to excavation or removal of those resources.

Cultural Context

The cultural development of Arizona is characterized by five main periods representing distinctly different lifeways: the Paleoindian period (ca. 10,000–8500 B.C.), the Archaic period (8500 B.C.–A.D. 100), the Formative period (A.D. 100–1450), the Protohistoric period (A.D. 1450–1694), and the Historic period (A.D. 1694–mid-1900s).

Paleoindian Period

Although there is still some debate regarding when humans entered the Americas, it is generally accepted that the Clovis tradition and subsequent Folsom tradition most likely represent the earliest occupation of North America. The two traditions, defined by fluted lanceolate dart points and a seasonal subsistence and nomadic settlement strategy, represent the Paleoindian period. Small, highly mobile bands of hunter-gatherers searched for megafauna, their primary food source, and supplemented their diet with small game and wild plant foods. In general, the Paleoindian sites are located near now-extinct springs, Pleistocene lakes (playas), or major drainages and include open camps, animal kill sites, animal processing sites, and caves or rockshelters.

Archaic Period

Changes in settlement and subsistence strategies mark the start of the Archaic period. Not coincidentally, these changes occurred after significant climatic changes. The Archaic period is characterized by groups of hunter-gatherers that appear to be more regionally diversified. Varying styles of stone tools along with the introduction of ground stone for grinding nuts and seeds indicates a greater reliance on plant foods than was previously seen in the Paleoindian period. Stone tools included basin metates, one-handed manos, and chipped stone tools. Projectile points consisted of dart points hafted to spears suited for throwing. Archaic sites were open camps located near water sources with chipped and ground stone tools and rockshelters or cave with well-preserved wood and fiber artifacts as well as stone tools. Petroglyphs and pictographs were first produced in this period. Horticulture, ceramic technology, and surface structures developed in the latter half of the Archaic period indicating a shift towards a more sedentary lifestyle.

Formative Period

The Formative period is characterized by a sedentary settlement system with an agricultural subsistence technology exploiting maize, beans, and squash. Increasingly larger villages were established where a variety of domestic and ceremonial items were manufactured. Small surface and pit structures were common in the earlier phases; larger roomblocks were erected

in the later phases, though the smaller, noncontiguous structures continued to be used. Ceremonial structures such as kivas, ballcourts, and platform mounds were constructed in the larger settlements.

Archaeologists have subdivided Arizona into the Ancestral Puebloan, Mogollon, Hohokam, and Patayan geographical-cultural areas. The Anasazi occupied the arid, northern plateau region; the Mogollon inhabited forested and mountainous regions in central and eastern Arizona; the Hohokam lived in low, dry deserts of central and southern Arizona; and the Patayan occupied the desert regions bordering the lower Colorado River in western Arizona. Each culture has been associated with distinctive ceramics. Formal ground stone tools were made to grind the cultigens. Smaller projectile points associated with the bow and arrow replaced the larger spear points utilized in the Archaic period. The Hohokam excavated extensive irrigation systems to support their agricultural plants; other groups created smaller systems or relied on rainwater only to water their crops. Gathered wild plants and hunted small and large animals supplemented the produce. A wide variety of archaeological sites dating to the Formative period have been located in diverse locations throughout Arizona.

Protohistoric Period

The Protohistoric period represents the time between the end of the Formative period and sustained Spanish contact. The archaeology of this period is poorly understood, largely due to the small sample of excavated material and poor chronometric control. As a result, the principal sources of information are Spanish ethnohistorical accounts from the late Protohistoric period. O'odham (Akimel, Tohono, Sobaipuri, and others) lived in southern Arizona. Yuman speakers (Quechan, Halchidoma, Cocopa, and others) lived along the Colorado River. Pai groups (Yavapai, Havasupai, Hualapai, and others) occupied northwestern and central Arizona. Puebloan people (Hopi, Zuni, and others) inhabited northeastern Arizona. In addition, it is believed that the Navajo and Apache became established in eastern Arizona (and elsewhere) during this time.

By the mid-to-late 1500s and early 1600s, Native American settlements were becoming increasingly affected by the intrusion of Spaniard expeditions. Most native groups cultivated maize, squash, and beans, though some still relied heavily on hunting and gathering. Introduced by the Spanish and others, horses, wheat, and livestock became major subsistence components. Metal tools began replacing stone tools.

Historic Period

Westward expansion by Euroamericans first occurred in the early 1840s as trappers sought beaver from the rivers. The Gold Rush resulted in thousands of emigrants crossing Arizona; many stayed (or returned) to exploit the local minerals. The Territory of Arizona was created by President Abraham Lincoln in 1863, and Prescott served as the capital. Statehood followed in 1912 with Phoenix as the capital. Historically, Arizona has been the home to cattle ranches, cotton farms, citrus orchards, and copper mines. The warm winter climate of southern Arizona encouraged tourism in the post-World War II years. Mining sites and homesteads are the most likely types to be found on BLM-managed lands.

3.11.2 Existing Conditions

Widespread and variable different types of cultural resource sites could be present in ADOT ROWs. Cultural resource site types that could be present include, but are not limited to, artifact scatters, smaller scale semi-permanent camps, permanent village sites containing architecture, agricultural sites, rock art sites, TCPs, historic habitation sites, historic mining sites, historic homesteads, and historic trails.

Agency Consultation

The BLM previously consulted with all parties required by 36 CFR 800.2 on effects of herbicide treatment as part of a larger undertaking, the 17 Western States Programmatic Environmental Impact Statement (FES 07-21).

BLM Responsibilities

In fulfillment of agency responsibilities under Section 106 of the NHPA, the BLM will consult with Native American Tribes on the annual treatment plans developed by ADOT.

FHWA Responsibilities

For projects funded under the FAHP, Section 106 consultation will be conducted by FHWA as the federal lead agency. FHWA will consult with the appropriate agencies, tribes, and other interested parties on a project-by-project basis, pursuant to 36 CFR 800.3.

3.11.3 Impacts from the Proposed Action Alternative

Under the proposed action alternative, herbicide treatments will not affect archaeological resources, buildings or structures. Under the Proposed Action Alternative, plans would be developed annually that describe the areas to be treated and the treatment method to be used throughout that year. As part of the annual treatment plan, areas where cultural resources that are or may be eligible for inclusion on the National Register would be identified and specific restrictions on treatment methods developed to protect these resources. Within the boundaries of cultural resource sites that are or may be eligible for inclusion on the National Register, the application of herbicides would be conducted from vehicles with booms operating on the pavement or by hand-spraying using backpack sprayers or hoses. No off-pavement vehicle travel is authorized within site boundaries.

TCPs or plants of cultural or religious importance could be impacted under the proposed action alternative. Application of herbicides could have a short-term impact by restricting access to TCPs or plants of cultural or religious importance by Native American communities. Depending upon the type of herbicide used, applications could kill plants that are of cultural or religious significance. If this potential harm is mitigated or avoided, the application of herbicides could be beneficial to plants that are culturally significant to Native American communities by improving viability due to lack of competition for limited resources from non-native plants.

3.11.4 Impacts from the No Action Alternative

Impacts to cultural resources under the no action alternative would be the same as those under the proposed action alternative and would be evaluated on a project-by-project basis.

3.12 Resources Protected Under Section 4(f)

3.12.1 Background and Existing Conditions

Section 4(f) of the US Department of Transportation Act of 1966 (as amended) states that the Secretary of Transportation "may approve a transportation program or project requiring the use of publicly owned land of a public park, recreation area, or wildlife and waterfowl refuge of national, State, or local significance, or land of an historic site of national, State, or local significance (as determined by the federal, state, or local officials having jurisdiction over the park, area, refuge, or site) only if 1) there is no prudent and feasible alternative to using that land; and 2) the program or project includes all possible planning to minimize harm to the park, recreation area, wildlife and waterfowl refuge, or historic site resulting from the use" (49 U.S.C. Section 303).

A "use" of a resource protected under Section 4(f), as defined in Title 23 CFR §774.17, occurs when:

Land is permanently incorporated into a transportation facility.

There is a temporary occupancy of land that is adverse in terms of the statute's preservation purpose.

There is a constructive use of a Section 4(f) property.

A constructive use of a resource protected under Section 4(f) occurs when the transportation project does not incorporate land from the resource, but the project's proximity impacts "are so severe that the protected activities, features, or attributes that qualify a resource for protection under Section 4(f) are substantially impaired" [23 CFR §774.15(a)].

Resources protected under Section 4(f) occurring within ADOT ROW on BLM-managed lands would be generally limited to trails that cross the ROW, or historic properties that warrant protection in place. Trailheads, campgrounds, recreation sites, and other similar protected resources may be located immediately adjacent to the ROW.

3.12.2 Impacts from the Proposed Action Alternative

Section 4(f) would only apply to projects receiving funding from, or requiring approval by, an agency within the USDOT (e.g. FHWA); it would not apply to BLM approval of this document or the state-funded spraying of herbicides conducted under annual treatment plans. Although no impacts to resources protected under Section 4(f) are anticipated from the use of herbicides within ADOT ROW on BLM-managed lands, projects funded by FHWA would involve additional actions beyond spraying of the roadway ROW. In the event that any such actions constitute a

use under Section 4(f), impacts to resources protected under Section 4(f) would be evaluated during the project-specific NEPA analysis conducted for each individual federally funded project.

3.12.3 Impacts from the No Action Alternative

There would be no impacts to resources protected under Section 4(f) under the No Action Alternative.

3.13 Resources Protected under Section 6(f)

3.13.1 Background and Existing Conditions

Section 6(f) of the Land and Water Conservation Fund Act (LWCFA), administered by the Interagency Committee (IAC) for Outdoor Recreation and the U.S. Department of the Interior's National Park Service (NPS), pertains to transportation projects that may affect or permanently convert outdoor recreational property acquired with LWCFA assistance. The LWCFA established the Land and Water Conservation Fund (LWCF), a fund-matching assistance program providing grants paying half the acquisition and development cost of outdoor recreational sites and facilities. Section 6(f) of the act prohibits the conversion of property acquired or developed with these grants to a non-recreational purpose without approval from IAC and NPS. NPS must ensure that replacement land of equal value, location, and usefulness is provided as condition of approval for land conversions (16 U.S.C. §§ 460l-4 through 460l-11).

No resources protected under Section 6(f) are located within ADOT ROW on BLM-managed lands. Properties that have been acquired or developed with LWCF funds may exist adjacent to ADOT ROW on BLM-managed lands. These properties may include parks or other properties operated or managed by local agencies through agreements with the BLM.

3.13.2 Impacts from the Proposed Action Alternative

Section 6(f) would only apply to projects receiving funding from, or requiring approval by, an agency within the USDOT (e.g. FHWA); it would not apply to BLM approval of this document or the state-funded spraying of herbicides conducted under annual treatment plans. Although no impacts to resources protected under Section 6(f) would result from the use of herbicides within ADOT ROW on BLM-managed lands as no land would be converted to a different use, projects funded under the FAHP would involve additional actions beyond spraying of the roadway ROW. In the event that any such actions would acquire property protected under 6(f) or convert the use of these properties, impacts to resources protected under Section 6(f) would be evaluated during the project-specific NEPA analysis conducted for each individual federally funded project.

3.13.3 Impacts from the No Action Alternative

There would be no impacts to resources protected under Section 6(f) under the No Action Alternative.

SECTION 4 CUMULATIVE IMPACTS

Cumulative impacts include the direct and indirect impacts of a project together with the impacts of all other anticipated past, present and reasonably foreseeable future actions in the area including those of others. This analysis of cumulative impacts concentrates on current and future actions that could contribute to cumulative impacts on the key considerations of land use, socioeconomics, noise levels, air quality, prime and unique farmland, water resources, cultural resources, and biological resources. Past, present, and reasonably foreseeable future actions considered in this analysis are the result of planned/proposed projects by FHWA, ADOT, and the BLM.

Previous projects would include those FHWA/ADOT projects constructed as part of previous State Transportation Implementation Plans as well as state-funded maintenance activities. Current and future projects include 37 projects programmed in ADOT's 5-year program that would occur on BLM-managed lands. These projects include bridge repair and replacements, drainage improvements, turn lane construction, shoulder widening, rockfall and numerous pavement preservation projects. Future projects would also include areas to be treated by ADOT in annual treatment plans.

While construction and other projects may create ground disturbance that would be susceptible to infestation by undesirable vegetation, project specific mitigation measures would be included to treat invasive species. Additional actions may occur on utility easements that are co-located or adjacent to ADOT easements and right-of-way. These actions may include expansion of existing utility lines or construction of new facilities. Other actions include the maintenance of utilities and maintenance of the utility ROW corridor. Maintenance activities include the management of vegetation by physical means or through the application of herbicides. ADOT has requested that utility companies provide prior notice or coordination regarding foliar applications of herbicide and combustible free space treatments in areas where utility corridors are co-located in or adjacent to ADOT easements on federal lands. The purpose of coordination 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 where ADOT and utility activities and herbicide treatments may overlap.

This proposal presents no significant detrimental cumulative impacts. The use of herbicides to control noxious and invasive weeds on ADOT ROWs on BLM-administered lands would lead to a reduction in the presence of noxious and invasive weeds within those areas. It is unlikely that the control program would ever completely eliminate noxious weeds. No other activities within ADOT ROWs on BLM-administered lands are expected to directly reduce the occurrence of noxious weeds. The cumulative effect of FHWA/ADOT, BLM, and utility project areas, as well as areas treated annually by ADOT, would be a reduction in roadside hazards, lower wildfire risk, and improved habitat.

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SECTION 5 –MITIGATION MEASURES

Habitat Conservation Measures

Aquatic Habitats

- Do not use diquat, fluridone, terrestrial formulations of glyphosate, or triclopyr butoxyethyl ester (BEE) in habitats where aquatic TEP species occur or may potentially occur.
- Avoid using glyphosate formulations that include the surfactant R-11 in the future and either avoid using any formulations with the surfactant polyethoxylated tallow amine (POEA), or seek to use the formulation with the lowest amount of POEA available, to reduce risks to aquatic organisms.
- Follow all instructions and SOPs to avoid spill and direct spray scenarios into aquatic habitats. Special care should be followed when transporting and applying 2,4-D, bromacil, clopyralid, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, tebuthiuron, and triclopyr.
- Do not broadcast spray diuron, glyphosate, picloram, or triclopyr BEE in upland habitats adjacent to aquatic habitats that support (or may potentially support) aquatic TEP species under conditions that would likely result in off-site drift.
- In watersheds that support TEP species or their habitat, do not apply bromacil, diuron, tebuthiuron, or triclopyr BEE in upland habitats within ½ mile upslope of aquatic habitats that support aquatic TEP species under conditions that would likely result in surface runoff.

Terrestrial Habitats

- When conducting herbicide treatments in or near terrestrial habitat occupied by TEP herpetofauna, avoid using the following herbicides, where feasible: clopyralid, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, and triclopyr.
- When conducting herbicide treatments in upland habitats occupied by TEP herpetofauna, do not broadcast spray 2,4-D, clopyralid, glyphosate, hexazinone, picloram or triclopyr; do not broadcast spray these herbicides in areas adjacent to habitats occupied by TEP herpetofauna under conditions when spray drift onto the habitat is likely.
- If conducting manual spot applications of glyphosate, hexazinone, or triclopyr to vegetation in upland habitats occupied by TEP herpetofauna, utilize the typical, rather than the maximum, application rate.
- If spraying imazapyr or metsulfuron methyl in or adjacent to upland habitats occupied by TEP herpetofauna, apply at the typical, rather than the maximum, application rate.

Herbicide Specific Conservation Measures

Low boom height is defined as up to 20 inches above ground (BLM 2007).

2,4-D

- Assess local site conditions when evaluating the risks from surface water runoff to TEP plants located within ½ mile down gradient from the treatment area.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.
- Do not use 2,4-D in terrestrial habitats occupied by TEP herpetofauna; do not broadcast spray 2,4-D within ¼ mile of terrestrial habitat occupied by TEP herpetofauna.

Bromacil

- Do not apply within 1,200 feet of terrestrial TEP plant species.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.
- Do not apply in upland habitats within ½ mile upslope of aquatic habitats that support aquatic TEP species under conditions that would result in off-site drift.
- Do not apply in upland habitats upslope of aquatic habitats that support (or potentially support) TEP amphibians under conditions that would result surface runoff.

Chlorsulfuron

- Do not apply by ground methods within 1,200 feet of terrestrial TEP species.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Clopyralid

- Since the risks associated with using a high boom are unknown, use only a low boom during ground applications of this herbicide within ½ mile of terrestrial TEP plant species.
- Do not apply by ground methods at the typical application rate within 900 feet of terrestrial TEP species.
- Do not apply by ground methods at the maximum application rate within ½ mile of terrestrial TEP species.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Dicamba

- If using a low boom at the typical application rate, do not apply within 1,050 feet of terrestrial TEP plant species.
- If using a low boom at the maximum application rate, do not apply within 1,050 feet of terrestrial TEP plant species.
- If using a high boom, do not apply within 1,050 feet of terrestrial TEP plant species.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Diflufenzopyr

- If using a low boom at the typical application rate, do not apply within 100 feet of terrestrial TEP plant species.
- If using a low boom at the maximum application rate, do not apply within 900 feet of terrestrial TEP plant species.
- If using a high boom, do not apply within 500 feet of terrestrial TEP plant species.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Diflufenzopyr+dicamba (Overdrive®)

- If using a low boom at the typical application rate, do not apply within 100 feet of terrestrial TEP plant species.
- If using a low boom at the maximum application rate, do not apply within 900 feet of terrestrial TEP plant species.
- If using a high boom, do not apply within 900 feet of terrestrial TEP plant species.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Diquat

- Do not apply by ground methods within 900 feet of terrestrial TEP species at the typical application rate
- Do not apply by ground methods within 1,000 feet of terrestrial TEP species at the maximum application rate.

Diuron

- Do not apply within 1,100 feet of terrestrial TEP species.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.
- Do not apply in upland habitats within ½ mile upslope of aquatic habitats that support aquatic TEP species under conditions that would result in off-site drift.
- Do not apply in upland habitats upslope of aquatic habitats that support (or potentially support) TEP amphibians under conditions that would result in surface runoff.

Fluridone

- Since effects on terrestrial TEP plant species are unknown, do not apply within ½ mile of terrestrial TEP species.

Glyphosate

- Since the risks associated with using a high boom are unknown, use only low boom applications of this herbicide within ½ mile of terrestrial TEP plant species.
- Do not apply at the typical application rate within 50 feet of terrestrial TEP plant species.
- Do not apply at the maximum application rate within 300 feet of terrestrial TEP plant species.

Hexazinone

- Since the risks associated with using a high boom are unknown, only apply this herbicide using a low boom within ½ mile of terrestrial TEP plant species.
- Do not apply at the typical application rate within 300 feet of terrestrial TEP plant species.
- Do not apply at the maximum application rate within 900 feet of terrestrial TEP plant species.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Imazapic

- Do not apply within 30 feet of terrestrial TEP species.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Imazapyr

- Since the risks associated with using a high boom are unknown, use only low boom applications of this herbicide within ½ mile of terrestrial TEP plant species.
- Do not apply at the typical application rate, within 900 feet of terrestrial TEP plant species.
- Do not apply at the maximum application rate, within ½ mile of terrestrial TEP plant species.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Metsulfuron Methyl

- Since the risks associated with using a high boom are unknown, use only a low boom application of this herbicide within ½ mile of terrestrial TEP plant species.
- Do not apply at the typical application rate within 900 feet of terrestrial TEP plant species.
- Do not apply at the maximum application rate within ½ mile of terrestrial TEP plant species.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Picloram

- Do not apply at any application rate, within ½ mile of terrestrial TEP plant species.
- Assess local site conditions when evaluating the risks from surface water runoff to TEP plants located within ½ mile down gradient from the treatment area.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.
- Do not broadcast spray in upland habitats adjacent to aquatic habitats that support (or may potentially support aquatic TEP species under conditions that would result in off-site drift.

Sulfometuron Methyl

- Do not apply within 1,500 feet of terrestrial TEP species.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Tebuthiuron

- If using a low boom at the typical application rate, do not apply within 30 feet of terrestrial TEP plant species.
- If using a low boom at the maximum application rate or a high boom at the typical application rate, do not apply within 50 feet of terrestrial TEP plant species.
- If using a high boom at the maximum application rate, do not apply within 900 feet of terrestrial TEP plant species.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.
- Do not apply in upland habitats within ½ mile upslope of aquatic habitats that support aquatic TEP species under conditions that would result in off-site drift.

Triclopyr Acid

- Since the risks associated with using a high boom are unknown, use only low boom applications of this herbicide within ½ mile of terrestrial TEP plant species.
- Do not apply at the typical application rate within 300 feet of terrestrial TEP plant species.
- Do not apply at the maximum application rate within ½ mile of terrestrial TEP plant species or aquatic habitats in which TEP plant species occur.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.

Triclopyr BEE

- Since the risks associated with using a high boom are unknown, use only a low boom application of this herbicide within ½ mile of terrestrial TEP plant species.
- Do not apply at the typical application rate within 300 feet of terrestrial TEP plant species.
- Do not apply at the maximum application rate within ½ mile of terrestrial TEP plant species.
- In areas where wind erosion is likely, do not apply within ½ mile of TEP plant species.
- Do not apply in upland habitats within ½ mile upslope of aquatic habitats that support aquatic TEP species under conditions that would result in off-site drift.
- Do not apply in upland habitats upslope of aquatic habitats that support (or potentially support) TEP amphibians under conditions that would result in surface runoff.

General Conservation Measures for Threatened and Endangered Species

- All pretreatment special status species surveys shall be conducted by a qualified biologist.
- If herbicide treatments are planned within delineated suitable habitat areas for threatened, endangered and proposed (TEP) plants, conduct a species-specific presence/absence survey within 1 to 3 years prior to the treatment per the species-specific conservation measures.
    - Pretreatment surveys shall be conducted per protocol, or in the absence of a protocol, during the season and conditions in which the species is most likely to be encountered (e.g. flowering season, fruiting season). Contact the USFWS Arizona Ecological Services Office (AESO) (602.242.0210) for current approved survey protocols.
    - If individuals are found, the surveyed habitat is considered to be occupied even if the species is absent from the habitat for some portion during the calendar year (e.g. dormant period, subterranean period).
    - If individuals are found, do not apply herbicide within the appropriate avoidance distance specified in the species- or herbicide-specific conservation measures for plants or occupied habitat.
    - If species-specific presence/absence pretreatment surveys have not been conducted during the specified time-frame and appropriate season prior to the treatment, apply the appropriate species- and herbicide-specific conservation measures to the delineated suitable habitat area for the species.
- If herbicide treatments are planned within delineated suitable habitat for TEP animals, contact the USFWS AESO (602.242.0210) within 60 days prior to herbicide treatment to determine if the habitat is occupied.
    - If the USFWS requests that pretreatment surveys be conducted, pretreatment surveys shall be conducted per protocol, or in the absence of a protocol, during the season and conditions in which the species is most likely to be encountered (e.g. breeding season). Contact the USFWS Arizona Ecological Services Office (AESO) (602.242.0210) for current approved survey protocols.
    - Delineated suitable habitats are considered to be occupied even if the species is absent from the habitat for some portion during the calendar year (e.g. migration, hibernation).
    - Within occupied habitats, do not apply herbicide within the appropriate avoidance distance specified in the species- or herbicide-specific conservation measures.
    - If species occupancy is unknown and surveys have not been conducted during the most recent appropriate survey season prior to treatment, assume that the species is present, delineate species-specific suitable habitat, and apply the appropriate species- and herbicide-specific conservation measures to the delineated suitable habitat.

Threatened and Endangered Species-Specific Conservation Measures

Arizona Cliffrose (Purshia subintegra)

- Conduct pretreatment surveys for Arizona cliffrose in suitable habitat along US Highway 93 within 3 years prior to treatment.
    - If Arizona cliffrose is found:
        - Do not apply herbicide within the following appropriate avoidance distance (or greater if specified in the herbicide-specific conservation measures) of the plant.

Herbicide Formulations	Herbicide Application Method	
	Manual	Mechanized Ground
Solid	20 feet	60 feet
Liquid	20 feet	60 feet
Ultra-low volume or dust	150 feet	150 feet

        - Do not apply herbicides that rate as Class 2 or Class 3 in the species toxicity group for Bee and/or Terrestrial Arthropod (Appendix C) within 300 feet of the plant and use only manual applications within ½ mile of the plant.
        - Herbicide applications using mechanized ground equipment should use either liquid streams or relatively course sprays to minimize spray drift.
        - Establish buffer zones for other special conditions based on the herbicide-specific conservation measures.
- If species-specific presence/absence pretreatment surveys have not been conducted during the specified time-frame and appropriate season prior to the treatment, apply the appropriate species- and herbicide-specific conservation measures to the delineated suitable habitat area for the species.

Arizona Hedgehog Cactus (Echinocereus triglochidiatus var. arizonicus)

- Conduct pretreatment surveys for Arizona hedgehog cactus in suitable habitat along State Route 77 within 3 years prior to treatment.
    - If Arizona hedgehog cactus are found within the action area:
        - Do not apply herbicide within the following appropriate avoidance distance (or greater if specified in the herbicide-specific conservation measures) of the plant.

Herbicide Formulations	Herbicide Application Method	
	Manual	Mechanized Ground
Solid	20 feet	60 feet
Liquid	20 feet	60 feet
Ultra-low volume or dust	150 feet	150 feet

- Do not apply herbicides that rate as Class 2 or Class 3 in the species toxicity group for Bee and/or Terrestrial Arthropod (Appendix C) within 300 feet of the plant and use only manual applications within ½ mile of the plant.
- Herbicide applications using mechanized ground equipment should use either liquid streams or relatively course sprays to minimize spray drift.
- Establish buffer zones for other special conditions based on the herbicide-specific conservation measures.

- If species-specific presence/absence pretreatment surveys have not been conducted during the specified time-frame and appropriate season prior to the treatment, apply the appropriate species- and herbicide-specific conservation measures to the delineated suitable habitat area for the species.

Bonytail Chub (Gila elegans)

- Herbicide applications using mechanized ground equipment along the Colorado River on State Route 95S and State Route 95 should use either liquid streams or relatively course sprays to minimize spray drift.
- Do not conduct herbicide treatments during bonytail chub spawning season (May through July) within ½ mile of the Colorado River along State Route 95 and State Route 95S.
- Do not use herbicides that rate as Class 1 in the species toxicity group for Warm Water Fish (Appendix C) within the following appropriate avoidance distance (or greater if specified in the herbicide-specific conservation measures) of the Colorado River shoreline along State Route 95S and State Route 95.

Herbicide Formulations	**Herbicide Application Method**	
	Manual	Mechanized Ground
Solid	10 feet	50 feet
Liquid	10 feet	80 feet*
Ultra-low volume or dust	150 feet	150 feet
Alternative Buffer Zones: * An avoidance distance of 50 feet may be used if herbicide is applied by a sprayer with low pressure nozzles that deliver a spray ranging from coarse to very coarse in droplet size		

- Do not use herbicides that rate as Class 2 in the species toxicity group for Warm Water Fish (Appendix C) within the following appropriate avoidance distance (or greater if specified in the herbicide-specific conservation measures) of the Colorado River shoreline along State Route 95S and State Route 95.

Herbicide Formulations	**Herbicide Application Method**	
	Manual	Mechanized Ground
Solid	20 feet	80 feet
Liquid	20 feet	100 feet
Ultra-low volume or dust	200 feet	200 feet

- Establish buffer zones for other special conditions based on the herbicide-specific conservation measures.

Brady Pincushion Cactus (Pediocactus bradyi)

- Conduct pretreatment surveys for Brady pincushion cactus in suitable habitat along United States Highway 89A during the survey season prior to treatment.
    - If Brady pincushion cactus are found within the action area:
        - Do not apply herbicide within the following appropriate avoidance distance (or greater if specified in the herbicide-specific conservation measures) of the plant.

Herbicide Formulations	Herbicide Application Method	
	Manual	Mechanized Ground
Solid	20 feet	60 feet
Liquid	20 feet	60 feet
Ultra-low volume or dust	150 feet	150 feet

        - Do not apply herbicides that rate as Class 2 or Class 3 in the species toxicity group for Bee and/or Terrestrial Arthropod (Appendix C) within 300 feet of the plant and use only manual applications within ½ mile of the plant.
        - Herbicide applications using mechanized ground equipment should use either liquid streams or relatively course sprays to minimize spray drift.
        - Establish buffer zones for other special conditions based on the herbicide-specific conservation measures.
    - If species-specific presence/absence pretreatment surveys have not been conducted during the specified time-frame and appropriate season prior to the treatment, apply the appropriate species- and herbicide-specific conservation measures to the delineated suitable habitat area for the species.

California Condor (Gymnogyps californianus)

The following measures will be implemented in Mitigation Area 1:

- Three days prior to herbicide application along State Route 389 and United States Highway 89A, the applicator shall contact the USFWS Field Office in Flagstaff (928.226.0614) to determine the nesting and roosting locations and status of any condors within 1 mile of the action area.
- Do not conduct herbicide treatments within ¼ mile of currently occupied nests, roosts or release sites.
- Do not use dicamba in Mitigation Area 1.
- Do not use 2,4-D or diuron in Mitigation Area 1 unless the action area has been surveyed for roadkill within 2 days prior to treatment and all carrion/roadkill has been removed prior to spraying.
- Do not broadcast spray clopyralid, diuron, glyphosate, hexazinone, picloram, or triclopyr within Mitigation Area 1; do not broadcast spray these herbicides in areas adjacent to California condor nesting or roosting habitat under conditions when spray drift onto the nesting or roosting habitat is likely.
- Where feasible, avoid use of the following herbicides within Mitigation Area 1: bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, and triclopyr.

The following measures will be implemented in Mitigation Areas 1, 2, and 3:

- The applicator shall avoid any interaction with condors and shall immediately contact the USFWS Field Office in Flagstaff (928.226.0614) if a condor is present within the action area. Any activity that could result in harm to condors shall cease and shall not resume until the condor leaves on its own accord or as a result of individuals working under an appropriate permit from USFWS.
- Do not use dicamba in Mitigation Areas 1, 2 or 3.
- If broadcast spraying bromacil, diquat, imazapyr, or metsulfuron methyl in or adjacent to California condor nesting or roosting habitat, apply at the typical, rather than the maximum, application rate.
- If conducting manual spot applications of glyphosate, hexazinone, or triclopyr to vegetation in California condor nesting or roosting habitat, utilize the typical, rather than the maximum, application rate.

Chiricahua Leopard Frog (Lithobates chiricahuensis)

- Do not use 2,4-D, diquat, fluridone glyphosate, or imazapyr within suitable habitat along State Route 83, State Route 90, and State Route 80.
- Contact the USFWS AESO (602.242.0210) prior to herbicide treatment within suitable habitat along State Route 83, State Route 90, and State Route 80, to determine if the habitat is occupied by Chiricahua leopard frogs.
- If Chiricahua leopard frogs (adults, tadpoles and eggs) are present within the action area:
    - Do not apply herbicides that rate as Class 1 in the species toxicity group for Aquatic-Amphibian, or as Class 2 or Class 3 for the species toxicity group Aquatic Arthropod and/or Terrestrial Arthropod (Appendix C) within the following appropriate avoidance distance (or greater if specified in the herbicide-specific conservation measures) of the edge of the annual high water line of the waterbody or wetland, or any contributing channel or tributary to the waterbody or wetland in which the Chiricahua leopard frog occurs.

Herbicide Formulations	**Herbicide Application Method**	
	Manual	Mechanized Ground
Solid	30 feet	300 feet
Liquid	30 feet	350 feet*
Ultra-low volume or dust	400 feet	400 feet
Alternative Buffer Zones: * An avoidance distance of300feet may be used if herbicide is applied by a sprayer with low pressure nozzles that deliver a spray ranging from coarse to very coarse in droplet size.		

    - Do not apply herbicides that rate as Class 2 in the species toxicity group for Aquatic-Amphibian (Appendix C) within the following appropriate avoidance distance (or greater if specified in the herbicide-specific conservation measures) of the edge of the annual high water line of the waterbody or wetland, or any contributing channel or tributary to the waterbody or wetland in which the Chiricahua leopard frog occurs.

Herbicide Formulations	Herbicide Application Method	
	Manual	Mechanized Ground
Solid	50 feet	350 feet
Liquid	50 feet	350 feet
Ultra-low volume or dust	450 feet	450 feet

    - Herbicide applications using mechanized ground equipment should use either liquid streams or relatively course sprays to minimize spray drift.
    - Establish buffer zones for other special conditions based on the herbicide-specific conservation measures.
- If species occupancy is unknown along State Route 83, State Route 90, and State Route 80, assume that the species is present, delineate suitable Chiricahua leopard frog habitat within the action area and apply the appropriate species- and herbicide-specific conservation measures to the delineated suitable habitat.

Fickeisen Plains Cactus (Pediocactus peeblesianus var. fickeiseniae)

- Conduct pretreatment surveys for Fickeisen plains cactus on suitable substrates along United States Highway 89A during the survey season prior to treatment.
    - If Fickeisen plains cactus are found within the action area:
        - Do not apply herbicide within the following appropriate avoidance distance (or greater if specified in the herbicide-specific conservation measures) of the plant.

Herbicide Formulations	Herbicide Application Method	
	Manual	Mechanized Ground
Solid	20 feet	60 feet
Liquid	20 feet	60 feet
Ultra-low volume or dust	150 feet	150 feet

        - Do not apply herbicides that rate as Class 2 or Class 3 in the species toxicity group for Bee and/or Terrestrial Arthropod (Appendix C) within 300 feet of the plant and use only manual applications within ½ mile of the plant.
        - Herbicide applications using mechanized ground equipment should use either liquid streams or relatively course sprays to minimize spray drift
        - Establish buffer zones for other special conditions based on the herbicide-specific conservation measures.
- If species-specific presence/absence pretreatment surveys have not been conducted during the specified time-frame and appropriate season prior to the treatment, apply the appropriate species- and herbicide-specific conservation measures to the delineated suitable habitat area for the species.

Gierisch Mallow (Sphaeralcea gierischii)

- Spray individual target plants by hand wand only within Gierisch mallow critical habitat along Interstate 15.
- Do not apply herbicides that rate as Class 2 or Class 3 in the species toxicity group for Bee and/or Terrestrial Arthropod (Appendix C) within 300 feet of Gierisch mallow critical habitat and use only manual applications of these herbicides within ½ mile of the critical habitat to protect pollinators for the Gierisch mallow.
- Establish buffer zones for other special conditions based on the herbicide-specific conservation measures.

Holmgren Milk-Vetch (Astragalus holmgreniorum)

- Conduct pretreatment surveys for Holmgren milk-vetch within suitable habitat along Interstate 15 during the survey season prior to treatment.
    - If Holmgren milk-vetch is found:
        - Do not apply herbicide within the following appropriate avoidance distance (or greater if specified in the herbicide-specific conservation measures) of the plant.

Herbicide Formulations	**Herbicide Application Method**	
	Manual	Mechanized Ground
Solid	20 feet	60 feet
Liquid	20 feet	60 feet
Ultra-low volume or dust	150 feet	150 feet

        - Do not apply herbicides that rate as Class 2 or Class 3 in the species toxicity group for Bee and/or Terrestrial Arthropod (Appendix C) within 300 feet of the plant and use only manual applications within ½ mile of the plant.
        - Herbicide applications using mechanized ground equipment should use either liquid streams or relatively course sprays to minimize spray drift.
        - Establish buffer zones for other special conditions based on the herbicide-specific conservation measures.
- If species-specific presence/absence pretreatment surveys have not been conducted during the specified time-frame and appropriate season prior to the treatment, apply the appropriate species- and herbicide-specific conservation measures to the delineated suitable habitat area for the species.

Huachuca Water Umbel (Lilaeopsis schaffneriana ssp recurva)

- Do not use 2,4-D, diquat, fluridone glyphosate, or imazapyr within 1 mile of suitable habitat along State Route 82 and State Route 90.
- Contact the USFWS AESO (602.242.0210) prior to herbicide treatment within suitable habitat along State Route 82, and State Route 90, to determine if the habitat is occupied by Huachuca water umbel.

- If Huachuca water umbel are present within the action area:
    - Do not apply herbicide within the following appropriate avoidance distance (or greater if specified in the herbicide-specific conservation measures) of the edge of the waterbody or wetland, or any contributing channel or tributary to the waterbody or wetland in which the plant occurs.

Herbicide Formulations	Herbicide Application Method	
	Manual	Mechanized Ground
Solid	50 feet	350 feet
Liquid	50 feet	350 feet
Ultra-low volume or dust	450 feet*	450 feet*
Alternative Buffer Zones: * An avoidance distance of 350 feet may be used if herbicide is applied by a sprayer with low pressure nozzles that deliver a spray ranging from coarse to very coarse in droplet size.		

    - Do not apply herbicides that rate as Class 2 or Class 3 in the species toxicity group for Bee and/or Terrestrial Arthropod (Appendix C) within 300 feet of the plant and use only manual applications within ½ mile of the plant.
    - Herbicide applications using mechanized ground equipment should use either liquid streams or relatively course sprays to minimize spray drift.
    - Establish buffer zones for other special conditions based on the herbicide-specific conservation measures.
- If species occupancy is unknown along State Route 82, and State Route 90, assume that the species is present, and apply the appropriate species- and herbicide-specific conservation measures to the delineated suitable habitat.

Mojave Desert Tortoise (Gopherus agassizii)

- In desert tortoise habitat, conduct herbicide treatments during the fall and winter months (October 15 through March 15), when desert tortoises are least active.
- If Mojave Desert tortoises are encountered during herbicide treatments, application shall cease and shall not resume until the tortoise moves over 100 feet from treatment area on its own accord.
- Do not use dicamba within suitable habitat for Mojave Desert tortoise along I-15.
- Use only sprays with coarse droplet sizes within suitable habitat for Mojave Desert tortoise along I-15.
- Herbicide applications using mechanized ground equipment should use either liquid streams or relatively course sprays to minimize spray drift.
- Establish buffer zones for other special conditions based on the herbicide-specific conservation measures.

Narrow-headed Gartersnake (Thamnophis rufipunctatus)

- Do not use 2,4-D, diquat, fluridone glyphosate, or imazapyr within suitable habitat along State Route 75, United States Highway 70 and United States Highway 191, or within 1 mile upstream from suitable habitat along any contributing channel, tributary or spring run.

- Contact the USFWS AESO (602.242.0210) prior to herbicide treatment within 1 mile of a perennial waterway along State Route 75, United States Highway 70 and United States Highway 191, to determine if the habitat is occupied by narrow-headed gartersnake.
- If narrow-headed gartersnakes are present:
    - Do not use herbicides that have a species toxicity rating of Class 0 or Class 1 (Appendix C) in the species toxicity groups for Reptile or Warm Water Fish within the following appropriate avoidance distance (or greater if specified in the herbicide-specific conservation measures). The avoidance distance applies to the occupied waterway, or any contributing channel, tributary or spring run within 1 mile upstream of the occupied waterway.

Herbicide Formulations	Herbicide Application Method	
	Manual	Mechanized Ground
Solid	30 feet*	300 feet
Liquid	30 feet*	350 feet[H]
Ultra-low volume or dust	400 feet[H]	400 feet[H]
Alternative Buffer Zones: * An avoidance distance of 10 feet may be used if the herbicide application and formulation is approved by USFWS [H] An avoidance distance of 300 feet may be used if herbicide is applied by a sprayer with low pressure nozzles that deliver a spray ranging from coarse to very coarse in droplet size		

    - Do not use herbicides that have a species toxicity rating of Class 2 (Appendix C) in the species toxicity groups for Reptile or Warm Water Fish within the following appropriate avoidance distance (or greater if specified in the herbicide-specific conservation measures). The avoidance distance applies to the occupied waterway, or any contributing channel, tributary or spring run within 1 mile upstream of the occupied waterway.

Herbicide Formulations	Herbicide Application Method	
	Manual	Mechanized Ground
Solid	50 feet	350 feet
Liquid	50 feet	350 feet
Ultra-low volume or dust	450 feet	450 feet

    - Herbicide applications using mechanized ground equipment should use either liquid streams or relatively course sprays to minimize spray drift.
    - Establish buffer zones for other special conditions based on the herbicide-specific conservation measures.
    - If species occupancy is unknown along State Route 75, United States Highway 70 and United States Highway 191, assume that the species is present, delineate suitable narrow-headed gartersnake habitat within the action area and apply the appropriate species and herbicide-specific conservation measures to the delineated suitable habitat.

Northern Mexican Gartersnake (*Thamnophis eques megalops*)

- Do not use 2,4-D, diquat, fluridone glyphosate, or imazapyr within suitable habitat along State Route 75, State Route 77, State Route 82, State Route 83, State Route 90, State Route 92 and United States Highway 191, or within 1 mile upstream from suitable habitat along any contributing channel, tributary or spring run.
- Contact the USFWS AESO (602.242.0210) prior to herbicide treatment within 1 mile of a perennial waterway along State Route 75, State Route 77, State Route 82, State Route 83, State Route 90, State Route 92 and United States Highway 191, to determine if the habitat is occupied by northern Mexican gartersnake.
- If northern Mexican gartersnakes are present:
    - Do not use herbicides that have a species toxicity rating of Class 0 or Class 1 (Appendix C) in the species toxicity groups for Reptile or Warm Water Fish within the following appropriate avoidance distance (or greater if specified in the herbicide-specific conservation measures). The avoidance distance applies to the occupied waterway, or any contributing channel, tributary or spring run within 1 mile upstream of the occupied waterway.

Herbicide Formulations	**Herbicide Application Method**	
	Manual	Mechanized Ground
Solid	30 feet*	300 feet
Liquid	30 feet*	350 feet[H]
Ultra-low volume or dust	400 feet[H]	400 feet[H]

Alternative Buffer Zones:

* An avoidance distance of 10 feet may be used if the herbicide application and formulation is approved by USFWS

[H] An avoidance distance of 300 feet may be used if herbicide is applied by a sprayer with low pressure nozzles that deliver a spray ranging from coarse to very coarse in droplet size

    - Do not use herbicides that have a species toxicity rating of Class 2 (Appendix C) in the species toxicity groups for Reptile or Warm Water Fish within the following appropriate avoidance distance (or greater if specified in the herbicide-specific conservation measures). The avoidance distance applies to the occupied waterway, or any contributing channel, tributary or spring run within 1 mile upstream of the occupied waterway.

Herbicide Formulations	**Herbicide Application Method**	
	Manual	Mechanized Ground
Solid	50 feet	350 feet
Liquid	50 feet	350 feet
Ultra-low volume or dust	450 feet	450 feet

    - Herbicide applications using mechanized ground equipment should use either liquid streams or relatively course sprays to minimize spray drift.
    - Establish buffer zones for other special conditions based on the herbicide-specific conservation measures.
    - If species occupancy is unknown along State Route 75, State Route 77, State Route 82, State Route 83, State Route 90, State Route 92 and United States Highway 191, assume that the species is present, delineate suitable northern

Mexican gartersnake habitat within the action area and apply the appropriate species- and herbicide-specific conservation measures to the delineated suitable habitat.

Ocelot (Leopardus pardalis)

- Prior to herbicide treatment in the Globe, Safford or Tucson ADOT districts contact USFWS AESO (602.242.0210) to determine if any recent sightings of ocelot have occurred near the treatment area.
- If an ocelot has been sighted within 6 months of the scheduled herbicide treatment:
    - Do not use 2,4-D, bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram and triclopyr within 5 miles of where the ocelot was sighted.
    - Establish buffer zones for other special conditions based on the herbicide-specific conservation measures

Peebles Navajo Cactus (Pediocactus peeblesianus var. peeblesianus)

- Conduct pretreatment surveys for Peebles Navajo cactus on suitable substrates along Interstate 40 during the survey season prior to treatment.
    - If Peebles Navajo cactus are found within the action area:
        - Do not apply herbicide within the following appropriate avoidance distance (or greater if specified in the herbicide-specific conservation measures) of the plant.

Herbicide Formulations	**Herbicide Application Method**	
	Manual	Mechanized Ground
Solid	20 feet	60 feet
Liquid	20 feet	60 feet
Ultra-low volume or dust	150 feet	150 feet

        - Do not apply herbicides that rate as Class 2 or Class 3 in the species toxicity group for Bee and/or Terrestrial Arthropod (Appendix C) within 300 feet of the plant and use only manual applications within ½ mile of the plant.
        - Herbicide applications using mechanized ground equipment should use either liquid streams or relatively course sprays to minimize spray drift.
        - Establish buffer zones for other special conditions based on the herbicide-specific conservation measures.
    - If species-specific presence/absence pretreatment surveys have not been conducted during the specified time-frame and appropriate season prior to the treatment, apply the appropriate species- and herbicide-specific conservation measures to the delineated suitable habitat area for the species.

Pima Pineapple Cactus (Coryphantha scheeri var. robustispina)

- Conduct pretreatment surveys for Pima pineapple cactus within suitable habitat along State Route 83, State Route 86 and State Route 286 within 3 years prior to treatment.
    - If Pima pineapple cactus are found within the action area:

- Do not apply herbicide within the following appropriate avoidance distance (or greater if specified in the herbicide-specific conservation measures) of the plant.

Herbicide Formulations	Herbicide Application Method	
	Manual	Mechanized Ground
Solid	20 feet	60 feet
Liquid	20 feet	60 feet
Ultra-low volume or dust	150 feet	150 feet

- Do not apply herbicides that rate as Class 2 or Class 3 in the species toxicity group for Bee and/or Terrestrial Arthropod (Appendix C) within 300 feet of the plant and use only manual applications within ½ mile of the plant.
- Herbicide applications using mechanized ground equipment should use either liquid streams or relatively course sprays to minimize spray drift.
- Establish buffer zones for other special conditions based on the herbicide-specific conservation measures.

- If species-specific presence/absence pretreatment surveys have not been conducted during the specified time-frame and appropriate season prior to the treatment, apply the appropriate species- and herbicide-specific conservation measures to the delineated suitable habitat area for the species.

Razorback Sucker (Xyrauchen texanus)

- Herbicide applications using mechanized ground equipment along the Colorado River on State Route 95S and State Route 95 should use either liquid streams or relatively course sprays to minimize spray drift.
- Do not conduct herbicide treatments during razorback sucker spawning season (January to May) within ½ mile of the Colorado River along State Route 95 and State Route 95S.
- Do not use herbicides that rate as Class 1 in the species toxicity group for Warm Water Fish (Appendix C) within the following appropriate avoidance distance (or greater if specified in the herbicide-specific conservation measures) of the Colorado River shoreline along State Route 95S and State Route 95.

Herbicide Formulations	Herbicide Application Method	
	Manual	Mechanized Ground
Solid	10 feet	50 feet
Liquid	10 feet	80 feet*
Ultra-low volume or dust	150 feet	150 feet
Alternative Buffer Zones: * An avoidance distance of 50 feet may be used if herbicide is applied by a sprayer with low pressure nozzles that deliver a spray ranging from coarse to very coarse in droplet size		

- Do not use herbicides that rate as Class 2 in the species toxicity group for Warm Water Fish (Appendix C) within the following appropriate avoidance distance (or greater if specified in the herbicide-specific conservation measures) of the Colorado River shoreline along State Route 95S and State Route 95.

Herbicide Formulations	Herbicide Application Method	
	Manual	Mechanized Ground
Solid	20 feet	80 feet
Liquid	20 feet	100 feet
Ultra-low volume or dust	200 feet	200 feet

- Establish buffer zones for other special conditions based on the herbicide-specific conservation measures.

Siler Pincushion Cactus (Pediocactus sileri)

- Conduct pretreatment surveys for Siler pincushion cactus within suitable habitats along State Route 89 and State Route 389 during the survey season prior to treatment.
    - If Siler pincushion cactus are found within the action area:
        - Do not apply herbicide within the following appropriate avoidance distance (or greater if specified in the herbicide-specific conservation measures) of the plant.

Herbicide Formulations	Herbicide Application Method	
	Manual	Mechanized Ground
Solid	20 feet	60 feet
Liquid	20 feet	60 feet
Ultra-low volume or dust	150 feet	150 feet

        - Do not apply herbicides that rate as Class 2 or Class 3 in the species toxicity group for Bee and/or Terrestrial Arthropod (Appendix C) within 300 feet of the plant and use only manual applications within ½ mile of the plant.
        - Herbicide applications using mechanized ground equipment should use either liquid streams or relatively course sprays to minimize spray drift.
        - Establish buffer zones for other special conditions based on the herbicide-specific conservation measures.
- If species-specific presence/absence pretreatment surveys have not been conducted during the specified time-frame and appropriate season prior to the treatment, apply the appropriate species- and herbicide-specific conservation measures to the delineated suitable habitat area for the species.

Sonoran Pronghorn (Antilocapra americana sonoriensis)

- Contact the USFWS AESO (602.242.0210) prior to herbicide treatment within the action area along Interstate 8 in Yuma County and along State Route 85 in Pima County, to determine if action area is sensitive pronghorn habitat, such as foraging and fawning areas.
    - If sensitive pronghorn habitats area present within the action area:
        - Do not conduct herbicide treatments in fawning areas.
        - Do not broadcast spray herbicides in key pronghorn foraging areas.
        - Do not use 2,4-D within ¼ mile of sensitive Sonoran pronghorn habitat.

- Where feasible, avoid use of the following: bromacil, clopyralid, diquat, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, diflufenzopyr + dicamba, picloram, tebuthiuron, and triclopyr.
- If broadcast spraying imazapyr, metsulfuron methyl, or tebuthiuron in or near Sonoran pronghorn habitat, apply at the typical, rather than the maximum, application rate.
- If conducting manual spot applications of glyphosate, hexazinone, imazapyr, metsulfuron methyl, tebuthiuron, or triclopyr utilize the typical, rather than the maximum, application rate.
- Establish buffer zones for other special conditions based on the herbicide-specific conservation measures.

- If presence of sensitive pronghorn habitat is unknown along Interstate 8 in Yuma County and along State Route 85 in Pima County, assume that sensitive pronghorn habitat is present, delineate sensitive habitat areas within the action area and apply the appropriate species- and herbicide-specific conservation measures to the delineated sensitive habitat.

Southwestern Willow Flycatcher (Empidonax traillii extimus)

- Contact the USFWS AESO (602.242.0210) prior to herbicide treatment within suitable riparian corridor habitats, to determine if the habitat is occupied by southwestern willow flycatcher.
- If southwestern willow flycatcher are present within or adjacent to the action area:
  - Do not conduct herbicide treatment within occupied riparian corridor habitat.
  - Do not conduct herbicide treatment within ½ mile of the occupied riparian corridor habitat during the southwestern willow flycatcher nesting season.
  - Do not use 2,4-D within occupied riparian corridor habitat, and do not broadcast spray 2,4-D within ¼ mile of the occupied riparian corridor habitat
  - Do not broadcast spray clopyralid, diquat, diuron, glyphosate, hexazinone, picloram, or triclopyr in areas adjacent to occupied habitat under conditions when spray drift onto the habitat is likely.
  - If broadcast spraying imazapyr or metsulfuron methyl adjacent to southwestern willow flycatcher habitat, apply at the typical, rather than the maximum, application rate.
  - Do not use herbicides that rate as Class 1 in the species toxicity group for Small Avian (Appendix C) within the following appropriate avoidance distance (or greater if specified in the herbicide-specific conservation measures) of the occupied riparian corridor habitat.

Herbicide Formulations	**Herbicide Application Method**	
	Manual	Mechanized Ground
Solid	none	30 feet*
Liquid	none	30 feet*
Ultra-low volume or dust	80 feet	80 feet
Alternative Buffer Zones: * An avoidance distance is unnecessary for these formulations if the herbicide is placed in the soil below a 1½-inch depth.		

- Do not use herbicides that rate as Class 2 in the species toxicity group for Small Avian (Appendix C) within the following appropriate avoidance distance (or greater if specified in the herbicide-specific conservation measures) of the occupied riparian corridor habitat.

Herbicide Formulations	Herbicide Application Method	
	Manual	Mechanized Ground
Solid	10 feet*	60 feet*
Liquid	10 feet*	60 feet*
Ultra-low volume or dust	150 feet	150 feet
Alternative Buffer Zones: * An avoidance distance is unnecessary for these formulations if the herbicide is placed in the soil below a 1½-inch depth.		

- Herbicide applications using mechanized ground equipment should use either liquid streams or relatively coarse sprays to minimize spray drift.
- Establish buffer zones for other special conditions based on the herbicide-specific conservation measures.

- If southwestern willow flycatcher presence is unknown within suitable riparian corridor habitats, assume that the species is present, and apply the appropriate species- and herbicide-specific conservation measures to the suitable riparian corridor habitat.

Virgin River Chub (Gila seminuda)

- Herbicide applications using mechanized ground equipment along the Virgin River on I-15 should use either liquid streams or relatively course sprays to minimize spray drift.
- Do not conduct herbicide treatments during Virgin River chub spawning season (April through July) within ½ mile of the Virgin River along Interstate 15.
- Do not use herbicides that rate as Class 1 in the species toxicity group for Warm Water Fish (Appendix C) within the following appropriate avoidance distance (or greater if specified in the herbicide-specific conservation measures) of the Virgin River floodplain along Interstate 15.

Herbicide Formulations	Herbicide Application Method	
	Manual	Mechanized Ground
Solid	10 feet	50 feet
Liquid	10 feet	80 feet*
Ultra-low volume or dust	150 feet	150 feet
Alternative Buffer Zones: * An avoidance distance of 50 feet may be used if herbicide is applied by a sprayer with low pressure nozzles that deliver a spray ranging from coarse to very coarse in droplet size		

- Do not use herbicides that rate as Class 2 in the species toxicity group for Warm Water Fish (Appendix C) within the following appropriate avoidance distance (or greater if specified in the herbicide-specific conservation measures) of the Virgin River floodplain along Interstate 15.

Herbicide Formulations	Herbicide Application Method	
	Manual	Mechanized Ground
Solid	20 feet	80 feet
Liquid	20 feet	100 feet
Ultra-low volume or dust	200 feet	200 feet

- Establish buffer zones for other special conditions based on the herbicide-specific conservation measures.

Woundfin (Plagopterus argentissimus)

- Do not conduct herbicide treatments during woundfin spawning season (April through July) within ½ mile of the Virgin River along Interstate 15.
- Do not use herbicides that rate as Class 1 in the species toxicity group for Warm Water Fish (Appendix C) within the following appropriate avoidance distance (or greater if specified in the herbicide-specific conservation measures) of the Virgin River floodplain along Interstate 15.

Herbicide Formulations	Herbicide Application Method	
	Manual	Mechanized Ground
Solid	10 feet	50 feet
Liquid	10 feet	80 feet*
Ultra-low volume or dust	150 feet	150 feet
Alternative Buffer Zones: * An avoidance distance of 50 feet may be used if herbicide is applied by a sprayer with low pressure nozzles that deliver a spray ranging from coarse to very coarse in droplet size		

- Do not use herbicides that rate as Class 2 in the species toxicity group for Warm Water Fish (Appendix C) within the following appropriate avoidance distance (or greater if specified in the herbicide-specific conservation measures) of the Virgin River floodplain along Interstate 15.

Herbicide Formulations	Herbicide Application Method	
	Manual	Mechanized Ground
Solid	20 feet	80 feet
Liquid	20 feet	100 feet
Ultra-low volume or dust	200 feet	200 feet

- Establish buffer zones for other special conditions based on the herbicide-specific conservation measures.

Yellow-billed Cuckoo (Coccyzus americanus)

- Contact the USFWS AESO (602.242.0210) prior to herbicide treatment within suitable riparian corridor habitats, to determine if the habitat is occupied by yellow-billed cuckoo.
- If yellow-billed cuckoo are present within or adjacent to the action area:
    - Do not conduct herbicide treatment within the occupied riparian corridor habitat.
    - Do not conduct herbicide treatment within ¼ mile of the occupied riparian corridor habitat during the yellow-billed cuckoo nesting season.

- Do not use herbicides that rate as Class 1 in the species toxicity group for Small Avian (Appendix C) within the following appropriate avoidance distance (or greater if specified in the herbicide-specific conservation measures) of the occupied riparian corridor habitat.

Herbicide Formulations	Herbicide Application Method	
	Manual	Mechanized Ground
Solid	none	30 feet*
Liquid	none	30 feet*
Ultra-low volume or dust	80 feet	80 feet
Alternative Buffer Zones: * An avoidance distance is unnecessary for these formulations if the herbicide is placed in the soil below a 1½-inch depth.		

- Do not use herbicides that rate as Class 2 in the species toxicity group for Small Avian(Appendix C) within the following appropriate avoidance distance (or greater if specified in the herbicide-specific conservation measures) of the occupied riparian corridor habitat.

Herbicide Formulations	Herbicide Application Method	
	Manual	Mechanized Ground
Solid	10 feet*	60 feet*
Liquid	10 feet*	60 feet*
Ultra-low volume or dust	150 feet	150 feet
Alternative Buffer Zones: * An avoidance distance is unnecessary for these formulations if the herbicide is placed in the soil below a 1½-inch depth.		

- Herbicide applications using mechanized ground equipment should use either liquid streams or relatively course sprays to minimize spray drift.

- If yellow-billed cuckoo present is unknown within suitable riparian corridor habitats, assume that the species is present, and apply the appropriate species- and herbicide-specific conservation measures to the suitable riparian corridor habitat.

Yuma Clapper Rail (Rallus longirostris yumanensis)

- Contact the USFWS AESO (602.242.0210) prior to herbicide treatment along State Route 95S, State Route 95 near the Colorado River and Interstate 15 near the Virgin River, to determine if the habitat is occupied by Yuma clapper rail.
- If Yuma clapper rails are present
  - Do not conduct herbicide treatment within ½ mile of the occupied habitat during the nesting season.
  - Do not use 2,4-D within occupied habitat, and do not broadcast spray 2,4-D within ¼ mile of the occupied habitat
  - If broadcast spraying metsulfuron methyl in or adjacent to Yuma clapper rail habitat, apply at the typical, rather than the maximum, application rate.
  - If conducting manual spot applications of, hexazinone, or triclopyr to vegetation in Yuma clapper rail habitat, utilize the typical, rather than the maximum, application rate.

- Do not broadcast spray clopyralid, diquat, diuron, glyphosate, hexazinone, picloram, or triclopyr in areas adjacent to occupied habitat under conditions when spray drift onto the habitat is likely.

- Do not use herbicides that rate as Class 1 in the species toxicity group for Small Avian (Appendix C) within the following appropriate avoidance distance (or greater if specified in the herbicide-specific conservation measures) of suitable habitat along the Colorado River shoreline along State Route 95S and State Route 95 or suitable habitat along the Virgin River floodplain along Interstate 15.

Herbicide Formulations	Herbicide Application Method	
	Manual	Mechanized Ground
Solid	10 feet	50 feet
Liquid	10 feet	80 feet*
Ultra-low volume or dust	150 feet	150 feet
Alternative Buffer Zones: * An avoidance distance of 50 feet may be used if herbicide is applied by a sprayer with low pressure nozzles that deliver a spray ranging from coarse to very coarse in droplet size		

- Do not use herbicides that rate as Class 2 in the species toxicity group for Small Avian (Appendix C) within the following appropriate avoidance distance (or greater if specified in the herbicide-specific conservation measures) of suitable habitat along the Colorado River shoreline along State Route 95S and State Route 95 or suitable habitat along the Virgin River floodplain along Interstate 15.

Herbicide Formulations	Herbicide Application Method	
	Manual	Mechanized Ground
Solid	20 feet	80 feet
Liquid	20 feet	100 feet
Ultra-low volume or dust	200 feet	200 feet

  - Establish buffer zones for other special conditions based on the herbicide-specific conservation measures.

- If Yuma clapper rail presence is unknown along the Colorado River along State Route 95S and State Route 95 or along the Virgin River along Interstate 15, assume that the species is present, delineate suitable Yuma clapper rail habitat within the action area, and apply the appropriate species- and herbicide-specific conservation measures to the suitable habitat.

BLM Sensitive Species Specific Conservation Measures

Paradine (Kaibab) Plains Cactus (Pediocactus paradinei)

- Conduct pretreatment surveys for Paradine plains cactus within all suitable habitat along US Highway 89A during the survey season prior to treatment.
    - If Paradine plains cactus are found within the action area:
        - Do not apply herbicide within 30 feet (or greater if specified in the herbicide-specific conservation measures) of the plant.
        - Establish buffer zones for other special conditions based on the herbicide-specific conservation measures.
    - If species-specific presence/absence pretreatment surveys have not been conducted during the specified time-frame and appropriate season prior to the treatment, apply the avoidance distance (30 feet or greater if specified in the herbicide-specific conservation measures) to the delineated suitable habitat area for the species.

Blue Sand Lily (Triteleiopsis palmeri)

- Conduct pretreatment surveys for blue sand lily within all suitable habitat along Interstate 8 during the survey season prior to treatment.
    - If blue sand lily is found within the action area:
        - Do not apply herbicide within 30 feet (or greater if specified in the herbicide-specific conservation measures) of the plant.
        - Establish buffer zones for other special conditions based on the herbicide-specific conservation measures.
    - If species-specific presence/absence pretreatment surveys have not been conducted during the specified time-frame and appropriate season prior to the treatment, apply the avoidance distance (30 feet or greater if specified in the herbicide-specific conservation measures) to the delineated suitable habitat area for the species.

California Flannelbush (Fremontodendron californicum)

- Conduct pretreatment surveys for California flannelbush within all suitable habitat along State Route 89 during the survey season prior to treatment.
    - If California flannelbush are found within the action area:
        - Do not apply herbicide within 30 feet (or greater if specified in the herbicide-specific conservation measures) of the plant.
        - Establish buffer zones for other special conditions based on the herbicide-specific conservation measures.
    - If species-specific presence/absence pretreatment surveys have not been conducted during the specified time-frame and appropriate season prior to the treatment, apply the avoidance distance (30 feet or greater if specified in the herbicide-specific conservation measures) to the delineated suitable habitat area for the species.

Huachuca Golden Aster (Heterotheca rutteri)

- Conduct pretreatment surveys for Huachuca golden aster within all suitable habitat along State Route 82 and State Route 83 during the survey season prior to treatment.
    - If Huachuca golden aster is found within the action area:
        - Do not apply herbicide within 30 feet (or greater if specified in the herbicide-specific conservation measures) of the plant.
        - Establish buffer zones for other special conditions based on the herbicide-specific conservation measures.
    - If species-specific presence/absence pretreatment surveys have not been conducted during the specified time-frame and appropriate season prior to the treatment, apply the avoidance distance (30 feet or greater if specified in the herbicide-specific conservation measures) to the delineated suitable habitat area for the species.

Marble Canyon Indigo Bush (Psorothamnus arborescens var. pubescens)

- Conduct pretreatment surveys for Marble Canyon indigo bush within all suitable habitat along US Highway 89A during the survey season prior to treatment.
    - If Marble Canyon indigo bush is found within the action area:
        - Do not apply herbicide within 30 feet (or greater if specified in the herbicide-specific conservation measures) of the plant.
        - Establish buffer zones for other special conditions based on the herbicide-specific conservation measures.
    - If species-specific presence/absence pretreatment surveys have not been conducted during the specified time-frame and appropriate season prior to the treatment, apply the avoidance distance (30 feet or greater if specified in the herbicide-specific conservation measures) to the delineated suitable habitat area for the species.

Paria Plateau Fishhook Cactus (Sclerocactus sileri)

- Conduct pretreatment surveys for Paria Plateau fishhook cactus within all suitable habitat along US Highway 89A within 3 years prior to treatment.
    - If Paria Plateau fishhook cactus is found within the action area:
        - Do not apply herbicide within 30 feet (or greater if specified in the herbicide-specific conservation measures) of the plant.
        - Establish buffer zones for other special conditions based on the herbicide-specific conservation measures.
    - If species-specific presence/absence pretreatment surveys have not been conducted during the specified time-frame and appropriate season prior to the treatment, apply the avoidance distance (30 feet or greater if specified in the herbicide-specific conservation measures) to the delineated suitable habitat area for the species.

Pima Indian Mallow (Abutilon parishii)

- Conduct pretreatment surveys for Pima Indian mallow within all suitable habitat along State Route 77, State Route 177, and State Route 96 during the survey season prior to treatment.
    - If Pima Indian mallow is found within the action area:
        - Do not apply herbicide within 30 feet (or greater if specified in the herbicide-specific conservation measures) of the plant.
        - Establish buffer zones for other special conditions based on the herbicide-specific conservation measures.
    - If species-specific presence/absence pretreatment surveys have not been conducted during the specified time-frame and appropriate season prior to the treatment, apply the avoidance distance (30 feet or greater if specified in the herbicide-specific conservation measures) to the delineated suitable habitat area for the species.

Scaly Sand Food (Pholisima arenaria)

- Conduct pretreatment surveys for scaly sand food within all suitable habitat along State Route 72 and State Route 95 during the survey season prior to treatment.
    - If scaly sand food is found within the action area:.
        - Do not apply herbicide within 30 feet (or greater if specified in the herbicide-specific conservation measures) of the plant.
        - Establish buffer zones for other special conditions based on the herbicide-specific conservation measures.
    - If species-specific presence/absence pretreatment surveys have not been conducted during the specified time-frame and appropriate season prior to the treatment, apply the avoidance distance (30 feet or greater if specified in the herbicide-specific conservation measures) to the delineated suitable habitat area for the species.

Schott Wire-lettuce (Stephanomeria schottii)

- Conduct pretreatment surveys for Schott wire-lettuce within all suitable habitat along Interstate 8 during the survey season prior to treatment.
    - If Schott wire-lettuce is found within the action area:
        - Do not apply herbicide within 30 feet (or greater if specified in the herbicide-specific conservation measures) of the plant.
        - Establish buffer zones for other special conditions based on the herbicide-specific conservation measures.
    - If species-specific presence/absence pretreatment surveys have not been conducted during the specified time-frame and appropriate season prior to the treatment, apply the avoidance distance (30 feet or greater if specified in the herbicide-specific conservation measures) to the delineated suitable habitat area for the species.

Smooth Catseye (Cryptantha semiglabra)

- Conduct pretreatment surveys for smooth catseye within all suitable habitat along US Highway 89A during the survey season prior to treatment.
    - If smooth catseye are found within the action area:
        - Do not apply herbicide within 30 feet (or greater if specified in the herbicide-specific conservation measures) of the plant.
        - Establish buffer zones for other special conditions based on the herbicide-specific conservation measures.
    - If species-specific presence/absence pretreatment surveys have not been conducted during the specified time-frame and appropriate season prior to the treatment, apply the avoidance distance (30 feet or greater if specified in the herbicide-specific conservation measures) to the delineated suitable habitat area for the species.

Sonoran Desert Tortoise (Gopherus morafkai)

- In Sonoran desert tortoise habitat, when feasible, conduct herbicide treatments during the fall and winter months (October 15 to March 15), when desert tortoises are least active.
- If any Sonoran desert tortoises are encountered during construction, the applicator shall adhere to the most recent agency guidance for Sonoran desert tortoise encounters to determine whether the tortoise may be moved out of the treatment area. If the guidance does not allow for tortoises to be moved, application shall cease and shall not resume until the tortoise moves over 100 feet from treatment area on its own accord or enters a burrow.

White-margined Penstemon (Penstemon albomarginatus)

- Conduct pretreatment surveys for white-margined penstemon within all suitable habitat along Interstate 40 during the survey season prior to treatment.
    - If white-margined penstemon is found within the action area:
        - Do not apply herbicide within 30 feet (or greater if specified in the herbicide-specific conservation measures) of the plant.
        - Establish buffer zones for other special conditions based on the herbicide-specific conservation measures.
    - If species-specific presence/absence pretreatment surveys have not been conducted during the specified time-frame and appropriate season prior to the treatment, apply the avoidance distance (30 feet or greater if specified in the herbicide-specific conservation measures) to the delineated suitable habitat area for the species.

SECTION 6 – PERSONS AND AGENCIES CONSULTED

Internal Scoping

The BLM Arizona State Office distributed an internal scoping letter to each Field Office within Arizona on December 21, 2012. The scoping letter provided information on the proposed action and requested that each Field Office identify a contact for further communication on the proposed action; provide a list of interested parties; form an interdisciplinary team of resource staff to provide input on the proposed action; and specifically identify any issues, sensitive resources of concern, and/or questions to be addressed in detail in the EA. A response from the Arizona Strip Field Office was received on January 26, 2013 addressing each of these requests. No other responses were received.

Public Scoping

Scoping letters were distributed to interested parties on April 2, 2013. Information was also placed on the BLM's NEPA Register website (https://www.blm.gov/epl-front-office/eplanning/projectSummary.do?methodName=renderDefaultProjectSummary&projectId=34810). Comments on the proposed action were requested by May 10, 2013. However, the BLM indicated that comments would be accepted up to the point that a decision is made on the proposed action. A copy of the letter, a draft of the purpose and need, and a draft of the proposed action were posted on the BLM website. To date, one comment has been received. As appropriate, the comments received were subsequently incorporated into the project proposal, mitigation, and analysis of impacts presented herein.

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APPENDIX A – BLM APPROVED HERBICIDES AND ADJUVANTS

Table A-1. Approved Herbicides

Herbicide (Active Ingredient)	Characteristics and Target Species	Species Selective Herbicide	Target Vegetation Types				
			Annual	Perennial	Broadleaf	Grasses	Riparian/ Aquatic
2, 4-D	Foliar absorbed; post-emergent. Targets kochia, mustards, and Russian thistle.	x	x	x	x		x
Bromacil	Inhibits photosynthesis. Targets kochia, Russian thistle, weeds, and brush.		x		x	x	
Chlorsulfuron	Inhibits enzyme activity. Targets biennial thistles, annual and perennial mustards	x	x	x	x	x	
Clopyralid	Mimics plant hormones. Targets knapweeds, mesquite, starthistle, and other thistles.	x	x	x	x		
Dicamba	Growth regulator. Targets knapweeds, kochia, Russian thistle, other thistles, brush, and trees.		x	x	x		
Diflufenzopyr	Post-emergent; inhibits auxin transport. Controls annual and perennial broadleaf weeds and suppresses annual grasses.		x	x	x	x	
Diflufenzopyr +Dicamba	Post-emergent; inhibits auxin transport. Targets knapweeds, kochia, Russian thistle, and other thistles.				x		
Diquat	Foliar applied. Targets giant salvinia, hydrilla, and watermilfoils.						x
Diuron	Pre-emergent control. Targets kochia, Russian thistle, and weeds.		x	x	x	x	
Fluridone	Controls submersed aquatic plants. Targets hydrilla and watermilfoils.						x
Glyphosate	Targets grasses, weeds, woody shrubs, and sedges.		x	x	x	x	x
Hexazinone	Foliar or soil applied; inhibits photosynthesis. Targets mesquite and scrub oak.		x	x	x	x	
Imazapic	Post-emergent. Targets downy brome, leafy spurge, medusahead, and mustards.	x			x	x	
Imazapyr	Pre-and post-emergent; absorbed through foliage and roots. Targets tamarisk.		x	x	x		x
Metsulfuron methyl	Post-emergent; inhibits cell division in roots and shoots. Targets mustards and biennial thistles.	x	x	x	x		
Picloram	Foliar and root absorption; mimics plant hormones. Targets knapweeds, leafy spurge, and starthistle.	x	x	x	x		

Table A-1. Approved Herbicides							
Herbicide (Active Ingredient)	**Characteristics and Target Species**	**Species Selective Herbicide**	**Target Vegetation Types**				
			Annual	**Perennial**	**Broadleaf**	**Grasses**	**Riparian/ Aquatic**
Sulfometuron methyl	Pre-and post-emergent; inhibits cell division. Targets downy brome, mustards, and medusahead.				**x**	**x**	
Tebuthiuron	Soil activated; pre-and post-emergent. Targets creosotebush, oak, Russian olive, and sagebrush.		**x**	**x**	**x**	**x**	
Triclopyr	Growth regulator. Targets mesquite and tamarisk.				**x**		**x**

Table A-2. Approved Adjuvants		
Adjuvant Class	**Adjuvant Type**	**Trade Name**
Surfactant	Non-ionic	Spec 90/10
		Optima
		Induce
		Actamaster Spray Adjuvant
		Actamaster Soluble Spray
		Adj.
		Activator 90
		LI-700
		Spreader 90
		UAP Surfactant 80/20
		X-77
		Cornbelt Premier 90
		Spray Activator 85
		R-11
		R-900
		Super Spread 90
		Super Spread 7000
	Spreader/Sticker	Cohere
		R-56
		Attach
		Bond
		Tactic
		Lastick
	Silicone-based	Aero Dyne-Amic
		Dyne-Amic
		Kinetic
		Freeway
		Phase
		Phase II
		Silwet L-77
		Sylgard 309
		Syl-Tac
Oil-based	Crop Oil Concentrate	Crop Oil Concentrate
		Herbimax
		Agri-Dex
		R.O.C. Rigo Oil Conc.
		Mor-Act
	Methylated Seed Oil	Methylated Spray Oil Conc.
		MSO Concentrate
		Hasten
		Super Spread MSO
	Vegetable Oil	Amigo
		Competitor

1

Table A-2. Approved Adjuvants		
Adjuvant Class	**Adjuvant Type**	**Trade Name**
Fertilizer-based	Nitrogen-based	Quest
		Dispatch, Dispatch 111, Dispatch 2N, Dispatch AMS
		Flame
		Bronc, Bronc Max, Bronc Max EDT, Bronc Plus Dry EDT, Bronc Total
		Cayuse Plus
Special Purpose or Utility	Buffering Agent	Buffers P.S.
		Tri-Fol
	Colorants	Hi-Light, Hi-Light WSP
		Marker Dye
		Signal
	Compatibility/Suspension Agent	E Z MIX
		Support
		Blendex VHC
	Deposition Aid	ProMate Impel
		Pointblank
		Strike Zone DF
		Intac Plus
		Liberate
		Reign
		Weather Gard
		Bivert
		EDT Concentrate
		Sta Put
	Defoaming Agent	Fighter-F 10, Fighter-F Dry
		Foam Buster
		Cornbelt Defoamer
		No Foam
	Diluent/Deposition Agent Foam Marker	Improved JLB Oil Plus
		Align
		R-160
	Invert Emulsion Agent	Redi-vert II
	Tank Cleaner	Wipe Out
		All Clear
		Tank and Equipment Cleaner
		Kutter
		Neutral-Clean
		Cornbelt Tank-Aid
	Water Conditioning	Blendmaster
		Choice, Choice Xtra, Choice Weather Master
		Cut-Rate

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3 For manufacturer information and registration numbers, refer to the adjuvant list in *Vegetation Treatments on*
4 *BLM-managed lands in 17 Western States Final Biological Assessment* (BLM 2007).

APPENDIX B – BLM SENSITIVE SPECIES EVALUATION

Table B-1 includes the BLM Arizona list of sensitive species which also includes ESA candidate and conservation agreement species potentially occurring in Arizona. Only the highlighted species are further evaluated in detail below. The remaining species were excluded from further evaluation, and a justification for their exclusion is included in the table. The project will have no impact on those species excluded from further evaluation.

Table B-1. BLM Arizona Species List

Species	Status[1]	Habitat Requirements	Exclusion Justification
AMPHIBIANS			
Arizona treefrog (Huachuca/Canelo DPS) (*Hyla wrightorum*)	ESA C	Madrean oak woodlands, savannah, pine-oak woodlands, and mixed conifer forests at an elevation range of 5,000–8,500.	Action area does not occur within the species known range. Species occurs in the Huachuca Mountains and Canelo Hills.
Relict leopard frog (*Lithobates* [*Rana*] *onca*)	ESA C	Permanent streams, springs, and spring-fed wetlands with open shorelines and available pools below 1,968 feet.	Action area does not occur within the species known range. A population within the action area at the Virgin River near Littlefield is now extinct (USFWS 2005).
Great Plains narrow-mouthed toad (*Gastrophryne olivacea*)	S	Mesquite semi-desert grassland to oak woodland, in the vicinity of streams, springs and rain pools. They can be found in deep, moist crevices or burrows, often with various rodents, and under large flat rocks, dead wood, and other debris near water. Elevation ranges from 1,400 to 4,700 feet.	Evaluated in detail.
Lowland burrowing treefrog (*Smilisca fodiens*)	S	Xeric environments in low open mesquite grasslands associated with major washes and arroyos. Elevation range is 1,930 – 2,480 feet.	Evaluated in detail.
Lowland leopard frog (*Lithobates yavapaiensis*)	S	Aquatic systems within lower and upper Sonoran desert, grassland, oak and oak-pine woodland at 480 to 6,200 feet in elevation.	Evaluated in detail.
Northern leopard frog (*Lithobates pipiens*)	S	Grasslands, brush lands, woodlands, and forests, usually in permanent waters with rooted aquatic vegetation; also frequents ponds, canals, marshes, springs, and streams. Elevations between 2,640 and 9,155 feet above the Mogollon Rim.	Action area does not occur within the species known range. The species range is mainly restricted to cattle tanks and a lake on the Coconino National Forest, with a few other small, isolated populations persisting in Arizona (Rorabaugh 2008).

Table B-1. BLM Arizona Species List			
Species	**Status**[1]	**Habitat Requirements**	**Exclusion Justification**
Plains leopard frog (*Lithobates blairi*)	S	Found mainly around streams, ponds, creek pools, reservoirs, marshes or irrigation ditches in prairie and desert grasslands, but also can be found in oak and oak-pine woodland and farmland. Elevation ranges from 4,060 – 5,880 feet.	Action area does not occur within the species known range. The species range is restricted to the west side of the Chiricahua Mountains and the Sulphur Springs Valley (AGFD 2002d).
Sonoran green toad (*Bufo retiformis*)	S	Rain pools, wash bottoms, and areas near water in semi-arid mesquite-grassland, creosotebush desert, and upland saguaro-paloverde desert scrub. Elevation ranges from 500 - 3,225 feet.	Evaluated in detail.
BIRDS			
Sprague's pipit (*Anthus spragueii*)	ESA C	Strong preference to native grasslands with vegetation of intermediate height and lacking woody shrubs below 5,000 feet.	Evaluated in detail.
American peregrine falcon (*Falco pereginus anatum*)	ESA D S	Areas with rocky, steep cliffs, primarily near water, where prey (primarily shorebirds, songbirds, and waterfowl) concentrations are high. Nests are found on ledges of cliffs, and sometimes on man-made structures such as office towers and bridge abutments. Elevation range is 3,500–9,000 feet.	Evaluated in detail.
Bald eagle (non-listed DPS) (*Haliaeetus leucocephalus*)	ESA D S	Large trees or cliffs near water (reservoirs, rivers, and streams) with abundant prey at various elevations.	Evaluated in detail.
Cactus ferruginous pygmy-owl (*Glaucidium brasilianum cactorum*)	ESA D PR S	Areas of desert woodlands with tall canopy cover. Primarily found in Sonoran desert scrub and occasionally in riparian drainages and woodlands within semi-desert grassland communities. Prefers to nest in cavities in saguaro cacti but has been found in low-density suburban developments that include natural open spaces. Found at elevations less than 4,000 feet.	Evaluated in detail.
Arizona Botteri's sparrow (*Peucaea botterii arizonae*)	S	Primarily found within grassland and coastal prairie, with some interspersed shrubs and trees. Prefers tall grasses for nesting.	Evaluated in detail.
Arizona grasshopper sparrow (*Ammodramus savannarum ammolegus*)	S	Open desert grassland and Sonoran desert scrub between 3,800 and 5,300 feet. Large expanses of intermediate height grass for nesting.	Evaluated in detail.
California black rail (*Laterallus jamaicensis coturniculus*)	S	Constricted to southwestern Arizona in the lower Colorado River marshes in elevations ranging from 155 to 475 feet.	No suitable habitat within the action area.

Table B-1. BLM Arizona Species List			
Species	**Status**[1]	**Habitat Requirements**	**Exclusion Justification**
Desert purple martin (*Progne subis hesperia*)	S	Giant cactus forests of southwestern deserts.	Herbicide use would not impact saguaros.
Ferruginous hawk (breeding population only) (*Buteo regalis*)	S	Open scrublands and woodlands, grasslands, and Semidesert Grassland. Elevation ranges from 3,500 to 6,000 feet.	Evaluated in detail
Gilded flicker (*Colaptes chrysoides*)	S	Saguaro cactus forests of the Sonoran Desert.	Herbicide use would not impact saguaros.
Golden eagle (*Aquila chrysaetos*)	S	Open country, prairies, arctic and alpine tundra, open wooded country and barren areas, especially in hilly or mountainous regions. They nest on rock ledges, cliffs or in large trees. Elevations from 4,000 – 10,000 feet.	Evaluated in detail.
Le Conte's thrasher (*Toxostoma lecontei*)	S	Remote desert scrub, mesquite, tall riparian brush and, locally, chaparral. Prefers undisturbed areas in remote locations.	Unlikely to occur in the action area. Intolerant of humans and activity (Corman 2005).
Northern goshawk (*Accipiter gentilis atricapillus*)	S	High, forested mountains and plateaus, usually above 6,000 feet, but ranges from 4,750-9,120 feet in elevation.	Action area does not occur within the species known range. Primarily occurs along the Mogollon Rim, outside of BLM-managed lands.
Pinyon jay (*Gymnorhinus cyanocephalus*)	S	Pinyon-juniper woodland, sagebrush, scrub oak, and chaparral communities, and occasionally pine dominated forests. Elevations range from 4,000 to 8,500 feet.	Evaluated in detail.
Western burrowing owl (*Athene cunicularia hypugaea*)	S	Open, well-drained grasslands, steppes, deserts, prairies, and agricultural lands, often associated with burrowing mammals. Also in open areas near human habitation, such as vacant lots, golf courses and airports. Elevation is 650 – 6,140 feet.	Evaluated in detail.
FISH			
Headwater chub *(Gila nigra)*	ESA C	Medium-sized streams in large, deep pools often associated with cover such as undercut banks or deep places created by trees or rocks from 3,000 to 6,700 feet.	Action area does not occur within the species known range. Located in streams on National Forest lands.
Roundtail chub (*Gila robusta*)	ESA C	Cool to warm waters of rivers and streams, often occupy the deepest pools and eddies of large streams at elevations of 1,000–7,500 feet.	Evaluated in detail.
Virgin spinedace (*Lepidomeda mollispinis mollispinis*)	ESA CA	Found in small streams, prefer cool, clear tributaries and inflow areas at large streams below 4,500 feet.	Evaluated in detail.

Table B-1. BLM Arizona Species List

Species	Status[1]	Habitat Requirements	Exclusion Justification
Desert sucker (*Catostomus clarki*)	S	Found in rapids and flowing pools of streams and rivers primarily over bottoms of gravel-rubble with sandy silt in the interstices between 480 to 8,840 feet.	Evaluated in detail.
Flannelmouth sucker (*Catostomus latipinnis*)	S	Restricted to large and moderately large rivers including the Colorado River and its larger tributaries. Elevation is between 1,540 - 3,160 feet.	Evaluated in detail.
Little Colorado sucker (*Catostomus* spp.)	S	Endemic to the upper portion of the Little Colorado River and many of its north flowing tributaries. Prefers creeks, small to medium rivers, and impoundments. Predominantly found in pools with abundant cover 2,200 to 7,100 feet.	Action area does not occur within the species known range.
Yaqui longfin dace (*Agosia chrysogaster*)	S	Small or medium size streams, with sandy or gravely bottoms; eddies, pools near overhanging banks or other cover at less than 4,900 feet.	Action area does not occur within the species known range. Occurs only in Cochise County, outside of BLM-managed lands.
Sonora sucker (*Catostomus insignis*)	S	Variety of habitat from warm water rivers to trout streams. Elevation range is from 1,210 to 8,730 feet.	Evaluated in detail.
Speckled dace (*Rhinichthys osculus*)	S	Rocky riffles, runs, and pools of headwaters, creeks, and small to medium rivers: rarely in lakes. At elevations greater than 4,921 feet.	Evaluated in detail.
INVERTEBRATES			
Huachuca springsnail (*Pyrgulopsis thompsoni*)	ESA C	Aquatic areas, small springs with vegetation and slow to moderate flow at an elevation range of 4,500–7,200 feet.	Action area does not occur within the species known range.
Page springsnail (*Pyrgulopsis morrisoni*)	ESA C	Permanently saturated cienegas, firm substrate like cobble, gravel, woody debris, and aquatic vegetation from 3,300 to 3,600 feet	Action area does not occur within the species known range.
Stephan's riffle beetle (*Heterelmis stephani*)	ESA C	Free-flowing springs and seeps, commonly referred to as rheocrenes from 5,100 to 6,600 feet.	Action area does not occur within the species known range.
San Xavier talussnail (*Sonorella eremita*)	ESA CA	Inhabits a deep, northwest facing limestone rockslide from 3,850 to 3,920 feet	Action area does not occur within the species known range. Found only on San Xavier Hill on private lands.
Wet Canyon talussnail (*Sonorella macrophallus)*	ESA CA	Talus slopes in heavily vegetated area of Wet Canyon (Pinaleno Mountains), between 6,050 and 6,900 feet elevation.	Action area does not occur within the species known range.
Arizona cave amphipod (*Stygobromus arizonensis*)	S	Aquatic habitats in subterranean caves and mine tunnels at around 5,245 feet in elevation in southeastern Arizona.	Action area does not occur within the species known range. No caves or mines within the action area.

Table B-1. BLM Arizona Species List			
Species	**Status**[1]	**Habitat Requirements**	**Exclusion Justification**
Bylas springsnail (*Pyrgulopsis arizonae*)	S	Mildly thermal spring sources. Found on firm substratum in the springbrooks, on dead wood, gravel, and pebbles. Elevation ranges from 2,580 - 2,800 feet.	Action area does not occur within the species known range.
Desert springsnail (*Pyrgulopsis deserta*)	S	Springs along the Virgin River in southwestern Utah and northwestern Arizona. Elevation from 1,870-1,900 feet.	Evaluated in detail.
Gila tryonia (*Tryonia gilae*)	S	Unnamed spring north of Bylas, Graham County, Arizona. Spring sources are all mildly thermal at elevations from 2,600 to 2,800 feet.	Action area does not occur within the species known range.
Grand Wash springsnail (*Pyrgulopsis bacchus*)	S	Grapevine Springs, Whisky Springs and Tassi Springs within the Grand Wash trough, Mohave County, northwestern Arizona from 1,570 – 1,720 feet.	Action area does not occur within the species known range.
Hydrobiid spring snails (*Pyrgulopsis* spp.)	S	In springs in various locations throughout Arizona.	Action area does not occur within the species known range. Species of the genus *Pyrgulopsis* in Arizona are endemic to specific locations in the state. The desert springsnail may occur within the action area and is evaluated below. All other springsnails of this genus are excluded based on geographic location.
Kingman springsnail (*Pyrgulopsis conica*)	S	Burns, Dripping, and Cool Springs in the Black Mountains near Kingman, Mohave County, northwestern Arizona at elevations from 2,640 - 3,600 feet.	Action area does not occur within the species known range.
Succineid snails (*Succineidae* spp.)	S	In various marshes and springs throughout Arizona.	Action area does not occur within the species known range. Species of the genus *Succineidae* in Arizona are endemic to specific locations in the state.
MAMMALS			
Allen's big-eared bat (*Idionycteris phyllotis)*	S	Most common in areas of ponderosa pine, pinyon-juniper, Mexican woodland and riparian areas of sycamores, cottonwoods and willows. Also found in white fir and in Mohave desertscrub. Elevation range is 3,500–7,500 feet.	No daytime roosts such as mines and caves occur in the action area.
Arizona myotis (*Myotis occultus*)	S	Ponderosa pine and oak-pine woodland near water. Elevation ranges from 3,200 feet in the Verde Valley to 8,620 feet in the San Francisco Peaks.	Evaluated in detail.
Banner-tailed kangaroo rat (*Dipodomys spectabilis*)	S	Scattered shrub-covered slopes and low hills within semidesert grasslands at elevations usually between 3,900 and 4,900 feet.	Evaluated in detail.

Table B-1. BLM Arizona Species List

Species	Status[1]	Habitat Requirements	Exclusion Justification
Black-tailed prairie dog (*Cynomys ludovicianus*)	S	Dry, flat, open plains and desert grasslands. Elevation ranges from 3,000 to 5,500 feet.	Action area does not occur within the species known range. Considered extirpated from Arizona since 1940. In 2008, reintroduced into Las Cienegas National Conservation Area.
California leaf-nosed bat (*Macrotus californicus*)	S	Mostly found in the Sonoran desertscrub; roost in mines, caves, and rock shelters up to 4,000 feet.	No day roosts such as caves or mines occur in action area. Bats roosting in rock shelters would not be exposed to herbicides.
Cave myotis (*Myotis velifer*)	S	Desertscrub of creosote, brittlebush, palo verde and cacti. Roost in caves, tunnels, and mineshafts, and under bridges, and sometimes in buildings within a few miles of water. Elevation is typically between 300 and 5,000 feet but has been observed between 6,000 and 8,800 feet.	No day roosts such as caves, tunnels, or mineshafts occur in action area.
Greater western mastiff bat (*Eumops perotis californicus*)	S	Lower and upper Sonoran desertscrub near cliffs, preferring the rugged rocky canyons with abundant crevices at 240 – 8,475 feet.	Bats roosting in deep crevices of cliffs and canyons would not be exposed to herbicides.
Gunnison's prairie dog (*Cynomys gunnisoni*)	S	Grass–shrub areas in low valleys and mountain meadows in level to gently sloping grasslands and semi-desert and montane shrublands, at elevations from 6,000 to 12,000 feet.	Evaluated in detail.
Houserock Valley chisel-toothed kangaroo rat (*Dipodomys microps leucotis*)	S	Great Basin desertscrub communities with relatively high shrub cover and sparse grass cover in elevations from 3,500 to 6,500 feet. Restricted to Houserock Valley, on the north and west side of the Colorado River.	Evaluated in detail.
Mexican long-tongued bat (*Choeronycteris mexicana*)	S	Mesic areas in canyons of mixed oak-conifer forests in mountains rising from the desert at elevations from 2,540 to 7,320 feet.	No day roost sites such as mines or caves are within the action area. Direct spray of food plants would not occur.
Spotted bat (*Euderma maculatum*)	S	Varied habitat including dry, rough desertscrub, ponderosa pine forest, low to high desert, riparian habitat, and conifer forests at elevations from 110 to 8,670 feet.	Bats roosting in cracks and crevices of cliffs would not be exposed to herbicides.
Townsend's big-eared bat (*Corynorhinus (=Plecotus) townsendii*)	S	Varied habitat including coniferous forests, mixed mesophytic forests, deserts, native prairies, riparian communities, and active agricultural areas. Distribution is strongly correlated with the availability of caves and cave-like roosting habitat at elevations up to 10,826 feet.	No day roost sites such as caves occur within the action area.

Table B-1. BLM Arizona Species List			
Species	**Status**[1]	**Habitat Requirements**	**Exclusion Justification**
REPTILES			
Sonoyta mud turtle (*Kinosternon sonoriense longifemorale*)	ESA C	Ponds and streams at approximately 1,100 feet.	Action area does not occur within the species known range.
Flat-tailed horned lizard (*Phrynosoma mcallii)*	ESA CA	Primarily found in creosote-white bursage series of Sonoran Desert Scrub in association with sandy flats and valleys commonly below 750 feet. Sympatric with desert horned lizard (*Phrynosonoma platyrhinos*) in Arizona. More than 95% of its diet is composed of ants, with species of harvester ants (genera *Messor* and *Pogonomyrmex*) predominating.	Action area does not occur within suitable habitat. A 0.5 mile portion of the action area along I-8 is within the species range, although the surrounding land is developed and lacks sandy flats (AGFD 2010c).
Arizona striped whiptail (*Aspidoscelis arizonae*)	S	Low valleys and sandy flats within Semidesert Grassland from 4,080 to 4,640 feet.	Action area does not occur within the species known range. Current range is restricted to three sites, near Willcox, Bonita, and the Whitlock Valley (Hammerson 2007).
Mohave fringe-toed lizard (*Uma scoparia*)	S	Restricted to fine, windblown sands and dunes, flats, riverbanks and washes of very arid desert, with low-growing vegetation. Elevation ranges from 510 to 1,090 feet.	Evaluated in detail.
Desert ornate box turtle (*Terrapene ornata*)	S	Found at elevations ranging from 2,000-7,100 ft., in semidesert grasslands and Chihuahuan desertscrub.	Evaluated in detail.
Slevin's bunchgrass lizard (*Sceloporus slevini*)	S	Coniferous forest to 10,000 feet and occasionally in desert-grassland in southeast Arizona.	Evaluated in detail.
Sonora mud turtle (*Kinosternon sonoriense sonoriense*)	S	Springs, creeks, ponds and waterholes of intermittent streams from sea level to 6,700 feet.	Evaluated in detail.
Yuman desert fringe-toed lizard (*Uma rufopunctata*)	S	Restricted to sparsely vegetated fine, windblown sand dunes, flats, riverbanks and washes of very arid desert from sea level to about 600 feet.	Evaluated in detail.
Sonoran desert tortoise* (*Gopherus morafkai*)	ESA C	Primarily found in rocky hillsides and bajadas of Mohave and Sonoran desertscrub below 7,800 feet. May also occur in desert grassland, juniper woodland, interior chaparral, and pine communities. Washes and valley bottoms may be used in dispersal.	Evaluated in detail.
PLANTS			
Arizona bugbane *(Cimicifuga arizonica)*	ESA CA	Areas of deep shade and moist, loamy soils with high humus content, and high humidity; typically along the bottoms and lower slopes of steep narrow canyons from 5,300 to 8,300 feet.	Action area does not occur within the species known range.

Table B-1. BLM Arizona Species List

Species	Status[1]	Habitat Requirements	Exclusion Justification
Arizona willow (*Salix arizonica*)	ESA CA	Unshaded or partially shaded wet meadows, streamsides and cienegas; typically found in or adjacent to perennial water above 8,000 feet.	Action area does not occur within the species known range.
Gooddings onion (*Allium gooddingii*)	ESA CA	Shaded sites on north-trending drainages, on slopes, or in narrow canyons, within mixed conifer and spruce fir forests between 7,500 and 11,250 feet.	Action area does not occur within the species known range.
Paradine (Kaibab) plains cactus (*Pediocactus paradinei*)	ESA CA S	May be restricted to Kaibab limestone soils in transitional areas between woodland and sagebrush communities at elevations of 4,500–7,000 feet.	Evaluated in detail.
Aquarius milkvetch (*Astragalus newberryi* var. *aquaria*)	S	Very narrow geographic range near Burro Creek, Mohave County, Arizona. Elevation range is 2,000 - 2,600 feet on white Miocene (Pliocene age lacustrine deposit) which is endemic to late Tertiary lacustrine deposits of inter-bedded white limestone and ash flows within the Sonoran desert.	Action area does not occur within the species known range. Endemic to Clay Hills ACEC approximately 5 miles northeast of US 93.
Aravaipa sage (*Salvia amissa*)	S	Located in south-central Arizona on upper floodplain terraces in shady canyon bottoms near streams in understory of mature sycamore, ash, walnut and mesquite. Elevation range is from 3,120-5,000 feet.	Action area does not occur within the species known range.
Aravaipa woodfern (*Thelypteris puberula* var. *sonorensis*)	S	In moist soil in the shade of boulders in mesic canyons. On riverbanks, seepage areas, and meadow habitat. Elevation range is 2,220 - 4,500 feet.	Evaluated in detail.
Arizona Sonoran rosewood (*Vauquelinia californica ssp. sonorensis*)	S	Chihuahuan desert scrub on dry limestone ridges, hills and rhyolite from 4,100 – 6,000 feet in elevation.	Action area does not occur within the species known range.
Bartram stonecrop (*Graptopetalum bartramii*)	S	Cracks in rocky outcrops in shrub live oak-grassland communities along meandering arroyos on sides of rugged canyons. Usually heavy litter cover and shade where moisture drips from rocks, often within Madrean evergreen woodland. Elevations from 3,650 - 6,700 feet.	No suitable habitat within the action area. Occurrences have been recorded in the Mule Mountains near US 80. However, no north facing slopes or rocky outcrops are present in the action area along US 80.
Blue sand lily (*Triteleiopsis palmeri*)	S	Sandy areas (dunes) in low desert. The elevation range is 250 – 1,600 feet.	Evaluated in detail.
California flannelbush (*Fremontodendron californicum*)	S	Mainly well-drained rocky hillsides and ridges, in chaparral and oak/pine woodland. Elevation ranges from 3,500 to 6,500 feet.	Evaluated in detail.
Chihuahua breadroot (*Pediomelum pentaphyllum*)	S	Desert grasslands in southeastern Arizona between 3,600 and 4,500 feet.	Action area does not occur within the species known range.
Clifton rock daisy (*Perityle ambrosiifolia*)	S	Fissures and crevices in conglomerate rock, near seeps and water falls; high desert above and riparian below from 1,800 to 4,900 feet.	Action area does not occur within the species known range.

Table B-1. BLM Arizona Species List

Species	Status[1]	Habitat Requirements	Exclusion Justification
Dalhouse spleenwort (*Asplenium (=Ceterach) dalhousiae*)	S	Shady, rocky ravines in moist soil among and at the bases of rocks, in Madrean oak woodland between 4,000 and 6,000 feet.	No suitable habitat within the action area. Occurrences have been recorded in the Mule Mountains near US 80. However, no shady, granitic, rocky ravines are present in the action area along US 80.
Diamond Butte milkvetch (*Astragalus toanus* var. *scidulus*)	S	Restricted to the bases of buttes within mixed desertscrub and scattered juniper and pinyon on seleniferous, red Moenkopi soils. Elevation range is 4,900 to 5,400 feet.	Action area does not occur within the species known range.
Fish Creek fleabane (*Erigeron piscaticus*)	S	Moist, sandy canyon bottoms associated with perennial streams at 2,250 to 3,500 feet.	Action area does not occur within the species known range.
Gentry indigo bush (*Dalea tentaculoides*)	S	Canyon bottoms on cobble terraces subject to occasional flooding from 3,600 – 4,580 feet.	Action area does not occur within the species known range.
Giant sedge (*Carex spissa* var. *ultra*)	S	Moist soil near perennially wet springs and streams; undulating rocky-gravelly terrain. Elevation from 2,040 - 6,000 feet.	Action area does not occur within the species known range.
Grand Canyon rose (*Rosa stellata var. abyssa*)	S	On or near canyon rims or the tops of cliffs at the edges of mesas or plateaus, along low ledges at depressions caused by breccia pipes. On limestone-red clay soils between 4,500 and 7,540 feet.	No suitable habitat within the action area. No canyon rims, cliff tops and plateaus within the species elevation range in the action area.
Huachuca golden aster (*Heterotheca rutteri*)	S	Level, open grassland. Grows on roadcuts, and disturbed sites from 4,500 to 6,500 feet.	Evaluated in detail.
Huachuca milkvetch (*Astragalus hypoxylus*)	S	Open, limestone rocky clearings in oak-juniper-pinyon woodland from 5,300 – 6,100 feet near the Huachuca and Patagonia mountains.	Action area does not occur within the species known range.
Kearney sumac (*Rhus kearneyi*)	S	Arid slopes, along canyons and drainages from 1,000 to 2,000 feet.	Action area does not occur within the species known range. Endemic to Tinajas Atlas Mountain on the Barry Goldwater Bombing Range (Rice 2013).
Kofa Mt. barberry (*Berberis harrisoniana*)	S	Inhabits the bottoms of deep, shady, rocky canyons from 2,200 – 3,500 feet.	Action area does not occur within the species known range.
Marble Canyon indigo bush (*Psorothamnus arborescens* var. *pubescens*)	S	Rocky clay knolls and talus under sandstone cliffs, 3,200-4,900 feet near Marble Canyon and eastern Grand Canyon.	Evaluated in detail.

Table B-1. BLM Arizona Species List			
Species	**Status**[1]	**Habitat Requirements**	**Exclusion Justification**
Marble Canyon milkvetch (*Astragalus cremnophylax* var. *hevronii*)	S	Great Basin desertscrub habitat, on rim-rock benches at the canyon edge in crevices and depressions with shallow soils on Kaibab limestone; 5,200 - 5,400 feet	Action area does not occur within the species known range. Action area near Marble Canyon is outside the species elevation range.
Mt Trumbull beardtongue (*Penstemon distans*)	S	Typically in gravelly Kaibab limestone on mesa tops in pinyon-juniper woodlands, but also known from steep north facing canyon slopes of Supai Formation in Mohave Desertscrub. From 3,900 – 5,200 feet.	Action area does not occur within the species known range.
Murphey agave (*Agave murpheyi*)	S	In central Arizona, it is commonly found on alluvial benches or terraces on gentle bajada slopes (not steep slopes or drainage bottoms) above major drainages in desert scrub between 1,300 - 3,200 feet.	Evaluated in detail.
Paria Plateau fishhook cactus (*Sclerocactus sileri*)	S	Pinyon-juniper woodlands and grama grasslands, silty sand or clay soils, often with gravel, in Moenave, Chinle and Navajo Formations often on mesa tops from 4,200-7,040 feet.	Evaluated in detail.
Parish phacelia (*Phacelia parishii*)	S	Edge of barren playa surrounded by semi-desert grassland and Mohave Desert; gypsum beds in lacustrine deposits of the Sonoran Desert between 2,300 and 2,800 feet.	No suitable habitat within the action area. The action area along SR 66 in Hualapai Valley and along US 93 at Burro Creek are both outside of the species elevation range.
Parish wild onion (*Allium parishii*)	S	Open rocky and sandy lopes in the Mohave Desert, including the desert mountain ranges; from 2,720 – 2,900 feet.	Action area does not occur within the species known range.
Pima Indian mallow (*Abutilon parishii*)	S	On rocky hillsides, cliff bases, canyon bottoms, lower side slopes and ledges of canyons among rocks and boulders from 1,720 to 4,900 feet.	Evaluated in detail.
Pinto beardtongue (*Penstemon bicolor*)	S	Gravel washes and disturbed roadsides, to outwash fans and plains from 1,970 – 5,480 feet near the Black Mountains in northwestern Arizona.	Action area does not occur within the species known range. Only known occurrences in Arizona are in the Black Mountains (Smith 2005)
Purple-spike coralroot (*Hexalectris warnockii*)	S	In humus beneath rocks and fallen oaks along streambeds 5,000 to 7,000 feet.	No suitable habitat within the action area. No rich humus soils within the action area in the species known range.
Round-leaf broom (*Errazurizia rotundata*)	S	Several types of outcrops ranging from sandy soils in sandstone, gravelly soils in calcareous outcrops, to deep, alluvial cinders in sandstone breaks from 4,620 – 5,200 feet. Thought to be endemic to the Little Colorado River drainage.	Action area does not occur within the species known range.

Table B-1. BLM Arizona Species List

Species	Status[1]	Habitat Requirements	Exclusion Justification
San Pedro River wild buckwheat (*Eriogonum terrenatum*)	S	Restricted to Pima and Cochise counties. In Pima County, the species is found on clayey outcrops of the Pantano Formation, whereas in Cochise County, it is confined to the eroded, clay slopes and flats of the Saint David Formation. Elevation ranges from 3,520 – 3,914 feet.	Action area does not occur within the species known range (Anderson 2013)
Sand food (*Pholisima sonorae*)	S	Drifting sandy soil and other sandy areas, in low desert from 492-1345 feet in elevation.	Action area does not occur within the species known range.
Scaly sand food (*Pholisima arenaria*)	S	Coastal strand; sand dunes from 470 - 900 feet.	Evaluated in detail.
Schott wire-lettuce (*Stephanomeria schottii*)	S	Sand dunes endemic to the Gran Desierto Region ranging from 350-800 feet in elevation.	Evaluated in detail.
September 11 stickleaf (*Mentzelia memorabilis*)	S	Restricted to the Clayhole Wash drainage in northern Mohave County. Grows on dry gypsum-clay outcrops with sparse vegetation at 4,689 – 5,197 feet in elevation.	Action area does not occur within the species known range.
Silverleaf sunray (*Enceliopsis argophylla*)	S	Warm desert shrub community on dry slopes and sandy washes. Clay and gypsum cliffs to gravelly slopes, and sandy washes; from 705 – 3,400 feet.	Action area does not occur within the species known range.
Smooth catseye (*Cryptantha semiglabra*)	S	Arid red detrital clay soils and gray shales of the Moenkopi Formation, in the Great Basin Desertscrub biotic community between 4,600 and 4,900 feet.	Evaluated in detail.
Sticky wild buckwheat (*Eriogonum viscidulum*)	S	Low dunes, washes, and sandy flats and slopes, in saltbush and creosote bush communities within Mohave Desertscrub at 1,180 – 2,492 feet in elevation.	Action area does not occur within the species known range.
Three-cornered milkvetch (*Astragalus geyeri* var. *triquetrus*)	S	Limited to washes and small pockets of wind-deposited sand, of the creosotebush scrub series, with sandy soils formed from sedimentary formations (Jurassic age sandstone), adjacent to Lake Mead and its tributary valleys from 1,100 – 2,400 feet.	Action area does not occur within the species known range.
Tumamoc globeberry (*Tumamoca macdougalii*)	S	Xeric situations, in the shade of a variety of nurse plants along gullies and sandy washes of hills and valleys in Sonoran desertscrub and Sinaloan thornscrub communities below 3,000 feet.	Evaluated in detail.
White-margined penstemon (*Penstemon albomarginatus*)	S	Coarse sandy and silty soil in Mohave Desertscrub communities from approximately 1,500 – 3,000 feet in elevation. Sometimes found in the open, but often near creosote bushes, Joshua trees, or other large shrubs.	Evaluated in detail.

[1] Status Definitions: ESA=Endangered Species Act, C=Candidate, PR=Petitioned for Relisting, CA=Conservation Agreement, D=Delisted, S=Bureau of Land Management Sensitive Species.

Sources: U.S. Fish and Wildlife Service Endangered Act Species List for the State of Arizona. Accessed March 12, 2014 (http://ecos.fws.gov/ipac/). Arizona Bureau of Land Management Sensitive Species List, List Date: December 2010 (http://www.blm.gov/az/st/en/prog/wildlife.html).

Amphibians

Great Plains Narrow-mouthed toad

This toad has a small pointed head, which is used to burrow under rocks and debris. It often burrows during the day in terrestrial areas adjacent to aquatic habitats such as streams, springs, and rain pools. It is found in valley bottoms and hilly terrain, and occurrences of the species are often documented in association with lowland burrowing treefrogs and Sonoran green toads. Great plains narrow-mouthed toads (*Gastrophryne olivacea*) are nocturnal, and remain dormant underground for much of the year, emerging during the summer monsoons between June and September to breed. Egg masses are laid in water and hatch within two days. The tadpoles metamorphose within 28-50 days. Adult and juvenile toads consume ants, termites, and small beetles (AGFD 2003b).

The species range includes semidesert grasslands, Sonoran desertscrub, and oak woodlands within south-central Arizona (AGFD 2003b). The species range overlaps with the action area in the Vekol Valley, particularly near Vekol Wash and Santa Rosa Wash along I-8 in Maricopa and Pinal counties, and in the Altar Valley along SR 86 in Pima County.

Lowland burrowing treefrog

This hylid is yellow-brown with dark olive brown blotches on the body and co-ossified skin on the head. Lowland burrowing treefrogs (*Smilisca fodiens*) are more often found on the ground than in trees and spend much of the year in underground burrows. Activity is spurred by the summer monsoons, when the frogs emerge to breed. Not discovered in Arizona until 1957, specific information regarding reproduction and diet of the species is largely unknown, although it is assumed that the frog feeds on arthropods (Nigro and Rorabaugh 2008a).

The northern range of the species is south-central Arizona, where it inhabits washes and uplands within Sonoran desertscrub. The species is primarily found in Pima County on Tohono O'odham lands, but has been discovered in the Vekol Valley of Maricopa and Pinal counties (Nigro and Rorabaugh 2008a).

Lowland leopard frog

Unlike other leopard frogs, lowland leopard frogs have a dark brown reticulate pattern on the outer thighs and broken, inset dorsolateral folds. Lowland leopard frogs (*Lithobates yavapaiensis*) utilize natural and man-made aquatic habitats. Where water is not present year-round, the frog takes refuge in mud cracks, mammal burrows, and rock fissures to prevent desiccation. The lowland leopard frog is active both day and night and nearly year-round. During the summer monsoon season, frogs will travel overland and along drainages to breed and disperse. From January to April and in October, eggs are laid in shallow water. Tadpoles metamorphose in three to nine months, but may overwinter if necessary. As with other leopard frogs, adults feed on invertebrates and larvae consume plant matter and detritus (AGFD 2006).

This species is found in central and southeastern Arizona, from desert grassland to pine-oak woodland habitats below the Mogollon Rim (AGFD 2006). Within the action area, this species occurs near waterways in Mohave, Yavapai, northern Maricopa, Gila, Pinal, Graham, and Greenlee counties.

Sonoran green toad

Distinguishing characteristics of the species include its bright coloring, which consists of greenish-yellow blotches surrounded by black or brown reticulation, and its large paratoid glands. Sonoran green toads (*Bufo retiformis*) occupy areas that accumulate water, such as cattle tanks, roadside ditches, and arroyos, although it spends most of its life in underground burrows. The species becomes active during the summer monsoon season, when it will travel to a water source to breed. Approximately 5-200 eggs are laid and hatch within two to three days; tadpoles metamorphose in two to three weeks. Diet likely consists of various invertebrates (Nigro and Rorabaugh 2008b).

Sonoran green toads are found within lower and upland Sonoran desertscrub and more vegetated semi-desert grasslands in south-central Arizona, throughout Pima County, up to the Vekol Valley and east to the Altar Valley (Nigro and Rorabaugh 2008b). Within the action area it may occur along I-8 in Maricopa and Pinal counties, and along SR 86 and SR 286 in Pima County.

Impact Analysis for BLM Sensitive Amphibians

Suitable habitat within each species' range occurs statewide within the action area, therefore presence is assumed.

Thin, permeable skin and gelatinous eggs without a protective shell leave amphibians highly susceptible to environmental toxins. Direct impacts to amphibians may include exposure through direct spray or dermal contact with recently sprayed vegetation. During dry seasons, terrestrial adults spend much of their time in underground burrows, which would minimize the possibility of exposure through direct spray, although during the summer monsoons, these species emerge, often traveling overland to an aquatic site. Therefore, herbicide applications conducted during the monsoon season would increase the likelihood of direct spray or exposure through contact with sprayed vegetation.

Aquatic life stages (eggs, tadpoles), or breeding adults could be impacted by spray, runoff, or spill of a terrestrial herbicide into a water body. Herbicide treatments conducted during the monsoon season would further accelerate herbicide runoff into aquatic habitats. However, buffer zones would be maintained around water bodies, and only selective herbicides, safe for uses in riparian zones or near aquatic sites, would be sprayed using hand application methods. Furthermore, SOPs would be followed, and treatment would not occur when winds exceed more than ten mph, or when a serious rainfall event is imminent. Such measures would greatly minimize the potential for exposure to sensitive amphibians and their aquatic habitats.

Amphibians may be indirectly impacted by a temporary increase in predation due to the reduced vegetative cover in upland and aquatic habitats within the action area. However, due to the amount of available BLM-managed lands adjacent to the action area for amphibians to disperse to, substantial impacts to amphibian populations are not anticipated.

Habitat loss and degradation is a common threat to these species. Amphibians may benefit from herbicide treatments if native habitats are restored. Containing or eliminating the encroachment of nonnative vegetation would restore aquatic habitats to their natural ecological function, rendering them more suitable for these species. The loss of undesirable vegetation would also reduce the risk of destructive wildfires within amphibian upland and aquatic habitats.

Determination for BLM Sensitive Amphibians

The proposed program of herbicide use within the action area along with proposed conservation measures may impact individual BLM sensitive amphibians, but is not likely to result in a trend toward federal listing or loss of viability.

Birds

Sprague's pipit

This small passerine is buff with dark streaking along the crown, nape, and upper body, pale wing-bars, and a pale eye-ring around each eye. All sexes and ages have a similar appearance. Sprague's pipit (*Anthus spragueii*) is a winter resident of Arizona, arriving by mid-October and leaving for its breeding grounds by early April. Preferred wintering habitat consists of grasslands with dense herbaceous vegetation or grassy agricultural fields, with little to no woody vegetation between 3,500 and 5,000 feet elevation. During the winter months seeds are the primary forage (AGFD 2010b).

Sprague's pipit is considered a rare migrant to Arizona, primarily seen wintering in the San Rafael, Sonoita, and Sulphur Springs grasslands in southeastern Arizona. Individuals have also been observed in grass and alfalfa fields along the lower Colorado River between Yuma and Parker, and near Phoenix and Sierra Vista (AGFD 2010b).

American peregrine falcon

The American peregrine falcon (*Falco peregrinus anatum*) is a large bird of prey with a dark blue-gray dorsum, light breast with variably dark barring, and a distinctive dark "helmet" that covers the head down to the nape of the neck and down the sides of the face in dark malar stripes. The falcon occurs statewide in areas that are rocky, with steep cliffs and canyons for nesting, near open landscapes and/or open bodies of water for foraging, from 400 to 9,000 feet. As a bird of prey, peregrine falcons consume small mammals and birds, including shorebirds, songbirds, and waterfowl. Arizona supports both resident and migratory birds (Glinski 1998).

Bald eagle (non-listed DPS)

Adult bald eagles (*Haliaeetus leucocephalus*) have dark brown to blackish bodies and a white head and tail. Arizona supports both wintering and breeding bald eagle populations. Eagles primarily consume fish, but will also feed on waterfowl, small mammals, and carrion. Wintering bald eagles can be seen statewide at elevations ranging from 460 to 7,390 feet in a variety of habitats and vegetation associations. Currently, bald eagles are known to breed in Arizona from the lower desert (1,100 feet) to higher elevation woodlands (5,600 feet), with the majority of breeding sites occurring at lower elevations along the Salt, Verde, and Gila rivers in the central part of the state. Nesting typically occurs in large deciduous or coniferous trees (alive and dead) and cliff ledges/pinnacles near creeks, rivers, and reservoirs (Glinski 1998). All nests are usually built within a mile of the water source (SBEMC 2006), and cliff nests are often located within 600 feet of the water source (AGFD 2002c). The nearest documented bald eagle nest is at Granite Basin along the Gila River near SR 77, approximately 1.20 miles from the action area.

Cactus ferruginous pygmy-owl

The cactus ferruginous pygmy-owl (*Glaucidium brasilianum cactorum*) is a small owl that is generally reddish to grayish brown with a long narrow tail, yellow eyes, and a rounded head with a pair of black spots on the nape. Pygmy owls are cavity nesters, preferring cavities in large saguaro cacti or large trees. The breeding season of this owl is from January to June. The pygmy-owl forages during the day on lizards, other birds, insects and small mammals. In Arizona the pygmy owl is non-migratory, currently restricted to Pima and Pinal counties in river bottom woodlands and paloverde-cacti mixed scrub associations of the Sonoran desert below 4,000 feet, with occasional occurrences in riparian drainages and woodlands in semi-desert grassland vegetation communities (USFWS 2008).

Arizona Botteri's sparrow

Botteri's sparrow (*Peucaea botterii arizonae*) is a medium sized bird with brown plumage. This species breeds in small isolated colonies in semidesert grasslands, preferring dense giant sacaton grass stands in swales, floodplains, and lower canyon drainages, but also occupies grasslands with widely scattered, low shrubs. The sparrow forages on the ground for insects and seeds. Breeding season is from July to September and two to four eggs are laid. Botteri's sparrow can be found in the southeastern portion of the state (Webb and Bock 2012).

Arizona grasshopper sparrow

The Arizona grasshopper sparrow (*Ammodramus savannarum ammolegus*) is a small sparrow with dark brown coloring above, buffy breast and sides, with a white belly. Birds begin breeding in mid-April, and some populations remain in the state to winter as well. Since this species nests on the ground, large expanses of intermediate height grass is preferred. The bird also forages on insects and seeds found on the ground. A grassland dependent species, grasshopper sparrows occur primarily throughout open grasslands with a low percentage of woody cover in southeastern Arizona from 3,800 to 5,300 feet (AGFD 2010a).

Ferruginous hawk

This is the largest hawk in North America. Adults are light gray on top of the head and down the back with rusty shoulder patches and are usually entirely white in front, which contrasts with rusty feathering on the legs. Immature birds do not have the rusty shoulder patches and are typically brown over the back. These birds primarily feed on small to medium-sized mammals, including rabbits, prairie dogs, pocket gophers, and ground squirrels (Glinski 1998).

Ferruginous hawks (*Buteo regalis*) are most closely associated with grassland or high desert habitats and generally avoid high-elevation montane forests and narrow canyons. Ferruginous hawks nest in open scrublands, badlands, woodlands, and grasslands north of the Mogollon Rim. Nests may be placed on rock pinnacles, small buttes, short cliffs, in juniper trees, or even on the ground; but habitat surrounding the nest site must support populations of preferred prey items. Eggs are typically laid by early May, with young usually fledging by early July (Glinski 1998).

Golden eagle

The golden eagle (*Aquila chrysaetos*) is a very large raptor with a mostly brown plumage and golden wash on the back of the head and neck. Golden eagles are carnivores that primarily consume small mammals and supplement their diet with carrion, insects, snakes, birds, and juvenile ungulates. The golden eagle is found statewide in Arizona in open country, prairies, open wooded and barren areas, especially in hilly or mountainous regions from 4,000–10,000 feet, and nests on rock ledges, cliffs, or in large trees (AGFD 2002a).

Pinyon jay

The pinyon jay (*Gymnorhinus cyanocephalus*) is a large song bird that is entirely blue with a whitish chin. Pinyon jays are highly social, travel in large flocks and live in complex colonies. They are omnivorous; although much time is spent harvesting, transporting, caching and retrieving pine seeds. This species does not migrate, but is nomadic, and depending on the conditions of their preferred habitat, they may disperse as necessary to meet food requirements. In Arizona, pinyon jays primarily occur in the northern portion of the state in pinyon-juniper woodlands, sagebrush, scrub-oak, and chaparral communities (Balda 2002).

Western burrowing owl

The Western burrowing owl (*Athene cunicularia hypugaea*) is a small, ground-dwelling owl lacking ear tufts, with yellow eyes, long legs, a brown dorsum and buffy white spots on the back, scapulars, and crown. Southern populations begin nesting in late March through June, while egg laying in northern populations occurs from mid-May to mid-August. Burrowing owls do not construct their own burrows, but rather rely on burrows abandoned by fossorial mammals. Burrowing owls are opportunistic feeders, consuming large insects, small mammals and birds, amphibians, and reptiles when available. Within Arizona, their distribution is widespread and includes open, well-drained grasslands, steppes, deserts, prairies, and agricultural lands, as well as areas near human habitation such as vacant lots, golf courses, and airports between 650 to 6,140 feet in elevation (AGFD 2001a).

Impact Analysis for BLM Sensitive Birds

Suitable habitat for sensitive birds is present statewide within the action area and therefore species presence is assumed. The temporary presence of crews and equipment is unlikely to disturb sensitive birds at levels greater than daily traffic. Direct herbicide contact with most birds is not anticipated due to the ability of flight. However, if nesting adults, eggs or flightless young are present within the action area during the treatment period, direct exposure could occur. Ground nesters such as the Arizona grasshopper and Botteri's sparrows, ferruginous hawk, and burrowing owl are at a greater risk of exposure. Because ROW habitats are fragmented and experience higher levels of human disturbance than surrounding areas, it is unlikely that a large number of nests would be present within the action area. The nearest documented bald eagle nest is approximately 1.20 miles from the action area, therefore, no impacts to nesting bald eagles are anticipated. Sprague's pipit does not breed in Arizona, therefore no direct impacts to eggs or young would occur.

Depending on the habitat preference of a particular species, herbicide treatments would produce both negative and beneficial indirect impacts. Herbicide treatments would result in reduced vegetative cover, which could alter habitat suitability for species that prefer dense vegetation, such as grassland birds. Conversely, herbicides would limit woody shrub encroachment into grassland habitats, benefitting grassland species long-term. For species such as raptors that utilize open habitats to forage, reduced vegetation would be a benefit. Other indirect impacts to sensitive birds include a possible reduction in the availability and production of

seeds, berries, plant material, or insects for forage. Due to the large expanses of BLM-managed lands available adjacent to the action area, a temporary reduction in cover sites or food sources is not anticipated to greatly impact sensitive birds. Over time, native vegetation should re-grow and re-establish, thus increasing foraging and breeding capabilities for many sensitive birds.

A beneficial impact of herbicide treatments includes the reduction in wildfire fuels, which have the capacity to destroy avian habitats on a large scale.

Determination for BLM Sensitive Birds

The proposed program of herbicide use within the action area with its proposed conservation measures may impact individual sensitive bird species, but is not likely to result in a trend toward federal listing or loss of viability.

Fish

Roundtail chub

Roundtail chub (*Gila robusta*) are olivaceous with silvery sides, a white belly, and a robust body and tail. Spawning occurs over gravel and cobble substrates in late spring. Roundtail chub primarily feed on aquatic insects but are omnivorous and will consume fishes and other small vertebrates. This species inhabits cool to warm water rivers and streams at various elevations in the Colorado River basin. Chubs prefer deep pools and eddies with dense cover such as boulders, overhanging cliffs, undercut banks, or vegetation (USFWS 2010).

The species occurs in tributaries of the Little Colorado and Bill Williams rivers, and in the mainstem and tributaries of the Gila, Salt, and Verde rivers (USFWS 2010). Roundtail chub may be encountered within the action area in the Big Sandy River and Burro Creek along US 93, and the Gila River near SR 177.

Virgin spinedace

This fish is small with a broad, flattened silvery body that often produces a brassy sheen. Spawning occurs in the spring through early summer. The species feeds primarily on a wide range of insects and occasional plant material and organic debris. Virgin spinedace (*Lepidomeda mollispinis mollispinis*) prefer clear, cool, relatively swift streams with scattered pools, runs, and riffles containing cover offered by boulders or undercut banks. Presently, Virgin spinedace occur in the mainstem Virgin River and 11 tributaries, including Beaver Dam Wash, which contains one of the largest remaining populations of Virgin spinedace (UDWR 2002; USFWS 1994). The action area along I-15 crosses and parallels suitable and occupied habitat within the Virgin River.

Desert sucker

The desert sucker (*Catostomus clarki*) is a medium-sized catostomid with large lips; the lower of which is covered with small papillae. Desert sucker prefer rapids and flowing pools in streams and rivers, primarily over bottoms of gravel-rubble with sandy silt. Adults live in pools, moving at night to riffles and runs to feed, while young will inhabit riffles during the day. Spawning occurs in late winter to early spring. Suckers use their cartilaginous-sheathed jaw to scrape diatoms and algae from stones. Juveniles feed primarily on chironomid larvae (AGFD 2002b).

In Arizona, the desert sucker is found in the Gila River, Bill Williams River, and Virgin River basins (AGFD 2002b). Within the action area, the species may occur in the Virgin River along I-15, the San Pedro River crossings at SR 82 and SR 90, Burro Creek at US 93, and the Gila River along SR 177.

Flannelmouth sucker

The flannelmouth sucker (*Catostomus latipinnis*) is a large catostomid with large fleshy lips; adults can measure up to 20 inches and over three pounds. Spawning occurs from March to July. Flannelmouth suckers feed on a variety of chironomid larvae, plankton, organic and inorganic material. This is a large river species that is currently extant in the Colorado River above Lake Mead and its large tributaries in Glen and Grand canyons, including the Virgin River (AGFD 2001c).

Sonora sucker

This catostomid is brownish in color with a yellow belly. Spawning occurs from late winter through mid-summer. Adults feed on diatoms, algae, and macroinvertebrates, while young consume small crustaceans, protozoans, and other detritus. Sonora suckers (*Catostomus insignis*) are typically found in rocky pools, and deep, quiet waters of warm or cold rivers. Sonora suckers are prevalent throughout the Gila and Bill Williams river basins (AGFD 2001b).

Speckled dace

Speckled dace (*Rhinichthys osculus*) are small minnows, of a drab olivaceous coloring with black blotchy patterning and a single or double lateral band. The fish is omnivorous, consuming algae, small crustaceans and snails, and insect larvae. This species breeds twice a year, once in the spring and again in summer, and broadcast spawns its eggs. Speckled dace prefer swift currents in rocky riffles, runs, and pools of rivers. A rather abundant species in Arizona, the fish occurs in the Colorado, Bill Williams, Virgin, Verde, and Gila rivers (AGFD 2002e).

Impact Analysis for BLM Sensitive Fish

Several of the sensitive fish species are relatively ubiquitous in the drainages throughout Arizona and so, if suitable aquatic habitat is present within or directly adjacent to the action area, presence of these species is assumed.

Impacts to sensitive fish species could occur in the event of an accidental spray, spill, runoff, or drift of herbicide into an aquatic habitat. Eggs and larvae in shoreline and backwater habitats are particularly susceptible to exposure via these pathways. A 10-100 foot buffer would be maintained around all perennial waterways to minimize the potential of contamination. Target vegetation along the periphery of water bodies would be spot treated using hand applications of selective herbicides, safe for uses in riparian zones or near aquatic sites. Thus, it is unlikely that herbicides would enter the aquatic system. If residual runoff or drift did occur, herbicides would likely be rapidly diluted within the water column and toxic levels of herbicide resulting in a direct loss of aquatic organisms or an alteration in natural riverine processes are not anticipated.

Herbicide treatments conducted within riparian corridors or streamside habitats would temporarily reduce the amount of vegetation in the area. Potential impacts from a loss of streamside habitat synonymous to sensitive fish include: a reduction in shade which may increase water temperature, killing fish or leaving them susceptible to disease; reduced bank stabilization leading to increased erosion and sediment loads, which can

change a river's morphology and structure by eliminating pool and riffle habitats, changing the width and depth of a system, and changing the flow velocity; increased runoff and pollutants entering the system; loss of microhabitat features; and a temporary decrease in invertebrate prey. However, only spot treatments of undesirable vegetation would occur within riparian corridors and streamside habitats, and treatment would occur over a number of years. As such, vegetation removal would not occur suddenly or at a large scale. In the interim, native vegetation would have the opportunity to re-colonize streamside habitats. Therefore, substantial indirect impacts to sensitive fish are not anticipated.

Over time, the re-establishment of native riparian corridors and streamside habitats is expected to improve fish habitats in terms of water quality and quantity, native invertebrate and aquatic forage, and microhabitat elements

Determination for BLM Sensitive Fish

The proposed program of herbicide use within the action area along with proposed conservation measures may impact individual BLM sensitive fish, but is not likely to result in a trend toward federal listing or loss of viability.

Invertebrates

Desert springsnail

This minute springsnail can be identified in the laboratory by having 3.25 to 4.25 whorls on a globose to ovate shell. The desert springsnail (*Pyrgulopsis deserta*) is locally endemic to springs along the Virgin River in northwestern Arizona (AGFD 2004b). The action area along I-15 crosses and parallels the Virgin River.

Impact Analysis for BLM Sensitive Invertebrates

Buffer zones would be implemented around perennial waters, within which only selective herbicides, safe for uses in riparian zones or near aquatic sites, would be applied using hand spray methods. Additionally, direct spray of herbicides into the water body would not occur. If accidental herbicide drift or runoff into the Virgin River were to occur, herbicides would likely be rapidly diluted and not remain at levels that would be toxic to invertebrates.

Determination for BLM Sensitive Invertebrates

The proposed program of herbicide use within the action area with its proposed conservation measures has no impact on the desert springsnail.

Mammals

Arizona myotis

Arizona myotis (*Myotis occultus*) can be distinguished from others in the genus by a long hind foot, a sloping forehead, and one small upper premolar behind the canine. In the summer, females form maternity roosts in bridges, abandoned buildings, or in ponderosa pine snags near permanent water. Males roost in ponderosa pine and oak-pine woodlands, or desert habitats near a water source. Hibernation roosts during the winter

months are not well known, but likely occur in mines, caves, or tree cavities. Arizona myotis hunt over water for flying aquatic insects. In Arizona, the population is concentrated along and adjacent to the Mogollon Rim, with other occurrences in the lower Colorado River Valley (AGFD 2003c; BCI 2013).

Banner-tailed kangaroo rat

The banner-tailed kangaroo rat (*Dipodomys spectabilis*) is a rodent of moderate size with a long white-tipped tail preceded by a black band; their long hind legs and feet and jumping movements give kangaroo rats their name. Kangaroo rats create complex burrow systems and are nocturnal. Banner-tailed kangaroo rats are currently found in northeastern and southeastern Arizona in semidesert grasslands and Plains and Great Basin grassland between 3,500–4,000 feet elevation (Best 1988).

Gunnison's prairie dog

Gunnison's prairie dogs (*Cynomys gunnisoni*) have a yellowish buff body streaked with black hairs that are noticeably darker on the top of the head, cheeks, and eyebrows. Breeding begins in April or May and one litter of about three pups is produced a year. A clan of prairie dogs will defend a territory of approximately 2.50 acres, although foraging may overlap with the periphery of territories belonging to other clans. Diet almost exclusively consists of grasses, along with forbs, sedges, and shrubs. Gunnison's prairie dogs inhabit level to sloping grasslands and semi-desert and montane-shrub lands in north-north central and eastern Arizona from 6,000 to 12,000 feet (USFWS 2006).

Houserock Valley chisel-toothed kangaroo rat

The Houserock Valley chisel-toothed kangaroo rat (*Dipodomys microps leucotis*) is a medium sized kangaroo rat with pale hip stripes and a long striped tufted tail. This kangaroo rat prefers good shrub cover with sandy soils conducive to burrowing. They are nocturnal and consume mostly seeds and saltbush leaves. This subspecies is found locally in Houserock Valley north and west of the Colorado River in shrub dominated Great Basin desertscrub communities (AGFD 2001d).

Impact Analysis for BLM Sensitive Mammals

Suitable habitat is present statewide within the action area, therefore presence of sensitive mammals is assumed. Direct spray of mammals is highly unlikely due to the ability to flee the action area or retreat to burrows or tree cavities. Exposure to herbicides could occur through dermal contact with recently sprayed vegetation or via ingestion of contaminated food/prey items. Exposure to the point of death is highly unlikely, given the amount of contaminated food/prey that would need to be consumed for exposure levels to be toxic. However, exposure induced illness cannot be completely discounted.

Indirect impacts to sensitive mammals include a temporary loss of vegetative cover and forage. Impacts would be greatest to grassland species such as the banner tailed kangaroo rat and Gunnison's prairie dog. The shrub dependent Houserock Valley chisel-toothed kangaroo rat could experience localized population losses if the more open habitat attracts Merriam's kangaroo rat. Long-term, herbicide treatments would benefit sensitive mammals by restoring native vegetation communities and food sources, and reducing the risk of wildfire.

Determination for BLM Sensitive Mammals

The proposed program of herbicide use within the action area with its proposed conservation measures may impact individual sensitive mammals, but is not likely to result in a trend toward federal listing or loss of viability.

Reptiles

Mohave fringe-toed lizard

The coloring of this lizard varies depending on the color of the sand upon which it lives, although all individuals have small orange spots surrounded by black reticulations on the back, and a plain light cream to yellow-green underbelly with an obvious dark spot on each side. This lizard is adapted to live upon fine sands in open dune fields and vegetated sand hummocks. The Mohave fringe-toed lizard (*Uma scoparia*) is active during daylight hours but hibernates underground through the late fall and winter. Breeding occurs in spring and one of more clutches of 1-5 eggs are buried in the sand to incubate. The species feeds on insects, spiders, flowers, and plant seeds (Brennan 2008a).

The Mohave fringe-toed lizard has a small range within Arizona, occurring in the westernmost portion of La Paz County, in the vicinity of Parker and areas south-south-east, within the Lower Colorado River subdivision of Sonoran Desertscrub (Brennan 2008a). In the action area, this species may be found along US 95, SR 95, and SR 72 in La Paz County.

Desert ornate box turtle

This turtle is small, with a high domed, hinged shell with yellow lines radiating along the carapace. Desert ornate box turtles (*Terrapene ornata*) are more terrestrial than aquatic, typically occupying low valleys, plains, and bajadas, although mountain populations are also known. This turtle is active during the day and hibernates during late fall and winter in self-constructed or existing burrows. Mating occurs in the spring and fall. Females may retain the eggs until environmental conditions promote nesting, upon which she will bury the eggs in a shallow nest of moist, but well-drained soil. The turtle is omnivorous and diet consists of various insects, worms, crayfish, reptiles, eggs, carrion, and fruit (Brennan 2008b).

The species occurs in the southeastern corner of Arizona in semidesert grassland, Chihuahuan desertscrub, Sonoran desertscrub, and Madrean evergreen woodland (Brennan 2008b). In the action area, ornate box turtles may occur throughout suitable habitat in Cochise and Santa Cruz counties and southern Graham County.

Slevin's bunchgrass lizard

These lizards can be boldly patterned or plain, but are differentiated from other lizards in genus *Sceloporus* by horizontal scale rows, which point straight back along the body rather than up and back. Slevin's bunchgrass lizards (*Sceloporus slevini*) occupy conifer forests and plains grasslands, where bunch grasses are abundant, and serve as an important source of shelter and cover for this species. This lizard is diurnal and active year-round. The lizard feeds on various insects and spiders. Mating occurs in April and eggs are laid in the summer (Brennan 2008c).

Primarily, this lizard occupies the "sky island" mountain ranges in southeastern Arizona, which are not located within the action area. The lizard also occupies valleys in eastern Santa Cruz County, specifically the Empire Valley (Brennan 2008c), which is located within the action area along SR 82 and SR 83.

Sonora mud turtle

The double-hinged shell and the head and neck markings are what distinguish this turtle from other mud turtles in the state. This turtle is highly aquatic, but will travel overland between water bodies. It inhabits most water bodies such as streams, creeks, rivers, ponds, cattle tanks, and ditches. This turtle hibernates in the substrate under water or in natural cavities along the bank. This turtle is carnivorous and feeds on insects, fish, frogs, snails, and carrion. It may also consume plant material. Mating occurs in the water in the spring. A clutch of up to 11 eggs is buried underground (Brennan 2008d).

The Sonora mud turtle (*Kinosternon sonoriense sonoriense*) is a subspecies related to the Sonoyta mud turtle, but occupies a much wider range across the state. This turtle can be found throughout much of southeastern Arizona and in areas below the Mogollon Rim. It is associated with major drainages such as the Salt, Gila, and lower Colorado rivers and their tributaries. It ranges from lower Sonoran desertscrub through woodland biotic communities (Brennan 2008d). Within the action area this turtle occurs in all counties below the Mogollon Rim, primarily in areas within or nearby a water source.

Yuman fringe-toed lizard

Coloration of this lizard varies to match the sand upon which it lives, but the back is reticulated and the underside is a plain pale cream with a dark spot on each side of its belly and black barring on the underside of the tail. This lizard is highly adapted for dune fields and sand hummocks within the Lower Colorado River subdivision of the Sonoran Desertscrub biotic community. It is diurnal, although hibernates underground during the colder months. The lizard feeds on insects, spiders, flowers and buds, and even small lizards. Mating occurs in spring and one or more clutches are laid (Brennan 2008e).

The range of the Yuman fringe-toed lizard (*Uma rufopunctata*) is restricted to the southwestern corner of Arizona to about a few miles northeast of Dateland (Brennan 2008e). Within the action area, it may occur along I-8 within Yuma County.

Sonoran Desert Tortoise

The adult desert tortoise is a fairly large (8–15 inches in length) tortoise with a high domed brownish carapace, yellowish unhinged plastron, short tail, and stocky limbs.

The Sonoran desert tortoise (*Gopherus morafkai*) is found south and east of the Colorado River throughout much of Arizona except for Navajo, Apache, Coconino, and Greenlee counties. Sonoran desert tortoises inhabit the bajadas and rocky slopes of the paloverde-cacti association of Sonoran desertscrub with boulders, rocky outcrops, and natural ground cavities. The action area south and east of the Colorado River and south of the Mogollon Rim occurs within the species range and the Sonoran desertscrub biotic community. Suitable habitat is present where development is minimal. The action area primarily encompasses BLM Category III habitat, suggesting that the habitat is not essential to the maintenance of tortoise populations and any populations in the vicinity are likely at low to medium densities. However, Categories I and II are also represented within portions of the action area, therefore essential habitat and extant populations occur

within the vicinity. Although high-quality habitat such as rocky outcrops and boulder/shelter sites are unlikely to occur in the action area, tortoises often enter and occupy roadway easements.

Impact Analysis for BLM Sensitive Reptiles

Suitable habitat within each species' range occurs within the action area, therefore presence is assumed in all of the specified localities.

Direct impacts to sensitive reptiles could occur through direct spray, dermal contact with treated vegetation, or ingestion of prey that has been directly sprayed. Sonora mud turtle could also be exposed to herbicides from off-site runoff or drift into aquatic habitats. The potential for off-site runoff or drift of herbicides into water bodies would be minimized by the implementation of buffers around water resources, utilizing hand spray application methods of selective herbicides, safe for uses in riparian zones or near aquatic sites, and not conducting treatments during inclement weather.

Herbicide treatments will temporarily reduce vegetative cover within the action area, which may increase predation on sensitive reptiles due to a lack of protective cover. Habitat suitability may temporarily decrease for Slevin's bunchgrass lizards, which depend on dense grasses. The reduction in ground cover may also lead to a temporary decline in insectivorous prey populations. However, due to the availability of suitable BLM habitat adjacent to the action area, substantial indirect impacts to reptile foraging opportunities are not anticipated.

Although temporary impacts may occur, the benefits of controlling or eliminating undesirable vegetation are long-term. Restoring native habitats would increase the amount of habitat available to sensitive reptiles. Furthermore, reducing the risk of wildfire protects the viability of habitat and reptile populations.

Determination for BLM Sensitive Reptiles

The proposed program of herbicide use within the action area with proposed conservation measures may impact individual BLM sensitive reptiles, but is not likely to result in a trend toward federal listing or loss of viability.

Plants

Paradine (Kaibab) Plains Cactus

This small, globose, tubercled cactus, measures three to 20 centimeters tall and six to eight centimeters in diameter. Each areole has four to six long, white, hair-like spines and 20 radial spines. In mid-April to May flowers with white or yellowish petals and pink midribs are produced and from May to June greenish-yellow fruit turn to tan as they ripen. Much of this species lifetime is spent retracted into the soil in response to hot summers and cold winters, only swelling above ground with an increase in water availability (AGFD 1999a).

Endemic to the east side of the Kaibab Plateau and the western edge of House Rock Valley, this cactus is restricted to relatively open sites on alluvial fans, ridge tops, and valley bottoms with gravelly Kaibab limestone soils and less than 15% slope. It is commonly associated with clumps of blue grama (*Bouteloua gracilis*) in Great Basin grassland, desertscrub, pinyon-juniper woodland, and lower ponderosa pine stringers between 5,000 and 7,200 feet in elevation. The action area along US 89A between MP 560.00 and MP 566.00 is located within the known range of Paradine plains cactus (*Pediocactus paradinei*). Although suitable habitat

is present, no known surveys have been conducted within the action area. Annual surveys however, have been conducted since 1986 at monitoring plots located on the adjacent Kaibab National Forest (AGFD 1999a).

Aravaipa Woodfern

Aravaipa woodfern (*Thelypteris puberula* var. *sonorensis*) is a perennial rhizomatous fern with long creeping stems that are characterized by lanceolate petiole scales which are reddish-brown in color. Fronds are large, measuring 50-130 centimeters (20 -51 inches) long and are light green with pinnatifid pinnae. Sori are circular within tan to brownish indusia that are pilose (AGFD 2004c and eFloras 2008). Within Arizona, occurrences for the Aravaipa woodfern have been recorded in Coconino, Maricopa, Pima, Pinal and Yavapai counties. This maidenfern prefers moist calcareous substrates along river banks, streams, seepage areas and springs at elevations ranging from 2,200 to 4,500 feet. It is often located within the shade of boulders and has been found in both canyon and meadow habitats. Emerging typically after summer rains, individuals may grow into winter (AGFD 2004c).

Blue Sand Lily

Blue sand lily (*Triteleiopsis palmeri*) is a perennial lily with leafy stems clustered at the base and a stout (one to three feet tall) scape that bears an inflorescence of 30 – 100 deep, purplish-blue, funnel-shaped flowers (AZRPC 2001). Flowering occurs from February through April in years with sufficient winter rains. This lily may only produce leaves during years of insufficient rain or may remain dormant with its bulbs buried deep in the sand during drought years. Reproduction occurs vegetatively by the development of several fibrous-coated bulblets from April through May. Once the blue sand lily flowers, the plant will die. However, bulblets will persist until a subsequent year with sufficient winter rain (AZRPC 2001 and AGFD 1999c).

This species is found in southwestern Arizona in the Tule Desert and Agua Dulce Mountains and may occur in the action area along I-8 between MP 17.30 and MP 22.60 at the base of the Gila Mountains. Preferred habitats are located in the loose sands of sand dunes and desert flats in creosotebush desertscrub biotic communities between elevations of 250 and 1,600 feet. Creosotebush (*Larrea tridentata*), desert lily (*Hesperocallis undulata*), and birdcage evening primrose (*Oenothera deltoides*) are often associated with the blue sand lily (AGFD 1999c).

California Flannelbush

Large shrub to small tree (typically between three and 13 feet tall) with dark gray, rough bark, evergreen leaves covered in stellate pubescence, and flowers with five yellow petal-like sepals. Flowering typically occurs in May, although it has been observed from April to June with fruit maturing between July and September. Fruit are ripe when the golden-brown, densely bristled capsule splits into four or five sections revealing a dark, ovoid seed. Abundant seed production, prolific sprouting and rapid growth are attributes possessed by this species which have made it well adapted to recurring fires (AGFD 2005a).

Within Arizona this species can be found across several mountain ranges in Gila, Maricopa, Mohave Pinal and Yavapai County; however, the only known occurrence near the action area is along SR 89 between MP 273.60 and MP276.00 in the Weaver Mountains. California flannelbush (*Fremontodendron californicum*) is associated with upper Sonoran desert, chaparral and oak/pine woodland habitats and prefers the north slope of dry, well-drained rocky hillsides, ridges and canyons at elevations ranging from 3,500 to 6,500 feet (AGFD 2005a).

Huachuca Golden Aster

This aster is a large, perennial herb measuring up to 3.30 feet tall with simple, alternate, leaves that have a silvery, silky, pubescence (AZRPC 2001). Yellow flower heads are comprised of 23 to 65 disc florets surrounded by 15 to 35 ray florets that are often surpassed by leafy bracts (eFloras. 2008). Flowering results from summer rains between July and October, and is subsequently followed by production of fruit between August and November. Though this species is rare, it is frequently confused with similar weedy *Heterotheca* species that occur within the same range (AGFD 2001e).

Preferred habitat is level, open, grasslands from 4,500 to 6,500 feet elevation, though it also has been observed on road cuts and disturbed sites (AGFD 2001). The range of Huachuca golden aster (*Heterotheca rutteri*) covers portions of Cochise, Pima and Santa Cruz counties. However, potential occurrence of the Huachuca golden aster within the action area is limited to SR 83 between MP 38.60 and MP 40.40 and SR 82 between MP 34.80 and MP 37.70

Marble Canyon Indigo Bush

Marble Canyon indigo bush (*Psorothamnus arborescens* var. *pubescens*) is a perennial shrub of the Fabaceae family that grows approximately 1.30 to 3.30 feet tall. Leaves are pinnate and comprised of seven to 15 leaflets and racemes are comprised of 11 to 21 indigo colored zygomorphic flowers. Ornamentation on the fruit pod including large, round, yellow or orange, blister glands with pubescence between the glands is the distinguishing characteristic of this species. Flowering and fruiting occurs from May to June (Roth 2008).

Preferred habitat for this indigo bush is on soils derived from the Moenkopi Formation within mixed desert shrub vegetation communities between 3,400 feet and 4,900 feet in elevation (Roth 2008). Endemic to northern Coconino County, this species occurs most commonly on rocky knolls and talus at the base of the sandstone cliffs in the area of Marble Canyon (Rhodes et al. 2011). Thus, suitable habitat is located within the action area along SR 89A between MP 538.80 and MP 5560.

Murphey Agave

This agave is a perennial succulent that grows in separated rosette clumps of light to dark green or blue-green leaves with pale cross-bands (AGFD 2003a). Leaves have small, close-set teeth along their margins and a short conical, terminal spine that is dark brown to grayish in color (eFloras 2008). The inflorescence is narrowly paniculate with lateral branches containing clusters of 12 to 21 waxy cream-green flowers with purple or brown tips, ascending to a 9.80 to 13 feet tall stalk (AGFD 2003a and eFloras 2008). Stalk elongation initiates in the winter and flowering occurs from March to June. After flowering, bulbils are produced at nodes on the stalk. Although rare, bulbils can take root when the stalk falls if ground conditions are conducive. Primarily the Murphey agave reproduces vegetatively by sending off rhizomatous suckers called “pups” (AGFD 2003a).

Murphey agave (*Agave murpheyi*) is typically associated with pre-Columbian agricultural and settlement features, as it was cultivated by the Hohokam for food. Its current known distribution covers the Lower Colorado Desert and Arizona Upland subdivisions of the Sonoran Desert in Gila, Maricopa, Pinal and Yavapai counties. This agave is usually found in well-drained soil on benches or alluvial terraces on gentle bajada slopes above drainages within an elevation range of 1,300 feet to 3,200 feet.

Paria Plateau Fishhook Cactus

This perennial succulent generally has two unbranched, green, stems with approximately 13 low ribs per stem. Each areole has six to eight radial needle shaped spines; four to five central spines that curve somewhat downward; one to two, gray or purplish, abaxial spines that are strongly hooked; and one to two white strongly flattened adaxial central spines. Funnelform flowers have yellow colored sepals and appear from late April through May. Green fruit are produced in May and June. Once ripened, the fruit turns red to tan and dehisces along two to four vertical slits. The dehiscence of the fruit is the distinguishing factor that makes this species unique from other *Sclerocactus* species within the region (AGFD 2011).

The current range of Paria Plateau fishhook cactus (*Sclerocactus sileri*) is highly contested; however it is generally thought to occur in House Rock Valley and the Paria Plateau in northeastern Coconino County. Suitable habitat occurs within Pinyon-Juniper woodlands and grama grasslands between 4,200 feet and 7,040 feet in elevation and often is located on mesa tops (AGFD 2011). Suitable habitat is located within the action area long US 89A between MP 557.00 and MP 566.00.

Pima Indian Mallow

Pima Indian mallow (*Abutilon parishii*) is a perennial mallow standing approximately 3.30 feet tall with one to 11 herbaceous stems extending from a woody base. Both branches and petioles are covered in dense stellate and hirsute hairs. Heart-shaped leaves have irregular teeth on the margin and are deeply veined with dark green coloration above and white coloration below due to velvety pubescence. Plants self-fertilize and flowering is not necessary for seed production. However, when it occurs, flowering is in spring through fall in response to rainfall, and light orange flowers will open only between the hours of 1530 and 1630 when it is sunny. Fruit persist for the majority of the year and are comprised of five to ten, fine-tipped carpels containing three seeds each (AGFD 2000).

Suitable habitat is located in full sun exposure among rocks and boulders on south-facing steep slopes and canyon bottoms, typically exceeding 45 degrees. Germination frequently occurs where water has flowed and is often found near trails, though seedlings seem to do best when they grow at the base of rocks in full sun. In Arizona, this species occurs in Sonoran desertscrub habitats between 1,720 and 4,900 feet elevation (AGFD 2000). Suitable habitat is located within the action area at several locations near known occurrences for this species. In Pinal County, suitable habitat is present along SR 177 from MP 159.50 to MP 159.70, and from MP 149.00 to MP 141.00. In Gila County suitable habitat is located along SR 77 from MP 141.00 to MP 157.00, and in Yavapai County suitable habitat is present along Little Shipp Wash on SR 96 between MP 10.00 and MP 11.00.

Scaly Sand Food

Due to a lack of chlorophyll, this species occurs as a root parasite and is typically found on the roots of white bursage (*Ambrosia dumosa)* in Arizona, but has also been known to parasitize shrubs in the genera *Hymenoclea*, *Eriodictyon*, *Haplopappus*, and *Chrysothamnus* (Yatskievych 1994 and AGFD 1999b). It has a primarily subterranean, rhizomatous growth form that is comprised of a fairly uniform, unbranched stem that is whitish in color and is covered in small, fleshy, brown, scale-like leaves (AZRPC 2001). The entire plant measures between six and 12 inches long, and approximately two-thirds of the stem occurs above ground (AGFD 1999b). Scaly sand food (*Pholisima arenaria*) is most visible when flowering, which occurs from April

through July. The spike-like inflorescence is covered in small lavender to bluish purple flowers with white margins.

Scaly sand food occurs only in sandy soils on wash edges and low sand dunes (AZRPC 2001). In Arizona this species is found only in La Paz County between 470 feet and 900 feet in elevation (AGFD 1999b). The action area along SR 72 between MP 13.00 and MP 23.60 and along SR 95 between MP 131.50 and 134.50 is located within the known range of this species.

Schott Wire-Lettuce

Schott wire-lettuce (*Stephanomeria schottii*) is an herbaceous annual that grows up to 24 inches tall with shiny, silvery, white stems that are branched, ending in flower heads of three to nine flowers. Flowers are nocturnal and have cream colored petals with five teeth at their apex and violet anthers, style and stigma. Small, thin, linear leaves wither quickly and are nearly non-existent by the time flowering occurs. Flowering and fruiting occurs from mid-March to mid-May. Seed germination seems to be cyclic in response to wet winters as populations of this species appear to be periodic (AGFD 2005b)

Schott wire-lettuce is endemic to sand dune habitats in southern Yuma County between elevations of 400 feet and 800 feet (AZRPC 2001). It occurs on sand dunes, sandy flats and semi-stabilized sand dunes, and is often associated with creosote (*Larrea tridentata*), white bursage (*Ambrosia dumosa*) and big galleta grass (*Pleuraphis rigida*). Although the range for this species is primarily south of I-8, there are known occurrences near the action area along I-8 between MP 10.70 and MP 11.30.

Smooth Catseye

This catseye is a perennial herb that is approximately 12 inches tall, and has stems that are covered in fine silky white hairs. Leaves are lanceolate with a hairless, shiny green upper surface and pubescent lower surface. A scorpioid raceme inflorescence comprised of a few white flowers with yellow centers, appear from May to June and produce seeds in the form of smooth shiny nutlets (AGFD 2004a).

The range of smooth catseye (*Cryptantha semiglabra*) extends into Arizona in the area of Fredonia and is located in Great Basin desertscrub community between 4,600 feet and 4,900 feet in elevation. Suitable habitat occurs on red detrital clay soils and gray shales of the Moenkopi Formation (AGFD 2004a). Suitable habitat and known occurrence are recorded within the action area along US89A between MP 605.50 and MP 607.70 (SEINet 2013).

Tumamoc Globeberry

This perennial vine grows slender annual stems and tendrils that die back after fruiting to a partially subterranean tuber-like root. Glabrous leaves appear lacy due to their narrow and linear structure forming three main lobes, each with secondary lobes. Flowers are green to pale yellow with male flowers occurring in racemes of two to six flowers and female flowers occurring singularly. Pollination occurs at night by moths. Succulent, berry-like fruit turn red when ripe and produce two to several seeds each. Dormant during winter and spring, above ground growth in this species occurs in response to summer rains and culminates with the first frost, usually in November. Flowering occurs in July and August, followed by production of fruit in August through September (AGFD 2004d).

This delicate vine is often found under trees and shrubs which serve as nurse plants and provide support for the vine to grow on. It prefers shaded situations in Sonoran desertscrub habitats along gullies and sandy washes below 3,000 feet elevation. Suitable habitat for Tumamoc globeberry (*Tumamoca madcougalii*) is located on less than 10 percent slopes in substrates ranging from sandy soils of valley bottoms to rocky soils of upper bajada slopes. The current known distribution of this species in Arizona covers the extreme southern portion of Pinal and Maricopa Counties, and is widespread throughout Pima County (AGFD 2004d).

White-Margined Penstemon

This penstemon is an herbaceous perennial that grows between six and 12 inches tall. Wide leaves are entire with wavy edges and pale green with white margins (MacKay 2013). Flowers have purple anthers and tubular corollas that are pink-lavender, ventrally white and have light golden hairs on the lower lip. Flowers bloom from late March through early April and are pollinated by insects including carabid beetles, large flies and vespid wasps. After spring this species dies back to the ground (AGFD 2003d and MacKay 2013).

The action area along I-40 between MP 10.00 and MP 45.00 is located within the approximate 100 square mile range of the only population of white-margined penstemon (*Penstemon albomarginatus*) in Arizona. This population is located in the Mohave Desertscrub community among creosote (*Larrea tridentate*), bursage (*Ambrosia* sp.) and sometime Joshua trees (*Yucca brevifolia*), between approximately 1,500 feet and 3,000 feet in elevation. Suitable habitat occurs on volcanic derived soils and course sand heavily laden with silt in sandy loam uplands and washes of broad alluvial fans. However, gravelly areas interspersed with patches of sand do not support this species (AGFD 2003d).

Impact Analysis for BLM Sensitive Plants

Suitable habitat within each species range occurs within the action area, therefore presence of BLM sensitive plants is assumed at the locations identified for each species.

Direct impacts to sensitive plants could occur from direct herbicide spray or drift onto sensitive plants, or from off-site runoff into a plant's habitat. Wetland species would be particularly vulnerable to runoff accumulation. However, where suitable habitat within a sensitive plant's range overlaps the action area, pre-treatment surveys for that species would be conducted prior to herbicide application. Buffer zones would be established around sensitive plants located within the action area to eliminate the potential for direct application and minimize the potential for exposure to herbicide. Around the no treatment areas, buffer zones would also be established, within which only selective herbicides applied by hand spraying methods to reduce the potential for herbicide drift. In addition, no herbicide treatment would occur when wind speeds exceed 10 mph or when heavy rainfall is imminent thereby further reducing the potential for herbicide drift and off-site runoff.

In addition to buffer zones around sensitive plants, impacts on wetland plants such as the Aravaipa woodfern would be further mitigated through establishment of buffer zones around wetland areas. The wetland buffer zones would be expanded based on the steepness of the surrounding grade to account for the increased potential of off-site run-off into these wetland areas. Furthermore, treatment within wetland buffer zones would only occur if selective herbicides are applied by hand with a wick sprayer to eliminate potential treatment of non-target plant species.

Herbicide treatments will temporarily reduce vegetation cover and competition for resources where it is conducted. Sensitive plants located within the treatment areas may directly benefit from reduced competition for space, light, water and soil nutrient resources, potentially allowing them to propagate new plants and possibly expand their range. In addition, by controlling or eliminating undesirable vegetation, expansion of

native vegetation is encouraged and over time native habitat would be restored, increasing the availability of suitable habitat for sensitive plants.

Determination for BLM Sensitive Plants

Several sensitive plants have a limited range that overlaps with the action area, thus requiring pre-treatment surveys and buffer zones surrounding plant locations within the action area. The proposed program of herbicide use within the action area with proposed conservation measures has no impact on the blue sand lily, California flannelbush, Huachuca golden aster, Marble Canyon indigo bush, Paria Plateau fishhook cactus, Pima Indian mallow, scaly sand food, Schott wire-lettuce, smooth catseye and white-margined penstemon due to the establishment of buffer zones that would prevent herbicide exposure to these plants. Refer to Appendix G, BLM Sensitive Species Conservation Measures for the portions of the action area requiring pre-treatment surveys.

Due to general habitat requirements and widespread distribution, the presence of Murphey agave and Tumamoc globeberry is assumed throughout the districts that encompass their range. Pre-treatment surveys are not recommended for these species because the populations are not isolated and suitable habitat is readily available throughout their wide range. Therefore, the proposed program of herbicide use within the action area with proposed conservation measures may impact individual Murphy agave and Tumamoc globeberry plants, but is not likely to result in a trend toward federal listing or loss of viability.

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Table B-2. BLM Sensitive Species by ADOT District and BLM Field Office

Common Name	Scientific Name	Status[1]	ADOT District									BLM Field Office								
			Flagstaff	Globe	Holbrook	Kingman	Phoenix	Prescott	Safford	Tucson	Yuma	Arizona Strip	Grand Canyon-Parashant	Hassayampa	Kingman	Lake Havasu	Lower Sonoran	Safford	Tucson	Yuma
AMPHIBIANS																				
Great Plains narrow-mouthed toad	*Gastrophryne olivacea*	S								X	X						X			
Lowland burrowing treefrog	*Smilisca fodiens*	S								X	X						X			
Lowland leopard frog	*Lithobates yavapaiensis*	S		X		X		X	X	X				X	X			X	X	
Sonoran green toad	*Bufo retiformis*	S								X	X						X			
BIRDS																				
Sprague's pipit	*Anthus spragueii*	ESA C S								X									X	
American peregrine falcon	*Falco peregrinus anatum*	ESA D S	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Bald eagle (non-listed DPS)	*Haliaeetus leucocephalus*	ESA D S		X		X	X	X	X	X	X			X	X	X	X	X	X	X
Cactus ferruginous pygmy-owl	*Glaucidium brasilianum cactorum*	ESA D, PR S								X							X		X	
Arizona Botteri's sparrow	*Peucaea botterii arizonae*	S							X	X							X	X	X	
Arizona grasshopper sparrow	*Ammodramus savannarum ammolegus*	S							X	X								X	X	
Ferruginous hawk, breeding population only	*Buteo regalis*	S	X	X	X	X						X	X	X	X			X		
Golden eagle	*Aquila chrysaetos*	S	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Pinyon jay	*Gymnorhinus cyanocephalus*	S	X	X	X	X		X	X			X	X	X	X			X		
Western burrowing owl	*Athene cunicularia hypugaea*	S	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X

Table B-2. BLM Sensitive Species by ADOT District and BLM Field Office

Common Name	Scientific Name	Status[1]	ADOT District									BLM Field Office								
			Flagstaff	Globe	Holbrook	Kingman	Phoenix	Prescott	Safford	Tucson	Yuma	Arizona Strip	Grand Canyon-Parashant	Hassayampa	Kingman	Lake Havasu	Lower Sonoran	Safford	Tucson	Yuma
FISH																				
Roundtail chub	*Gila robusta*	ESA C S		X		X									X				X	
Virgin spinedace	*Lepidomeda mollispinis mollispinis*	ESA CA	X									X								
Desert sucker	*Catostomus clarki*	S	X	X		X			X			X			X				X	
Flannelmouth sucker	*Catostomus latipinnis*	S	X									X								
Sonora sucker	*Catostomus insignis*	S		X		X									X				X	
Speckled dace	*Rhinichthys osculus*	S	X			X			X			X			X				X	
INVERTEBRATES																				
Desert springsnail	*Pyrgulopsis deserta*	S	X									X								
MAMMALS																				
Arizona myotis	*Myotis occultus*	S							X									X		
Banner-tailed kangaroo rat	*Dipodomys spectabilis*	S	X	X	X	X		X	X					X				X		
Gunnison's prairie dog	*Cynomys gunnisoni*	S	X									X								
Houserock Valley chisel-toothed kangaroo rat	*Dipodomys microps leucotis*	S							X	X							X	X	X	
REPTILES																				
Mohave fringe-toed lizard	*Uma scoparia*	S									X					X				X
Desert ornate box turtle	*Terrapene ornata*	S							X	X								X	X	
Slevin's bunchgrass lizard	*Sceloporus slevini*	S								X									X	
Sonora mud turtle	*Kinosternon sonoriense sonoriense*	S		X		X		X	X	X	X			X	X		X	X	X	X

Table B-2. BLM Sensitive Species by ADOT District and BLM Field Office

Common Name	Scientific Name	Status[1]	ADOT District									BLM Field Office								
			Flagstaff	Globe	Holbrook	Kingman	Phoenix	Prescott	Safford	Tucson	Yuma	Arizona Strip	Grand Canyon-Parashant	Hassayampa	Kingman	Lake Havasu	Lower Sonoran	Safford	Tucson	Yuma
Yuman desert fringe-toed lizard	*Uma rufopunctata*	S									X						X			X
PLANTS																				
Paradine (Kaibab) plains cactus	*Pediocactus paradinei*	ESA CA	X									X								
Aravaipa woodfern	*Thelypteris puberula* var. *sonorensis*	S	X	X	X	X	X	X		X	X	X			X	X	X	X	X	X
Blue sand lily	*Triteleiopsis palmeri*	S									X									X
California flannelbush	*Fremontodendron californicum*	S						X						X						
Huachuca golden aster	*Heterotheca rutteri*	S								X									X	
Marble Canyon indigo bush	*Psorothamnus arborescens* var. *pubescens*	S	X									X								
Murphey agave	*Agave murpheyi*	S	X	X		X	X	X		X	X			X	X		X	X	X	X
Paria Plateau fishhook cactus	*Sclerocactus sileri*	S	X									X								
Pima Indian mallow	*Abutilon parishii*	S		X		X									X				X	
Scaly sand food	*Pholisima arenaria*	S									X					X				
Schott wire-lettuce	*Stephanomeria schottii*	S									X									X
Smooth catseye	*Cryptantha semiglabra*	S	X									X								
Tumamoc globeberry	*Tumamoca macdougalii*	S								X	X						X	X	X	
White-margined penstemon	*Penstemon albomarginatus*	S				X									X	X				

[1] Status Definitions: ESA=Endangered Species Act, C=Candidate, PR=Petitioned for Relisting. CA=Conservation Agreement, D=Delisted, S=Bureau of Land Management Sensitive Species.

Sources: U.S. Fish and Wildlife Service list of candidate and conservation agreement species for the State of Arizona. List Date: April 17, 2013 http://www.fws.gov/southwest/es/arizona/ ; Bureau of Land Management Sensitive Species List, List Date: December 2010 http://www.blm.gov/az/st/en/prog/wildlife.html .

APPENDIX C – ECOTOXICITY RATINGS FOR HERBICIDE ACTIVE INGREDIENTS

Ecotoxicity Ratings for Herbicide Active Ingredients Approved for Use on BLM-administered Lands(from USFWS 2007f)																			
Herbicide				Species toxicity groups*H §															
Common Name/ Active Ingredient	Alternative Name/ e.g., trade name®	Use**	CASRN	L-MA	P-MA	S-MA	G-AV	L-AV	P-AV	S-AV	W-AV	REP	A-AM	T-AM	CW-F	WW-F	A-AR	BEE	T-AR	FW-M	PLANT
Aminopyralid		C,ROW, R/P, U	150114-71-9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	D
Bromacil		C,U	314-40-9	1	1	1	0	0	0	0	0	0	1	1	1	1	1	0	1	1	NS
Chlorsulfuron		C	64902-72-3	1e	1e	1e	1e	1e	1e	1e	1e	1e	0	1e	0	0	0	0	0	0	NS
Clopyralid		C,R/P, U	1702-17-6	1e	1e	1e	1e	1e	1e	1e	1e	1e	0	1e	0	0	0	0	0	0	D
2, 4-D (acid formulations)	Chlorophenoxy-Acetic Acid	C,R/P, U	94-75-7	1e	1e	1e	1e	1e	1e	1e	1e	1e	1	1	1	0	1	0	1	1	D
2, 4-D (aquatic amine salt formulations)		W	Various CASRNs	1e	1e	1e	1e	1e	1e	1e	1e	1e	0	1e	0	0	2		2	2	D_{aq}
2, 4-D (nonaquatic amine salt formulations)		C,R/P, U	Various CASRNs	1e	1e	1e	1e	1e	1e	1e	1e	1e	0	1e	0	0	2		2	2	D
2, 4-D (aquatic ester formulations)	e.g.,Aqua-kleen	W	Various CASRNs	1	1	1	0	0	0	0	0	0	1	1	2	2	3		3	3	D_{aq}
2, 4-D (nonaquatic ester formulations)		C,R/P, U	Various CASRNs	1	1	1	0	0	0	0	0	0	1	1	2	2	3		3	3	D
Dicamba	Anisic Acid	C,R/P	1918-00-9	2e	2e	2e	2e	2e	2e	2e	2e	2e	1	2e	1	1	1	0	1	1	D
Diflufenzopyr		C	109293-97-2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	D
Diquat (aquatic)	Diquat dibromide	W	85-00-7	2	1	1	1	1	1	1	1	1	1	1	1	1	2	0	2	2	NS_{aq}
Diquat (nonaquatic)	Diquat dibromide	C,U	85-00-7	2	1	1	1	1	1	1	1	1	1	1	1	1	2	0	2	2	NS
Diuron (see note below)		C	330-54-1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	0	2	2	NS

Ecotoxicity Ratings for Herbicide Active Ingredients Approved for Use on BLM-administered Lands(from USFWS 2007f)

Herbicide				Species toxicity groups*H §															
Common Name/ Active Ingredient	Alternative Name/ e.g., trade name®	Use**	CASRN	L-MA	P-MA	S-MA	G-AV	L-AV	P-AV	S-AV	W-AV	REP	A-AM	T-AM	CW-F	WW-F	A-AR	BEE	T-AR	FW-M	PLANT
Fluridone (aquatic)	e.g.,Sonar	W	5976-60-4	0	0	0	0	0	0	0	0	0	1	1	1	1	1		1	1	NS_{aq}
Fluroxypyr (acid formulation)		C,P	69377-81-7	1	1	1	0	0	0	0	0	0	1	1	1	1	0	0	0	0	D
Glyphosate (nonaquatic)	e.g., Roundup	C,R/P, U, W	1071-83-6	1_e	1_e	1_e	1_e	1_e	1_e	1_e	1_e	1_e	1	1	1	1	1	0	1	1	NS
Hexazinone		C,F,R/P	51235-04-2	1_e	1_e	1_e	1_e	1_e	1_e	1_e	1_e	1_e	0	1_e	0	0	1	0	1	1	NS f
Imazapic		C	1928-43-4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	NS
Imazapyr (technical formulation)		C,ROW, R/P	81334-34-1	1_e	1_e	1_e	1_e	1_e	1_e	1_e	1_e	1_e	0	1_e	0	0	0	0	0	0	NS
Imazapyr (aquatic)	e.g.,Habitat	W	81334-34-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	NSaq
Imazapyr (nonaquatic)	e.g., Aresenal	C,ROW, R/P	81334-34-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	NS
Metsulfuron-methyl (see note below)		C	74223-64-6	1_e	1_e	1_e	1_e	1_e	1_e	1_e	1_e	1_e	1	1_e	1	1	1	1	1	0	NS
Picloram (see note below)	e.g.,Tordon	C,R/P	1918-02-1	1	1	1	0	0	0	0	0	0	1	1	1	1	1	0	1	1	NS
Rimsulfuron		C	122931-48-0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	NS
Sulfometuron-methyl	Sulfometuron	R/P,ROW	74222-97-2	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0	1	1	NS
Tebuthiuron		R/P,U	34104-18-1	1	1	1	0	0	0	0	0	0	1	1	1	1	0	1	1	0	NS f
Triclopyr (amine salt formulations)	e.g., Garlon 3A	F,R/P, ROW	55226-06-3	1_e	1_e	1_e	1_e	1_e	1_e	1_e	1_e	1_e	0	1_e	0	0	0	0	0	0	D
Triclopyr (ester formulations)	e.g., Garlon 4	F,R/P, ROW	55335-06-3	1	1	1	0	0	0	0	0	0	2	2	2	2	1	0	1	1	D

** C = Cropland, F = Forest, P = Pasture, R/P = Rangeland and/or Pasture, ROW = Right-of-way, U = Urban, W = Water

* A-AM = Aquatic Amphibian; CW-F = Cold Water Fish; G-AV= Gallinaceous Avian; L-MA= Large Mammal; P-MA = Predatory Mammal; S-AV = Small Avian; T-AM = Terrestrial Amphibian; W-AV =Waterfowl Avian; A-AR = Aquatic Arthropod; FW-M = Freshwater Mollusk; L-AV = Large Avian; P-AV = Predatory Avian; REP = Reptile; S-MA = Small Mammal; T-AR =Terrestrial Arthropod; WW-F =Warm Water Fish

1

Ecotoxicity Ratings for Herbicide Active Ingredients Approved for Use on BLM-administered Lands(from USFWS 2007f)	
H	Animal ecotoxicity classes: 0 =practically non-toxic, 1 =slightly to moderately toxic, 2 = highly toxic, 3 =very highly toxic; Plant ecotoxicity classes: D= dicot-specific, NS = non-specific for dicots or monocots
§	Subscripts: aq = aquatic formulation, e = eye irritation rating, f = formulation-dependent

Notes:

Diuron may be released as urine into water bodies by ungulates that have grazed on field-applied

Metsulfuron is rated as Class 1 in toxicity groups for fish and amphibians due to reported mortality incidents not indicated by toxicity data

Picloram is used mostly for broad-leaved plants but can harm some grasses and other monocots

1