TFO Programmatic Vegetation Treatment
DOI-BLM-AZ-G020-2012-0018 (EA)

Decision:

The BLM is proposing to treat vegetation as needed within approximately 645,500 acres in the Tucson Field Office (TFO) of the Bureau of Land management, using 18 currently-approved herbicide active ingredients, prescribed fire management and mechanical treatments. At present, the BLM treats about 300,000 acres annually using 20 approved herbicides. The proposed action would reduce the risk of catastrophic wildfires by reducing hazardous fuels, restoring fire-damaged lands, and improving ecosystem health by 1) controlling weeds and invasive species; and 2) manipulating vegetation to benefit fish and wildlife habitat, improve riparian and wetlands areas, and improve water quality in priority watersheds.

The proposed action will not have direct or indirect adverse impacts on energy development, production, supply and/or distribution.

Finding of No Significant Impacts:

Based on the information contained in the attached Environmental Assessment, it is my determination that the proposed action is not a major Federal Action and will have no significant effect on the quality of the human environment; therefore, an Environmental Impact Statement is not required.

Rationale for Decision:

The use of a combination of mechanical and chemical herbicides to control the invasive species will have the least impact on the natural resources of the Tucson Field Office as directed by the BLM policy, monument proclamation, and legislation establishing NCA's, Wilderness and National Scenic Trail, while providing the most effective means of removing the dangers of catastrophic wildfire from the public lands.

STIPULATIONS:

Mitigation and Stipulations that will apply to this action are listed on pages 43 through 47 of the Environmental Assessment.

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Brian Bellew
Field Manager Date

Finding of No Significant Impact

TFO Programmatic Vegetation Treatment
DOI-BLM-AZ-G020-2012-0018 (EA)

The Bureau of Land Management, Tucson Field Office, has proposed to use prescribed fire, herbicides and mechanical methods to treat invasive and noxious plant species within the boundaries of the field office. The proposed action and any potential mitigation measures are described in the attached Environmental Assessment (DOI-BLM-AZ-G020-2012-0018 (EA))

Related Environmental Documents

Phoenix Resource Management Plan (1988)
Las Cienegas Resource Management Plan (2003)
San Pedro River Riparian Management Plan and EIS (1989)
Arizona Statewide Land Use Plan Amendment for Fire, Fuels, and Air Quality Management (March 2004)
Biological and Conference Opinion for the BLM Arizona Statewide Land Use Plan Amendment for Fire, Fuels, and Air Quality Management (2004)
Interim Management Policy for Bureau of Land Management National Monuments and National Conservation Areas (IM-2002-008) (2002)
The Biological Evaluation for the BLM, Safford Grazing Program – 1996
The Biological Opinion for the Safford and Tucson Field Offices' Grazing Program (2-21-96-F-160) – 1997
Arizona BLM Standards for Rangeland Health and Guidelines for Grazing Administration - 1997.
Presidential Proclamation establishing the Ironwood Forest National Monument - June 09, 2000.
Nichol's Turks head cactus Recovery Plan – 1986
BLM Vegetation Treatments Using Herbicides Final Programmatic EIS - June 2007
Vegetation Treatment on BLM lands in Thirteen Western states Environmental Impact Statement – May 1991
Migratory Bird Treaty Act- 1918
Neotropical Migratory Bird Conservation Act (NMBCA) – July 21, 2000

Reasons for Finding No Significant Impact

Both beneficial and adverse effects of the proposed action have been considered. Mitigation measures have been included to reduce or eliminate any potential adverse impacts. Therefore, the beneficial effects outweigh any potential negative effects from implementing the proposed action.

- The proposed action is consistent with the applicable Land Use Plans and other environmental documentation.

- No impacts to paleontological, cultural, or historic resources would occur from implementation of the proposed action.
- There are endangered, threatened, proposed, or candidate species in the immediate vicinity of the proposed action. Implementation of the proposed action will not adversely affect any listed, proposed or candidate species. Implementation of the proposed action will not affect the desert tortoise, because of mitigation measures.
- Resources within Monument, National Conservation Areas (NCA) and Areas of Critical Environmental Concern (ACEC) will be affected temporarily, during the treatment phase. However, the long-term result will protect the objects and habitats within the NMs NCAs and ACECs.
- Public health and safety of the general public are not affected.
- The actions are not precedent setting or unique. The BLM has experience with these types of projects and actions, and their effects are not uncertain. Therefore, a unique or unknown risk is not being taken by implementing the proposed actions.
- This proposal is consistent with applicable state and federal laws, regulations, and policy.
- The EA discloses the actions would reduce, and potentially eliminate, the invasive and noxious plants from the Public lands of the Tucson Field Office. There are no adverse cumulative impacts.
- There is no substantial controversy over the effects of this proposal. No controversy or significant concerns were identified during public comment meetings or agency reviews

An opportunity, of 30 days was made available to the public to address concerns and provide comments on the proposed project.

Determination:

Based on the information contained in the attached Environmental Assessment, it is my determination that the proposed action is not a major Federal Action and will have no significant effect on the quality of the human environment; therefore, an Environmental Impact Statement is not required.

_____

Brian Bellew Date
Field Manager

TFO Programmatic Vegetation Treatment

U.S. Bureau of Land Management
Tucson Field Office
12661 E. Broadway,
Tucson, Arizona 85748

November 16, 2010

EA #: DOI-BLM-AZ-G020-2012-0018
Project Name: TFO Programmatic Vegetation Treatment
Contact Person(s): Darrell Tersey
Legal Description: See Figure 1
Topo Map Name:
Project Area Flagged: __Yes X No

Section I. Purpose and Need for Action

Introduction

The BLM is proposing to treat vegetation as needed within approximately 645,500 acres in the Tucson Field Office (TFO) of the Bureau of Land Management (BLM), using chemical treatments, prescribed fire, and mechanical treatments. At present, the BLM treats about 300,000 acres annually nationwide, using approved herbicides and many more acres using fire and mechanical treatments. The proposed action would improve ecosystem health by reducing the risk of catastrophic wildfires through reductions in hazardous fuels, restore fire-damaged lands, and control of weeds and invasive species; and by manipulating vegetation to benefit fish and wildlife habitat, improve riparian and wetlands areas, and improve water quality in priority watersheds.

In areas suitable for fire where conditions allow, BLM will allow naturally ignited wildland fire, use prescribed fire and a combination of biological, mechanical, and chemical treatments to maintain non-hazardous levels of fuels reduce hazardous effects of unplanned wildland fires and meet resource objectives. In areas not suitable for fire where fuel loading is high, BLM will utilize biological, mechanical or chemical treatments, and some prescribed fire to maintain non-hazardous levels of fuels to meet resource objectives.

In recent years, the severity and intensity of wildfires in the West has increased dramatically from levels in the 1970s and 1980s, to a million or more acres annually. Changes in the vegetation on public lands have resulted in increases in hazardous flammable fuels. Much of the increase in hazardous fuels can be attributed to fire exclusion policies over the past 100 years. Contributors to the change include intermittent- and long-term drought over the past 40 years and an increase in the spread of noxious weeds species and invasive vegetation.

Invasive vegetation and noxious weeds are the dominant vegetation on an estimated 35 million acres of public lands. The estimated rate of weed spread on western public lands in 1996 was 2,300 acres per day. 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, and are detrimental to the agriculture and commerce of the U.S. and to public health. Weed infestations can become permanent if left untreated.

In response to the threats of wildfire and invasive vegetation and noxious weeds, the President and Congress have directed the USDI and BLM, through implementation of the *National Fire Plan*, 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.

Many partners are working together to control invasive species in the Tucson Field Office (TFO) area. The goal of this project is to control invasive plant species in the TFO. The project proposes to treat invasives with prescribed fire, herbicides and mechanical methods. Control efforts (prescribed fire, chemical and/or physical) of invasives are planned, or currently implemented, in the TFO by BLM, Saguaro National Park East and West districts, The University of Arizona, Pima County, Arizona Game and Fish Department, Pima Community College, Santa Cruz River (County) Park, and adjacent neighborhood and homeowners' associations. Longer-term efforts in Saguaro National Park West and Tucson Mountain Park are also near the proposed project location.

The Tucson Field Office includes Sonoran Desert, Semi-desert grasslands, and riparian/wetland areas; all of which have different requirements for treating invasive species.
Within the Sonoran Desert Ecosystem, several invasive species have been introduced and are spreading including buffelgrass fountain grass, Sahara mustard and Kikuyu grass Should the treatment of invasives not occur, its uncontrolled growth and constant threat as a fire hazard may result in the loss of native Sonoran Desert vegetation and the wildlife that depend on the Sonoran Desert ecosystem. Many invasives displace native plants, animals, and habitat by competing for space, sunlight, moisture, and nutrients. Dry vegetation produces tinder-dry fuels that can quickly carry hot wildfires. Native Sonoran Desert plants and wildlife have not evolved with fire and are seriously damaged by it. Fires that kill native plants and damage wildlife habitat create even more space for fire adapted invasives, which not only survive the fire but thrive on fire. Currently, invasives such as buffelgrass and tamarisk have formed large and dense colonies in several locations in the TFO, which provide fuel and have the potential to quickly carry wildfires. These stands of invasives will have to be treated several times to effectively eliminate the stands.

Mesquite (*Prosopis spp*.) has also invaded former grasslands and degraded watershed condition by increasing runoff, and decreasing water infiltration needed to sustain riparian ecosystems. Other woody invasives that may require control in grassland or upland associations include desert broom (*Baccharis sarothroides*), burroweed (*Isocoma tenuisecta*), snakeweed (*Gutierrezia microcephala*), acacia (*Acacia spp.*), creosote (*Larrea tridentata*), juniper (*Juniperus spp.*), Russian knapweed (*Acroptilon repens*), *onionweed (Asphodelus fistulosus),* and others.

A riparian zone or riparian area is the interface between land and a river or stream. Plant habitats and communities along the river margins and banks are called riparian vegetation, characterized by hydrophilic plants. These areas are on the Loamy Bottom, Loamy Swales, Clay bottom and Clay Swales ecological sites in Major Land resource Area 41. Common invasives in riparian areas include tamarisk, giant reed (*Arundo donax), vinca (Vinca major),* tree of heaven (*Ailanthus altissima)* and bermuda grass Because of the propensity for tamarisk to invade areas where riparian mesquite is removed, and because mesquite provides habitat for obligate species (e.g. yellow-billed cuckoo, gray hawk, Bell's vireo, Lucy's warbler, and many others), the

proposed action does not include, and this EA does not analyze mechanical and chemical control of mesquite within washes, terraces, bosques, or other riparian or xeroriparian areas. If riparian mesquite control is desired, a separate EA shall be prepared in order to assess this proposal, along with consultation with the US Fish and Wildlife Service. The present EA only addresses prescribed fire within grassland and other upland areas, riparian and bosque areas, tamarisk control within riparian areas such as SPRNCA (see AZ 420 2008-011 EA) and LCNCA, and mesquite or other woody invasive mechanical and chemical control within shrub-invaded grassland habitat. This EA does NOT address mechanical and chemical control of mesquite within the San Pedro River, Cienega Creek, Empire Gulch, washes, terraces, bosques, or other xeroriparian areas. Additional areas that may not receive mesquite control shall be identified by the BLM interdisciplinary team at the project level during site-specific NEPA analysis. Other areas that may not receive mesquite control will be addressed at the project level, and may include erosion concerns, recent fire or flooding events, sensitive wildlife issues (such as migratory bird nesting avoidance or dates), presence of special status species, etc. at each site-specific treatment location.

This EA will also cover any noxious weed or other invasive (native or non-native weed) target species that may be found in the future on TFO land, but that is not currently documented. Noxious weeds not currently documented, but to be controlled in the future, will be listed as federal noxious or state prohibited, regulated, and restricted weeds. This may include any weed not currently listed as noxious, but that may become listed in the future. Lists of federal noxious and Arizona State prohibited, regulated and restricted weeds may be found at http://plants.usda.gov/java/noxious?rptType= Federal prohibited, regulated and restricted weeds may be found at http://plants.usda.gov/java/noxious?rptType=State&statefips=04, and http://www.azda.gov/PSD/quarantine5.htm. The current lists are attached as Appendix A.

Additionally, application methodologies to test the most effective ways to apply pesticides may be utilized along with partners from other agencies, non-governmental organizations, and private individuals. Testing methodologies generally do not require the use of pesticides, with only water, indicator, and/or adjuvants tested along with various application equipment and/or techniques. Equipment and/or techniques tested or utilized during weed control may include application by helicopter or fixed-wing aircraft. The highest priority areas for treatment would be units of BLM's National Landscape Conservation System (NLCS) within the TFO. These include the Ironwood Forest National Monument (IFNM), Las Cienegas National Conservation Area (LCNCA), San Pedro National Riparian Conservation Area (SPRNCA), along with four wilderness area's (Baboquivari, Coyote, White Canyon and Needles Eye), three designated or eligible Wild and Scenic River segments, and the Arizona National Scenic Trail.

The Need for the Proposal:

The need for implementing the proposed action is to improve ecosystem health by reducing the risk of catastrophic wildfires through reductions in hazardous fuels, restore fire-damaged lands, control weeds and invasive species, by manipulate vegetation to benefit fish and wildlife habitat, improve riparian and wetland areas, and improve water quality in priority watersheds.

The Purpose of the Proposal:

The purpose of this proposal is to determine which methods of vegetation treatment are suitable for implementation on Public Lands within the TFO, and to tier nation-wide and regional evaluation and planning documents into one analysis for integrated vegetation treatment. All treatments will be in accordance with the BLM's Integrated Vegetation Management Handbook 1740-2. Appropriate portions of chapters 6 and 7 are shown in Appendix B**.** The vegetative species targeted for treatment within TFO are shown in Appendix C and other species that may be found in the future on TFO land, but that is not currently documented.

Conformance with Land Use Plan:

The proposed action is subject to the San Pedro Riparian Management Plan; an Activity Level Plan tiered from the Safford District Resource Management Plan (RMP), approved in 1992 and amended in July 1994 and in 2004 by the Arizona Statewide Land Use Amendment, Fire, Fuels and Air Quality. This proposed action has been reviewed and determined to be in conformance to the land use plan terms and conditions as required by 43 CFR 1610.5, BLM MS 1617.3. According to pages 22 and 23 of the San Pedro RMP/EIS, "the BLM will conserve groundwater resources while providing necessary support for other programs" as well as "maintain and enhance the soils/watershed resources of the EIS area to reduce future soil erosion (BLM 1989)."

The proposed action is in conformance with the Las Cienegas RMP/EIS, and review of the RMP has further determined that 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 the plan. The approval date for the Record of Decision or the Approval of the Las Cienegas Resource Management Plan and EIS (Final) was July 2003. This proposed action has been reviewed to determine if it conforms to the land use plan terms and conditions as required by 43 CFR 1610.5, BLM MS 1617.3.

The proposed action is in conformance with the Ironwood Forest National Monument RMP/EIS, and review of the RMP has further determined that 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 the plan. The approval date for the Record of Decision or the Approval of the Ironwood Forest National Monument Resource Management Plan and EIS (Final) was XXXXX. This proposed action has been reviewed to determine if it conforms to the land use plan terms and conditions as required by 43 CFR 1610.5, BLM MS 1617.3.

The proposed action is in conformance with the Phoenix RMP/EIS, as amended in 2004 by the Arizona Statewide Land Use Amendment, Fire, Fuels and Air Quality, and review of the RMP has further determined that 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 the plan. The approval date for the Record of Decision or the Approval of the Phoenix Resource Management Plan and EIS (Final) was June 1989. This proposed action has been reviewed to determine if it conforms to the land use plan terms and conditions as required by 43 CFR 1610.5, BLM MS 1617.3.

For portions of TFO, the proposed action is also in conformance with the Safford District RMP/EIS, and review of the RMP has further determined that 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 the plan. The approval date for the Record of Decision or the Approval of the Safford District Resource Management Plan and EIS (Final) was 1991. This proposed action has been reviewed to determine if it conforms to the land use plan terms and conditions as required by 43 CFR 1610.5, BLM MS 1617.3.

Relationship to Statutes, Regulations or Other Plans or Policies:

The proposed action is consistent with requirements of 43 CFR 2800, Public Law 100-696, and the Federal Land Policy Management Act (FLPMA) Title V.
SPRNCA Legislation - Public Law 100-696 (section 102) instructs the Secretary to manage SPRNCA in a manner that *conserves, protects, and enhances the riparian area* and the aquatic, wildlife, archeological, paleontological, scientific, cultural, educational, and recreational resources of the conservation area.

The proposed project includes all public lands within the LCNCA and Sonoita Valley Acquisition Planning District created by Congress in 2000. Enabling legislation for the LCNCA directed the BLM to "conserve, protect and enhance" resources including aquatic habitat, fish and wildlife. LCNCA Legislation - Public Law 106-538 (December 6, 2000): (excerpt) *In order to conserve, protect, and enhance for the benefit and enjoyment of present and future generations the unique and nationally important aquatic, wildlife, vegetative, archaeological, paleontological, scientific, cave, cultural, historical, recreational, educational, scenic, rangeland, and riparian resources and values of the public lands described in subsection (b) while allowing livestock grazing and recreation to continue in appropriate areas, there is hereby established the Las Cienegas National Conservation Area in the State of Arizona. The Secretary shall manage the Conservation Area in a manner that conserves, protects, and enhances its resources and values, including the resources and values specified in section above, pursuant to the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701 et seq.) and other applicable law, including this Act. The Secretary shall allow only such uses of the Conservation Area as the Secretary finds will further the purposes for which the Conservation Area is established.*

The BLM Decision only authorizes use of BLM land. Use of non-BLM land (National Forest, State Trust Lands, private land) is subject to the agency or private landowners' permission.

The "Salt Cedar & Russian Olive Control Act" (H.R. 2720) was signed into law during 2006. H.R. 2720 directs the DOI to carry out an assessment and demonstration program to control the spread of salt cedar (*Tamarix spp.*) and Russian olive (*Elaeagnus angustifolia*) in the Western U.S.

50 CFR §402.01 directs federal agencies to carry out conservation programs for listed species under the Endangered Species Act. Conservation is "*...to use and the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures of pursuant to this Act are no longer necessary*." Public lands in the

area are subject to Section 7 of the Endangered Species Act as the proposed project is likely to have some effects to listed species (see Biological Opinion).

The Migratory Bird Treaty Act (MBTA) of 1918 implemented the 1916 convention between the United States and Great Britain for the protection of birds migrating between the U.S. and Canada. Similar conventions between the United States and Mexico (1936), Japan (1972) and the Union of Soviet Socialists Republics (1976) further expanded the scope of international protection of migratory birds. Each new treaty has been incorporated into the MBTA as an amendment and the provisions of the new treaty are implemented domestically. These four treaties and their enabling legislation, the MBTA, established Federal responsibilities for the protection of nearly all species of birds, their eggs and nests. The MBTA made it illegal for people to "take" migratory birds, their eggs, feathers or nests. Take is defined in the MBTA to include by any means or in any manner, any attempt at hunting, pursuing, wounding, killing, possessing or transporting any migratory bird, nest, egg, or part thereof. A migratory bird is any species or family of birds that live, reproduce or migrate within or across international borders at some point during their annual life cycle.

Executive Order (EO) 13186, signed by President Clinton on 10 January 2001 (66 FR 3853-3856), established federal agency responsibilities to develop and implement, within two years, a Memorandum of Understanding with the U.S. Fish and Wildlife Service (USFWS) to promote the conservation of migratory bird populations. Notwithstanding the requirement to finalize the MOU within two years, each agency was encouraged to immediately begin implementing the conservation measures set forth in the EO (subparagraphs 1 through 15). In lieu of the MOU, interim management guidance was provided in BLM Washington Office (WO) IM 2008-050. The MOU between BLM and USFWS was completed and transmitted through WO IB 2010-110 (76 FR 6494-6495), which identified migratory bird conservation as a significant part of the BLM planning and NEPA process. Strategic policy and an implementation Instruction Memoranda is forthcoming from the BLM Washington Office (see WO IB 2010-110).

The MOU is consistent with the provisions of the following statutes and Executive Orders:

- Bald and Golden Eagle Protection Act of 1940 (16 U.S.C. §§ 668-668d)
- Endangered Species Act of 1973 (16 U.S.C. §§ 1531-1544)
- Federal Land Policy and Management Act of 1976 (43 U.S.C. § 1701-1785)
- Fish and Wildlife Act of 1956 (16 U.S.C. § 742a et seq.)
- Fish and Wildlife Conservation Act of 1980 (16 U.S.C. § 2901-2911)
- Migratory Bird Conservation Act of 1934 (16 U.S.C. § 715 et seq.)
- Migratory Bird Treaty Act of 1918 (16 U.S.C. § 703-712)
- Multiple-Use Sustained-Yield Act [of 1960] (16 U.S.C. §§ 528-531)
- National Environmental Policy Act of 1969 (42 U.S.C. § 4321-4370d)
- Public Rangeland Improvement Act of 1978 (43 U.S.C. § 1901-1908)
- Responsibilities of Federal Agencies to Protect Migratory Birds, Executive Order No.13186, signed 2001, 66 Fed. Reg. 3853 (Jan. 17, 2001)

In addition to the protection afforded by the MBTA and associated policy guidelines, the Bald and Golden Eagle Protection Act, as amended, affords supplementary protection to all bald and golden eagles. When BLM engages in the planning process, it shall also address Bureau sensitive species and their habitats in land use plans and associated NEPA documents (per BLM 1610 Planning Manual and Handbook, Appendix C, and BLM Manual 6840). Implementation-level planning should consider all site-specific methods and procedures needed to bring species and their habitats to the condition under which management under the Bureau sensitive species policies would no longer be necessary. All Federal candidate species, proposed species, and delisted species in the 5 years following delisting will be conserved as BLM sensitive species.

The following information is taken from White (2007) regarding the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), and pesticide use and the Endangered Species Act.

Under the ESA, "take" of animal species listed as threatened or endangered is prohibited. Take of
Federally-listed animal species includes harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, collecting, or attempting to engage in any such conduct. Take can only be exempted under limited circumstances through (1) incidental take provisions as authorized by a biological opinion in an ESA section 7 consultation or (2) an incidental take permit obtained under section 10 of the ESA. Incidental take refers to take that is incidental to, and not the purpose of, carrying out of an otherwise lawful activity (e.g., loss of individuals of a listed animal species through pesticide spray drift from nearby cropland). Pesticide use can cause take of listed animals through killing, harming, or harassment. As defined under 50 CFR (Code of Federal Regulations) § 17.3, harm to listed animal species can include significant habitat modification or degradation that results in death or injury to listed species by impairing essential behavioral patterns such as breeding, feeding, or sheltering. Examples of harm to listed animal species that can be caused by pesticide applications include loss of prey species, abnormal behavioral changes, and induced sub lethal effects (e.g., endocrine system disruption). Harassment of listed animal species under 50 CFR § 17.3 can be an intentional or negligent action (or omission of an action) that creates a likelihood of injury to a listed species by annoying individuals of the species to such an extent as to significantly disrupt normal behavior patterns that include (but are not limited to) breeding, feeding, or sheltering. Noise disturbance from pesticide application equipment can result in harassment through (1) nest abandonment by birds or (2) disruption of nesting colonies of shorebirds or wading birds.

Although take does not apply to listed plant species, the ESA does prohibit the following actions in areas under Federal jurisdiction: (1) removal, damage, or destruction of endangered plant species and (2) removal of threatened plant species. In addition, actions that remove, damage, or cause destruction of endangered plant species in non-Federal areas that are in violation of state or local laws are prohibited. Experimental populations of listed species are protected by the ESA (as modified by special rules in 50 CFR § 17.80-17.85) against unlawful use of pesticides if these populations are (1) essential experimental populations on either public or private lands or (2) nonessential experimental populations on national parks or wildlife refuges. Candidate species and species proposed for listing do not have ESA protections until the time of listing; however, Federal agencies are required to confer with the Service about potential actions that may

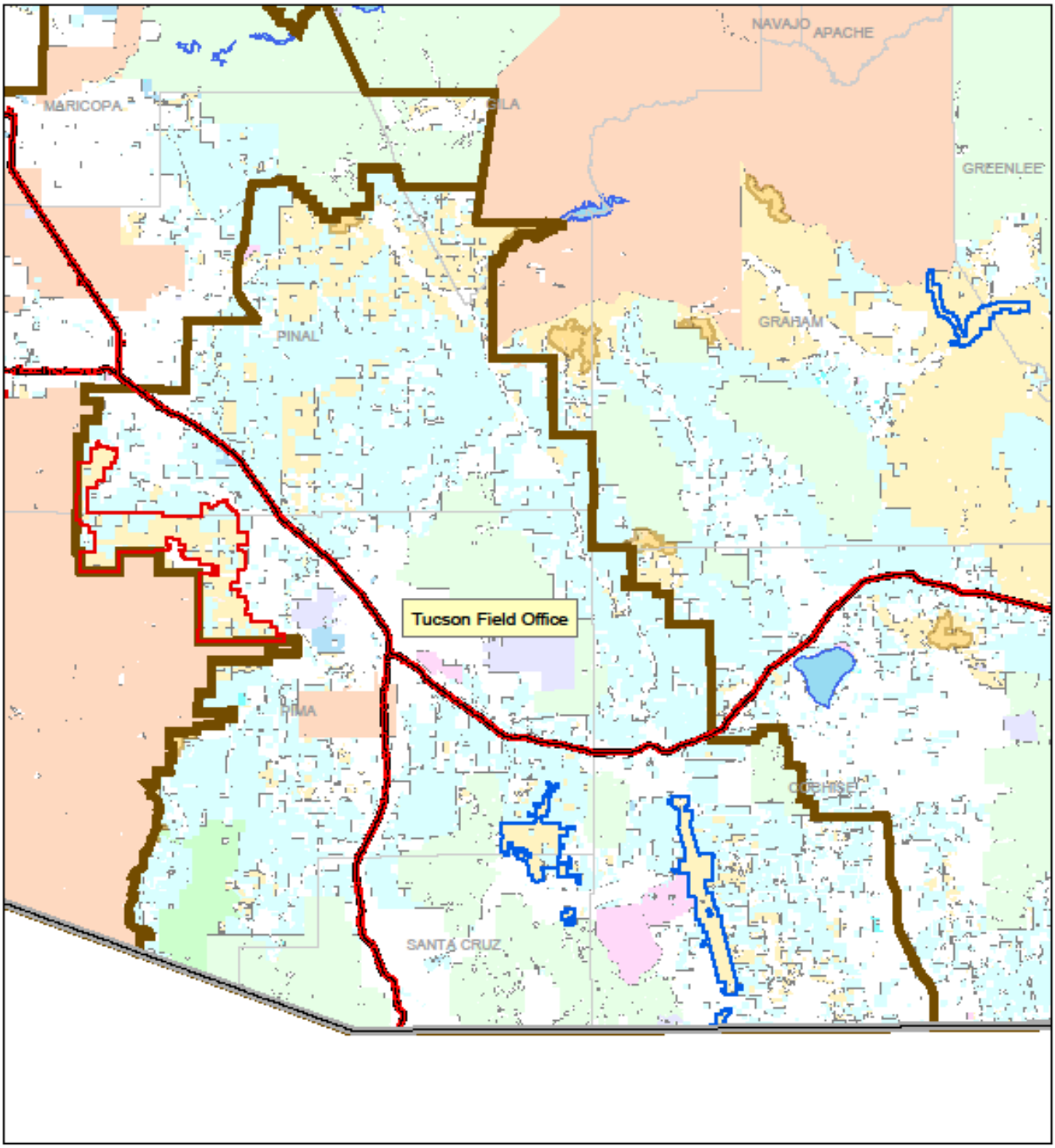
jeopardize the continued existence of proposed species. Federal agencies are also required to consult with Service on actions that can adversely modify critical habitat of listed species.

Section 7(a)(2) of the ESA requires Federal agencies to ensure that any action (e.g., pesticide use) they authorize, fund, or carry out is not likely to jeopardize the continued existence of any Federally-listed threatened or endangered species or result in the destruction or adverse modification of designated critical habitat.
In the event that a Federal agency concludes that its action "may affect" a listed species or designated critical habitat, the agency is required to consult with the Service regarding the degree of impact to the species from the agency's action and the measures necessary to avoid or minimize adverse effects. Federal agencies involved with pesticide programs that can modify critical habitat through activities such as brush control or removal of prey species must consult with the Service.

The proposal to implement herbicide treatments is consistent with and conforms to the 1994 Environmental Impact Statement for Rangeland Reform; the Federal Land Policy and Management Act of 1976 (FLPMA) (43 U.S.C. 1700 et seq.); the Taylor Grazing Act of 1934 (TGA) (43 U.S.C. 315 et seq.); the Public Rangelands

Figure 1.Project area.

State of Arizona



United States Department of the Interior
Bureau of Land Management
Gila District
Tucson Field Office
Map created on Dec 05, 2006

CAUTION:
Land ownership data is derived from less accurate data than the 1:24000 scale base map. Therefore, land ownership may not be shown for parcels smaller than 40 acres, and land ownership lines may have plotting errors due to source data.

No warranty is made by the Bureau of Land Management for the use of the data for purposes not intended by the BLM.

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Legend

- Private Lands
- State Lands
- State Wildlife Area
- City, State, County Parks
- County Lands
- Bureau of Land Management (BLM)
- National Forest Lands (USFS)
- National Park Service (NPS)
- USFW Service, National Wildlife Refuges
- Indian Lands or Reservations
- BLM Wilderness Area
- Forest Service Wilderness Area
- NPS Wilderness Area
- USFW Service Wilderness Area
- BLM National Monument
- National Conservation Area
- Military Reservations/Corps of Engineers
- Bureau of Reclamation (BOR)

Figure 1 Location Map

Improvement Act of 1978 (PRIA) (43 U.S.C. 1901 et seq.); the Federal Noxious Weed Act of 1974 (7 U.S.C. 2801-2813), as amended by Section 15, Management of Undesirable Plants on Federal Lands, 1990; the Plant Protection Act of 2000, and the Carson-Foley Act of 1968 (P.L. 90-583).

BLM and other federal agencies signed a Memorandum of Understanding in 1994 to coordinate and collaborate on weed treatment and prevention through the Federal Interagency Committee for the Management of Noxious and Exotic Weeds (FICMNEW).

Placement of dredged or fill material into a waters of the U.S. falls under jurisdiction of the United States Army Corps of Engineers (USACE) and is outlined in Section 404 of the Clean Water Act (CWA). Because of the nature of the proposed action, BLM will be required to receive all applicable permits from the USACE if mechanical treatment occurs within any jurisdictional waters, including the San Pedro River and Cienega Creek. However, permits are not expected to be needed because the proposed action will not occur within any washes, rivers, or xeroriparian areas.

Arizona state law requires prohibited, regulated, and restricted weeds to be prohibited from entry into the state, or if found within the state may be controlled or quarantined to prevent further infestation or contamination, and if found within the state shall be quarantined to prevent further infestation or contamination, respectively.

Management Practices for Vegetation Treatments (included in all alternatives where the treatment is proposed)

Prescribed Fire

The Integrated Vegetation Management Handbook (H 1740-2), Prescribed Fire Handbook (H1741-5), and BLM Technical Reference 1734-7, Ecological Site Inventory, shall be used for each site-specific project in order to determine vegetation management objectives for each site. In addition, best management practices shall be utilized. All prescribed burn plans shall be approved by Arizona Dept. of Environmental Quality (ADEQ), and permits shall be obtained prior to implementation of any prescribed fire. SASEM smoke and particulate matter (PM) shall be part of any burn plan. PM-10 and PM-2 are both calculated with the SASEM program. Public announcements of proposed prescribed fire date shall be released.

The application/implementation of any prescribed fire shall adhere to all agency guidelines as well as guidelines outlined in the Interagency Prescribed Fire Planning and Implementation Procedures Guide (July 2008).

All conservation measures prescribed in the Statewide LUP Amendment for Fire, Fuels, and Air Quality for each potential listed species (Appendix B) shall be followed on each burn unit.

T & E habitat may be protected during prescribed fire utilizing the following measures, if needed: 1) construction of hand line around habitat, 2) relocation of burn unit boundary, 3) removal of ladder fuels to ensure fire does not enter the crowns of cottonwood or willow trees, 4) removal of and/or reduction of ground fuels to lessen flame intensity, 5) use of backing fires to lower flame length and fire intensity, and 6) use of different types of ignition patterns to control rates of spread, fire line intensity, and flame lengths.

Agave (nectar source for lesser long-nosed bat), yucca (substrate for Aplomado falcon), and cacti (listed species and nectar source) will not be targeted for treatment under this document. Burn plan objectives in areas with agave will include minimum mortality per the prescribed terms and conditions from the relevant Biological Opinion (Appendix C).

Prescribed fire in areas invaded by Johnson grass, non-native love grasses, and any other undesirable vegetation should be a consideration in project planning in order to achieve project goals in the species.

Per the Statewide LUP Amendment for Fire, Fuels, and Air Quality, a Resource Advisor will be present on all prescribed fires.

Burn plans shall be coordinated with a biologist and any site-specific burn plans shall be implemented with biologist input before implementation of any prescribed fire. The biologist shall address sensitive species objectives, timing restrictions, avoidance, minimization, and mitigation measures, etc. for wildlife, fisheries, migratory birds, and special status species. The biologist shall be included in the preparation and completion of any NEPA document required (a DNA at a minimum).

Manual and Mechanical Treatments

Prior to project implementation all areas scheduled for mechanical vegetation/mesquite removal projects will be required to be surveyed for cultural resources. All known cultural resource sites will be avoided during project operations. Cultural resource sites will be protected using a flagged no entry buffer installed prior to project operations.

Sites identified for mechanical treatments utilizing heavy equipment will require cultural resource site monitoring both during and after treatment. The BLM archeologist will create necessary buffer zones (outlined with flagging) to protect cultural/paleontological resources. Surface disturbing activities within these designated buffer zones will be prohibited.

Treatment areas requiring the use of heavy equipment will require cultural clearance prior to any surface disturbing activities.

Use of natural and man-made barriers (outcroppings, washes, sparse fuel, roads, trails, etc.) will be implemented in order to minimize ground-disturbing activities. Minimal or no ground disturbance will be done on or adjacent to cultural and historic sites.

Revegetation and erosion prevention in areas of widespread vegetation control will be planned and implemented. Sufficient ground cover (woody debris) will remain onsite to provide

immediate bank stability and minimize erosion. The use of soil-stabilizing techniques such as (but not limited to) placement of hydromulch, biodegradable fabrics, straw waddles, straw bales, rock structures such as zuni bowls, one rock dams, and media lunas etc., may be implemented on a site-by-site basis to further reduce erosion and promote establishment of desirable vegetation. Implementation of stabilization methods will be incorporated into the treatment plans for site specific projects. ." In those cases where prescribed fire is used to achieve resource objectives after mechanical removal, woody debris may be left scattered, if desired, for prescribed fire objectives.

Biomass utilization including firewood cutting can be authorized during site specific NEPA analysis on those areas within TFO covered under the appropriate land use plans on a case by case basis. Per the Safford District RMP/EIS (page 45), "do not allow cutting in major desert washes, wilderness areas or some special management areas."

To minimize impacts to natural drainage patters and morphologic site conditions, the use of heavy equipment as a means of mechanical treatment will not occur-when soils are saturated.

Parking and fueling heavy equipment used for treatment will not occur within the 100 year floodplain as determined by BLM on a site-specific basis.

Access routes requiring repetitive vehicle use or heavy equipment, and treatment boundaries will be clearly marked during project planning by the interdisciplinary team prior to implementation of mechanical treatments.

Sites identified for mechanical treatments utilizing heavy equipment will require surveys for federally listed or special status plant and animal populations. If these populations are found, the BLM biologist will create necessary buffer zones (outlined with flagging) to protect the sensitive plant and animal resources. Surface disturbing activities within these designated buffer zones will be prohibited. Monitoring of these populations will occur following treatments.

Herbicide Treatments

A BLM Pesticide Use Proposal shall be approved for each herbicide before beginning application.

Only federally registered and BLM approved herbicides will be used.

Herbicides and adjuvant will be used only in accordance with product labeling and the respective Material Safety Data Sheet (MSDS). Herbicide application will be under the direct supervision of an Arizona Department of Agriculture certified Commercial Applicator or BLM certified applicator.

All individuals associated with the handling or application of herbicides on public lands would be familiar with the pesticides used and emergency procedures to be used in case of herbicide spill. Safe use of herbicides includes precautionary measures to prevent accidental spills. The following written precautions describe measures that shall be used to reduce the chance of such accidents.

Applicable Federal regulations concerning the storage and disposal of herbicides and herbicide containers will be followed. These are described in the EPA's "Regulations for Acceptance and Procedures for Disposal and Storage" Federal Register notices as amended.

It is essential to prevent damage to containers so that leaks do not develop; care will be exercised so that containers will not be punctured or ruptured, and so that the lids or caps will not be loosened.

Precautions will be taken when loading pesticide containers in transport vehicles to assure that containers are secured and will not tip over in transport. Open containers will not be transported. Partially used containers will be securely resealed before transportation.

Each day after returning to the project office, all herbicide containers will be inspected for damage and leaks, and the vehicle will be examined for contamination.

In the event of a spill, BLM and/or the contractor will remove the contaminated soil and place the soil in plastic containers. The contaminated soil will be taken to an appropriate hazardous materials facility for disposal. Spill site location, size of spill, and disposal site will be documented and monitored.

The intake operation of water for mixing will be arranged so that an air gap or reservoir will be placed between the live water intake and the mixing tank to prevent back flow or siphoning of pesticide into the water source.

Potential for drift of herbicide during foliar application will be minimized by using spray pressures no greater than required to obtain adequate coverage of each target plant individually, and with nozzle tips sized to produce large droplets. Herbicide foliar application will occur from less than two feet away in order to minimize drift. Potential for drift during cut-stump applications is virtually non-existent because herbicide will be applied directly to the stump. For both foliar and cut-stump methods, herbicide application will not occur during precipitation, if there is an impending threat of precipitation, and/or when wind velocity (greater than 10 mph) could carry herbicide beyond each target plant. Herbicide application will also not occur when air temperatures equal or exceed 85° F.

During preparation of the Pesticide Use Proposal, the project area would be reviewed for known populations of plant species of special concern or their potential habitats. BLM shall inventory potential habitat and confirm absence of sensitive plants prior to any herbicide use. Documented populations of plant species of special concern will be monitored following chemical treatment to assess the health and condition of existing populations.

The Vegetation Treatment using Herbicides on BLM lands in 17 Western States Programmatic EIS is incorporated by reference to this document. However, some specific best management practices will be used for herbicide applications within TFO which may be more restrictive due to the sensitivity of resources:

- Because of the presence of shallow water tables, highly erosive and steep slopes, and the endangered Huachuca water umbel, only those herbicides that do not have the potential to contaminate ground or surface water or to move off-site, to the extent that they may have detectable impacts to vegetation off site, shall be used within the boundaries of LCNCA and SPRNCA, even if approved in the EIS.

- Granular and pellet formations of herbicides will not be used any closer than three miles to the San Pedro River and Babocomari River on SPRNCA, and Cienega Creek, Empire Gulch, and Mattie Canyon on LCNCA. This restriction is due to the possibility of movement of pesticides during severe rain events before being bound in the soil, the potential for herbicides to remain active in the soil for long periods, and the presence of [critical-SPRNCA] habitat for the endangered Huachuca water umbel.

- Aerial application of herbicide will not occur within three miles of riparian habitat at LCNCA and SPRNCA.

- Pesticides that pose risks to fish will not be used within three miles of riparian corridors (including washes and other xeroriparian areas), which are potential habitat within TFO for the federally listed Gila chub, Gila topminnow, desert pupfish, and other species.

- Diquat, fluridone, and other pesticides that pose risks to amphibians will not be used within three miles of riparian corridors (including washes and other xeroriparian areas), which are potential habitat within TFO for the threatened Chiricahua leopard frog.

- Herbicide treatments, including foliar ground application, shall not occur within fifteen meters of any documented populations of Huachuca water umbel. Existing populations have been mapped and will be avoided. All employees responsible for implementing vegetation control via chemical means will be capable of identifying Huachuca water umbel to ensure existing populations are not impacted and to document occurrence of new populations (if any).

- Foliar ground application of herbicides not labeled for aquatic sites will not occur within five meters of perennial surface water and/or native fish re-introduction sites.

- Any suitable southwestern willow flycatcher and/or yellow-billed cuckoo habitat identified for treatment during the nesting/breeding season (April through September) will be surveyed for nesting/breeding activities by a BLM wildlife biologist or contractor who is certified to carry out surveys prior to any vegetation treatments. No treatment will occur until surveys using proper protocol document that territories are vacated.

Foliar application will only be used when herbicide affects to vegetation species beneath the individual target plant is acceptable.

Recommended Protection Measures for Pesticide Applications in Region 2 of the U. S. Fish and Wildlife Service" (2007) will be used for pesticide applications that may affect listed species or habitat. Recommended protection measures in the regional pesticide recommendations (RPR) may be

modified on a case-by-case basis with additional information. However, these regional pesticide recommendations cannot be used in lieu of section 7 consultations or section 10 permits as required under the Endangered Species Act.

Before pesticides can be applied inside or adjacent to habitat of a proposed or listed species, a determination should be made as to whether the habitat is occupied. As part of a Federal action involving habitat of a listed plant species, a survey should be conducted for the listed plant species before application of herbicide.

In general, pesticides with the least acute toxicity and persistence should be selected for use inside or adjacent to habitat of proposed or listed species. Environmental fate of pesticides involves persistence, leaching ability, volatilization, transformations (e.g., lethal degradates), bioaccumulation, and other attributes of pesticides after release into the environment. Comparisons should be made between alternative pesticides and their individual characteristics for applications inside listed species habitat, critical habitat, or other sensitive areas. Site-specific information for the evaluation process may be obtained from aerial maps, soil surveys, and other sources.

Pre-emergent herbicides or pesticides that remain active within the soil after application should generally not be applied in habitat of proposed or listed plant species by any application method

Safety Measures for all Treatments:

Prior to implementation of the approved proposed action, a Risk Management Worksheet (Form 1112-5) will be conducted to plan for the safety of all employees, contract laborers, and volunteers who participate in this management action.

Necessary safety precautions for noise, eye, and hand protection as outlined by BLM safety protocol will be followed.

Mitigation for all Treatments:

Heavy equipment (including trucks and trailers) will be pressure washed prior to entry to treatment areas for removal of any noxious/invasive plant species (seed) that may be transported in the undercarriage.

Should any archaeological resources or vertebrate fossils be discovered during the implementation of projects, all surface disturbing activities in the area of discovery shall cease. The archaeologist will evaluate the discovery and provide recommendations to the Authorized Officer. Surface disturbing activities shall not resume until permission is obtained from the Authorized Officer.

Any archaeological or historical artifacts or remains, vertebrate fossils discovered during operations shall be left intact and undisturbed; all work in the area shall stop immediately, and the Tucson BLM Archaeologist shall be notified immediately. Commencement of operations shall be allowed upon clearance by the Field Manager.

If in connection with operations under this authorization, any human remains, funerary objects, sacred objects or objects of cultural patrimony as defined in the Native American Graves Protection and Repatriation Act (P.L. 101-601; Stat. 3048; 25 U.S.C. 3001) are discovered, the permittee shall stop operations in the immediate area of the discovery, protect the remains and objects, and immediately notify the Authorized Officer of the discovery. The permittee shall continue to protect the immediate area of the discovery until notified by the Authorized Officer that operations may resume.

A biologist will review any site-specific NEPA documents for burn or treatment plans before implementation of any prescribed fire or treatment and will specify avoidance and conservation measures to be used for T & E and other special status species. Terms and Conditions from associated Biological Opinions for federally listed T&E species that may be adversely affected by actions under this project will be incorporated into site-specific burn or treatment plans as part of the proposed action.

The 2010 MOU with USFWS (BLM WO IB 2010-110) specifies that during the NEPA process, at the project level, the effects of BLM's actions on migratory birds shall be evaluated, focusing first on species of concern, priority habitats, and key risk factors (MOU VII.F). In addition, a potential conservation measure includes avoidance of nesting season during rangeland improvements, such as prescribed fire (MOU VII.G.4). Therefore, at the project level, the specific habitat identified for treatment, potential migratory bird species of conservation concern, and risk factors shall be identified. Vegetation treatments shall be timed to avoid nesting season for birds of conservation concern in each habitat type (e.g. grassland, mesquite bosque, riparian, Sonoran desert, Chihuahuan desert, etc.). Generally speaking, vegetation treatments shall not occur from June 15 through September 30 in grassland habitat, or between March 1 through September 30 in all other habitat types, including potential grassland habitat. Ultimate timing shall be determined on a case by case basis at the project level during site-specific NEPA analysis, and shall include considerations for annual weather conditions such as early or late monsoon season, potential and/or historic habitat type, actual occurrence of bird species of conservation concern, etc.

Site-specific NEPA analysis will be prepared for each vegetation treatment (prescribed fire, manual or mechanical, herbicide, or integrated) using input from an interdisciplinary (ID) team. A Determination of NEPA Adequacy (DNA), at a minimum, shall be completed for each site-specific project. The NEPA document shall be scoped and completed with the BLM ID team before project initiation, and shall include any avoidance, mitigation, or minimization measures deemed appropriate for the site. The NEPA document shall include site-specific information, such as maps, presence of special status species, and any migratory bird nesting timing restrictions, rehabilitation plans, or any additional mitigation and stipulations that the ID team requires.

Because of the propensity for tamarisk to invade areas where riparian mesquite is removed, and because mesquite provides habitat for obligate species (e.g. yellow-billed cuckoo, gray hawk, Bell's vireo, Lucy's warbler, and many others), the proposed action does not include, and this EA does not analyze, mechanical and chemical control of mesquite within washes, terraces,

bosques, or other riparian or xeroriparian areas. If riparian mesquite control is desired, a separate EA shall be prepared in order to assess this proposal, along with consultation with the US Fish and Wildlife Service. The present EA only addresses prescribed fire within grassland and other upland areas, riparian, and bosque areas, tamarisk or other introduced weed in riparian areas, and mesquite or other woody invasive mechanical and chemical control within shrub-invaded grassland habitat. Additional areas that may not receive mesquite control shall be identified by the BLM ID team at the project level during completion of site-specific NEPA analysis.

The Integrated Vegetation Management Handbook (H 1740-2), Prescribed Fire Handbook (H 1741-5), and BLM Technical Reference 1734-7, titled Ecological Site Inventory, will be used (as appropriate) for each site-specific project in order to determine vegetation management objectives for each site. In addition, best management practices will be utilized.

Monitoring

Pre and post-treatment monitoring will provide data for determining the success of the treatments in meeting treatment and resource objectives Monitoring plans should be incorporated into the site specific project plans and should include type and frequency of monitoring, both pre and post-treatment.. Photo points will be established on select treatment areas at the time of treatment. Pre and post-treatment monitoring and repeat photography of these sites will document treatment effectiveness, non-target plant mortality, and regeneration.

If monitoring results indicate the need to stimulate native riparian regeneration, BLM will plant desirable riparian species (e.g. willows and cottonwoods) to mitigate soil erosion in treated areas that contain only undesirable plant species.

In addition to monitoring designed to determine if vegetation management has been successful in obtaining objectives, the following monitoring is recommended in White (2007). Federal agencies should either conduct monitoring or otherwise require monitoring in any action that the Federal agency authorizes, funds, or carries out under section 7 of the ESA. In addition to weather monitoring during pesticide application, monitoring may be necessary for pesticide applications involving sensitive areas or species habitat near managed areas (golf courses, municipal parks, etc.). Measures for monitoring should be described in the work (site specific project) plan. State agricultural departments, county extension services, and other appropriate agencies (e.g. universities) may be consulted on procedures and techniques to implement pesticide monitoring.

Pre-application monitoring and/or post-application monitoring may be necessary for pesticide applications that can affect proposed or listed species or critical habitat. Pre-application monitoring may be used to determine prerequisites for pesticide application. The population dynamics and life stages of pest or invasive species may have to be monitored by sampling (frequency measurements, trapping, etc.) prior to pesticide application. This information can be used for determination of threshold levels of pest or invasive species that will require control by pesticides.
In post-application monitoring, applicators or relevant agencies may need to monitor areas with proposed or listed species or critical habitat for (1) ambient pesticide concentrations after application or (2) possible long-term trends in adverse effects for species or habitat. The

monitoring portion of the work plan should address sampling locations, sample matrices (soil, sediment, tissue, etc.), numbers of samples, and the schedule for sampling. Monitoring equipment should be placed in areas where pesticides can be transported into species habitat by spray drift or surface runoff.

Water quality in habitat of aquatic listed species should be monitored continuously when this habitat is in close proximity to managed areas that require repeated applications of pesticide (golf courses, municipal parks, etc.). To determine pesticide concentrations, samples should be collected during normal flow periods and during storm events large enough to produce surface runoff. If only a single storm runoff sample can be taken, sampling should occur near the beginning of the runoff event to capture the first pulse of runoff-borne pesticides.

Section II: DESCRIPTION OF ALTERNATIVES INCLUDING THE PROPOSED ACTION

The technique common to all alternatives includes the use and implementation for all vegetation treatments (manual/mechanical, chemical, prescribed fire, and integrated vegetation management) of BLM Technical Reference 1734-7, titled Ecological Site Inventory, http://www.blm.gov/nstc/library/1734-7direct.html (Habich, 2001. Examples of ecological site descriptions, which provide the characteristics of ecological sites, and are useful for reference when reading this section, can be found at http://esis.sc.egov.usda.gov/ESIS.

The Reference that Vegetation Condition is Gauged Against:

A potential natural community or historic climax plant community is identified for each ecological site. The plant species composition of the potential natural community or the historic climax plant community is the reference condition that is gauged against. Typically the plant species composition is represented as a range in production (pounds per acre), which is derived from a range of aboveground annual production (air-dry weight) for each plant species in the community. Cover of plant species can be used instead of aboveground annual production, but in most instances aboveground annual production is used because many ecological site descriptions do not yet provide a range of cover values for each plant species in the reference condition.

A potential natural community is the biotic community that would become established on an ecological site if all successional sequences were completed without interference by humans under the present environmental conditions. The plant species composition of the potential natural community reflects past influences by humans, including past use and introduced species of plants and animals. The influence of humans on the plant species composition is excluded from the present onward to eliminate the complexities of future management and to set a baseline plant species composition for the potential natural community. The plant species composition of the potential natural community explicitly recognizes that naturalized exotic species can persist in the final stage of secondary succession and that succession after disturbance does not always reestablish the historic climax vegetation existing before European immigration and settlement.

A historic climax plant community is the plant community that existed on an ecological site before European immigration and settlement. The historic climax plant community was best adapted to the unique combination of environmental factors associated with the ecological site. Natural disturbances such as drought, fire, unusually wet periods, and herbivory were inherent in the development and maintenance of the historic climax plant community. The effects of these disturbances are a part of the range of characteristics of the ecological site that contribute to a dynamic equilibrium. Fluctuations in plant community structure and function caused by the effects of these natural disturbances establish the boundaries of dynamic equilibrium. Plant communities that are subjected to abnormal disturbances and physical site deterioration or that are protected from natural disturbances—such as herbivory—for long periods, seldom typify the historic climax plant community. The historic climax plant community is not a precise assemblage of plant species for which the proportions are the same from place to place or from year to year. Variability is apparent in productivity, cover, and occurrence of individual plant species and that is why the plant species composition is presented as a percent range for each plant species.

BLM managers and resource specialists have the option when designing vegetation treatments of using a potential natural community or a historic climax plant community as a reference condition.

Table 1 – Summary of Alternatives

Alternative	Prescribed Fire	Mechanical Treatments	Herbicide Treatments	Other??
1 No Action	Small scale case by case basis	Small scale case by case basis	Small scale case by case basis	
2 Physical Control and Removal	No?	Small scale < 5acre manual removal		
3 Chemical (Herbicide) Removal of Exotic, Noxious Species and Re-establishment of Native Plants	No?	No?	Small scale < 5acre manual application	
4 Prescribed Fire Only	Prescribed fire program to control invasive species where appropriate	No	No	

5 Integrated Vegetation Management	Prescribed fire program to control invasive species where appropriate	Mechanical treatment program to control invasive species and noxious weeds where appropriate	Herbicide Treatment Program to control invasive species and noxious weeds where appropriate	

Alternative 1. No Action

Under the no action alternative, only very small patches of buffelgrass, giant reed, tamarisk and Russian knapweed (less than 5 acres at a time), would be controlled on a case-by case basis. Woody invasives would not be controlled, and would continue to invade desert grassland habitats. Project specific NEPA analysis would need to be completed for each project, and as each new invasive species was documented.

This alternative would not take direct action to control invasive vegetation in the TFO. This alternative would continue with current actions that include limited use of manual removal and mapping locations of invasives throughout the TFO. Project specific NEPA analysis would need to be completed for each project, and as each new invasive species was documented.

Alternative 2. Manual and Mechanical Control and Removal

A description of the application of manual and mechanical control is incorporated by reference from the BLM Integrated Vegetation Management Handbook (H-1740-2) and portions are included in Appendix G. Also incorporated by reference with this alternative is the BLM Technical Reference 1734-7, titled Ecological Site Inventory.

This alternative would implement the physical control of invasives using several methods, including manual removal and/or mowing. Transportation of plant material removed by either method would be in a manner that would minimize the possibility of plants "escaping." Disposal would be in landfill sites where species could be contained on site through continual removal of colonizing plants.

Manual removal would be used as a means of controlling some of the buffelgrass infestations, and would be applied to those infestations that are relatively small. Manual control and removal is costly and labor intensive because of the huge workforce involved. However, enlisting the help of volunteers could reduce the cost of physical control. The high cost and labor intensiveness of physical methods may preclude control of species that are currently established as a large area of infestation and is rapidly spreading. Manual removal would not be practiced in archeologically sensitive areas or in very thick stands on steep slopes due to the high risk of soil erosion. Because of the huge extent of buffelgrass and mesquite in some areas, physical control/removal may be insufficient to prevent its further spread, thus manual removal would not be practical on a large scale.

Alternative 3. Chemical (Herbicide) Removal of Exotic, Noxious Species and Re-establishment of Native Plants

A description of the application of chemical control is incorporated by reference from the BLM Integrated Vegetation Management Handbook (H-1740-2) and portions are included in Appendix G. Also incorporated by reference with this alternative is the BLM Technical Reference 1734-7, titled Ecological Site Inventory.

Under this alternative only the herbicides and other ingredients including surfactant (a chemical added to improve absorption on the leaf surface) would be used for eradication of invasives, applied at a rate approved by the BLM in its *BLM Vegetation Treatments Using Herbicides Final Programmatic EIS (June 2007).* See Appendix F for approved herbicides. The chemicals would be applied during periods of active growth or just preceding dormancy as has been determined in research to be the most effective timing of treatments for specific species. Active growth periods can occur from February to November during the respective winter and summer rains. Other herbicides (e.g. imazapyr) may be used anytime of the year when sap is not flowing in the spring.

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 native vegetation. All information and instructions on the herbicide label would be strictly followed. The herbicide would be mixed strictly according to labeled mixtures and uses. All herbicide containers would show the product label and would be leak- and spill-resistant. All application equipment and chemicals would be stored in appropriate storage facilities. Material Safety Data Sheets (MSDS) would be maintained on-site. The applicator(s) would have appropriate State of Arizona or BLM pesticide applicator's certification.

Appropriate application techniques could include using a backpack sprayer for steeper terrain and areas away from roads, paint brushes applying herbicide on cut stumps, and using a vehicle-mounted boom sprayer along roadsides. Aerial spraying would be limited to appropriate species in areas suitable to do so. BLM Standard Operating Procedures for Aerial Operations would be followed. A backpack sprayer would also be used for spot treatment in areas where invasives occurs in close proximity to non-target species.

Within the action areas, an intact native flora exists in areas not infested with invasive species. These intact areas will provide a ready seed source for native re-vegetation in areas treated for weed eradication. Native species include: palo verde, saguaro, mesquite, mixed native perennial grasses (three-awns, tanglehead, Arizona cottontop, tobosa, curly mesquite, grama grasses, etc.), creosote bush, and a variety of cactus, ephemeral grasses, forbs, and wildflowers. Within the riparian areas native species include cottonwood, willow, hackberry, walnut, graythorn, sumac, seep willow, bulrush, cattails, carex, and juncus species.

Alternative 4 Prescribed Fire Only

A description of the application of prescribed fire is incorporated by reference from the BLM Integrated Vegetation Management Handbook (H-1740-2) and portions are included in Appendix

G. Also incorporated by reference with this alternative are the Prescribed Fire Handbook (H 1741-5), and BLM Technical Reference 1734-7, titled Ecological Site Inventory.

Under this alternative, only prescribed fire would be utilized to control invasive and noxious weeds. Herbicide application and mechanical removal of vegetation would not occur.

Prescribed fire treatments would be applied on LCNCA and SPRNCA, primarily in upland and grassland vegetation communities. The overall goals would be to reduce the undesirable consequences of uncontrolled wildfires within the riparian corridor, to improve native grassland habitat in upland areas, to reduce shrub encroachment in areas historically dominated by native perennial grasses, to improve and maintain infiltration in the watershed, to reduce hazardous fuel buildup near urban interface areas, and to improve and maintain wildlife habitat, including habitat for T & E species.

LCNCA and SPRNCA contain a variety of different vegetation communities that require unique and individual approaches to prescribed fire. Each vegetation community has its own set of objectives that will benefit its particular fuel type. These differences in objectives are due to the different characteristics in fuel loading (tons/acre), fuel density (compactness), fuel height (feet), fuel dimensions (1 hr, 10 hr, 100 hr, 1000 hr), fuel type (models), habitat objectives, and species which utilize specific habitat types. More specifically, prescribed fire objectives for each of the five vegetation communities include:

Riparian:

- Reduce the number, intensity, and size of wildfires in cottonwood/willow galleries.
- Improve wildlife habitat for species such as southwestern willow flycatcher, yellow-billed cuckoo, gray hawk, yellow warbler, summer tanager, green kingfisher, and other cottonwood/willow obligates.
- Create a mosaic burn pattern, leaving patches of unburned fuel and patches of partially burned fuels.

Grassland:

- Increase cover and density of native perennial grasses such as sacaton, giant sacaton, blue grama, sideoats grama, green sprangletop, plains bristlegrass, squirrel tail, sand dropseed, vine mesquite, and tobosa.
- Decrease annual weed cover and density.
- Reduce canopy cover of shrub species that are out-competing perennial grasses.
- Reduce fuel loading.
- Improve wildlife habitat for species such as Cassin's sparrow, scaled quail, Botteri's sparrow, Swainson's hawk, Aplomado falcon, and other grassland-obligate species.
- Maintain a scattered canopy cover of mesquite, hackberry, Mexican elderberry, soapberry, Arizona walnut, and other native desert shrub and tree species.
- Rehabilitate abandoned agricultural fields by removing weed sources and competition by non-native plants, such as Russian thistle, bindweed, and Johnson grass.

Upland:

- Improve and maintain density of native perennial grasses such as sacaton, giant sacaton, blue grama, sideoats grama, tobosa, green sprangletop, plains bristlegrass, squirreltail, and sand dropseed.
- Decrease annual non-native weed density and cover.
- Decrease the frequency of invasive shrub species.
- Reduce the fuel loading under larger mesquite. Maintain an open canopy of mesquite and other trees with a >4" DBH.
- Improve wildlife habitat for wildlife species such as Cassin's sparrow, black-throated sparrow, scaled quail, Swainson's hawk, and giant grassland whiptail lizard.
- Improve and maintain a scattered canopy of mesquite, hackberry, Mexican elderberry, soapberry, Arizona walnut, and other desert tree species.
- Create a mosaic burn pattern, leaving patches of unburned fuel and patches of partially burned fuels.

Cienega:

1. Reduce fuel loading in bulrush, cattail, and sedges.
2. Remove decadent vegetation to encourage re-growth and recycling of nutrients.
3. Reduce annual non-native weed cover and density.
4. Open areas for wildlife access to water.
5. Improve wildlife habitat by maintaining a mixture of open water areas, low-growing wetland plants, and dense patches of cattails and bulrush. Provide a mix of habitat for waterfowl, shorebirds, and marsh birds.
6. Maintain canopy cover of trees such as cottonwood, willow, and other native tree species.
7. Create a mosaic burn pattern, leaving patches of unburned fuel and patches of partially burned fuels.

Bosque:

1. Reduce fuel loading in the understory.
2. Reduce the size, intensity, and number of wildfires in the mesquite bosque.
3. Promote structural diversity of growth forms within the mesquite bosque (i.e. a mix of native perennial grasses, shrubs, and trees).
4. Enhance the canopy cover of larger mesquite (trees with a >4" DBH).
5. Promote and maintain a mix of shrub and tree species within the bosque, such as mesquite, hackberry, wolfberry, and lotebush.
6. Improve wildlife habitat for species such as yellow-billed cuckoo, Abert's towhee, Cooper's hawk, Lucy's warbler, Bell's vireo, Gambel's quail, gray hawk, ornate tree lizard, southwestern fence lizard, and other mesquite or tree-obligate species.

Prescribed fire treatments would occur during the late fall, winter, and early spring months (October through March for habitat with early nesting bird species, and October through June 15 for grassland habitat before monsoon rains). Using prescribed fire treatments during this period would not adversely affect nesting bird species. Prescribed fire would be implemented on approximately 500 – 2000 acres per year on SPRNCA, 500-2000 Acres on LCNCA and up to

1000 acres elsewhere within TFO. If prescribed fire is determined to be necessary within the riparian, bosque or cienega habitats, they will be analyzed in separate Environmental Assessments. Warm season prescription parameters would be used in grassland habitats before monsoon season.

Prescribed fire would be utilized in a cyclical manner, with the number of years between cycles dependent upon each burn unit's resource objectives. For example, an upland or grassland burn unit will likely be burned on a cycle of one prescribed fire every five years (Robinette 1994). Factors involved with deciding a particular unit's fire cycle include fuel type (sacaton, mesquite, etc.), fuel loading and dead and down fuel, annual rainfall amounts, time of year burn is scheduled (cool or warm season), regional drought conditions, number of years since last burn (wild or prescribed), vegetation growth since last burn, wildlife and endangered species response, and resource management objectives. The exact return cycle for prescribed fire will be determined through monitoring and adaptive management. Monitoring of vegetation treatments will include line point intercept, gap intercept, and belt transects as described in the "Monitoring Manual for Grassland, Shrubland, and Savanna Ecosystems" (USDA-ARS 2005). Other monitoring methods, such as pace-frequency transects (BLM (1985a), may also be used. Frequency data may be analyzed using the methods also described by BLM (1985b). Treatment objectives will determine what to monitor and the appropriate monitoring tools; Resource Specialist(s) will conduct the pre-burn and post-burn monitoring to determine whether the objectives are being met.

Prescribed fire control lines would utilize natural barriers (i.e. rock outcrops, bare ground, bladed roads, trails, mowed areas, black lines, and two-tracks) when possible to avoid creating new surface disturbance. The appropriate level of cultural resources inventory would be determined. The following measures would apply to all prescribed burn treatments within the project area:

1. Plan to protect or mitigate damage to range and/or wildlife improvements structures located within the planned prescribed fire treatment area.
2. For those areas with permitted grazing, livestock would be removed prior to treatment. Treatment areas would be deferred from livestock grazing for at least two consecutive growing seasons following treatment. The growing season usually begins at the onset of the summer rains in late June and continues through September. Livestock numbers would not increase as a result of treatment.
3. All prescribed fires would be conducted under a site specific Prescribed Fire Burn Plan as per BLM Manual 9214. The burn plan will outline the specific fire treatment unit's parameters, including resource objectives, burn plan objectives, weather constraints, pre-burn preparations, pre- and post-burn monitoring plan, contingency plan, safety plan, pre-burn notifications, mop-up plan, complexity analysis, maps, estimated smoke drift maps, predicted particulate matter emissions, ignition plan, holding operations, amount of personnel, equipment needs, fire behavior predictions, Arizona Dept. of Environmental Quality (ADEQ) burn plans, and patrol plan. The burn plan would also identify any persons and agencies to be notified concerning the prescribed fire project.

Alternative 5 (Proposed Action) Integrated Vegetation Management: Chemical (Herbicide), Mechanical, Prescribed Fire, and Re-establishment of Native Plants

Incorporated by reference with this alternative are the Integrated Vegetation Management Handbook (H 1740-2), Prescribed Fire Handbook (H 1741-5), and BLM Technical Reference 1734-7, titled Ecological Site Inventory.

Under this alternative herbicides and other ingredients including surfactant (a chemical added to improve absorption on the leaf surface) and dyes would be used for eradication of invasives, applied at label and at a rate approved by the BLM in its *BLM Vegetation Treatments Using Herbicides Final Programmatic EIS (June 2007)*, the same as in Alternative 3. This alternative would also employ treatment methods as found in alternatives 2 (manual and mechanical), 3 (chemical), and 4 (prescribed fire).
Within the action areas, an intact native flora exists in areas not infested with invasive species. These intact areas will provide a ready seed source for native re-vegetation in areas treated for weed eradication. Native species include: palo verde, saguaro, mesquite, mixed native perennial grasses (three-awns, tanglehead, Arizona cottontop, tobosa, curly mesquite, sacaton, etc.), creosote bush, and a variety of cactus, ephemeral grasses, forbs, and wildflowers. Within the riparian areas native species include cottonwood, willow, Arizona walnut, hackberry, seep willow, cattails, carex, and juncus species.

Under this alternative, chemical, mechanical, prescribed fire, and re-establishment of native vegetation will occur. Not all methods would be used on each individual site in all circumstances; rather, each site would receive treatments that are specific to the area in order to manage the vegetation at-hand. Russian knapweed, giant reed, tamarisk, mesquite, etc., would receive chemical control, as-needed, in order to control the perennial root system. Prescribed fire may be used in conjunction with chemical control, or alone, depending upon the age and species for control in question. For example, prescribed fire may be used alone in those circumstances where the age class of mesquite is very young. Chemical control may be used for older mesquite, followed at the recommended interval with prescribed fire. Or perhaps control of larger mesquite would be accomplished through mechanical control alone, where this method has been determined to be more effective. Mechanical control may be used in conjunction with chemical control, e.g. in cut-stump treatment methods. Depending upon the desired habitat objectives, mechanical control may be used alone or in conjunction with prescribed fire; e.g. prescribed fire for the removal of slash piles created from mechanical control.

The preferred alternative would allow control of tamarisk. Allowing further establishment of tamarisk monocultures throughout the SPRNCA and LCNCA (in lower density) would increase risk for riparian wildfire, potentially decrease stream channel/bank morphologic stability, potentially reduce surface water quality, potentially lower groundwater elevations within the alluvial aquifer, and potentially diminish stream flows in the San Pedro River and Cienega Creek. This may result in reduced plant and wildlife diversity, decreasing the potential for scientific research on native flora and fauna in the RNAs. Under the preferred alternative, isolated populations of tamarisk located in the upper reaches of the San Pedro River, Cienega Creek, Empire Gulch, tributaries, and isolated springs may eventually be controlled, and intact

cottonwood-willow forests will be preserved for use by yellow-billed cuckoo, summer tanager, yellow warbler, and other neotropical bird species.

The preferred alternative would also manage woody invasives within grassland habitat types, resulting in a positive effect on those wildlife species that are grassland obligates, such as Botteri's sparrow, Aplomado falcon, Sprague's pipit, black-tailed prairie dogs, pronghorn, etc. The preferred alternative allows the San Rafael RNA to be managed for preservation of sacaton grasslands, as these habitat types require periodic prescribed fire in order to rejuvenate decadent plants and control invasive woody species.

Section III: Affected Environment/Current Conditions

The Tucson Field Office area includes approximately 645,500 acres of scattered public land in central and south central Arizona. The land is among private and state holdings and Indian reservations. The planning area has about 20 percent of the state's 6.6 million people and includes the major metropolitan areas of Tucson. The public land pattern in the project area includes 20 percent blocked land, 40 percent checkerboard and 40 percent scattered. BLM land comprises 10% of the total land area within the boundaries of the Tucson Field Office. Population pressures exerted by the major metropolitan areas of Phoenix and Tucson have greatly increased the demands on public land in the area. The BLM's public land provides valuable public recreation opportunities and exhibits important wildlife, archaeological, wilderness, scenic and recreational values. Often the protection of these important resource values conflicts with development pressures, requiring that difficult choices be made.

The Tucson Field Office contains several units of BLM's National Landscape Conservation System including one National Monument, two National Conservation Areas, four Wilderness areas, three designated or eligible Wild and Scenic River segments, and the Arizona National Scenic Trail.

Ironwood Forest National Monument;

The Ironwood Forest National Monument (IFNM) lies in the heart of the Sonoran Desert ecosystem in southern Arizona, and is a unique scenic area of rolling desert and ironwood woodlands including the Silverbell, Waterman, and Roskruge mountains. Much of the vegetation in this area is classic Sonoran desert upland habitat dominated by cacti such as saguaro, Bigelow's cholla, and staghorn cholla. Other common plants include ironwood, palo verde, creosote, brittlebush, triangle-leaf bursage, ocotillo, and white thorn acacia. The upper slopes of the Silverbell Mountains possess a chaparral community dominated by jojoba. The lower bajadas contain inter-braided streambeds that carry water after heavy rains. These desert wash habitats are characterized by large ironwood, blue palo verde, and mesquite trees.

The IFNM encompasses most of the mountain ranges that are important to the diverse wildlife and plant communities associated with the ironwood/saguaro forest. In addition, the IFNM contains habitats for several endangered species and species of concern (e.g., desert tortoise), an Area of Critical Environmental Concern (ACEC) to protect an endangered cactus, and a desert

bighorn sheep special management area. IFNM also includes a site listed on the National Register of Historic Places (National Register), two archaeological districts on the National Register, historic mining camps, and other cultural resources that are eligible for the National Register. The IFNM is located in Pinal and Pima Counties, Arizona, approximately 80 miles south of Phoenix and 25 miles northwest of Tucson, Arizona. The IFNM is bordered by the Tohono O'odham Indian Reservation on the west and unincorporated county land otherwise. The closest population center is the Town of Marana to the east. There are no perennial waters or fish in the IFNM. Amphibians are known to occur in the area.

San Pedro Riparian National Conservation Area:

In 1988, Congress designated portions of the river as the San Pedro Riparian National Conservation Area (SPRNCA; Public Law 100-696) to be managed by the Bureau of Land Management (BLM). The San Pedro River, located in southeastern Arizona, flows from Cananea Mexico up to the Gila River. The San Pedro River and surrounding watershed are one of the most biologically diverse areas of the U.S. The 56,431-acre San Pedro NCA stretches 40 miles north into Arizona from the U.S. Mexico border. The legislation directed the Secretary of the Interior to conserve, protect, and enhance the natural resources of this riparian ecosystem. With this direction in mind, the Safford District Resource Management Plan and the San Pedro River Riparian Management Plan, were written. Within these plans are many goals and objectives, one of which is to enhance the vegetation communities on the land with which the BLM is charged with managing.

Early accounts of the San Pedro River Valley describe conditions of the adjacent benches as markedly different from current conditions (Hastings and Turner 1965). Today the most common vegetation association (an estimated 45,750 acres) is the mixed Chihuahuan scrub found in the uplands surrounding the river. Much of what is currently Chihuahuan desert scrub was probably more similar to desert grassland, prior to the expansion of the mining and livestock industries in the 1870's and 1880's. Intensive woodcutting (Bahre and Hutchinson 1985) and grazing (Allen 1989) caused heavy erosion throughout the watershed, gully formation in side drainages, and entrenchment of the main river channel. This deterioration resulted in the loss of the shallow productive surface soils, and exposed more calcareous lower soil profiles. Along with wildfire suppression, these events resulted in the expansion of shrubby species, such as mesquite and acacia, and reduced the native perennial grass component in most of the upland vegetation associations (Hastings and Turner 1965). This has resulted in increased water runoff, accelerated erosion, and reduced the effectiveness of the watersheds to capture and hold water. If the site deterioration is limited to a shift from grasses to scrub dominance, without soil loss and degradation, vegetation management practices may be applied to manipulate composition and restore historic grasslands. The potential to restore native grassland habitat in areas without topsoil will be lacking. The restoration of scrub communities to native grassland would have a number of benefits, including increased ground cover, soil protection, and habitat for a wide variety of grassland-associated wildlife species such as Botteri's sparrow, Cassin's sparrow, Swainson's hawk, Sprague's pipit, and scaled quail. Future reintroduction of pronghorn, Aplomado falcon, and black-tailed prairie dog may be more successful in restored grassland habitats.

Extensive mesquite-grassland communities in the San Pedro River valley are well documented in historic accounts (Davis 1982). Only portions of this community persisted into the early 20th century. The earliest aerial photos, taken in 1935, delineate a mosaic pattern of native grassland, mesquite, and scattered cottonwood trees which occurred prior to clearing land for agricultural production. Friedman (1989) documented a 28.7% decline in acreage of mesquite/ sacaton vegetation between 1973 and 1986. However, along the San Pedro River, mesquite/sacaton supports a more diverse mammalian community than the now abandoned farm fields (Duncan 1989).

The disclimax grassland vegetation associations (143.163, 143.164, and 143.152; Brown et al. 1981) are found in the sandy loam, loamy, and clay loam upland ecological sites. Surface soils are generally shallow and plant-soil moisture relationships are good. The potential plant community in excellent condition is predominantly warm season perennial grasses, which are well dispersed throughout the site, and make up 75-85% of the plant composition by weight (BLM 1989). The aspect should be open grassland. The potential of the sites to produce grass is reduced as shrub canopy increases. Natural fire probably played an important role in the development of the potential plant community. Vegetation mapping identified approximately 20% or 17,602 acres of the surveyed area (90,138 acres in and adjacent to the NCA in 1987) as desert grassland association. Currently, these remnant grasslands are dominated by the scrub components with perennial grasses making up only a minor percentage of the composition. Some sites generally have the potential to be restored desert grasslands, and contain enough topsoil to support native perennial grass species.

The desert scrub and mixed scrub-grassland associations (153.261, 153.215, 153.221, 153.272, 233,210, and 154.213; Brown et al. 1981) are found on the limy upland and limy hills ecological sites in this areas. Soils are calcareous, and often shallow to lime pans. The potential plant community on the site in excellent condition is a diverse mixture of desert shrubs, perennial grasses, and forbs (BLM 1989). The perennial grasses should make up 25-40% of the total plant community by weight, with shrubs and trees comprising 50-70% of the composition. The aspect should be shrubland (BLM 1989). Natural fire may have been important in maintaining this balance between grasses and shrubs on these sites, but the fire-free interval was probably greater that other more productive sites, due to the length of time needed for fine fuels to accumulate. In addition, the major perennial grass species (bush muhly and black grama) may be adversely affected by fire and take several years to recover to pre-fire conditions. Again, control of woody invasives and restoration of grassland will be impossible without topsoil. Vegetation mapping identified approximately 69% of the surveyed area (90,138 acres in and adjacent to the NCA in 1987) as desert scrub and mixed scrub grassland. Most of these sites are currently in poor condition with little native perennial grass remaining. The current vegetation lacks the understory necessary to carry a prescribed fire, an important tool to reduce shrub cover and favor grass establishment. Head-cutting and gully erosion is present throughout these upland sites and intensive management practices (e.g. gabion and Zuni bowl construction) may be necessary to stop further deterioration, and to reduce sediment loads from side channels from entering the San Pedro River. Erosion control would be necessary before shrub control could be initiated, and would require a separate EA.

The remaining 11% of the surveyed area, or 10,243 acres, of upland association is a mixture of sacaton and sacaton-mixed scrub. These occur on heavy clay soils adjacent to the riparian zones of the San Pedro River and its major tributaries. Most of these sites are in good condition with varying amounts of mesquite and other shrubs. Prescribed fire and judicious use of herbicide could be used to reduce the tree and shrub components and restore a more open grassland community. These soils can be erosive and, due to the proximity to the "true" mesquite bosques and cottonwood-willow galleries, care must be taken in the use of prescribed fire or herbicides.

The San Pedro River basin contains 50% of the remaining cienega wetlands in the United States (Hendrickson and Minckley 1984). This formerly extensive wetland community is represented within the SPRNCA by the St. David Cienega and Lewis Springs, but has been subject to a variety of impacts including dredging, railroad construction, gas line construction, diversion of artesian flow, exotic fish and amphibian introduction, exotic plant invasion, and continuing trespass over-grazing. Vegetation in the cienega is dominated by great bulrush (*Schoenoplectus americanus*), cattail (*Typha spp.*), beaked spikerush (*Eleocharis rostellata*), clustered field sedge (*Carex praegracilis*), saltgrass (*Distichlis spicata*), and button-bush (*Cephalanthus occcidentalis*). Prescribed fire of marshes is generally used as a management tool to recycle nutrients, remove decadent vegetation, create patches of open water, and encourage germination of dormant seeds.

Las Cienegas National Conservation Area:

The Las Cienegas NCA and Sonoita Valley Acquisition Planning District (SVAPD) were designated by Congress and signed into law by the President on December 6, 2000, in order to conserve, protect, and enhance the unique and nationally important aquatic, wildlife, vegetative, archaeological, paleontological, scientific, cave, cultural, historical, recreational, educational, scenic, rangeland and riparian resources and values of the public lands within the NCA, while allowing livestock grazing and recreation to continue in appropriate areas. Together, Las Cienegas NCA and the SVAPD encompass nearly 96,000 acres. Situated in southeastern Pima County and northeastern Santa Cruz County, the areas are within an hours' drive of the rapidly growing Tucson metropolitan area. In addition to Tucson, the areas are readily accessible from the nearby towns of Sonoita, Patagonia, Benson and Sierra Vista. Las Cienegas NCA and SVAPD encompass much of the upper Cienega Creek watershed, which is important to Tucson for flood control and aquifer recharge. Among the significant resources within the NCA are:

- Five of the rarest habitat types in the American Southwest: cienegas, cottonwood/willow riparian areas, sacaton grasslands, mesquite bosques, and semi-desert grasslands.
- Habitat for several endangered species.
- A site on the National Register of Historic Places.
- Two proposed wild and scenic river segments.

Climate

Precipitation in Tucson including the project area is bi-seasonal with an annual average precipitation of 12 inches that falls during winter and summer months. The months of April, May, and June are the driest months and a time of great moisture stress for native vegetation. Temperatures frequently exceed 100° F in summer and occasionally drop below freezing in winter. Depth to groundwater is over 100 feet below land surface.

Soils

Soils in the Project Area are primarily the product of the climate, the underlying bedrock lithology, and the landscape. The soils of this region complement some of the designated uses of public lands such as recreation, wildlife management, livestock grazing, and mining. The soil associations mapped by NRCS for the region are closely correlated to the various landforms of the area. Fan terraces compose more than half of the field office. The soils in fan terraces are used primarily for rangeland; fan terrace landforms are relatively smooth alluvial fans that have been incised by drainages. Basin floors primarily cover the perimeter of the BLM lands and areas between mountain ranges of the Field office such as Avra Valley. Basin soils are very deep, well drained, with a moderately fine texture, formed in unconsolidated material or granite. Piedmont soils are prevalent in the rolling hills and mountains, covering approximately one third of the Project Area. These soils are shallow and well drained, and often contain gravel. Prime farmland is a distinction made by the U.S. Department of Agriculture as necessary for the preservation of the Nation's domestic food and other supplies, specifically the capacity to preserve high yields of food, seed, forage, fiber, and oilseed, with minimal agricultural amendment of the soil, adequate water, and a sufficient growing season. The Project Area does not contain soils that qualify as prime farmland.

Air Quality

There are no longer any U.S. Environmental Protection Agency designated non-attainment areas within the TFO. There are currently four Attainment areas within the field office with maintenance plans. The ambient air quality in the United States is protected by the Clean Air Act (CAA) and its amendments as well as other federal, state, and local regulations.

The CAA is administered by the Arizona Department of Environmental Quality (ADEQ). The Environmental Protection Agency (EPA) has developed National Ambient Air Quality Standards (NAAQS) for certain criteria pollutants. These Criteria pollutants are nitrogen dioxide (NO2), sulfur dioxide (SO2), particulate matter less than 10 or 2.5 microns in diameter (PM10 and PM 2.5), carbon monoxide (CO), ozone (O3), and lead (Pb). Arizona has adopted the NAAQS which were established to protect public health (primary standards) and public welfare (secondary standards) as indicated in Table 1.

Table 2. National Ambient Air Quality Standards				
	Primary Standards		Secondary Standards	
Pollutant	Level	Averaging Time	Level	Averaging Time
Carbon Monoxide	9 ppm (10 mg/ m^3)	8-hour (1)	None	
	35 ppm (40 mg/ m^3)	1-hour (1)		
Lead	0.15 µg/m3 (2)	Rolling 3-Month Average	Same as Primary	

	1.5 µg/m^3	Quarterly Average	Same as Primary	
Nitrogen Dioxide	0.053 ppm (100 µg/m^3)	Annual (Arithmetic Mean)	Same as Primary	
Particulate Matter (PM_{10})	150 µg/m^3	24-hour (3)	Same as Primary	
Particulate Matter ($PM_{2.5}$)	15.0 µg/m^3	Annual (4) (Arithmetic Mean)	Same as Primary	
	35 µg/m^3	24-hour (5)	Same as Primary	
Ozone	0.075 ppm (2008 std)	8-hour (6)	Same as Primary	
	0.08 ppm (1997 std)	8-hour (7)	Same as Primary	
	0.12 ppm	1-hour (8) (Applies only in limited areas)	Same as Primary	
Sulfur Dioxide	0.03 ppm	Annual (Arithmetic Mean)	0.5 ppm (1300 µg/m3)	3-hour (1)
	0.14 ppm	24-hour (1)		

* Table information from: http://www.epa.gov/air/criteria.html

(1) Not to be exceeded more than once per year.
(2) Final rule signed October 15, 2008.
(3) Not to be exceeded more than once per year on average over 3 years.
(4) To attain this standard, the 3-year average of the weighted annual mean PM2.5 concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m3.
(5) To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m3 (effective December 17, 2006).
(6) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm. (effective May 27, 2008)
(7) (a) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.

(b) The 1997 standard—and the implementation rules for that standard—will remain in place for implementation purposes as EPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard.
(8) (a) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is < 1.

(b) As of June 15, 2005 EPA revoked the 1-hour ozone standard in all areas except the 8-hour ozone nonattainment Early Action Compact (EAC) Areas.

TFO-wide Threatened and Endangered Species:

All of the T&E species that were listed as of 2004 within the TFO were addressed in the *Biological and Conference Opinion for the BLM Arizona Statewide Land Use Plan Amendment for Fire, Fuels, and Air Quality Management* and the status and environmental baseline for those species can be found in it on pages 18-112. All T&E Conservation Measures from the above-mentioned BO shall be incorporated into this EA by reference. However, per Appendix E of this BO (Conducting Future Consultations for Site-Specific Actions and Implementation Level Plans under This Biological Opinion), BLM "will need to enter into additional consultation once site-specific projects are planned. These include programmatic wildland fire use plans and programmatic, batched, or individual prescribed fire and fuels treatment projects that include site-specific information, prescriptions, and treatment methods." In addition, Chiricahua leopard frog, southwestern willow flycatcher, spikedace, and loachminnow have received proposed critical habitat designations within TFO, and this proposed critical habitat may require conference with FWS if affected by a proposed action under this EA.

Several species have been added to the T&E list as candidate species and, as such, are described below. Per the BLM Manual 6840.1F12 j, "It is not necessary to consult or confer on candidate or Bureau sensitive species. However, States or offices may wish to seek technical assistance from the FWS and/or NMFS when it is determined to be advantageous to a species' conservation or BLM management options."

Acuna cactus (Echinomastus erectrocentus var. acunensis)

Acuna cactus can be up to 7 inches tall and 4 inches in diameter. The stems are spherical when young, becoming ovoid-cylindrical when mature. The areoles are borne on the tubercles. The central spines are maroon or mauve, and upturned. The plant blooms in the spring (March) and the flowers are rose-pink, lavender, or pink-purple. Acuna cactus seems to be restricted to well drained knolls and gravel ridges between major washes in the Palo Verde-Saguaro plant association of the Sonoran Desert. Populations are known to occur in Organ Pipe Cactus National Monument, the Coffeepot Mountains (BLM lands), Arizona State lands, and private lands. Acuna cactus is also known from Sonora, Mexico. The Acuna cactus population on BLM lands seemed secure, with many adults flowering (site visit in 2002). Threats to Acuna cactus are illegal collection, habitat degradation from undocumented alien traffic and Border Patrol activities, mining, and development. The continued protection of populations on BLM lands is important for the conservation of this species because threats on non-Federal lands are high with little or no section 7 protection for these populations.

Western yellow-billed cuckoo (Coccyzus americanus occidentalis)

Listing of the western yellow-billed cuckoo in California, Washington, Oregon, Idaho, and Nevada as an endangered species was first petitioned in 1986 (USFWS 1987). However, the petitioned action was not warranted (USFWS 1988). Listing as an endangered species was again petitioned in 1998 (USFWS 2000b), and YBCU gained candidate species recognition with a finding of warranted (but precluded by higher listing priorities) in 2001 (USFWS 2001).

The yellow-billed cuckoo (YBCU) is a locally common to uncommon breeding summer resident on the SPRNCA and LCNCA. The characteristic call (a rapid "kuk-kuk-kuk") of the YBCU is frequently heard during the months of June through August in large blocks of riparian habitat, particularly woodlands with Fremont cottonwoods (*Populus fremontii*) and willows (*Salix spp.*).

The peak nesting period for this species in Arizona is between 15 June and 10 August (EEC 2006). Dense understory foliage appears to be an important factor in nest site selection, while cottonwood trees are an important foraging habitat. On the SPRNCA, YBCU have been documented annually from 2001 to 2006 with approximately 41 birds detected per survey year (see EEC 2006). YBCU have also been documented annually on the SPRNCA from 2008-2011, and on LCNCA from 2010-2011 (M. Radke, pers. obs).

Breeding distribution and number of YBCU has declined significantly in the past eighty years (Corman and Wise-Gervais 2005), and a general decline of 1.6% per year is occurring according to North American Breeding Bird Surveys (AGFD 2002a). Primary threats currently facing the yellow-billed cuckoo include present or threatened destruction, modification, or curtailment of its habitat or range, and pesticide use (USFWS 2001). Available breeding habitats for cuckoos have also been substantially reduced in area and quality by decreased water tables and the replacement of native riparian habitats by nonnative plants (Corman and Wise-Gervais 2005).

Sprague's pipit (*Anthus spragueii)*

Sprague's pipit gained candidate species recognition with a finding of warranted, but precluded by higher listing priorities, in 2010 (USFWS 2010). Sprague's pipit winters mainly in the grasslands of San Rafael, Sonoita, and Sulphur Springs Valley in southeastern Arizona, therefore, wintering birds do have the potential to occur on LCNCA. Reasons for decline and vulnerability of Sprague's pipit include loss of native prairie habitat at breeding grounds as a result of conversion of the land to agriculture, invasion of non-native plant species, poor livestock grazing practices (especially in drought-prone areas), encroachment of woody vegetation, fire suppression, and urban development. Winter habitats are similar to breeding habitats; i.e., large grassland areas that may or may not primarily consist of native grass (Dieni et al. 2003, Desmond et al. 2005). In Arizona and New Mexico, pipits are found in extensive areas of well-developed desert grasslands (Merola-Zwartjes 2005). Conservation strategies include habitat protection and restoration of wintering and migration areas, but the current status of migration and wintering distribution and habitats are unknown, along with the factors that threaten the quantity and quality of these habitats.

Northern Mexican gartersnake (*Thamnophis eques megalops*)

Listing of the northern Mexican gartersnake was first petitioned in 2003 (USFWS 2006a), however, the petitioned action was not warranted (USFWS 2006b). Initiation of status review (USFWS 2008a) led to candidate species recognition with a finding of warranted, but precluded by higher listing priorities (USFWS 2008b).

The northern Mexican gartersnake ranges from southeastern Arizona and extreme southwestern New Mexico, southward into the highlands of western and southern Mexico (Stebbins 1985). In Arizona, the species occurs in the southeast corner of state from the Santa Cruz Valley east and generally south of the Gila, with recent valid records (post-1980) from the San Rafael and Sonoita grasslands area and from Arivaca (AGFD 2001). As a riparian obligate species (USFWS 2008b), these snakes are most abundant in densely vegetated habitat surrounding cienegas, stock tanks, and in or near water along streams in valley floors, but not in steep mountain canyon stream habitat (Rosen and Schwalbe 1988). As with most reptiles, the species

is active during the warmer months of the year and surface-active at ambient temperatures ranging from 71 to 91 degrees F. The species preys primarily on frogs, tadpoles, and native fish, although lizards and mice may be taken as well (Rosen and Schwalbe 1988). Northern Mexican gartersnakes may be observed foraging along watercourses, but they are quick to seek shelter in streamside vegetation or in the stream.

Sexual maturity in male Mexican gartersnakes occurs at two years, and in two to three years in females. Females are larger than males and begin reproducing at 53-70 cm total length (Degenhardt et al. 1996). Only half of the sexually mature females within a population reproduce in any one season. The species mates in April and May in their northern distribution. Clutch sizes range up to 26 live-born young (with an average of 13.6), which are born from June through August (Rosen and Schwalbe 1988; Stebbins 1985).

On the SPRNCA, Corman (1988) documented northern Mexican gartersnake in aquatic riparian habitat during baseline inventories. Rosen (2005) noted six voucher specimens from the Upper San Pedro River. Local herpetologists have documented adults in 2006 and 2007 from a locality south of Fairbank (T. Miscione, pers. comm.).

In Arizona, distribution of northern Mexican gartersnake has been reduced to less than ten percent of its former range along large main stem rivers. Population numbers are decreasing, with extirpations at several localities since 1950 as habitat is changed and introduced predators invade habitat (Rosen and Schwalbe 1988). The species is listed as extirpated on the San Pedro River in the U.S. due to improper grazing, groundwater pumping, road construction and use, borderland security and undocumented immigration, and intentional harm (USFWS 2008b). However, the current status on the Babocamari River is unknown (USFWS 2008b).

Desert tortoise, Sonoran population (*Gopherus agassizii*)

Sonoran desert tortoises are most closely associated with the Arizona Upland and Lower Colorado River
subdivisions of Sonoran desertscrub and Mojave desertscrub vegetation types. They occur most commonly on rocky (predominantly granitic rock), steep slopes and bajadas (lower mountain slopes often formed by the coalescing of several alluvial fans (fan-shaped deposits at the ends of canyons formed when fast flowing streams slow and widen)) and in paloverde-mixed cacti associations (Ortenburger and Ortenburger 1927, p. 120; Burge 1979, p. 49; 1980, p. 48). In addition to steep, rocky slopes and bajadas, Sonoran desert tortoises also use inter-mountain valleys as part of their home ranges and for dispersal at all age classes (Averill-Murray and Averill-Murray 2002, p. 16). In the Ironwood National Forest, Averill-Murray and Averill-Murray (2005, p. 65) found tortoises or their signs (such as scat and burrows) on 92 percent of transects in boulder habitat, on 71 percent of transects that included incised washes (dry stream beds that flow in response to precipitation), and on 25 percent of transects that had neither boulder habitat nor incised washes. Sonoran desert tortoises were found up to one mile (1.6 km) away from the nearest slope, indicating that they occur in low densities in inter-mountain valleys. Averill-Murray and Averill-Murray (2005, p. 65) stated that maintaining these areas ‘‘may be important for long-term population viability.’’ Washes might also be selectively chosen by reproductive female Sonoran desert tortoises as all eggs and hatchling desert tortoises observed by Barrett (1990, p. 205) occurred there.

Tucson shovel-nosed snake (Chionactis occipitalis klauberi)

The subspecies was historically known from Pima County in the Avra and Santa Cruz valleys (Rosen 2003, p. 4) and from western Pinal and a portion of eastern Maricopa County's (Klauber 1951, p. 196). As of 2001, over one-third of the range of the Tucson shovel-nosed snake (Mardt et al. 2001, p. 731.2) had been converted to either urban development or agriculture (U.S. Geological Survey National Gap Analysis Program 2004). The area between the Tucson and Phoenix metropolitan areas is believed to encompass the majority of the current range of this subspecies, particularly west of Tucson northward along Avra Valley in Pima County to western Pinal County, and then north into eastern Maricopa County, although no systematic surveys have been conducted to assess the status of Tucson shovel-nosed snakes throughout their range (Arizona Game and Fish Department 2008, p. 2). The last verifiable record of the Tucson shovel-nosed snake in Pima County was in 1979, near the intersection of Avra Valley Road and Sanders Road in the Avra Valley (Rosen 2003, p. 10). Although habitat still exists in Pima County, the current distribution and abundance in Pima County is unknown. Most of the currently occupied range of the Tucson shovel-nosed snake is believed to lie in southwestern Pinal County and eastern Maricopa County, where the most recent records occur (Rosen 2008b, p. 8; Mixan and Lowery, p. 1). Survey efforts on the Florence Military Reservation (Mixan and Lowery 2008) and in the northern Avra Valley (Rosen 2003, 2004, and 2008b) provide the only recent intensive survey data available. Dr. Rosen conducted road surveys in 2003, 2004, and 2007, as well as trap arrays in 2007. From the road surveys he detected four Tucson shovel-nosed snakes, plus one photo-vouchered specimen from 2006, all near Eloy and Picacho in Pinal County, Arizona (Rosen 2004, p. 18; 2008b, p. 2). The trap arrays, which were set in previously occupied habitat in Pima County, did not result in any Tucson shovel-nosed snake captures. In the spring and summer of 2008, the Arizona Game and Fish Department conducted Tucson shovel-nosed snake surveys on the Florence Military Reservation in Pinal County, Arizona. A total of 29 Tucson shovel-nosed snakes were found during these surveys: 6 within trap arrays west of State Route 79 and 23 as road kill mortalities on State Route 79 (Mixan and Lowery 2008, p. 5). In 2006, the Arizona Game and Fish Department coordinated attempts to collect shovel-nosed snake tissues for genetic analyses. Based on these efforts, populations are persisting in areas dominated by creosote flats along State Route 79, north of Florence and south of Florence Junction; along Maricopa Road (including State Route 238) between Maricopa and Gila Bend (likely including much of the Rainbow Valley and lower Vekol Wash); east of the San Tan Mountains; along State Route 349 between Maricopa and Casa Grande; south of Interstate 8 near the northern boundary of the Tohono O'odham Reservation; and in the vicinity of the Santa Cruz Flats near Eloy and Picacho.

Wildlife:

Some of the wildlife species observed in TFO include mule and whitetail deer, javelina, ringtail cat, rock squirrels, antelope squirrels, gray fox, bobcat, desert tortoise, diamondback rattlesnake, black-tailed rattlesnake, tiger rattlesnake, gopher snake, whiptail lizards, red-tailed hawk, turkey vulture, American kestrel, Cooper's hawk, western screech owl, Gamble's quail, dove, verdin, canyon wren, cactus wren, mockingbird, and curve-billed thrasher. There are 36 listed endangered, threatened or candidate species in the project area. These are discussed in the biological evaluation for this EA.

Wildlife abounds on LCNCA and SPRNCA because of the abundant food, water and cover within and surrounding the riparian zone. The SPRNCA supports about 400 species of birds, more than 80 species of mammals, two native species and several introduced species of fish, and more than 60 species of amphibians and reptiles. Approximately 100 species of breeding birds and more than 250 species of migrant and wintering birds can be found in the area, representing a large number of known breeding species in North America. Mammals are abundant throughout the area, although some are mostly nocturnal and therefore rarely seen. Included in this group are many species of rodents, several bats, mountain lions, and bobcats. Other mammals, like the white-tailed deer, mule deer, javelina, desert cottontail, and black-tailed jackrabbit, are commonly observed.

Migratory Birds

Per the 2010 Memorandum of Understanding between the BLM and US Fish and Wildlife Service, the BLM shall, at the project level, evaluate the effects of the BLM's actions on migratory birds during the NEPA process, focusing first on species of concern, priority habitats, and key risk factors (MOU VII.F). TFO contains lands in both the Sierra Madre Occidental Bird Conservation Region (BCR34) and the Sonoran and Mojave Deserts Bird Conservation Region (BCR33). LCNCA and SPRNCA are within BCR 34, while IFNM is within BCR 33. The following table lists those migratory bird species of conservation concern from BCRs 33 and 34.

Sonoran and Mojave Deserts (BCR33)	Sierra Madre Occidental (BCR 34)
least bittern	bald eagle (b)
bald eagle (b)	common black-hawk
peregrine falcon (b)	peregrine falcon (b)
prairie falcon	mountain plover (nb)
black rail	yellow-billed cuckoo (W.US DPS) (a)
snowy plover (c)	flammulated owl
mountain plover (nb)	elf owl
whimbrel (nb)	blue-throated hummingbird
long-billed curlew (nb)	elegant trogon
marbled godwit (nb)	Lewis's woodpecker
red knot (roselaari ssp.) (nb)	Arizona woodpecker
gull-billed tern	northern beardless-tyrannulet
black skimmer	buff-breasted flycatcher
yellow-billed cuckoo (w. US DPS) (a)	rose-throated becard
elf owl	Bell's vireo (c)
burrowing owl	gray vireo
Costa's hummingbird	pinyon jay
Gila woodpecker	Bendire's thrasher
gilded flicker	Sprague's pipit (a)(nb)
Bell's vireo (c)	phainopepla
gray vireo	olive warbler
Bendire's thrasher	Lucy's warbler
LeConte's thrasher	yellow warbler (sonorana ssp.)

Lucy's warbler	black-throated gray warbler
yellow warbler (sonorana ssp.)	Grace's warbler
rufous-winged sparrow	red-faced warbler
black-chinned sparrow	canyon towhee
Lawrence's goldfinch	rufous-winged sparrow
	Botteri's sparrow
	five-striped sparrow
	black-chinned sparrow
	lark bunting (nb)
	grasshopper sparrow (ammolegus ssp.)
	Baird's sparrow (nb)
	chestnut-collared longspur (nb)
	varied bunting

(a) ESA candidate, (b) ESA delisted, (c) non-listed subspecies or population of Threatened or Endangered species, (d) MBTA protection uncertain or lacking, (nb) non-breeding in this BCR

The effects of the BLM's actions on migratory birds during the NEPA process shall be evaluated, focusing first on these species of concern listed above in their respective priority habitats (MOU VII.F). Avoidance measures, such as timing restrictions during nesting season, shall be utilized for these birds of conservation concern in site-specific NEPA analysis (see mitigation measures for all treatments).

BLM Sensitive Species:

When BLM engages in the planning process, it shall also address Bureau Sensitive Species and their habitats in land use plans and associated NEPA documents (per BLM Land Use Planning Handbook 1601-1, Appendix C, and BLM Manual 6840). Implementation-level planning should consider all site-specific methods and procedures needed to bring species and their habitats to the condition under which management under the Bureau sensitive species policies would no longer be necessary. All Federal candidate species, proposed species, and delisted species in the five years following delisting will be conserved as BLM sensitive species.

Federal candidate species which may occur within TFO include Acuna cactus, western yellow-billed cuckoo, Sprague's pipit, northern Mexican garter snake, Tucson shovel-nosed snake, and Sonoran desert tortoise. These species have been discussed under the T & E section. Delisted species which may occur within TFO include cactus ferruginous pygmy-owl.

Other BLM Sensitive Species (IM AZ-2011-005) which may occur within TFO, but have been discussed above under the Migratory Bird section, include Botteri's sparrow and grasshopper sparrow. Other potential BLM Sensitive Species which occur within TFO shall be evaluated during site-specific NEPA analysis, and potential TFO-only sensitive species are given in Appendix H.

Fisheries:

Historically, the San Pedro River contained at least 13 species of native fish. Today, these have been largely replaced by introduced species such as common carp, yellow bullhead, and mosquito fish. Only the Gila longfin dace and desert sucker remain from the original populations. Big river fishes, including the Colorado pikeminnow, razorback sucker, and flannel mouth sucker, were extirpated from the San Pedro River by the early 1900s (BLM 1987). Extirpation of cienega species (Gila chub) and pool-riffle species (roundtail chub) followed by the 1880s (BLM 1987). The other six native desert fishes, including speckled dace, loach minnow, desert pupfish, spikedace, Gila topminnow, and Sonora sucker, were extirpated from the San Pedro River, springs, and marshes by the early 1980s (BLM 1987). Of the 13 fish species native to the San Pedro River during the 1700 and 1800s, only two native species currently remain that are tolerant of existing erosive, shallow, and sandy-bottomed river conditions. These two native species include the Gila longfin dace and desert sucker (BLM 1987).

Gila longfin dace (Agosia chrysogaster chrysogaster)

Gila longfin dace are native to the Gila River drainages of Arizona, including the San Pedro River (AGFD 2006b). Habitat of longfin dace is wide ranging from desert scrub to the lower end of conifer woodlands, but longfin dace generally occur at less than 1,500 m. in elevation (AGFD 2006b, Minckley 1973). Longfin dace tend to occupy water habitats with sandy or gravelly bottoms and pools (Johnson 2008, Page and Burr 1991), near overhanging banks in water usually less than 0.2 meters deep, and with moderate velocities of about 0.3 m/s (AGFD 2006b). Longfin dace are tolerant of high temperatures and low dissolved oxygen (Minckley 1973), which may be why this species has been able to adapt to non-native species and changing conditions of the San Pedro River over the last several centuries. On the San Pedro River, longfin dace may commonly be observed in areas of the river where water is less than one foot deep, flowing over sand and gravel substrates.

According to the Arizona Game and Fish Department's Fish Diversity Review Team (1995), the population trend of longfin dace is declining. Threats to the species are considered to be widespread and ongoing, and the San Pedro River population is not considered to be stable over the next ten years of the review (AGFD 1995). Because of these concerns, longfin dace is listed as a sensitive species by BLM (BLM 2005) and as a species of concern with U.S. Fish and Wildlife Service (AGFD 2006b). Non-native species that now occur in the San Pedro River, including red shiner (*Cyprinella lutrensis*) and crayfish, are another major threat to longfin dace. The species has the ability to rapidly recover population numbers (Rinne and Minckley 1991), but massive mortalities to longfin dace may occur through alteration in the quality or amount of water.

Desert sucker (Catostomus clarki)

The desert sucker occurs throughout the Gila River basin (Minckley 1973), including the San Pedro River, but has decreased rapidly in the southern part of its range (AGFD 2002b). Desert sucker are generally found over gravel-rubble substrates in rapids and flowing pools (AGFD 2002b). Adult desert sucker live in pools and move to swifter water to feed at night (AGFD 2002b, Minckley 1973, Page and Burr 1991). Young desert sucker inhabit flowing riffles during

both night and day (Page and Burr 1991). There appears to be little seasonal movement of desert sucker within water courses, and they appear resistant to downstream displacement despite flood events (AGFD 2002b). On the San Pedro River, mid-sized desert sucker may be observed in hard-bottomed, shallow, turbulent areas of the river. Alteration of historic flow patterns have diminished available habitat for desert sucker in the San Pedro River. Because of these concerns, desert sucker is listed as a species of concern with U.S. Fish and Wildlife Service (AGFD 2002b).

For both longfin dace and desert sucker, management of minimum instream flows can maintain the existing fishery, and should be an immediate priority (BLM 1987). A major priority should be to maintain at least the present minimum and median discharges in permanent reaches (BLM 1987).

Cultural Resources:

The San Pedro River Valley has been continuously occupied by humans for at least the past 13,000 years. The oldest known archaeological sites, of the Clovis Culture, are among the best examples of the late Ice Age mega-fauna hunting complex ever found in the U.S. The traces left by later Archaic people (circa 9,000 B.C – A.D. 300) are also found buried in the rich deposits of the valley.

The Formative Period (A.D. 300- 1450) was an especially highly populated period along the San Pedro valley and hundreds of archaeological sites of this time period have been recorded, though few have been excavated or fully investigated. Many cultural influences were present during this time, including the well-known and extensively investigated cultural complexes of the Hohokam (Gila-Salt-Santa Cruz Rivers), the Mogollon (northern Arizona and New Mexico-Mogollon Rim) and the Anasazi (Four Corners area), as well as influences from the Casas Grandes area in Mexico. Architectural styles, mortuary practices and material culture (especially ceramics) show clear ties to all of these cultures, either as a result of colonization, or trade, or both.

After a collapse in population and social organization, possibly caused by extended droughts, of all three major cultural complexes around A.D.1450, the area was inhabited by people of a variety of cultural groups, the most well-known being the Sobaipuri and the Apache. Often called the Protohistoric, this period experienced the first contact with Europeans, particularly the Spanish who came to colonize the American Southwest.

Eventually, the Apache dominated the landscape, driving away the Piman, or O'odham-related Sobaipuri and the Spanish when the Presidio Santa Cruz de Terrenate was abandoned in 1780. This period saw the San Pedro at possibly its least populated, until the 1870s when silver was discovered in Tombstone.

In the Historic Period, Fort Huachuca was established, the mines in Tombstones rose, the milling communities sprung up along the river, transportation routes were established (railroads, stage lines, and freight lines), cattle ranchers arrived, and farmers grew crops. The area was flooded with Europeans, Mexicans, and Indian groups who came here to make a living, and quite often, seeking fame and fortune.

Since the areas covered in this Programmatic EA are widespread and variable different types of cultural resource sites could be present. Examples of different cultural resource site types that could be present include but are not limited include: smaller scale semi-permanent camps, permanent village sites containing architecture with features representative of early agriculture, rock art sites containing petroglyphs, historic habitation sites, TCP's (Traditional Cultural Properties), historic mission sites, historic mining sites and historic trails.

All Alternatives involving any level of ground disturbance will be surveyed under guidelines set forth under Section 106 NHPA (National Historic Preservation Act) on a case by case or project by project basis depending on the level of ground disturbing activity proposed. If cultural resource sites are located they will be avoided. If the situation occurs where cultural resource sites cannot be avoided SHPO consultation will be required.

Native American Religious Concerns:

Ongoing efforts by the BLM through tribal consultation efforts would identify special use areas or areas containing cultural resource sites that would need protection prior to project implementation.

Wetlands/Riparian Zones/Vegetation:

The natural resource values of LCNCA and SPRNCA are inextricably linked to water resources. Riparian vegetation, wildlife, fisheries, recreation and other water-related natural values depend on instream flows (including floods and related groundwater conditions). Base flows and riparian zone water tables are maintained almost entirely by inflows from the regional groundwater aquifer. Either regional groundwater depletions or localized (near-stream) drawdowns in the floodplain aquifer can reduce instream flows and concurrently lower riparian zone water tables. The cottonwood stands along the San Pedro River are especially sensitive to water table declines. Periodic flood flows are required for vegetation reproduction, floodplain development, and channel geomorphic maintenance and evolution (BLM 1987).

The SPRNCA, known for its extensive riparian corridor, is a composite of several vegetation communities. Fremont cottonwood (*Populus fremontii*), Goodding's willow (*Salix gooddingii*), and seepwillow (*Baccharis salicifolia*) are the major species providing the structure of the riparian gallery forests (BLM 1987). Lesser amounts of velvet ash (*Fraxinus velutina*), Arizona walnut (*Juglans major*), netleaf hackberry (*Celtis reticulata*), and soapberry (*Sapindus saponaria*) occur as well (Makings 2006). Chihuahuan desert-scrub, typified by thorny species such as tarbush (*Flourensia cernua*), creosote (*Larrea tridentata*), and acacia (*Acacia spp.*), characterize the uplands bordering both sides of the river, while mesquite (*Prosopis velutina*) and native and exotic grass dominate the bottomland adjacent to the riparian corridor.

Tamarisk populations occur throughout the entire SPRNCA. However, only isolated populations of tamarisk occur south of Fairbank (typically wet reaches with shallower depth to groundwater) while dense stands of tamarisk are well established and make up a significant portion of the riparian community north of Fairbank where surface water is intermittent and depths to groundwater begin to increase. Research conducted by Leenhouts et al. (2006) indicates the spatial distribution pattern of tamarisk contrasts that of cottonwoods and willows in that tamarisk

basal area and density decreased among sites as conditions became wetter. Species dominance thus shifted from cottonwood-willow to tamarisk as sites became drier. This shift was also evidenced by significant correlations between species abundance and stream flow permanence and annual maximum depth to groundwater. Within the SPRNCA, the mean of the annual maximum depth to groundwater beneath surfaces occupied by tamarisk (9.50 feet) was greater than that for cottonwood (6.89 feet), and Goodding's willow (6.23 feet) (Leenhouts et al., 2006).

Weeds:

The following weeds are currently present within TFO and have the potential to become problems in areas where disturbance occurs and if control efforts are not continued and maintained.

Buffelgrass (*Pennisetum ciliare*) grows densely and crowds out native plants of similar size. Competition for water can weaken and kill larger desert plants. Dense roots and ground shading prevent germination of seeds. It appears that buffelgrass can kill most native plants by these means alone. Buffelgrass is a very drought-tolerant perennial, so it can remain dense and even spread in dry years. It is present to burn year round and supports hotter fires than those of red brome. The Sonoran Desert evolved without fire as an ecological factor and most of its plants cannot tolerate it. A single buffelgrass fire kills nearly all native plants in its path.

The invasive Russian knapweed (*Acroptilon repens*) occupies less than one acre total in six separate sites on SPRNCA (see the Russian knapweed files for exact locations). Russian knapweed is a rhizomatous, deep-rooted, long-lived perennial (Parker 1972), native to eastern Europe and Asia (Kearney and Peebles 1951). Features of Russian knapweed make cultural control difficult, and allow knapweed to outcompete native species and form monocultures. For these reasons, Russian knapweed is rated as prohibited and restricted (ADA 2008).

Bindweed (*Convolvulus arvensis*) is an introduced, prostrate perennial with a deep taproot, producing by seeds as well as by horizontal rhizomes (Parker 1972). The twining or trailing stems may reach up to three meters in length. Bindweed occurs on dry soil in retired agricultural fields on SPRNCA. Bindweed is difficult to eradicate because of this drought-tolerant nature and root system, resulting in a prohibited and regulated rating (ADA 2008).

Puncturevine (*Tribulus terrestris*) is an introduced, prostrate annual with a shallow taproot that produces large, spiny seedpods (Parker 1972). The trailing stems may reach two meters in length, forming dense mats. Puncturevine begins its vegetative growth after the beginning of monsoons on barren soil along roads, trails, and retired agricultural fields on SPRNCA. Each plant produces many seedpods, seeds may remain viable for many years, and burs are extremely painful to remove from skin. These features of bindweed result in a prohibited and regulated rating (ADA 2008).

Johnsongrass (*Sorghum halepense*) occurs commonly in moist areas along the San Pedro River, forming monocultures and out-competing many native plant species. Johnsongrass is a tall, leafy, introduced perennial which spreads by seeds and by an extensive system of underground rhizomes (Parker 1972). These underground roots extend up to a meter underground, and seeds may lie dormant for many years, thus making eradication very difficult.

Bermuda grass (*Cynodon dactylon*) is an introduced perennial which produces by seeds, but mainly spreads by long runners on top of the ground and by rhizomes that may be very deep underground (Parker 1972). Bermuda grass is widespread along the banks of the San Pedro River where additional moisture is present. However, it is also very drought and alkali-resistant once established, and may also be found in sandy washes on SPRNCA where only ephemeral moisture is available.

Russian thistle (*Salsola tragus*) is an annual reproduced only by seed, but one plant may produce thousands of seeds (Parker 1972). At maturity, the plant commonly breaks at ground level and becomes "tumbleweed." Russian thistle commonly occurs in disturbed areas and retired agricultural fields on SPRNCA.

Spiny aster (*Chloracantha spinosa*) is a native, nearly leafless, branched perennial with widespread creeping rhizomes (Parker 1972). Spiny aster commonly forms rank decadent thickets in moist soil along the banks of the San Pedro River.

Lehmann lovegrass (*Eragrostis lehmanniana*) was first introduced by the U.S. Soil Conservation Service (now Natural Resources Conservation Service) in the arid southwest from South Africa for range restoration purposes (Gould 1951). The aggressive, spreading habit of Lehmann lovegrass causes the displacement of native grasses and is a concern for maintaining native grasslands.

Bur bristlegrass (*Setaria adherence*) occurs in retired agriculture fields on SPRNCA. Although not rated as a noxious weed with Arizona Dept. of Agriculture, the seed heads are difficult to remove from clothing and fur. Dense stands of bur bristlegrass makes movement through some areas difficult, both for humans and probably wildlife.

Coastal sandbur (*Cenchrus spinifex*) occurs mainly in disturbed areas on SPRNCA. Although not rated as a noxious weed with Arizona Dept. of Agriculture, the plant is very troublesome once the burs mature.

Giant reed (*Arundo donax)* is introduced from the Old World (Kearney and Peebles 1951), and is found occasionally along the San Pedro River in moister soils. Giant reed is a perennial grass, spreading through its rhizomatous roots, which may form impenetrable rank thickets.

Tamarisk (*Tamarix spp.*) occurs throughout the SPRNCA, with the most severe infestations being situated adjacent to the San Pedro River north of the historic town of Fairbank, AZ. Isolated populations of tamarisk to the south of Fairbank functionally serve as extended seed sources increasing potential for further spread along the San Pedro River. Mature tamarisk trees can produce millions of pollen-size seeds dispersed through wind and water. Seeds can germinate while floating and establish themselves on wet banks within two weeks. Newly formed sand banks (common along the San Pedro River following monsoon season) are particularly susceptible. Trees may reproduce in the first year, but typically they reproduce during the second year. Adventitious roots can also produce new trees when buried (Taylor and McDaniel 1998). It has been documented that alterations in the prominence of perennial surface water flow in response to recent drought conditions, alteration to upland/riparian vegetative

communities, changes in land use (urbanization), and groundwater pumping may favor the establishment of invasive species such as tamarisk within the riparian corridor (Tamarisk Coalition 2007).

Russian olive (*Elaeagnus angustifolia*) has been documented twice within the SPRNCA boundary near Escapule and at Murray Springs. Further spread of this invasive species into riparian habitat is likely in the future.

Malta starthistle **(***Centaurea melitensis*) and Yellow Starthistle (*Centaurea solstitialis* L.). These starthistles are annual invasive weeds that closely resemble each other. Originally introduced during the 1700s from southern Europe, they are now a pest in most western states. Scattered populations also occur in the TFO. Like so many invasive weed species, starthistle will rapidly displace diverse native vegetation and create a monoculture, or pure stand of the weed. When this occurs, range forage value is lost, as it is low in palatability. Its root structure is ineffective at protecting soil against erosion. The spiny flower head on Malta starthistle guarantees that recreationists will avoid infested areas. Malta starthistle may be toxic when eaten by horses over a long period, causing a nervous disorder called "chewing disease."

Tree of heaven (*Ailanthus altissima*) has been documented on SPRNCA at Boquillas. This rapidly growing clonal tree (Makings 2006) is listed as a prohibited, invasive, or noxious weed in four states.

Several native, woody, perennial plants may also cause concern for maintenance of native grasslands. These species may include mesquite (*Prosopis spp.*), whitethorn acacia (*Acacia constricta*), catclaw acacia (*Acacia greggii*), broom snakeweed (*Gutierrezia sarothrae*), creosote (*Larrea tridentata*), tarbush (*Flourensia cernua*), juniper (*Juniperus spp.*), and other species. Decades of overgrazing and fire suppression activities may have resulted in the expansion of these species into grassland habitats.

Wild and Scenic Rivers:

The San Pedro River in the SPRNCA was determined to be eligible for inclusion in the Wild and Scenic Rivers System by the BLM because the river is free flowing, and has outstandingly remarkable scenic, recreation, fish and wildlife habitat, hydrologic, paleontological, and cultural/historic values. The San Pedro River, Cienega Creek, and parts of the Gila River are recommended for inclusion in the National Wild and Scenic Rivers System, in the Final Arizona Statewide Wild and Scenic Rivers Legislative Environmental Impact Statement (1994). The EIS requires certain management actions to be initiated and carried forward.

Wastes, Hazardous or Solid:

There are no existing hazardous waste sites in the project area. The disposal of solid and/or hazardous wastes is not authorized as part of any of the four Alternatives. Incidental releases of hazardous materials could result in the contamination of soils, groundwater, or surface water.

Rangeland Health Standards:

The Grazing Administration Regulations, at §4180.1 (43 Code of Federal Regulation [CFR] 4180.1), Federal Register Vol. 60, No. 35, pg. 9970, direct that the authorized officer ensures that the following conditions of rangeland health exist:

> (a) Watersheds are in, or are making significant progress toward, properly functioning physical condition, including their upland, riparian-wetland, and aquatic components; soil and plant conditions support infiltration, soil moisture storage, and the release of water that are in balance with climate and landform and maintain or improve water quality, water quantity, and timing and duration of flow.
>
> (b) Ecological processes, including the hydrologic cycle, nutrient cycle, and energy flow, are maintained, or there is significant progress toward their attainment, in order to support healthy biotic populations and communities.
>
> (c) Water quality complies with State water quality standards and achieves, or is making significant progress toward achieving, established BLM management objectives such as meeting wildlife needs.
>
> (d) Habitats are, or are making significant progress toward being, restored or maintained for Federal threatened and endangered species, Federal Proposed, Category 1 and 2 Federal candidate and other special status species.

These fundamentals focus on sustaining productivity of a rangeland rather than its uses. Emphasizing the physical and biological functioning of ecosystems to determine rangeland health is consistent with the definition of rangeland health as proposed by the Committee on Rangeland Classification, Board of Agriculture, National Research Council (Rangeland Health, 1994, pg. 4 and 5). This Committee defined Rangeland Health ". . . as the degree to which the integrity of the soil and the ecological processes of rangeland ecosystems are sustained." This committee emphasized ". . . the degree of integrity of the soil and ecological processes that are most important in sustaining the capacity of rangelands to satisfy values and produce commodities." The Committee also recommended that “The determination of whether a rangeland is healthy, at risk, or unhealthy should be based on the evaluation of three criteria: degree of soil stability and watershed function, integrity of nutrient cycles and energy flow, and presence of functioning mechanisms" (Rangeland Health, 1994, pg. 97-98).

Standards describe conditions necessary to encourage proper functioning of ecological processes on specific ecological sites. An ecological site is the logical and practical ecosystem unit upon which to base an interpretation of rangeland health. Ecological site is defined as: ". . . a kind of land with specific physical characteristics which differs from other kinds of land in its ability to produce distinctive kinds and amounts of vegetation and in its response to management" (NRCS, National Range and Pasture Handbook, December 2003)

Ecological sites result from the interaction of climate, soils, and landform (e.g. slope, topographic position). The importance of this concept is that the "health" of different kinds of

rangeland must be judged by standards specific to the potential of the ecological site. Acceptable erosion rates, water quality, productivity of plants and animals, and other features are different on each ecological site.

Since there is wide variation of ecological sites in Arizona, standards and guidelines covering these sites must be general. To make standards and guidelines too specific would reduce the ability of BLM and interested publics to select specific objectives, monitoring strategies, and grazing permit terms and conditions appropriate to specific land forms.

Recreation:

Recreation activities on BLM within the TFO are governed by the Phoenix and Safford Resource Management Plans and through rules and regulations. Recreational activities can bring noxious and invasive weeds into the area on vehicles that have picked up seed on other areas. Species identified as noxious or invasive are being treated on a case by case basis under current management guidance. The species of concern have been identified in the noxious weed section above. Activities vary from driving off-highway vehicles to camping, bird watching, studying nature and history, picnicking, horseback riding, and hunting. These activities may be impacted by the proposed project through short-term and temporary effects during control operations.

Lands/Realty:

Lands/Realty activities on BLM within the TFO are governed by the Phoenix and Safford Resource Management Plans and through rules and regulations. Lands/Realty activities can bring noxious and invasive weeds into the area on vehicles that have picked up seed on other areas. Species identified as noxious or invasive are being treated on a case by case basis under current management guidance that includes placing stipulations in Lands/Realty actions to comply with BLM guidance. The species of concern have been identified in the noxious weed section above.

Access/Transportation:

Access/Transportation activities on BLM within the TFO are governed by the Phoenix and Safford Resource Management Plans and through rules and regulations. Access/Transportation activities can bring noxious and invasive weeds into the area on vehicles that have picked up seed on other areas. Transportation routes have been identified as the major source of spread of invasive species. Species identified as noxious or invasive are being treated on a case by case basis under current management guidance that includes placing stipulations in Access/Transportation plans to comply with BLM guidance. The species of concern have been identified in the noxious weed section above.

Visual Resources:

Visual resources on TFO lands are an important part of the landscape viewed from public travel routes and populated areas, including the Avra and Santa Cruz valleys, I-10, Tucson, Sonoita, and other nearby communities. The landscape in the TFO exhibits outstanding examples of the Basin and Range, Sonoran and Chihuahuan Deserts with visual resources in largely natural

appearing condition. The scenic quality has many outstanding landform, vegetation and special features that attract sightseeing activities, and define the surrounding area's landscape setting.

Water Quality, Drinking or Ground:

Groundwater: The San Pedro River flows north from its headwaters in Mexico through a classic basin and range physiography. Sedimentary basins have formed in grabens between block-faulted mountain ranges filling with Miocene through early Pleistocene sediments eroded from the uplifted blocks. The result is a series of relatively linear and parallel northwest-trending mountain/basin complexes (Leenhouts et al. 2006). Within the United States, the Upper San Pedro Basin is defined to the east by the Mule and Dragoon Mountains, to the west by the Huachuca and Whetstone Mountains, to the south by the U.S./Mexico International border, and to the north by a bedrock constriction point known as "The Narrows" approximately 11 miles north of Benson, AZ. The area within this basin is an alluvium filled valley with surfaces that slope gradually down from the base of the mountains to the San Pedro River. Because precipitation in the watershed is primarily concentrated in the mountains, most recharge to the regional groundwater system occurs along the margins of the watershed, along the juncture between the mountains and basin floor (Pool and Coes 1999). Water also enters the watershed as underflow from Mexico. Water that recharges along the mountain fronts moves toward lower elevations discharge locations. Within the project area, groundwater discharge occurs mostly as outflow to the San Pedro River (base flow) and through consumption by the riparian vegetation along the river corridor (evapotranspiration).

According to drinking-water regulations and aquifer water quality standards, groundwater within the Upper San Pedro Basin is generally suitable for domestic, irrigation, stock, industrial, and municipal uses (Coes et al. 1999). The U.S. Environmental Protection Agency (USEPA) primary maximum contaminant levels (MCL's) for drinking water are health-based standards that define the maximum concentration of a constituent that is allowed in public-water system; the State of Arizona aquifer water-quality standards apply to aquifers classified for drinking water use. The USEPA secondary MCL is an unenforceable guideline that defines the maximum concentration of a characteristic or constituent that can be present without unpleasant taste, color, odor, or other aesthetic effects on drinking water. An updated list of the USEPA Primary and Secondary MCL list can be found online by accessing the following link: http://www.azdeq.gov/environ/water/dw/download/mcls.pdf

The following results are the product of research conducted by Coes and others (1999) from water quality testing on 39 separate groundwater wells in the Sierra Vista Sub-basin. Water quality testing indicated 1 sample exceeded the USEPA primary MCL and State of Arizona aquifer water-quality standards for fluoride, 7 samples exceeded the USEPA secondary MCL for Fluoride, 1 sample exceeded the USEPA secondary MCL for iron, 1 sample exceeded the USEPA secondary MCL for manganese, 2 samples were outside the USEPA secondary MCL range for pH, 2 samples exceeded the USEPA secondary MCL for sulfate, and 2 samples exceeded the USEPA secondary MCL for total dissolved solids (Coes et al. 1999).

Coes and others (1999) summarized that on the basis of statistical tests, significant variations were identified between ground-water quality data and well depth, well location, and aquifer type. Temperature and pH values increased and concentrations of calcium decreased with

increased well depth. Concentrations of sodium, potassium, and fluoride in the northern portions of the Upper San Pedro Basin were higher than concentrations in the southern portion of the basin. Nitrite plus nitrate concentrations in the south eastern portion of the basin were higher than concentrations in the northeast. Concentrations of sodium and chloride in the bedrock water-bearing units were higher than concentrations in unconfined parts of the basin-fill aquifer. Concentrations of sodium and fluoride in confined parts of the basin-fill aquifer near St. David were higher than concentrations in unconfined parts of the basin-fill aquifer.

Surface water: A review of Arizona's 1988 Nonpoint Source Assessment Report (plus updates), the 2004 305(b) Assessment and 303(d) Listing Report (ADEQ 2004) was done to see if any surface water quality concerns have been identified. As requested in EPA's Guidance for 2004 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d) and 305(b) of the Clean Water Act, ADEQ has assigned each water quality stream segment to one of the following five categories based on whether water quality stream segments are attaining their designated uses (Table 2):

Table 3: Combined assessment of Water Quality Stream Segment Designated Uses

Category 1-Attaining all uses:	All designated uses are assessed as attaining.
Category 2-Attaining some uses:	At least one designated use is assessed as "attaining" and others are assessed as "inconclusive" or "threatened".
Category 3-Inconclusive:	All designated uses are assessed as "inconclusive". (Note that all surface waters that were not assessed due to insufficient credible data are by default assessed as being in Category 3.)
Category 4-Not Attaining:	One or more designated use is assessed as "not attaining" and none are assessed as "impaired"..
Category 5-Impaired:	One or more designated use is assessed as "impaired".

*Table data from ADEQ 2004 305(b) Assessment and 303(d) Listing Report

The proposed action falls within water quality stream segments AZ150502020008 (segment 8), AZ15050202006 (segment 6), and AZ150502020003 (segment 3) of the San Pedro Watershed. Table 3 defines the geographic extent, listing category, designated uses, impairments, and rational for impairments on each of the water quality stream segments affected by the proposed action.

Table 4: Affected ADEQ Water Quality Stream Segments
*Table data from ADEQ 2004 305(b) Assessment and 303(d) Listing Report

Gila River From San Pedro River to Mineral Cr. 15050100-008	19.8 miles	Suspended sediment	5

From Devil's Canyon to Gila River 15050100-012B	19.6 miles	Copper, selenium, and low dissolved oxygen	5
Brewery Gulch From headwaters to Mule Gulch 15080301-337	1 mile	Copper	5
Mule Gulch From headwaters to above Lavender Pit 15080301-090A	3 miles	Copper	5
Mule Gulch From above Lavender Pit to Bisbee WWTP discharge 15080301-090B	0.8 miles	Copper	5
Mule Gulch From Bisbee WWTP discharge to Highway 80 bridge 15080301-090C	3.8 miles	Copper and zinc	5
San Pedro River From Babocomari Creek to Dragoon Wash 15050202-003	17 miles	*E. coli*	5
San Pedro River From Dragoon Wash to Tres Alamos Wash 15050202-002	15.5 miles	Nitrate	5
San Pedro River From Aravaipa Creek to Gila River 15050203-001	14.8 miles	Selenium and *E. coli*	5

Currently, the San Pedro River within the SPRNCA is defined as an interrupted perennial stream. A continuous perennial reach in the middle of the SPRNCA extends about 14 km upstream and 4 km downstream from the Charleston gaging station (see Map 2). The upstream reach between the international boundary and the continuous perennial reach consists of alternating reaches of intermittent and perennial flow. The reach north of the continuous perennial reach to the

downstream end of the SPRNCA near St. David, AZ is intermittent and becomes generally drier as it nears St. David (Leenhouts et al. 2006).

Intermittent reaches typically lack surface flow during periods of drought and dry summer months and are characterized by in-channel vegetation transitions to domination by deep rooted phreatophytes such as mesquite and tamarisk (Hereford 1993). Currently, tamarisk populations occur throughout the entire SPRNCA. However, only isolated populations of tamarisk occur within the SPRNCA south of Fairbank while dense stands of tamarisk make up a significant portion of the riparian community in the dryer reaches north of Fairbank.

Wilderness:

The project area has four designated wilderness areas and no other public lands suitable for wilderness designation; vegetation treatment is not proposed for any of the wilderness areas at this time, but may be proposed at a later date if monitoring indicates that an invasive species is becoming established in a wilderness area and that it would diminish the wilderness values of the area.

Soils:

A complete summary of order III soil surveys conducted of all counties within TFO by the Natural Resource Conservation Service (NRCS) can be accessed online at: http://soildatamart.nrcs.usda.gov/County.aspx?State=AZ

Section IV: Environmental Consequences

Non-Affected Resources

The following environmental values are not present or are not affected by the proposed action, no action, mechanical, prescribed fire, and chemical control alternatives:

- Farmlands (prime or unique): The planning area has no designated prime and unique farmlands.
- Waste, Hazards or Solids: Any waste generated by this project will be disposed of properly and in conformance with all Laws, Rules and Regulations dealing with waste at approved disposal sites.
- National Energy Policy: There will be no adverse energy impact.
- Water Rights: There will be no effect on Water Rights

Alternative 1: No Action

Impacts on Air Quality

No potential for herbicide drift would occur, fugitive dust would not be created by equipment and mechanical removal, no debris would be disposed of by burning, and there would be no smoke produced by prescribed fire. No impacts to air quality are anticipated with the No Action Alternative.

Impacts on Wildlife Habitat

The no action alternative, where existing invasive species infestations are not treated, would have major adverse and long-term impacts to native wildlife and their habitat through continued competition for space, water and nutrients, and a change in native habitat's structure and composition from the introduction and continued threat of wild and catastrophic fire. Without invasive species control, native vegetation would be replaced and result in little or no beneficial native habitat for wildlife.

Expansion of the density of the weedy tamarisk would be expected to increase, resulting in a tamarisk monoculture within the riparian area. Establishment of tamarisk monocultures would increase risk for riparian wildfire, potentially decrease stream channel/bank morphologic stability, potentially reduce surface water quality, potentially lower groundwater elevations within the alluvial aquifer, and potentially diminish stream flows. This may result in decreased available aquatic habitat and groundwater available for use by terrestrial wildlife. Tamarisk monocultures would not support those species dependent on cottonwood-willow forests.

Desert grassland habitat would continue to be degraded by an increase in density and size of woody invasives, with a corresponding negative effect to grassland-obligates.

Impacts on Water Quantity and Quality

Invasive vegetation and noxious weeds are the dominant vegetation on an estimated 35 million acres of public lands. The estimated rate of weed spread on western public lands in 1996 was 2,300 acres per day. 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. If no action is taken to control invasives, the result would have a major adverse, long-term impact to water quantity and quality in the project area when compared to areas containing native vegetation. Large stands of buffelgrass, tamarisk, and giant reed would remain along with the continued threat of fire. During pre-monsoon periods, when conditions are the driest, buffelgrass may burn within the project area, which includes steep-sided slopes. With burning soon followed by intense monsoon storms, the effect would be an increase in potentially devastating soil erosion from reduced infiltration and increased runoff.

Isolated tamarisk infestations located within the upper reaches of the San Pedro River will continue to distribute seed-promoting colonization in downstream reaches and replacing desirable native riparian vegetation. Tamarisk monocultures will potentially elevate soil and surface/ground water salinity levels, increase potential riparian wildfire, lower water table elevations and potentially reduce surface flows in the San Pedro River. Riparian wildfire will leave stream banks and floodplains temporarily denuded and vulnerable to erosion. Increased erosion will deteriorate surface water quality in the San Pedro River.

Impacts on Aesthetic and Visual Resources

This alternative could have major adverse, long-term impacts on the aesthetic and visual resources of the Sonoran Desert ecosystem. Not treating invasives would result the increased displacement of native Sonoran Desert vegetation by expanding areas of invasives and potential removal of native vegetation by the constant threat of fire. Fire events would destroy the native habitat; exotic plants would replace this desert ecosystem.

Impacts on Riparian/Wetlands

The proposed action would reduce the risk of catastrophic wildfires by reducing hazardous fuels, restoring fire-damaged lands, and improving ecosystem health by 1) 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. Under the no action alternative, only very small patches of giant reed, tamarisk, and Russian knapweed (less than 5 acres at a time), would be controlled. This would allow for unchecked growth and spread of invasives throughout the riparian/wetland areas of the field office.

Impacts on Environmental Justice

There are communities of low income and minority populations within the project area such as Three Points, Marana, Mammoth and Winkleman/Hayden, along with the Tohono O'odham, and Pascua Yaqui tribal nations. This project is not expected to impact any community as there is very little BLM land near those communities. The proposed action will not disproportionately affect any low income or minority communities.

Impacts on Socioeconomic Resources

No action would have a major adverse, long-term impact on the socioeconomic resources of area. The areas tourism industry depends in a large part on the scenic beauty of the Sonoran desert and the lush riparian areas and the bird life that they attract. The no action alternative would not control the invasives which threaten those socioeconomic drivers of the communities, and therefore would continue to serve as a seed source for infestations, and possible loss of the qualities that drive them on adjacent lands.

Impacts on Areas of Critical Environmental Concern: Seven ACEC's occurs within the proposed project.

Ironwood Forest National Monument:
The Waterman ACEC includes approximately 2,368 acres of public land. It is managed under a habitat management plan for Nichol Turk's head cactus (NTHC). The current effort to manually remove the buffelgrass through the use of volunteers does not keep up with the expansion of the grass within the Waterman ACEC. This may lead to the buffelgrass out-competing NTHC or inducing a wildland fire of the intensity that the NTHC are destroyed.

Las Cienegas National Conservation Area:
Approximately 20,000 acres of grasslands on the LCNCA are invaded by mesquite and other invasive shrub and half shrub species. The Las Cienegas RMP identifies desert grassland as the desired plant community in these areas, thereby requiring the removal or reduction of much of the mesquite, burroweed and other undesirable shrub species. The following text from the LCNCA RMP elaborates generally on the rationale to manage toward desired plant communities and desired future condition. The LCNCA RMP identifies chemical, mechanical and prescribed fire as means of reducing shrub and tree cover.

The no action alternative leaves the historic grasslands of the LCNCA ecologically unbalanced toward shrub and tree dominance. As such, wildfire intensity and frequency are likely to be higher thereby increasing wildlife mortality levels, soil sterilization, plant species homogeneity, and threats to health and human safety.

San Pedro Riparian National Conservation Area:
The San Pedro Riparian Management Plan and EIS (BLM 1989) recommended three Research Natural Areas (RNAs) of Critical Environmental Concern. These three RNAs were implemented in the Safford District Resource Management Plan (BLM 1991) and include St. David Cienega, San Pedro River, and San Rafael. The Saint David Cienega RNA designated 350 acres for preservation of the remaining cienega habitat for scientific research. The San Pedro RNA designated 1,340 acres for preservation of Fremont cottonwood, Goodding's willow, mesquite bosques, and Chihuahuan desert scrub vegetation for scientific research. The San Rafael RNA designated 370 acres for preservation of alkali and giant sacaton grassland, and Fremont cottonwood-willow riparian areas for scientific research.

Under the no action alternative no treatment will occur. Isolated patches of Russian knapweed, giant reed, Malta star-thistle, and other weeds will continue to become established and populations will increase in size. Isolated populations of tamarisk located in the upper reaches of the San Pedro River will continue to expand, potentially resulting in a tamarisk monoculture within the riparian area. Establishment of tamarisk monocultures throughout the SPRNCA would increase risk for riparian wildfire, potentially decrease stream channel/bank morphologic stability, reduce surface water quality, lower groundwater elevations within the alluvial aquifer, and potentially diminish stream flows in the San Pedro River. This may result in reduced plant and wildlife diversity, decreasing the potential for scientific research on native flora and fauna in the RNAs. The no action alternative leaves the historic grasslands ecologically unbalanced toward shrub and tree dominance, with a corresponding negative effect on those wildlife species adapted to grassland habitats. The no action alternative does not allow the San Rafael RNA to be

managed for preservation of sacaton grasslands, as these habitat types require periodic prescribed fire in order to rejuvenate decadent plants and control invasive woody species.

Other TFO Lands:

The Desert Grassland ACEC is in the Mescal Mountains near the Needles Eye Wilderness area. The no action alternative leaves the historic grasslands of the ACEC ecologically unbalanced toward shrub and tree dominance. As such, wildfire intensity and frequency are likely to be higher thereby increasing wildlife mortality levels, soil sterilization, and plant species homogeneity.

The White Canyon ACEC is adjacent to the White Canyon Wilderness area. The no action alternative leaves the Sonoran desert of the ACEC subject to invasion by buffelgrass. As such, wildfire intensity and frequency are likely to be higher thereby increasing wildlife mortality levels, soil sterilization, and increased plant species homogeneity.

Impacts on Wild and Scenic Rivers:

Under the no action alternative, only very small patches of giant reed, tamarisk and Russian knapweed (less than 5 acres at a time), would be controlled. This would allow for unchecked growth and spread of invasives throughout the Wild and Scenic Rivers (WSR) of the field office. Tamarisk would remain untreated on the SPRNCA. Isolated populations of tamarisk located in the upper reaches of the San Pedro River will continue to expand, potentially resulting in a tamarisk monoculture within the riparian area. Establishment of tamarisk monocultures throughout the SPRNCA would increase risk for riparian wildfire, potentially decrease stream channel/bank morphologic stability, reduce surface water quality, lower groundwater elevations within the alluvial aquifer, and potentially diminish stream flows in the San Pedro River. Natural resource values of the SPRNCA would diminish, impairing the suitability of the San Pedro River for consideration of its inclusion to the WSR system.

Wastes, Hazardous or Solid:

Under the no action alternative, there would be no opportunity for the development of hazardous waste.

Impacts on Floodplain management:

This would have a negative impact on the floodplains of the field office as the stands of tamarisk are too extensive to manipulate with hand labor, and are causing a serious degradation of water quality along the streams within the banks of the floodplains.

Impacts on Cultural Resources:

No change and no impacts would be expected to occur to cultural resources under this alternative.

Impacts on Native American Religious Concerns:

No change and no impacts would be expected to occur to cultural resources under this alternative.

Impacts to T&E:

The nature of impacts under the no action alternative would be similar to those during the past 10 years. The BLM would be unable to use herbicides to treat unwanted vegetation to the benefit of T&E Species, without additional project-specific NEPA documentation and FWS consultation.

Nichol Turk's head cactus and Acuna cactus:
No action would have a major adverse, long-term impact on native cacti. The no action alternative would not control invasives; therefore, the infestations would continue to spread, serving as a fuel source for wildfires within the Waterman Mountain ACEC's that destroy the population of the native cacti.

Yellow-billed cuckoo, Northern Mexican gartersnake, and Huachuca water umbel:
No action would allow invasive riparian species, such as tamarisk, Russian olive, and giant reed, to further invade aquatic and riparian ecosystems and affect these species adapted to this habitat. Tamarisk monocultures may eventually invade the cottonwood-willow forests along the riparian areas of SPRNCA and LCNCA. Tamarisk monocultures may result in shading, changes in soil pH, water flow diversion, and water quality and quantity that may become detrimental to aquatic species, such as Huachuca water umbel and northern Mexican gartersnake. Cottonwood-obligate species, such as yellow-billed cuckoo, may not adapt to an eventual tamarisk monoculture. Eventual control efforts would require increasing amounts of funding, herbicide use, mechanical control, and ground disturbance.

Tucson shovel-nosed snake:
The no action alternative may allow the invasion of annual and perennial weed species in sandy soils within the TFO, eventually displacing native vegetation and the wildlife species and their prey adapted to native plants.

Impacts to Noxious Weeds:

The no action alternative would not control invasives or noxious weeds; therefore the infestations would continue to spread, serving as a fuel source for wildfires within the field office that destroy the population of the native vegetation.

Alternative 2. Manual and Mechanical Control and Removal

A description of the application of manual and mechanical control is incorporated by reference from the BLM Integrated Vegetation Management Handbook (H-1740-2) and portions are included in Appendix G. Also incorporated by reference with this alternative is the BLM Technical Reference 1734-7, titled Ecological Site Inventory.

Impacts to Air Quality:

Fugitive dust (PM_{10}) may be produced during mechanical removal of invasive plants. However, due to the scale of the proposed mechanical treatments and intensity of operations (limited quantity of heavy equipment for use), impacts to air quality from fugitive dust production would be highly localized and of short duration. Field vehicles accessing the project sites will create short term, localized, insignificant increases in particulate, airborne road dust.

Impacts on Wildlife Habitat :

This alternative would have minor, beneficial, localized, short-term impacts to native wildlife and their habitat by reducing the competition for space, water and nutrients, and reducing the introduction of fire. These impacts would be localized and short-term because of the time and cost constraints of physical removal and limited area of treatment. At locations where this alternative may be implemented, manual removal or mowing treatment will restore localized, small areas of native vegetation. This alternative may have negligible, localized, short-term adverse impacts when buffelgrass is pulled that is adjacent to native vegetation due to damage to the adjacent plant's root structure. Physical control and removal may also have a short-term, negligible adverse effect on vertebrate or invertebrate species inhabiting areas where invasives would be removed. Short-term displacement of wildlife may occur during removal; however the impact is expected to be negligible.

Impacts on Water Quantity and Quality:

This alternative would have major adverse, long-term impacts to water quantity and quality in the project area because invasive infestations would not be effectively managed under this alternative. Large, contiguous stands of invasives would remain because of the time and cost constraints of physical removal and the limited area receiving treatment. These stands would serve as a continued source of fire. The water quantity and quality in the treated areas may be reduced when compared to areas containing native vegetation. This impact could result from exposure of bare ground due to manual buffelgrass removal or pre-monsoon fires, resulting in the potential for increased runoff during monsoon events and movement of sediment into the major drainages.

Impacts on Aesthetic and Visual Resources:

The physical removal action alternative would have minor, beneficial, short-term impacts on the aesthetic and visual resources of the Sonoran Desert ecosystem. Physical removal methods would have minor, short-term impacts by removing some of the seed source and allowing localized, small areas of the native Sonoran Desert vegetation to reestablish.

Impacts on Riparian/Wetlands:

The proposed action would reduce the risk of catastrophic wildfires by reducing hazardous fuels, restoring fire-damaged lands, and improving ecosystem health by 1) controlling weeds and invasive species; and 2) manipulating vegetation to benefit fish and wildlife habitat, improve riparian and wetlands areas, and improve water quality in priority watersheds. Under this alternative, only very small patches of giant reed, tamarisk and Russian knapweed (less than 5

acres at a time), would be controlled. This would allow for unchecked growth and spread of invasives throughout the riparian/wetland areas of the field office.

Impacts on Environmental Justice:

There are communities of low income and minority populations within the project area such as Three Points, Marana, Mammoth and Winkleman/Hayden, along with the Tohono O'odham, and Pascua Yaqui tribal nations. This project is not expected to impact any community as there is very little BLM land near those communities. The proposed action will not disproportionately affect any low income or minority communities.

Impacts on Socioeconomic Resources:

The areas tourism industry depends in a large part on the scenic beauty of the Sonoran desert and the lush riparian areas and the bird life that they attract. This alternative would have minor, short-term positive impacts by removing local, small areas of the seed source and reducing the potential for large, hot fires. Physical removal would have a very minor beneficial impact on the socioeconomic resources of the area and its citizens. This action would have a major adverse, long-term impact on the socioeconomic resources of area. This alternative would not control the invasives which threaten those socioeconomic drivers of the communities, and therefore would continue to serve as a seed source for infestations and possible loss of the qualities that drive them on adjacent lands.

Impacts on Areas of Critical Environmental Concern:

Seven ACEC's occurs within the proposed project.

Ironwood Forest National Monument:

The Waterman ACEC includes approximately 2,368 acres of public land. It is managed under a habitat management plan for Nichol Turk's head cactus (NTHC). The current effort to manually remove the buffelgrass through the use of volunteers does not keep up with the expansion of the grass within the Waterman ACEC. This may lead to the buffelgrass out-competing the NTHC or inducing a wildland fire of the intensity that the NTHC are destroyed.

Las Cienegas National Conservation Area:

Approximately 20,000 acres of grasslands on the LCNCA are invaded by mesquite and other invasive shrub and half shrub species. The Las Cienegas RMP identifies desert grassland as the desired plant community in these areas, thereby requiring the removal or reduction of much of the mesquite, burroweed, and other undesirable shrub species. The following text from the LCNCA RMP elaborates generally on the rationale to manage toward desired plant communities and desired future condition. The LCNCA RMP identifies chemical, mechanical and prescribed fire as means of reducing shrub and tree cover.

Wildlife species primarily dependent upon mesquite habitats will be impacted by the tree cover reduction; however, much mesquite habitat will remain outside treatment areas, and within those ecological sites with a mesquite bosque historic climax plant community which are excluded

from treatment in this EA. As such, the proposed action is not expected to reduce or significantly impact the abundance and diversity of general wildlife species; however, the distribution of some species will obviously shift once mesquite dominated grasslands are converted to pure grassland stands. Conversely, grassland–obligate species such as the pronghorn antelope, grasshopper sparrow, and Botteri's sparrow will increase in both abundance and diversity because more suitable grassland habitat will be available once treatments are complete. Wildfire events will likely be more controllable and less intense in the grassland setting versus the shrub/tree invaded grassland setting, and damage to wildlife, soil and vegetative resources is expected to be less severe.

San Pedro Riparian National Conservation Area:

The physical control and removal alternative will not result in the eventual control and/or eradication of many invasive and noxious weeds. For example, the perennial rhizomes of Russian knapweed and giant reed will not be killed through physical control. Isolated patches of Russian knapweed, giant reed, and other perennial weeds will continue to become established and populations will increase in size. Isolated populations of tamarisk located in the upper reaches of the San Pedro River will continue to expand, potentially resulting in a tamarisk monoculture within the riparian area. Establishment of tamarisk monocultures throughout the SPRNCA would increase risk for riparian wildfire, potentially decrease stream channel/bank morphologic stability, reduce surface water quality, lower groundwater elevations within the alluvial aquifer, and potentially diminish stream flows in the San Pedro River. This may result in reduced plant and wildlife diversity, decreasing the potential for scientific research on native flora and fauna in the RNAs.

Physical control and removal of woody invasives will not allow the San Rafael RNA to be managed for preservation of sacaton grasslands, as these habitat types require periodic prescribed fire in order to rejuvenate decadent native perennial grasses.

Other TFO Lands:

The Desert Grassland ACEC is in the Mescal Mountains near the White Canyon Wilderness area. The physical control and removal alternative leaves the historic grasslands of the ACEC ecologically unbalanced toward shrub and tree dominance. As such, wildfire intensity and frequency are likely to be higher thereby increasing wildlife mortality levels, soil sterilization, and plant species homogeneity.

The White Canyon ACEC is adjacent to the White Canyon Wilderness area. The physical control and removal alternative leaves the Sonoran desert of the ACEC subject to invasion by buffelgrass. As such, wildfire intensity and frequency are likely to be higher thereby increasing wildlife mortality levels, soil sterilization, and increased plant species homogeneity.

Impacts on Wild and Scenic Rivers:

The manual control only method would be expected to control only annual invasive species. Perennial weed species, such as giant reed and Russian knapweed, could not be controlled using manual/mechanical methods only. Under this alternative, only very small patches of giant reed, tamarisk and Russian knapweed (less than 5 acres at a time), would be controlled. This would

allow for unchecked growth and spread of invasives throughout the Wild and Scenic Rivers of the field office.

Impacts on Floodplain management:

The physical control only method would be expected to control only annual invasive species, such as starthistle. Perennial invasive species, such as tamarisk, giant reed, and Russian olive, could not be controlled using mechanical methods only. However, mechanical methods (e.g. cut-stump method) in conjunction with chemical control may result in more selective weed control and control of perennials. More selective mechanical methods may allow competition by desirable plant species, and result in a more healthy vegetation community comprised of native species. Cover by native species may allow more infiltration and decreased run-off and erosion in the floodplain.

Impacts on Cultural Resources:

Alternatives that involve ground disturbance could impact cultural resources by displacing, crushing, moving or destroying artifacts, features or cultural resource sites. Cultural resources could be impacted under this Alternative. Impacts expected to occur could include displacement of artifacts caused by mechanical grubbing, digging and subsequent removal of mesquite trees. Archaeological sites could be impacted by displacement of artifacts from their original location. Also, mechanical equipment used in the operation to remove mesquite could impact archaeological sites through ingress and egress through cultural resource sites.

The risks to paleontological and cultural resources would be higher than alternative 3, and the same as in alternative 5. This alternative would be least affective among herbicide treatment alternatives in reducing hazardous fuels, perhaps leading to greater incidence of wildfire and loss of paleontological and cultural resources.

Impacts on Native American Religious Concerns:

Traditional Cultural Properties (TCPs) areas identified through consultation with American Indian Tribes could be impacted under this alternative. This project could have a small short term impact on Native American communities when it comes to the gathering of plant material. This impact would be both a positive and a negative depending on how the treatments are implemented. The risks to paleontological and cultural resources and health of Native Americans and other human receptors would be lower than under the other alternatives. Fewer acres would be treated to control weeds and poisonous plants that could adversely affect humans and that could displace native vegetation desirable to Native peoples' uses. This alternative would be least affective among herbicide treatment alternatives in reducing hazardous fuels, perhaps leading to greater incidence of wildfire and loss of Native people's life and property.

Impacts to T&E:

Physical control of the invasives would have an adverse, long-term impact on the native ecosystems. As it would not effectively control invasives, the infestations would continue to spread, serving as a fuel source for wildfires and destroying the habitat for T&E species that the BLM is charged to protect.

Impacts to Noxious Weeds:

The Physical Control and Removal alternative would not completely control invasive species; therefore, the infestations would continue to spread, destroying the vegetation and wildlife habitat within TFO.

Alternative 3. Chemical (Herbicide) removal of exotic, noxious species and Re-establishing native plants.

A description of the application of chemical control is incorporated by reference from the BLM Integrated Vegetation Management Handbook (H-1740-2) and portions are included in Appendix G. Also incorporated by reference is the BLM Technical Reference 1734-7, titled Ecological Site Inventory.

Impacts on Air Quality:

Potential for drift of herbicide during foliar application represents another air quality concern associated with the proposed action. However, herbicide drift will be minimized by using spray pressures no greater than required to obtain adequate coverage of each target plant individually, with nozzle tips sized to produce large droplets, and from a maximum of two feet from the target plant. Potential for drift during stump cut applications is virtually non-existent because herbicide may be applied with a brush or wand.

Impacts on Wildlife Habitat:

The chemical only method for invasive control would not allow the use of mechanical or prescribed fire methods. Chemical application would only occur using foliar sprays on invasive riparian species, such as tamarisk, giant reed, and Russian olive. Therefore, the chemical control only method is much less selective on vegetation than using chemical and mechanical methods (e.g. cut-stump treatment) of control. Mortality to non-target vegetation is more likely using foliar sprays.

Herbicides can injure or kill non-target plants, with short-term, negligible, localized, adverse impacts. However, chemical control of invasive and noxious species would have long-term, moderate beneficial impacts on native vegetation and wildlife habitat. Different herbicides act on plant-specific pathways differently. Appropriate chemicals would be selected to treat specific invasive species based on the best available research, thus its impact to wildlife habitat under normal application conditions would be negligible. Native plant communities and wildlife habitat would be restored by reducing or eliminating target species and allowing the limited water and nutrients to become available to surrounding native vegetation and newly recruiting native vegetation. The Vegetation Treatment using Herbicides on BLM lands in the 17 western states Programmatic EIS address this issue and is incorporated by reference to this document.

Impacts on Water Quantity and Quality:

The use of chemical removal methods could have negligible, short-term, localized, adverse impacts on water quantity and quality. Killing invasive species with herbicides would lead to natural restoration of native plant communities. This would have positive effects on soil nutrient availability and cycling, water availability, and soil erosion. Overall the alternative will have negligible, short-term, adverse impacts and long-term, beneficial impacts on the water quantity

and quality. The Vegetation Treatment using Herbicides on BLM lands in the 17 western states Programmatic EIS address this issue and is incorporated by reference to this document.

Impacts on Aesthetic and Visual Resources:

Adverse visual impacts associated with herbicide treatments would be greatest under this and the preferred alternative. Over the long term, this alternative should have the greatest positive impact on visual resources as natural vegetation communities and landscapes are restored. The alternative would have major, direct, beneficial impacts on the aesthetic and visual resources of the native ecosystems within TFO.

Impacts on Riparian/Wetlands:

The chemical only method for invasive control would not allow the use of mechanical or prescribed fire methods. Chemical application would only occur using foliar sprays on invasive riparian species, such as tamarisk, giant reed, and Russian olive. Therefore, the chemical control only method is much less selective on vegetation than using chemical and mechanical methods (e.g. cut-stump treatment) of control. Mortality to non-target vegetation is more likely using foliar sprays under this alternative.

Impacts on Environmental Justice:

There are communities of low income and minority populations within the project area such as Three Points, Marana, Mammoth and Winkleman/Hayden, along with the Tohono O'odham, and Pascua Yaqui tribal nations. This project is not expected to impact any community as there is very little BLM land near those communities. The proposed action will not disproportionately affect any low income or minority communities.

Impacts on Socioeconomic Resources:

The areas tourism industry depends in a large part on the scenic beauty of the Sonoran and Chihuahuan deserts, lush riparian areas, and desert grasslands, and the bird life that they attract. Application of a chemical herbicide could have a minor, short-term impact on area, by increasing the fuel threat during the next two to three years as a result of killing the new growth of woody invasives and exotic grasses, and adding to the existing stands of dead grass in the area. This would have a minor, short-term impact because dead and volatile fuels would break down within two to three years from rain and wind, therefore reducing and removing the threat of fire.

The minor, short-term impacts would be negligible and offset because the application of a chemical herbicide could have a major direct, long-term impact by removing the seed source, reducing future infestations, and reducing the potential for large, hot wildfires. The preferred alternative would have a major direct, long-term, beneficial impact on the socioeconomic resources of the area. The threat of fire fuels near a highly urbanized area would be reduced. In addition, the aesthetic and visual resources would be improved by restoring the area to native vegetation.

Impacts on Areas of Critical Environmental Concern:

Seven ACEC's occurs within the proposed project.

Ironwood Forest National Monument:

The Waterman ACEC includes approximately 2,368 acres of public land. It is managed under a habitat management plan for Nichol Turk's head cactus (NTHC). The current effort to manually remove the buffelgrass through the use of volunteers does not keep up with the expansion of the grass within the Waterman ACEC. This may lead to the buffelgrass out-competing the NTHC or inducing a wildland fire of the intensity that the NTHC are destroyed.

Las Cienegas National Conservation Area:

Approximately 20,000 acres of grasslands on the LCNCA are invaded by mesquite and other invasive shrub and half shrub species. The Las Cienegas RMP identifies desert grassland as the desired plant community in these areas, thereby requiring the removal or reduction of much of the mesquite, burroweed and other undesirable shrub species. The following text from the LCNCA RMP elaborates generally on the rationale to manage toward desired plant communities and desired future condition. The LCNCA RMP identifies chemical, mechanical and prescribed fire as means of reducing shrub and tree cover.

Wildlife species primarily dependent upon mesquite habitats will be impacted by the tree cover reduction; however, much mesquite habitat will remain outside treatment areas. As such, the proposed action is not expected to reduce or significantly impact the abundance and diversity of general wildlife species; however, the distribution of some species will obviously shift once mesquite dominated grasslands are converted to pure grassland stands. Conversely, grassland dependent species such as the pronghorn antelope, grasshopper sparrow, and Botteri's sparrow will increase in both abundance and diversity because more suitable grassland habitat will be available once treatments are complete. Wildfire events will likely be more controllable and less intense in the grassland setting versus the shrub/tree invaded grassland setting, and damage to wildlife, soil and vegetative resources is expected to be less severe.

San Pedro Riparian National Conservation Area:

Chemical control of woody invasives and re-establishment of native vegetation will not allow the San Rafael RNA to be managed for preservation of sacaton grasslands, as this habitat types requires periodic prescribed fire in order to rejuvenate decadent plants and recycle nutrients.

Other TFO Lands:

The Desert Grassland ACEC is in the Mescal Mountains near the White Canyon Wilderness area. The chemical control alternative leaves the historic grasslands of the ACEC ecologically unbalanced toward shrub and tree dominance. As such, wildfire intensity and frequency are likely to be higher thereby increasing wildlife mortality levels, soil sterilization, and plant species homogeneity.

The White Canyon ACEC is adjacent to the White Canyon Wilderness area. The chemical control alternative leaves the Sonoran desert of the ACEC subject to invasion by buffelgrass. As such, wildfire intensity and frequency are likely to be higher thereby increasing wildlife mortality levels, soil sterilization, and increased plant species homogeneity.

Impacts on Wild and Scenic Rivers:

There would not be any adverse impacts to Wild and Scenic Rivers areas under this alternative. The removal of invasive and exotic species would benefit the qualities for which those areas were designated.

Impacts on Floodplain Management:

The chemical control only method would be expected to control annual and perennial invasive species, such as tamarisk, giant reed, and Russian olive. However, mechanical methods (e.g. cut-stump method) in conjunction with chemical control may result in more selective weed control than chemical control only through foliar application. More selective mechanical methods may allow competition by desirable plant species, and result in a more healthy vegetation community comprised of native species. Cover by native species may allow more infiltration and decreased run-off and erosion in the floodplain.

Impacts on Cultural Resources:

The risks to paleontological and cultural resources would be lower than under the other alternatives, except for the no action alternative. This is due to the fact that no ground disturbance will in the areas of vegetation removal. This alternative would be least affective among treatment alternatives in reducing hazardous fuels, perhaps leading to greater incidence of wildfire and loss of paleontological and cultural resources.

Impacts on Native American Religious Concerns:

TCP's (Traditional Cultural Properties) areas identified through consultation with American Indian Tribes could be impacted under this alternative. This alternative could have impacts on areas identified through consultation efforts with American Indian Tribes. Ongoing efforts by the BLM through tribal consultation efforts would identify special use areas or areas containing cultural resource sites that would need protection prior to project implementation. Once identified, these areas would be avoided. The risks to paleontological and cultural resources and health of Native Americans and other human receptors would be lower than under the other alternatives. This project could have a small short term impact on Native American communities when it comes to the gathering of plant material. This impact would be both a positive and a negative depending on how the treatments are implemented. Fewer acres would be treated to control weeds and poisonous plants that could adversely affect humans and that could displace native vegetation desirable to native peoples' uses. This alternative would be least affective among treatment alternatives in reducing hazardous fuels, perhaps leading to greater incidence of wildfire and loss of native people's life and property.

Impacts to T&E:

Yellow-billed cuckoo and Northern Mexican gartersnake:

The chemical only method for invasive control would not allow the use of mechanical or prescribed fire methods. Chemical application would only occur using foliar sprays on invasive riparian species, such as tamarisk, giant reed, and Russian olive. Therefore, the chemical control only method is much less selective on vegetation than using chemical and mechanical methods (e.g. cut-stump treatment) of control. Mortality to non-target vegetation is more likely using foliar sprays, and this may result in less selective habitat management for yellow-billed cuckoo and Mexican gartersnake. The chemical only method for invasive control would also not allow

for more selective manual/mechanical removal of vegetation close to aquatic habitats containing Huachuca water umbel.

Nichol Turk's head cactus and Acuna cactus:
This alternative would control invasive plants; therefore, infestations would not continue to spread, eliminating a fuel source for wildfires within the monument that could destroy the population of the Nichol Turk's head cactus and the saguaros that serve as an important food resource for lesser long-nosed bats.

Tucson shovel-nosed snake:
This alternative would allow for control of invasive species only through chemical application. Prescribed fire and mechanical methods of control would not occur, although mechanical methods may result in more selective removal of some invasive plants within Tucson shovel-nosed snake habitat.

Impacts to Noxious Weeds:

The chemical control only alternative would not allow for mechanical and prescribed fire methods. Mechanical and prescribed fire methods may be used to promote control of invasives through specific selection of individual plants and timing of fire in order to promote native vegetation. Thus, chemical control only is not expected to be as effective in controlling invasive plants as using a combination of control methods.

Alternative 4 Prescribed Fire Only

A description of the application of prescribed fire is incorporated by reference from the BLM Integrated Vegetation Management Handbook (H-1740-2) and portions are included in Appendix G. Also incorporated by reference with this alternative is the Prescribed Fire Handbook (H 1741-5), and BLM Technical Reference 1734-7, titled Ecological Site Inventory.

Impacts on Air Quality:

Treatment with prescribed fire would have an immediate, but localized short-term impact on air quality in the immediate area. If it is determined that debris produced from the proposed action will be disposed of via burning, the BLM will follow stipulations outlined in existing burn plans and adhere to all applicable local, state, and federal air quality regulations. Field vehicles accessing the project sites for a period of less than seven work days will create short term, localized, insignificant increases in particulate, airborne road dust. Prescribed fire would cause an increase in particulates in the air from the smokes, but appropriate approval from ADEQ will be received prior to ignition.

Impacts on Wildlife Habitat:

This action would reduce the risk of catastrophic wildfires by reducing hazardous fuels, restoring fire-damaged lands, and improving ecosystem health by manipulating vegetation to benefit fish and wildlife habitat, improve riparian and wetlands areas, and improve water quality in priority watersheds. However, many noxious weeds have deep, perennial root systems, and prescribed fire only would not kill the plants. This would allow for unchecked growth and spread of invasives, such as tamarisk, giant reed, and Russian olive, throughout the riparian/wetland areas of the field office which could have negative impacts on habitat for fish and wildlife.

Impacts on Water Quantity and Quality:

Treatment with prescribed fire would have an immediate, but localized short-term impact on water quality in the project area, but could have long term benefits through increases infiltration of water and filtering out of sediments due to an increase in herbaceous ground cover and reduction of shrubs and bare ground. Invasive vegetation and noxious weeds degrade or reduce soil productivity, water quality and quantity. Utilizing only prescribed fire for control of noxious and invasive species would not result in long-term control or eradication of those species with perennial root systems. The result would have a major adverse, long-term impact to water quantity and quality in the project area when compared to areas containing native vegetation. Large stands of fire-adapted buffelgrass, tamarisk, and giant reed would remain. During pre-monsoon periods, when conditions are the driest, buffelgrass may burn within the project area, which includes steep-sided slopes in some areas. With burning soon followed by intense monsoon storms, the effect would be an increase in potentially devastating soil erosion from reduced infiltration and/or increased runoff.

Impacts on Aesthetic and Visual Resources:

Treatment with prescribed fire would have an immediate, but localized short-term impact on water quality in the project area, but could have long term benefits through creating a visually aesthetic landscape in the madrean oak woodlands. This alternative could have major adverse, long-term impacts on the aesthetic and visual resources of more sensitive habitats such as the Sonoran Desert and cottonwood-willow gallery riparian ecosystems. The use of only prescribed fire, without chemical or mechanical control methods, could be only used in some limited ecological sites. This alternative would result in the increased displacement of native Sonoran Desert and riparian vegetation by potential removal of native vegetation by fire-adapted species, such as buffelgrass, tamarisk, and giant reed. Fire events would destroy the native habitat, and exotic plants would replace the Sonoran Desert and cottonwood-willow gallery ecosystems.

Impacts on Riparian/Wetlands:

Prescribed fire may not the appropriate tool to apply in riparian/wetland areas. It could only be applied if the identified management objectives for the area would be met by the use of prescribed fire. However, many noxious weeds have deep, perennial root systems, and prescribed fire only would not kill the plants. This would allow for unchecked growth and spread of invasives, such as tamarisk, giant reed, and Russian olive, throughout the riparian/wetland areas of the field office which could have negative impacts on habitat for fish and wildlife

Impacts on Environmental Justice:

There are communities of low income and minority populations within the project area such as Three Points, Marana, Mammoth and Winkleman/Hayden, along with the Tohono O'odham, and Pascua Yaqui tribal nations. This project is not expected to impact any community as there is very little BLM land near those communities and prescribed fire is not expected to be a management component near these areas. The proposed action will not disproportionately affect any low income or minority communities.

Impacts on Socioeconomic Resources:

The prescribed fire-only alternative would have a major adverse, long-term impact on the socioeconomic resources of area. The areas' tourism industry depends in a large part on the scenic beauty of the Sonoran Desert and lush riparian areas of LCNCA and SPRNCA, with the associated bird life that they attract. The prescribed fire alternative would not control the invasives which threaten those socioeconomic drivers of the communities as prescribed fire is not allowed in the Sonoran Desert as per the 2004 Land Use Plan Amendment for Fire, Fuels and Air Quality Management. Untreated areas therefore, would continue to serve as a seed source for infestations and possible loss of the qualities that drive them on adjacent lands.

Impacts on Areas of Critical Environmental Concern:

Seven ACEC's occurs within the proposed project. Of the seven ACEC's, only the Las Cienegas, St David Cienega and Desert Grasslands ACEC's would be suitable for the use of prescribed fire as a tool for vegetation treatment. Utilizing only prescribed fire for control of noxious and invasive species would not result in long-term control or eradication of those species with perennial root systems. The result would have a major adverse, long-term impact to vegetation quantity and quality in the project area when compared to areas containing native vegetation. Large stands of fire-adapted buffelgrass, tamarisk, and giant reed would remain to the detriment of the native vegetation.

Ironwood Forest National Monument:

The Waterman ACEC includes approximately 2,368 acres of public land. It is managed under a habitat management plan for Nichol Turk's head cactus (NTHC). The current effort to manually remove the buffelgrass through the use of volunteers does not keep up with the expansion of the grass within the Waterman ACEC. This may lead to the buffelgrass out-competing the NTHC or inducing a wildland fire of the intensity that the NTHC are destroyed. Prescribed fire is not allowed in the Ironwood National Monument as it is not the appropriate vegetation management tool for this area.

Las Cienegas National Conservation Area:

Approximately 20,000 acres of grasslands on the LCNCA are invaded by mesquite and other invasive shrub and half shrub species. The Las Cienegas RMP identifies desert grassland as the desired plant community in these areas, thereby requiring the removal or reduction of much of the mesquite, burroweed and other undesirable shrub species. The following text from the LCNCA RMP elaborates generally on the rationale to manage toward desired plant communities and desired future condition. The LCNCA RMP identifies chemical, mechanical and prescribed fire as means of reducing shrub and tree cover.

The prescribed fire-only alternative leaves the historic grasslands of the LCNCA ecologically unbalanced toward shrub and tree dominance. As such, wildfire intensity and frequency are likely to be higher, thereby increasing wildlife mortality levels, soil sterilization, plant species homogeneity, and threats to health and human safety.

San Pedro Riparian National Conservation Area:

The San Pedro Riparian Management Plan and EIS (BLM 1989) recommended three Research Natural Areas (RNAs) of Critical Environmental Concern. These three RNAs were implemented in the Safford District Resource Management Plan (BLM 1991) and include St. David Cienega, San Pedro River, and San Rafael. The Saint David Cienega RNA designated 350 acres for

preservation of the remaining cienega habitat for scientific research. The San Pedro RNA designated 1,340 acres for preservation of Fremont cottonwood, Goodding's willow, mesquite bosques, and Chihuahuan desert scrub vegetation for scientific research. The San Rafael RNA designated 370 acres for preservation of alkali and giant sacaton grassland, and Fremont cottonwood-willow riparian areas for scientific research.

Under the prescribed fire alternative, perennial plants such as Russian knapweed, giant reed, and other weeds will continue to become established and populations will increase in size. Isolated populations of tamarisk located in the upper reaches of the San Pedro River will continue to expand, potentially resulting in a tamarisk monoculture within the riparian area after fires. Establishment of tamarisk monocultures throughout the SPRNCA would increase the risk for riparian wildfire, potentially decrease stream channel/bank morphologic stability, reduce surface water quality, lower groundwater elevations within the alluvial aquifer, and potentially diminish stream flows in the San Pedro River. This may result in reduced plant and wildlife diversity, decreasing the potential for scientific research on native flora and fauna in the RNAs. Because prescribed fire alone will not control woody invasives or perennial noxious weeds, this alternative leaves the historic grasslands ecologically unbalanced toward shrub and tree dominance, with a corresponding negative effect on those wildlife species adapted to grassland habitats. The prescribed fire alternative does not allow the San Rafael RNA to be managed for preservation of sacaton grasslands, as these habitat types not only require periodic prescribed fire in order to rejuvenate decadent plants, but will also require some chemical control of those older age-class invasives. The use of prescribed fire only as a method of control for woody invasives is generally less effective than combinations with herbicides or mechanical methods. As a result, succession from sacaton grassland to mesquite-invaded grassland is likely on the San Rafael RNA under the prescribed fire only alternative.

Other TFO Lands:

The Desert Grassland ACEC is in the Mescal Mountains near the Needles Eye Wilderness area. The prescribed fire alternative would reduce the invasive species that are not fire tolerant, and leave the historic grasslands of the ACEC ecologically balanced toward a savanna aspect that naturally occurred in the area.

The White Canyon ACEC is adjacent to the White Canyon Wilderness area. The prescribed fire alternative would destroy the Sonoran desert of the ACEC as the ecosystem is not fire adapted and is destroyed by fire of even moderate intensity. This alternative would leave the Sonoran desert subject to invasion by buffelgrass, which is a fire dependent species. As such, wildfire intensity and frequency are likely to be higher thereby increasing wildlife mortality levels, soil sterilization, and increased plant species homogeneity.

Impacts on Wild and Scenic Rivers:

The prescribed fire alternative may reduce the risk of catastrophic wildfires by reducing hazardous fuels, restoring fire-damaged lands, and improving ecosystem health within the upland portions of Wild and Scenic River corridors by 1) controlling only annual weeds and younger age-class invasive species; and 2) manipulating vegetation to benefit fish and wildlife habitat, improve riparian and wetlands areas, and improve water quality in priority watersheds. However, perennial noxious and invasive species would not be controlled in the Riparian and wetland portion of the corridors, and fire-adapted invasives, such as tamarisk and giant reed,

would likely out-compete native vegetation and provide negative impacts to possible WSR designation.

Impacts on Floodplain Management:

The effect of the prescribed fire-only alternative would have a negative impact on the floodplains of the field office because tamarisk is fire-adapted and readily resprouts after fire to outcompete native species. The result would likely be tamarisk monocultures, which would cause a serious degradation of neo-tropical bird habitat, and possibly water quality and quantity along the streams within the banks of the floodplains.

Impacts on Cultural Resources:

The use of prescribed fire could have negative impacts to historic cultural resources through damage to sites by the fires. Prehistoric sites have likely been previously burned through by fire prior to the modern historic period. The use of prescribed fire to control invasive and noxious plant species would require cultural resource clearances on a site-specific basis. Areas with cultural resources would be avoided during actions involving prescribed fire.

Impacts on Native American Religious Concerns:

This alternative could have impacts for TCP's and other cultural resource sites. Cultural Resource sites as well as TCP areas identified through consultation efforts with American Indian Tribes would be identified and protected prior to project implementation. This project could have a small short term impact on Native American communities when it comes to the gathering of plant material. This impact would be both a positive and a negative depending on how the treatments are implemented. This Alternative could have minor short term beneficial impacts for NA Religious Concerns. This could occur with the introduction of prescribed fire where collected plants beneficial to Native Americans would be enhanced with the use of regular controlled prescribed fire. The improved access resulting from a prescribed fire could result in both beneficial and detrimental effects. Beneficial effects could result in the ground area becoming free of clogging vegetation-thus making access for people travelling to these areas much easier. Detrimental effects could occur with increased accessibility for areas of cultural significance, making them more visible which can lead to looting and vandalism of cultural resource sites. This Alternative could also have negative effects on TCP's. This could occur if prescribed fire got out of control and turned into a wildland fire, thus, increasing destruction of desired collectable plant materials.

Impacts to T&E:

This action would reduce the risk of catastrophic wildfires in areas suitable for the use of prescribed fire by reducing hazardous fuels, restoring fire-damaged lands, and improving ecosystem health by 1) controlling weeds and invasive species; and 2) manipulating vegetation to benefit fish and wildlife habitat, improve riparian and wetlands areas when it would meet resource objectives for the area, and improve water quality in priority watersheds. However, many noxious weeds have deep, perennial root systems, and prescribed fire only would not kill the plant. This would allow for unchecked growth and spread of invasives, such as tamarisk, giant reed, and Russian olive, throughout the riparian/wetland areas of the field office.

Yellow-billed cuckoo:

Unchecked growth and spread of tamarisk may eventually lead to a tamarisk monoculture within the riparian corridors of SPRNCA and LCNCA. Because tamarisk is fire-adapted, the use of only prescribed fire may result in a shift from cottonwood gallery forest to tamarisk monocultures, resulting in habitat not utilized by yellow-billed cuckoo.

Nichol Turk's head cactus and Acuna cactus:
The prescribed fire alternative would have a major adverse, long-term impact on cacti by not controlling perennial, fire-adapted invasives; therefore, the infestations would continue to spread, serving as a fuel source for further wildfires that destroy the population of the native cacti.

Northern Mexican gartersnake:
The perennial root systems of tamarisk, giant reed, and Russian olive are not killed by prescribed fire alone. This alternative would allow the continued spread of these invasive species within the aquatic and riparian habitat of Northern Mexican gartersnake, possibly resulting in habitat degradation for the species.

Tucson shovel-nosed snake:
This alternative would allow for control of invasive species only through prescribed fire. Chemical and mechanical methods of control would not occur, although chemical and mechanical methods may result in more selective removal of some invasive plants within Tucson shovel-nosed snake habitat.

Impacts to Noxious Weeds:

Under the prescribed fire alternative, existing invasive species infestations would not be chemically or mechanically controlled. The prescribed fire alternative may control perennial, invasive species. Success depends on the target species, prescriptive burn parameters, management objectives, and fuel type. for example: young mesquite trees may be controlled with prescribed fire as opposed to older, larger mesquite trees not being controlled; burroweed and prickly pear may be controlled with prescribed fire depending on the time of year prescribed fire is applied and sufficient fine fuels are present. Perennial noxious and invasive species, such as Russian knapweed, giant reed, tamarisk, and buffelgrass, are fire-adapted and would likely increase after prescribed or wildfire, outcompeting native vegetation. In addition, many noxious weeds have deep, perennial root systems, and prescribed fire only would not kill the plant The prescribed fire alternative would not control perennial invasive or noxious weeds; therefore, the infestations would continue to spread.

Alternative 5 (Proposed Action) Integrated Vegetation Management, Chemical (Herbicide), Manual/Mechanical, and Prescribed Fire Treatment of Exotic, Noxious, and Invasive Species and Re-establishment of Native Plants

Incorporated by reference with this alternative are the Integrated Vegetation Management Handbook (H 1740-2), Prescribed Fire Handbook (H 1741-5), and BLM Technical Reference 1734-7, titled Ecological Site Inventory.

Impacts on Air Quality:

Fugitive dust (PM_{10}) may be produced during mechanical removal of invasive plants. However, due to the scale of the proposed mechanical treatments and intensity of operations (limited quantity of heavy equipment for use), impacts to air quality from fugitive dust production would be highly localized and of short duration. Potential for drift of herbicide during foliar application represents another air quality concern associated with the proposed action. However, herbicide drift will be minimized by using spray pressures no greater than required to obtain adequate coverage of each target plant individually, and with nozzle tips sized to produce large droplets. Potential for drift during stump cut applications is virtually non-existent because herbicide will be applied with a brush. If it is determined that debris produced from the proposed action will be disposed of via burning, the BLM will follow stipulations outlined in existing burn plans and adhere to all applicable local, state, and federal air quality regulations. Treatment with prescribed fire would have an immediate, but localized short-term impact on air quality in the immediate area. Field vehicles accessing the project sites will create short term, localized, insignificant increases in particulate, airborne road dust.

Impacts on Wildlife Habitat:

Herbicides can injure or kill non-target plants, with short-term, negligible, localized, adverse impacts. However, chemical control of invasive and noxious species would have long-term, moderate beneficial impacts on native vegetation and wildlife habitat. Different herbicides act on plant-specific pathways differently. Appropriate chemicals would be selected to treat specific invasive species based on the best available research, thus its impact to wildlife habitat under normal application conditions would be negligible. Native plant communities and wildlife habitat would be restored by reducing or eliminating target species and allowing the limited water and nutrients to become available to surrounding native vegetation and newly recruiting native vegetation. The Vegetation Treatment using Herbicides on BLM lands in 17 western states Programmatic EIS addresses this issue and is incorporated by reference to this document. At locations where this alternative may be implemented, manual removal or mowing treatment will restore localized, small areas of native vegetation. This alternative may have negligible, localized, short-term adverse impacts when weeds (e.g. buffelgrass, Malta starthistle) are pulled t adjacent to native vegetation due to damage to the adjacent plant's root structure. Physical control and removal may also have a short-term, negligible adverse effect on vertebrate or invertebrate species inhabiting areas where invasives would be removed. Short-term displacement of wildlife may occur during removal; however, the impact is expected to be negligible.

Neo-Tropical Migratory Birds, Mammals, Reptiles, and Amphibians:

The proposed action may have a short-term effect of disturbance on local wildlife due to control activities (e.g. noise, human activities, operation of equipment). This disturbance will end once vegetation management activities are complete. Impacts associated with control and removal of vegetation used as wildlife habitat is expected to be short-term as native plants become reestablished. Impacts associated with removal of vegetation is not anticipated due to yearly limitations for size of treatment areas (see proposed action), potential recruitment of desirable species in treated areas, and future utilization by the habitat's obligate species. In addition, timing restrictions will avoid impacts to nesting bird species of concern.

Fisheries:

Local ground water tables may be elevated with removal of non-desirable invasive plants. Elevated water tables will aid in recharging affected stream segments and help develop desirable riparian communities. Additionally, future salt loading to soils would be minimized, and amount of surface/ground water would be maximized with implementation of the proposed action. The results may be beneficial to surface and ground water quality and quantity, resulting in increased available habitat for Gila longfin dace and desert sucker (and potential habitat for other special status fishes) at the SPRNCA, and for Gila chub and Gila topminnow at LCNCA.

Impacts on Water Quantity and Quality:

The use of chemical removal methods could have negligible, short-term, localized, adverse impacts on water quantity and quality. Killing invasive species with herbicides would lead to natural restoration of native plant communities. This would have positive effects on soil nutrient availability and cycling, water availability, and soil erosion. Overall the alternative will have negligible, short-term, adverse impacts and long-term, beneficial impacts on the water quantity and quality. The Vegetation Treatment using Herbicides on BLM lands in the 17 western states Programmatic EIS addresses this issue and is incorporated by reference to this document. Physical removal methods would have short-term impacts by disturbing the ground and removing some of the seed source and allowing localized, small areas of the native vegetation to reestablish. These impacts would be insignificant in the overall picture, but would allow for the removal of invasive species in sensitive areas when their populations are small and easily manipulate.

Removal of tamarisk monoculture vegetative communities will temporarily reduce the affected stream banks ability to withstand normal high flows (bank full flows) until desirable native vegetation becomes re-established. However, in many of these areas there is currently a heavy understory with down debris, and/or heavy Bermuda grass (*Cynodon dactylon*) and Johnson grass (*Sorghum halepense*) cover that would help withstand bank full flows. Revegetation and erosion prevention in areas of widespread vegetation control will be planned and implemented. Local ground water tables may be elevated with removal of non-desirable invasive plants. Elevated water tables will aid in recharging affected stream segments and help develop desirable riparian communities. Additionally, future salt loading to soils and surface/ground water would be minimized with implementation of the proposed action. The results would be beneficial to surface and ground water quality. No impacts to drinking/groundwater quality are anticipated with implementation of the proposed actions. With the proposed methods of application and small quantities of herbicide to be used, any reasonable risk of groundwater or drinking water contamination is virtually eliminated.

Impacts on Aesthetic and Visual Resources:

Adverse visual impacts associated with herbicide treatments would be greatest under this and alternative 3. Over the long term, this alternative should have the greatest positive impact on visual resources as natural vegetation communities and landscapes are restored. The alternative would have major, direct, beneficial impacts on the aesthetic and visual resources of the ecosystems within TFO through preservation and maintenance of native vegetation communities.

Impacts on Riparian/Wetlands:

The proposed action would reduce the risk of catastrophic wildfires by reducing hazardous fuels, restoring fire-damaged lands, and improving ecosystem health by 1) controlling weeds and invasive species; and 2) manipulating vegetation to benefit fish and wildlife habitat, improving riparian and wetland areas, and improving water quality in priority watersheds. Restoring natural fire regimes and native vegetation, and controlling weeds and other invasive vegetation, would improve wetland and riparian habitat and function, with greatest benefits likely to occur under this Preferred Alternative.

Implementation of tamarisk control will first initiate treatment at the U.S./Mexico International Border and progressively move north as isolated populations are removed. By starting at the upstream end of the SPRNCA, the proposed treatment will help eliminate the upstream seed sources slowing the downstream spread (and establishment) of tamarisk. Controlling the spread of tamarisk will reduce competition with native riparian species (e.g. cottonwood/willow) minimizing establishment of dense stands of tamarisk. By minimizing establishment of dense stands of tamarisk potential for devastating riparian wildfire is considerably reduced, salt loading to soils within the riparian area is decreased, and riparian area ground water consumption can also be reduced. Implementation of the proposed action will help restore/maintain health and vigor of the native riparian community as more deeply rooted and drought resistant tamarisk will no longer compete with native vegetation for groundwater and soil nutrients. Promoting healthy, natural, riparian communities by removing tamarisk will improve riparian function and condition as stream channel/bank morphologic stability is maintained and the health and vigor of desirable riparian species is elevated (helping meet congressional mandates outlined in P.L 100-696). Removal of tamarisk will also lead to improved water quality, increased water table elevations in areas previously occupied by heavy tamarisk infestations, and potentially increased base flows to the San Pedro River during critical summer low flow period. Removal of tamarisk from the riparian system will also promote future riparian species diversity by improving wildlife habitat within the SPRNCA.

The use of herbicide to treat tamarisk may inadvertently result in damage to nearby desirable vegetation if non target species are misidentified or applicators become careless during treatment operations. However, negative impacts to non-target species will be successfully mitigated with the stipulations included in this EA.

The use of heavy equipment will be utilized in areas of heavy tamarisk infestation which predominantly occur north of Fairbank. Removal of dense stands of tamarisk will likely result in the same long term benefits to the riparian area as described above. However, the use of heavy equipment when soils are saturated may result in soil compaction reducing soil permeability/infiltration rates altering natural flow patterns and elevating erosive potential in the floodplain and uplands. Furthermore, removal of large tamarisk communities adjacent to the stream channel could leave the treatment area vulnerable to erosion during periods of flooding. Therefore, best management practices, erosion control, and revegetation plans will be established before mechanical control of tamarisk is attempted.

Tamarisk control within LCNCA may be initiated before tamarisk becomes well-established, resulting in less funding, herbicide, and ground disturbance required when compared to postponement of control.

Impacts on Environmental Justice:

There are communities of low income and minority populations within the project area such as Three Points, Marana, Mammoth and Winkleman/Hayden, along with the Tohono O'odham, and Pascua Yaqui tribal nations. This project is not expected to impact any community as there is very little BLM land near those communities. The proposed action will not disproportionately affect any low income or minority communities.

Impacts on Socioeconomic Resources:

The areas tourism industry depends in a large part on the scenic beauty of the Sonoran desert and the lush riparian areas and the bird life that they attract. Application of a chemical herbicide could have a minor, short-term impact on area, by increasing the fuel threat during the next two to three years as a result of killing the new growth and adding to the existing stands of dead grass in the area. This would have a minor, short-term impact because dead and volatile fuels would break down within two to three years from rain and wind, therefore reducing and removing the threat of fire.

The minor, short-term impacts would be negligible and offset because the application of a chemical herbicide could have a major direct, long-term impact by removing the seed source, reducing future infestations, and reducing the potential for large, hot wildfires. The preferred alternative would have a major direct, long-term, beneficial impact on the socioeconomic resources of the area. The threat of fire fuels near a highly urbanized area would be reduced. In addition, the aesthetic and visual resources would be improved by restoring the area to native vegetation.

Impacts on Areas of Critical Environmental Concern:

Seven ACEC's occur within the proposed project.

Ironwood Forest National Monument:

The Waterman ACEC occurs within the proposed project. The Waterman ACEC includes approximately 2,368 acres of public land. It is managed under a habitat management plan for Nichol Turk's head cactus. The use of herbicides will greatly reduce the amount of effort to treat the invasion, allowing a greater area to be treated annually, thereby reducing the threats of wildfire and crowding that is destroying the native vegetation of the IFNM. Within the action areas, an intact native flora exists in areas not infested with buffelgrass. These intact areas will provide a ready seed source for native re-vegetation in areas treated for buffelgrass eradication. Native species include palo verde, saguaro, mesquite, mixed native perennial grasses (three-awns, tanglehead, Arizona cottontop, tobosa, curly mesquite, etc.), creosote bush, and a variety of cactus, ephemeral grasses, forbs, and wildflowers.

Las Cienegas National Conservation Area:

Approximately 20,000 acres of grasslands on the LCNCA are invaded by mesquite and other invasive shrub and half shrub species. The Las Cienegas RMP identifies desert grassland as the desired plant community in these areas, thereby requiring the removal or reduction of much of the mesquite, burroweed and other undesirable shrub species. The following text from the

LCNCA RMP elaborates generally on the rationale to manage toward desired plant communities and desired future condition. The LCNCA RMP identifies chemical, mechanical and prescribed fire as means of reducing shrub and tree cover.

Wildlife species primarily dependent upon mesquite habitats will be impacted by the tree cover reduction; however, much mesquite habitat will remain outside treatment areas. As such, the proposed action is not expected to reduce or significantly impact the abundance and diversity of general wildlife species; however, the distribution of some species will obviously shift once mesquite dominated grasslands are converted to grassland stands. Conversely, grassland dependent species such as the pronghorn antelope, grasshopper sparrow, and Botteri's sparrow will increase in both abundance and diversity because more suitable grassland habitat will be available once treatments are complete. Wildfire events will likely be more controllable and less intense in the grassland setting versus the shrub/tree invaded grassland setting, and damage to wildlife, soil and vegetative resources is expected to be less severe.

San Pedro Riparian National Conservation Area:

The San Pedro Riparian Management Plan and EIS (BLM 1989) recommended three Research Natural Areas (RNAs) of Critical Environmental Concern. These three RNAs were implemented in the Safford District Resource Management Plan (BLM 1991) and include St. David Cienega, San Pedro River, and San Rafael. The Saint David Cienega RNA designated 350 acres for preservation of the remaining cienega habitat for scientific research. The San Pedro RNA designated 1,340 acres for preservation of Fremont cottonwood, Goodding's willow, mesquite bosques, and Chihuahuan desert scrub vegetation for scientific research. The San Rafael RNA designated 370 acres for preservation of alkali and giant sacaton grassland, and Fremont cottonwood-willow riparian areas for scientific research.

The proposed action will result in continued preservation of the three RNAs. Enhancement and preservation of native flora and fauna may be expected to occur with the removal of invasive weeds. Scientific research of native flora and fauna on the RNAs will continue with no anticipated modification with the proposed action.

Other TFO Lands:

The Desert Grassland ACEC is in the Mescal Mountains near the White Canyon Wilderness area. The proposed action alternative could restore the historic grasslands of the ACEC towards an ecologically balanced ecosystem.

The White Canyon ACEC is adjacent to the White Canyon Wilderness area. The proposed action alternative removes the threat of invasion by buffelgrass that the Sonoran desert of the ACEC is currently subject to.

Impacts on Wild and Scenic Rivers:

Adverse impacts, including temporary closures of Wild and Scenic River (WSR) areas, could be great under this alternative. Visitors could be displaced to other recreation areas. Positive ecosystem benefits would also be great under this alternative and the BLM would be most likely to control noxious weeds and other invasive species in special areas under this alternative. The use of mechanical removal methods would also be available for the Wild and Scenic river

segments for small infestations and areas with sensitive plants that would need to be protected from herbicide treatment.

The proposed action will result in removal of a non-native, noxious/invasive riparian species which threatens proper hydrologic and vegetative function of the San Pedro River. Implementation of the proposed action will contribute to BLM success in fulfilling congressional mandates outlined in P.L. 100-696 which instruct the BLM to protect, preserve, and enhance the natural and cultural resource values of the SPRNCA. Progress towards meeting objectives outlined in P.L. 100-696 will elevate outstanding remarkable scenic values within the SPRNCA. This alternative would enhance the suitability of the river for consideration of its inclusion to the W&SR system.

Wastes, Hazardous or Solid:

Under the proposed action suitable herbicides analyzed and approved in the Vegetation Management EIS for the 17 Western States (BLM 2007) would be used for vegetation control. The proposed application rates would follow label instructions, and will not result in a release of a reportable quantity (the active ingredients are not listed chemicals). Use of these herbicides in conformance with label instructions would not result in the generation of hazardous waste.

Impacts on Floodplain management:

The spread of weeds and fire suppression have caused some wetland and riparian areas on public lands to fail to function properly. To correct this situation, vegetation treatments would be focused on watershed in greatest need. Restoring natural fire regimes and native vegetation, and controlling weeds and other invasive vegetation, would improve wetland and riparian habitat and function, with greatest benefits likely to occur under this Preferred Alternative. Use of new herbicides proposed for use by the BLM would further reduce risks to wetland and riparian areas from the use of herbicides.

Impacts on Cultural Resources:

Chemical treatments would involve no identifiable impacts to cultural resources due to the aspect that no ground disturbance would take place in these areas. Mechanical Treatments could involve impacts to cultural resources due to the aspect that ground disturbance will occur. Alternatives that involve ground disturbance could impact cultural resources by displacing, crushing, moving or destroying artifacts, features or cultural resource sites. Impacts expected to occur could include displacement of artifacts caused by mechanical grubbing, digging and subsequent removal of mesquite or other trees. Archaeological sites could be impacted by displacement of artifacts from their original location.

Areas identified within this EA for mechanical treatments would receive cultural resource stipulations, including the buffer of all cultural resource areas where there are known sites prior to project implementation, and all areas previously identified for treatment would require a section 106 NHPA Class III survey prior to project implementation. New cultural resource sites would be recorded, buffered, and protected. Impacts to Cultural Resources from heavy equipment operation could result in cultural resource sites being crushed, run over, bulldozed or otherwise destroyed. Other impacts that could occur to cultural resource sites included the potential to increase site looting and vandalism due to the clearing and opening up of previously brush covered areas.

Risks to paleo and cultural resource sites would be higher under Alternative #5 than risks under Alts. 2, 3, and 4. This is because a higher percentage of acreage would be prescribed for treatment thus impacting more area. More acres would be treated to control weeds and poisonous plants. This alternative would be most effective among all alternatives in reducing hazardous fuels, perhaps leading to lesser incidence of wildfire and loss of paleontological and cultural resources.

Impacts on Native American Religious Concerns:

Traditional Cultural Properties (TCPs) areas identified through consultation with American Indian Tribes could be impacted under this alternative. This project could have a small short term impact on Native American communities when it comes to the gathering of plant material. This impact would be both a positive and a negative depending on how the treatments are implemented. The risks to paleontological and cultural resources and health of Native Americans and other human receptors would be slightly more than under the other alternatives. More acres would be treated to control weeds that could adversely affect humans and that could displace native vegetation desirable to Native peoples' uses. This alternative would be most effective among herbicide treatment alternatives in reducing hazardous fuels, perhaps leading to lesser incidence of wildfire and loss of Native people's life and property. BLM has notified the affected Tribes of the proposed action in writing. Implementation of the proposed action is contingent on addressing any concerns the Tribes may bring to the attention of BLM. This Alternative could have minor short term beneficial impacts for NA Religious Concerns. This could occur with the introduction of prescribed fire where collected plants beneficial to Native Americans would be enhanced with the use of regular controlled prescribed fire. The improved access resulting from a prescribed fire could result in both beneficial and detrimental effects. Beneficial effects could result in the ground area becoming free of clogging vegetation-thus making access for people travelling to these areas much easier. Detrimental effects could occur with increased accessibility for areas of cultural significance, making them more visible which can lead to looting and vandalism of cultural resource sites. This Alternative could also have negative effects on TCP's. This could occur if prescribed fire got out of control and turned into a wildland fire, thus, increasing destruction of desired collectable plant materials.

Impacts to T&E:

Human-related activities, including urbanization, building of dams, conversion of wetlands to other land types, fire exclusion, agriculture, and construction of roads have had a profound impact on populations and habitats of T&E species in the western U.S. Fire suppression has led to degraded riparian habitats, while the spread of weeds and other invasive vegetation have clogged waterways, and degraded upland and riparian habitats that has led to erosion and degradation of water quality in habitats used by these organisms. Efforts to restore natural fire regimes and control the spread of invasive vegetation should benefit aquatic habitat. Treatments would be focused in the most degraded watershed sub-basins. Adverse and beneficial effects of using herbicides would be greatest under the Preferred Alternative; effects of other treatment methods would be similar among all action alternatives. Herbicides would not be used under Alternative 1 and 2; thus, the BLM's ability to control aquatic weeds would be limited. Treatments could adversely affect the health and survivorship of aquatic organisms, and indirectly impact these organisms through impacts to habitat. New herbicides proposed for use should improve treatment success while having minimal impacts to aquatic organisms.

Individuals harmed or killed, and short-term productivity lost, from treatment would be irreversible. However, treatments should restore habitat function and populations should recover following treatment.

Yellow-billed cuckoo:
The yellow-billed cuckoo arrives in the area in late May with nesting occurring shortly after between June through August. The proposed action will not be authorized to occur in areas occupied by yellow-billed cuckoos during the breeding/nesting season (see T & E stipulations). Because yellow-billed cuckoos will not be nesting/breeding at (or near) identified project areas during treatments, impacts associated with herbicide drift and treatment crew activities are not anticipated to occur from implementation of the proposed actions.

In addition, the mesquite bosques, or other areas that benefit special status species identified by the wildlife biologist, are excluded from treatment.

Huachuca water umbel:
Due to the nature of the herbicide application (refer to Water Quality and T & E stipulations), the possibility of herbicide drift into the water is virtually eliminated. Treatment/removal of tamarisk will not occur within 15 meters of any known Huachuca water umbel. Additionally, employees responsible for implementing tamarisk control via chemical means will be capable of identifying Huachuca water umbel to ensure existing populations are not impacted and to document occurrence of new populations. Because of these measures there will be no effect on any existing Huachuca water umbel.

Treatment/removal of tamarisk may have beneficial results to the Huachuca water umbel. Local ground water tables may be elevated with removal of non-desirable invasive tamarisk plants. Elevated water tables will aid in recharging affected stream segments and help develop desirable riparian communities. Additionally, future salt loading to soils would be minimized, and amount of surface/ground water would be maximized with implementation of the proposed action. The results would be beneficial to surface and ground water quality and quantity, resulting in increased available habitat for the Huachuca water umbel.

Northern Mexican gartersnake:
Treatment/removal of tamarisk may have beneficial results. Local ground water tables may be elevated with removal of non-desirable invasive tamarisk plants. Elevated water tables will aid in recharging affected stream segments and help develop desirable riparian communities. Additionally, future salt loading to soils would be minimized, and amount of surface/ground water would be maximized with implementation of the proposed action. The results would be beneficial to surface and ground water quality and quantity, resulting in increased available habitat for the Northern Mexican gartersnake.

Nichol Turk's head cactus and Acuna cactus:
This alternative would allow for control of buffelgrass and other invasive weeds; therefore, the infestations would not continue to spread, eliminating it as a fuel source for wildfires that could destroy populations of the cacti.

Tucson shovel-nosed snake:
This alternative would allow for control of perennial invasive species which have the potential to invade sandy soils within habitat for the Tucson shovel-nosed snake. There is no incidental take of the species anticipated from the proposed project. The effects determination for the proposed action is "may affect, not likely to adversely affect," although all effects are expected to be positive.

Impacts to Noxious Weeds:
Introduction of new weed species could occur during the movement and operation of equipment in access or treatment areas of the proposed project. However, equipment will be thoroughly cleaned before introduction from other areas. Therefore, introduction of new weed species is unlikely. The proposed action is likely to create soil disturbance and create conditions favorable to those weed species that invade disturbed sites. This may include puncture vine, Johnson grass, Bermuda grass, Russian thistle, and Lehmann lovegrass. However, these species are already present on the sites.

Human-caused effects to vegetation began when man first arrived in North America, nearly 12,000 years ago, but intensified in the western U.S. during the past 150 years as a result of modern human influences such as commodity extraction and urbanization. Fire suppression led to altered fire regimes and ecosystem degradation that has resulted in high severity fires and the spread of noxious weeds and other invasive vegetation during the past few decades. Woodlands have invaded grasslands, and some native grasslands and shrublands have been invaded by annual weeds. Only 34% of public land was considered to be in good to excellent condition in 1986. Treatments to reduce hazardous fuel levels, control the spread of weeds, and restoration native vegetation should improve ecosystem health over much of the West. Treatments would be focused in degraded watersheds and in the Temperate Desert Ecoregion. All treatments would benefit vegetation, but the Preferred Alternative would convey the greatest benefits as more acres would be treated under that alternative than the other alternatives. Native plant production that was lost from treatments could not be retrieved, but treatments should result in improved native plant communities and improved ecosystem health in the long term. This alternative would control the buffelgrass; therefore the buffelgrass infestations would not continue to spread, eliminating it as a fuel source for wildfires within the Waterman Mountain ACEC that could destroy the population of the cactus.

Soils:

Erosion potential from the project area will be elevated during control activities and prior to completion of reclamation or revegetation activities, if any are needed (e.g. decommissioning access points, construction of all erosion control measures). However, the proposed action will not occur during rainy season (monsoon) conditions and will utilize best management practices (BMPs, Appendix X) to limit the area of disturbance and minimize erosion potential.

Alternative 6: Alternatives Considered But Not Analyzed

Other Chemical Treatment - There are other chemicals on BLM's list of approved herbicides that could be used to control woody invasive plant species. A partial list of these chemicals include 2,4-D, dicamba, and hexazinone. BLM rejected their use due to impacts to non-target vegetation or increased impacts to soil or water resources. Therefore, the use of these chemicals as a primary control will not be analyzed.

Biological Treatment - Currently BLM is not aware of any specific effective biological control for mesquite, Russian knapweed, giant reed, or other woody invasive species. A leaf beetle, *Diorhabda elongata deserticola* has already been released by USDA Animal and Plant Health Inspection Service as a biological control for tamarisk. Therefore, biological treatments as a primary control for noxious weed and woody invasive species will not be analyzed.

Livestock Exclusion - This alternative was previously analyzed in the 1994 Range Reform EIS. The 1988 Phoenix RMP, which incorporated the Eastern Arizona Grazing EIS, determined the public land within the project area as suitable for livestock grazing. Use of livestock exclusion as a management tool would not result in a decrease of the target shrub species. Therefore, a no-livestock grazing alternative will not be analyzed.

Prescribed Natural Fire and Fuel Breaks – This alternative does not meet the objectives and planned actions stated in the San Pedro River Riparian Management Plan and EIS, preferred alternative (vegetation and fire sections). Natural fires are subject to 100% suppression under the San Pedro River Riparian Management Plan, and full suppression of all natural fires does not meet resource objectives.

Cumulative Impacts of the Proposed Action:

Significant cumulative effects of vegetation treatment is analyzed and disclosed in the *Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic EIS(PEIS)and the Statewide LUP Amendment for Fire, Fuels, and Air Quality,* and are incorporated by reference here.

The Geographic scope of this document is the Public Lands administered by the Bureau of Land Management, Tucson Field Office, which is a subset of the lands analyzed in the PEIS.

Other actions (all federal, nonfederal and private actions) affecting the same resources, ecosystems, and human communities of concern is analyzed and disclosed in the *Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic EIS(PEIS) and the Statewide LUP Amendment for Fire, Fuels and Air Quality,* and are incorporated by reference here.

Cumulative Impacts of the No Action Alternative:

Significant cumulative effects of the No Action Alternative is analyzed and disclosed in the *Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic EIS(PEIS), and the Statewide LUP Amendment for Fire, Fuels, and Air Quality,* and are incorporated by reference here.

The Geographic scope of this document is the Public Lands administered by the Bureau of Land Management, Tucson Field Office, which is a subset of the lands analyzed in the PEIS.

Other actions (all federal, nonfederal and private actions) affecting the same resources, ecosystems, and human communities of concern is analyzed and disclosed in the *Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States*

Programmatic EIS(PEIS), and the Statewide LUP Amendment for Fire, Fuels, and Air Quality and are incorporated by reference here.

Management Practices for Vegetation Treatments (included in all alternatives where the treatment is proposed)

Prescribed Fire

The Integrated Vegetation Management Handbook (H 1740-2), Prescribed Fire Handbook (H1741-5), and BLM Technical Reference 1734-7, Ecological Site Inventory, shall be used for each site-specific project in order to determine vegetation management objectives for each site. In addition, best management practices shall be utilized.

All prescribed burn plans shall be approved by Arizona Dept. of Environmental Quality (ADEQ), and permits shall be obtained prior to implementation of any prescribed fire.

SASEM smoke and particulate matter (PM) shall be part of any burn plan. PM-10 and PM-2 are both calculated with the SASEM program.

Public announcements of proposed prescribed fire date shall be released.

The application/implementation of any prescribed fire shall adhere to all agency guidelines as well as guidelines outlined in the Interagency Prescribed Fire Planning and Implementation Procedures Guide (July 2008).

All conservation measures prescribed in the Statewide LUP Amendment for Fire, Fuels, and Air Quality for each potential listed species (Appendix B) shall be followed on each burn unit.

T & E habitat may be protected during prescribed fire utilizing the following measures, if needed: 1) construction of hand line around habitat, 2) relocation of burn unit boundary, 3) removal of ladder fuels to ensure fire does not enter the crowns of cottonwood or willow trees, 4) removal of and/or reduction of ground fuels to lessen flame intensity, 5) use of backing fires to lower flame length and fire intensity, and 6) use of different types of ignition patterns to control rates of spread, fire line intensity, and flame lengths.

Agave (nectar source for lesser long-nosed bat), yucca (substrate for Aplomado falcon), and cacti (listed species and nectar source) will not be targeted for treatment under this document. Burn plan objectives in areas with agave will include minimum mortality per the prescribed terms and conditions from the relevant Biological Opinion (Appendix C).

Prescribed fire in areas invaded by Johnson grass, non-native love grasses, and any other undesirable vegetation should be a consideration in project planning in order to achieve project goals in the species.

Per the Statewide LUP Amendment for Fire, Fuels, and Air Quality, a Resource Advisor will be present on all prescribed fires.

Burn plans shall be coordinated with a biologist and any site-specific burn plans shall be implemented with biologist input before implementation of any prescribed fire. The biologist shall address sensitive species objectives, timing restrictions, avoidance, minimization, and mitigation measures, etc. for wildlife, fisheries, migratory birds, and special status species. The biologist shall be included in the preparation and completion of any NEPA document required (a DNA at a minimum).

Manual and Mechanical Treatments

Prior to project implementation all areas scheduled for mechanical vegetation/mesquite removal will be required to be surveyed for cultural resources. All known cultural resource sites will be avoided during project operations. Cultural resource sites will be protected using a flagged no entry buffer installed prior to project operations.

Sites identified for mechanical treatments utilizing heavy equipment will require cultural resource site monitoring both during and after treatment. The BLM archeologist will create necessary buffer zones (outlined with flagging) to protect cultural/paleontological resources. Surface disturbing activities within these designated buffer zones will be prohibited.

Treatment areas requiring the use of heavy equipment will require cultural clearance prior to any surface disturbing activities.

Use of natural and man-made barriers (outcroppings, washes, sparse fuel, roads, trails, etc.) will be implemented in order to minimize ground-disturbing activities.

Revegetation and erosion prevention in areas of widespread vegetation control will be planned and implemented.

Sufficient ground cover (woody debris) will remain onsite to provide immediate bank stability and minimize erosion. The use of soil-stabilizing techniques such as (but not limited to) placement of hydromulch, biodegradable fabrics, straw waddles, straw bales, rock structures such as zuni bowls, one rock dams, and media lunas etc., may be implemented on a site-by-site basis to further reduce erosion and promote establishment of desirable vegetation. Implementation of stabilization methods will be incorporated into the treatment plans for site specific projects.

Biomass utilization including firewood cutting can be authorized during site specific NEPA analysis on those areas within TFO covered under the appropriate land use plans on a case by case basis. Per the Safford District RMP/EIS (page 45), “do not allow cutting in major desert washes, wilderness areas or some special management areas.”

To minimize impacts to natural drainage patters and morphologic site conditions, the use of heavy equipment as a means of mechanical treatment will not occur-when soils are saturated.

Parking and fueling heavy equipment used for treatment will not occur within the 100 year floodplain as determined by BLM on a site-specific basis.

Access routes requiring repetitive vehicle use or heavy equipment, and treatment boundaries will be clearly marked during project planning by the interdisciplinary team prior to implementation of mechanical treatments.

Sites identified for mechanical treatments utilizing heavy equipment will require surveys for federally listed or special status plant and animal populations. If these populations are found, the BLM biologist will create necessary buffer zones (outlined with flagging) to protect the sensitive plant and animal resources. Surface disturbing activities within these designated buffer zones will be prohibited. Monitoring of these populations will occur following treatments.

Herbicide Treatments

A BLM Pesticide Use Proposal shall be approved for each herbicide before beginning application.

- Only federally registered and BLM approved herbicides will be used.
- Herbicides and adjuvant will be used only in accordance with product labeling and the respective Material Safety Data Sheet (MSDS). Herbicide application will be under the direct supervision of an Arizona Department of Agriculture certified Commercial Applicator or BLM certified applicator.

- All individuals associated with the handling or application of herbicides on public lands would be familiar with the pesticides used and emergency procedures to be used in case of herbicide spill. Safe use of herbicides includes precautionary measures to prevent accidental spills. The following written precautions describe measures that shall be used to reduce the chance of such accidents.

- Applicable Federal regulations concerning the storage and disposal of herbicides and herbicide containers will be followed. These are described in the EPA's "Regulations for Acceptance and Procedures for Disposal and Storage" Federal Register notices as amended.

- It is essential to prevent damage to containers so that leaks do not develop; care will be exercised so that containers will not be punctured or ruptured, and so that the lids or caps will not be loosened.

- Precautions will be taken when loading pesticide containers in transport vehicles to assure that containers are secured and will not tip over in transport. Open containers will not be transported. Partially used containers will be securely resealed before transportation.

- Each day after returning to the project office, all herbicide containers will be inspected for damage and leaks, and the vehicle will be examined for contamination.

- In the event of a spill, BLM and/or the contractor will remove the contaminated soil and place the soil in plastic containers. The contaminated soil will be taken to an appropriate hazardous materials facility for disposal. Spill site location, size of spill, and disposal site will be documented and monitored.

- The intake operation of water for mixing will be arranged so that an air gap or reservoir will be placed between the live water intake and the mixing tank to prevent back flow or siphoning of pesticide into the water source.

- Potential for drift of herbicide during foliar application will be minimized by using spray pressures no greater than required to obtain adequate coverage of each target plant individually, and with nozzle tips sized to produce large droplets. Herbicide foliar application will occur from less than two feet away in order to minimize drift. Potential for drift during cut-stump applications is virtually non-existent because herbicide will be applied with an applicator wand or brush. For both foliar and cut-stump methods, herbicide application will not occur during precipitation, if there is an impending threat of precipitation, and/or when wind velocity (greater than 10 mph) could carry herbicide beyond each target plant. Herbicide application will also not occur when air temperatures equal or exceed 85° F.

During preparation of the Pesticide Use Proposal, the project area would be reviewed for known populations of plant species of special concern or their potential habitats. BLM shall inventory potential habitat and confirm absence of sensitive plants prior to any herbicide use. Documented populations of plant species of special concern will be monitored following chemical treatment to assess the health and condition of existing populations.

The Vegetation Treatment using Herbicides on BLM lands in 17 Western States Programmatic EIS is incorporated by reference to this document. However, some specific best management practices will be used for herbicide applications within TFO which may be more restrictive due to the sensitivity of resources:

- Because of the presence of shallow water tables, highly erosive and steep slopes, and the endangered Huachuca water umbel, only those herbicides that do not have the potential to contaminate ground or surface water or to move off-site, to the extent that they may have detectable impacts to vegetation off site, shall be used within the boundaries of LCNCA and SPRNCA, even if approved in the EIS.

- Granular and pellet formations of herbicides will not be used any closer than three miles to the San Pedro River and Babocomari River on SPRNCA, and Cienega Creek, Empire Gulch, and Mattie Canyon on LCNCA. This restriction is due to the possibility of movement of pesticides during severe rain events before being bound in the soil, the potential for herbicides to remain active in the soil for long periods, and the presence of [critical-SPRNCA] habitat for the endangered Huachuca water umbel.

- Aerial application of herbicide will not occur within three miles of riparian habitat at LCNCA and SPRNCA.

- Pesticides that pose risks to fish will not be used within three miles of riparian corridors (including washes and other xeroriparian areas), which are potential habitat within TFO for the federally listed Gila chub, Gila topminnow, desert pupfish, and other species.

- Diquat, fluridone, and other pesticides that pose risks to amphibians will not be used within three miles of riparian corridors (including washes and other xeroriparian areas), which are potential habitat within TFO for the threatened Chiricahua leopard frog.

- Herbicide treatments, including foliar ground application, shall not occur within fifteen meters of any documented populations of Huachuca water umbel. Existing populations have been mapped and will be avoided. All employees responsible for implementing vegetation control via chemical means will be capable of identifying Huachuca water umbel to ensure existing populations are not impacted and to document occurrence of new populations (if any).

- Foliar ground application of herbicides not labeled for aquatic sites will not occur within five meters of perennial surface water and/or native fish re-introduction sites.

- Any suitable southwestern willow flycatcher and/or yellow-billed cuckoo habitat identified for treatment during the nesting/breeding season (April through September) will be surveyed for nesting/breeding activities by a BLM wildlife biologist or contractor who is certified to carry out surveys prior to any vegetation treatments. No treatment will occur until surveys using proper protocol document that territories are vacated.

Foliar application will only be used when herbicide affects to vegetation species beneath the individual target plant is acceptable.

Recommended Protection Measures for Pesticide Applications in Region 2 of the U. S. Fish and Wildlife Service" (2007) will be used for pesticide applications that may affect listed species or habitat. Recommended protection measures in the regional pesticide recommendations (RPR) may be modified on a case-by-case basis with additional information. However, these regional pesticide recommendations cannot be used in lieu of section 7 consultations or section 10 permits as required under the Endangered Species Act.

Before pesticides can be applied inside or adjacent to habitat of a proposed or listed species, a determination should be made as to whether the habitat is occupied. As part of a Federal action involving habitat of a listed plant species, a survey should be conducted for the listed plant species before application of herbicide.

In general, pesticides with the least acute toxicity and persistence should be selected for use inside or adjacent to habitat of proposed or listed species. Environmental fate of pesticides involves persistence, leaching ability, volatilization, transformations (e.g., lethal degradates), bioaccumulation, and other attributes of pesticides after release into the environment. Comparisons should be made between alternative pesticides and their individual characteristics for applications inside listed species habitat, critical habitat, or other sensitive areas. Site-specific information for the evaluation process may be obtained from aerial maps, soil surveys, and other sources.

Pre-emergent herbicides or pesticides that remain active within the soil after application should generally not be applied in habitat of proposed or listed plant species by any application method.

Safety Measures for all Treatments:

Prior to implementation of the approved proposed action, a Risk Management Worksheet (Form 1112-5) will be conducted to plan for the safety of all employees, contract laborers, and volunteers who participate in this management action.

Necessary safety precautions for noise, eye, and hand protection as outlined by BLM safety protocol will be followed.

Mitigation for all Treatments:

Heavy equipment (including trucks and trailers) will be pressure washed prior to entry to treatment areas for removal of any noxious/invasive plant species (seed) that may be transported in the undercarriage.

Should any archaeological resources or vertebrate fossils be discovered during the implementation of projects, all surface disturbing activities in the area of discovery shall cease. The archaeologist will evaluate the discovery and provide recommendations to the Authorized Officer. Surface disturbing activities shall not resume until permission is obtained from the Authorized Officer.

Any archaeological or historical artifacts or remains, vertebrate fossils discovered during operations shall be left intact and undisturbed; all work in the area shall stop immediately, and the Tucson BLM Archaeologist shall be notified immediately. Commencement of operations shall be allowed upon clearance by the Field Manager.

If in connection with operations under this authorization, any human remains, funerary objects, sacred objects or objects of cultural patrimony as defined in the Native American Graves Protection and Repatriation Act (P.L. 101-601; Stat. 3048; 25 U.S.C. 3001) are discovered, the permittee shall stop operations in the immediate area of the discovery, protect the remains and objects, and immediately notify the Authorized Officer of the discovery. The permittee shall continue to protect the immediate area of the discovery until notified by the Authorized Officer that operations may resume.

A biologist will review any site-specific NEPA documents for burn or treatment plans before implementation of any prescribed fire or treatment and will specify avoidance and conservation measures to be used for T & E and other special status species. Terms and Conditions from associated Biological Opinions for federally listed T&E species that may be adversely affected by actions under this project will be incorporated into site-specific burn or treatment plans as part of the proposed action.

The 2010 MOU with USFWS (IB 2010-110) specifies that during the NEPA process, at the project level, the effects of BLM's actions on migratory birds shall be evaluated, focusing first on species of concern, priority habitats, and key risk factors (MOU VII.F). In addition, a potential conservation measure includes avoidance of nesting season during rangeland improvements, such as prescribed fire (MOU VII.G.4). Therefore, at the project level, the Wildlife Biologist shall identify the specific habitat identified for treatment, potential migratory bird species of concern, and risk factors. In vegetation treatments designed to improve grassland

habitat, species of concern which nest in this habitat include Botteri's sparrow and grasshopper sparrow, and nesting occurs during the summer monsoon season generally from mid-June to late September. Therefore, avoidance dates for grassland prescribed fire shall be June 15 to September 30.

Site-specific NEPA analysis will be prepared for each vegetation treatment (prescribed fire, manual or mechanical, herbicide, or integrated) using input from an interdisciplinary (ID) team. A Determination of NEPA Adequacy (DNA), at a minimum, shall be completed for each site-specific project. The NEPA document shall be scoped and completed with the BLM ID team before project initiation, and shall include any avoidance, mitigation, or minimization measures deemed appropriate for the site. The NEPA document shall include site-specific information, such as maps, presence of special status species, any migratory bird nesting timing restrictions, rehabilitation plans, or any additional mitigation and stipulations that the ID team requires.

Because of the propensity for tamarisk to invade areas where riparian mesquite is removed, and because mesquite provides habitat for obligate species (e.g. yellow-billed cuckoo, gray hawk, Bell's vireo, Lucy's warbler, and many others), the proposed action does not include, and this EA does not analyze, mechanical and chemical control of mesquite within washes, terraces, bosques, or other riparian or xeroriparian areas. If riparian mesquite control is desired, a separate EA shall be prepared in order to assess this proposal, along with consultation with the US Fish and Wildlife Service. The present EA only addresses prescribed fire within grassland and other upland areas, riparian and bosque areas, and mesquite or other woody invasive mechanical and chemical control within shrub-invaded grassland habitat. Additional areas that may not receive mesquite control shall be identified by the BLM ID team at the project level during completion of site-specific NEPA analysis.

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Section V: Public Involvement

Public participation in the National Environmental Policy Act (NEPA) process for this proposed project was conducted consistent with the BLM's NEPA procedures. The current public involvement and notification process is as follows:

1) Insert description of public involvement efforts for draft EA soliciting comments on this EA (i.e. web site posting and library copy) during a 30-day public comment period. All groups or individuals expressing interest during the public involvement period were sent a copy or provided with a web site to retrieve a copy of this EA for review and comment. All comments received will be considered in the final EA and accompanying decision.

2) After all public comments have been evaluated and considered, the lead agency expects to finalize the EA and release a decision. Groups and individuals submitting comments during the public comment periods will receive a notice of the decision.

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Appendix A

Invasive and Noxious Weeds

NRCS Invasive Species Policy
Invasive Species Executive Order 13112

Federal Noxious Weeds
Plant Protection and Quarantine. 2006. *Federal noxious weed list* (24 May 2006). USDA Animal and Plant Health Inspection Service.

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Symbol	Scientific Name	Noxious Common Name	Federal Noxious Status†	Native Status*
AEGIN	*Aeginetia* L.		NW	
AGAD2	*Ageratina adenophora* (Spreng.) King & H. Rob.	crofton weed	NW	L48 (I), HI (I)
ALECT2	*Alectra* Thunb.		NW	
ALSE4	*Alternanthera sessilis* (L.) R. Br. ex DC.	sessile joyweed	NW	L48 (I), HI (I), PR (N), VI (N)
ASFI2	*Asphodelus fistulosus* L.	onionweed	NW	L48 (I)
AVST	*Avena sterilis* L.	animated oat	NW	L48 (I), CAN (W)
AZPI	*Azolla pinnata* R. Br.	mosquito fern	NW	L48 (I)
CAOX6	*Carthamus oxyacanthus* M. Bieb.			L48 (I)
CAOX2	*Carthamus oxyacantha* M. Bieb., orth. var.	wild safflower	NW	
CATA5	*Caulerpa taxifolia* (Vahl) C. Agardh1		NW	L48 (I)
CHAC	*Chrysopogon aciculatus* (Retz.) Trin.	pilipiliula	NW	HI (I)
COBE2	*Commelina benghalensis* L.	Benghal dayflower	NW	L48 (I), HI (I), PR (I)
CRVU2	*Crupina vulgaris* Cass.	common crupina	NW	L48 (I)
CUSCU	*Cuscuta* L.2	dodder	NW	
DIAB	*Digitaria abyssinica* (Hochst. ex A. Rich.) Stapf			HI (I)
DISC5	*Digitaria scalarum* (Schweinf.) Chiov.	African couch grass	NW	
DIVE2	*Digitaria velutina* (Forssk.) P. Beauv.	velvet fingergrass	NW	L48 (I)
DRAR7	*Drymaria arenarioides* Humb. & Bonpl. ex Schult. [excluded]	alfombrilla	NW	
EIAZ2	*Eichhornia azurea* (Sw.) Kunth	anchored waterhyacinth	NW	L48 (I), PR (I)
EMAU	*Emex australis* Steinh.	three-cornered jack	NW	L48 (I)
EMSP	*Emex spinosa* (L.) Campd.	devil's thorn	NW	L48 (I), HI (I)
GAOF	*Galega officinalis* L.	goatsrue	NW	L48 (I), CAN (I)
HEMA17	*Heracleum mantegazzianum* Sommier & Levier	giant hogweed	NW	L48 (I), CAN (I)
HOMER	*Homeria* Vent.	Cape tulip	NW	
HYVE3	*Hydrilla verticillata* (L. f.) Royle	hydrilla	NW	L48 (I)
HYPO3	*Hygrophila polysperma* (Roxb.) T. Anderson	Miramar weed	NW	L48 (I)
IMBR	*Imperata brasiliensis* Trin.	Brazilian satintail	NW	L48 (I), PR (I)
IMCY	*Imperata cylindrica* (L.) P. Beauv.	cogongrass	NW	L48 (I)
IPAQ	*Ipomoea aquatica* Forssk.	Chinese waterspinach	NW	L48 (I), HI (I), PR (I)
ISRU	*Ischaemum rugosum* Salisb.	murain-grass	NW	L48 (I)
LAMA15	*Lagarosiphon major* (Ridley) Moss	oxygen weed	NW	
LECH2	*Leptochloa chinensis* (L.) Nees [excluded]	Asian sprangletop	NW	
LISE3	*Limnophila sessiliflora* (Vahl) Blume	ambulia	NW	L48 (I)

LYFE4	*Lycium ferocissimum* Miers			L48 (I)
LYFE3	*Lycium ferrocissimum* Miers, orth. var.	African boxthorn	NW	
MEQU	*Melaleuca quinquenervia* (Cav.) S.F. Blake	melaleuca	NW	L48 (I), HI (I), PR (I)
MEMA	*Melastoma malabathricum* L.		NW	HI (I)
MICO16	*Mikania cordata* (Burm. f.) B.L. Rob. [excluded]	mile-a-minute	NW	
MIMI5	*Mikania micrantha* Kunth	mile-a-minute	NW	L48 (I), PR (N)
MIDI8	*Mimosa diplotricha* C. Wright			HI (I), PR (I)
MIIN80	*Mimosa invisa* Mart., non Mart. ex Colla	giant sensitive plant	NW	
MIPE2	*Mimosa pellita* Kunth ex Willd.			L48 (N), PR (N)
MIPI	*Mimosa pigra* auct. non L.	catclaw mimosa	NW	
MOHA2	*Monochoria hastata* (L.) Solms [excluded]	monochoria	NW	
MOVA	*Monochoria vaginalis* (Burm. f.) C. Presl ex Kunth	pickerel weed	NW	L48 (I), HI (I)
NATR3	*Nassella trichotoma* (Nees) Hack.	serrated tussock	NW	L48 (I)
OPAU10	*Opuntia aurantiaca* Lindl.	jointed prickly pear	NW	
OROBA	*Orobanche* L.2	broomrape	NW	
ORLO3	*Oryza longistaminata* A. Chev. & Roehr.	red rice	NW	
ORPU13	*Oryza punctata* Kotzchy ex Steud.	red rice	NW	
ORRU	*Oryza rufipogon* Griffiths	red rice	NW	L48 (I)
OTAL	*Ottelia alismoides* (L.) Pers.	duck-lettuce	NW	L48 (I)
PASC6	*Paspalum scrobiculatum* L.	Kodo-millet	NW	L48 (I), HI (I)
PECL2	*Pennisetum clandestinum* Hochst. ex Chiov.	kikuyugrass	NW	L48 (I), HI (I), PR (I), VI (I)
PEMA80	*Pennisetum macrourum* Trin.	African feathergrass	NW	L48 (I), HI (I)
PEPE24	*Pennisetum pedicellatum* Trin.	kyasuma-grass	NW	L48 (I)
PEPO14	*Pennisetum polystachion* (L.) Schult.			L48 (I), HI (I), PR (I)
PEPO4	*Pennisetum polystachyon* (L.) Schult., orth. var.	missiongrass	NW	
PRAL11	*Prosopis alpataco* Phil.	mesquite	NW	
PRAR6	*Prosopis argentina* Burkart	mesquite	NW	
PRBU2	*Prosopis burkartii* Muñoz	mesquite	NW	
PRCA9	*Prosopis caldenia* Burkart	mesquite	NW	
PRCA10	*Prosopis calingastana* Burkart	mesquite	NW	
PRCA11	*Prosopis campestris* Griseb.	mesquite	NW	
PRCA12	*Prosopis castellanosii* Burkart	mesquite	NW	
PRDE4	*Prosopis denudans* Benth.	mesquite	NW	
PREL5	*Prosopis elata* (Burkart) Burkart	mesquite	NW	
PRFA2	*Prosopis farcta* (Banks & Sol.) J.F. Macbr.	Syrian mesquite	NW	L48 (I)
PRFE2	*Prosopis ferox* Griseb.	mesquite	NW	
PRFI4	*Prosopis fiebrigii* Harms	mesquite	NW	
PRHA4	*Prosopis hassleri* Harms ex Hassler	mesquite	NW	
PRHU3	*Prosopis humilis* Gillies ex Hook. & Arn.	mesquite	NW	
PRKU2	*Prosopis kuntzei* Harms ex Hassler	mesquite	NW	
PRPA4	*Prosopis pallida* (Humb. & Bonpl. ex Willd.) Kunth	kiawe	NW	HI (I), PR (I), VI (I)
PRPA10	*Prosopis palmeri* S. Watson	mesquite	NW	
PRRE2	*Prosopis reptans* Benth.	tornillo	NW	L48 (N)
PRRO4	*Prosopis rojasiana* Burkart	mesquite	NW	
PRRU4	*Prosopis ruizlealii* Burkart	mesquite	NW	
PRRU5	*Prosopis ruscifolia* Griseb.	mesquite	NW	

PRSE5	*Prosopis sericantha* Gillies ex Hook. & Arn.	mesquite	NW	
PRST3	*Prosopis strombulifera* (Lam.) Benth.	Argentine screwbean	NW	L48 (I)
PRTO3	*Prosopis torquata* DC.	mesquite	NW	
PRVE	*Prosopis velutina* Woot.			L48 (N), HI (I)
PRAR4	*Prosopis articulata* S. Watson	velvet mesquite	NW	
ROCO6	*Rottboellia cochinchinensis* (Lour.) W.D. Clayton	itchgrass	NW	L48 (I), PR (I)
RUFR80	*Rubus fruticosus* L. [excluded]	wild blackberry complex	NW	
RUMO4	*Rubus moluccanus* L. [excluded]	wild blackberry	NW	
SASP	*Saccharum spontaneum* L.	wild sugarcane	NW	HI (I), PR (I)
SASA7	*Sagittaria sagittifolia* L. [excluded]	arrowhead	NW	
SAVE6	*Salsola vermiculata* L.	wormleaf salsola	NW	L48 (I)
SAAU	*Salvinia auriculata* Aubl.	giant salvinia	NW	PR (I)
SABI9	*Salvinia biloba* Raddi	giant salvinia	NW	
SAHE7	*Salvinia herzogii* de la Sota	giant salvinia	NW	
SAMO5	*Salvinia molesta* Mitchell	giant salvinia	NW	L48 (I), HI (I)
SEPUP3	*Setaria pumila* (Poir.) Roem. & Schult. ssp. *pallidefusca* (Schumach.) B.K. Simon			L48 (I)
SEPA82	*Setaria pallidifusca* (Schumach.) Stapf & C.E. Hubbard, orth. var.	cattail grass	NW	
SOTA3	*Solanum tampicense* Dunal	wetland nightshade	NW	L48 (I)
SOTO4	*Solanum torvum* Sw.	turkeyberry	NW	L48 (I), HI (I), PR (I), VI (I)
SOVI2	*Solanum viarum* Dunal	tropical soda apple	NW	L48 (I)
SPER	*Sparganium erectum* L.	exotic bur-reed	NW	L48 (N)
SPAL3	*Spermacoce alata* Aubl. [excluded]	borreria	NW	
STRIG	*Striga* Lour.	witchweed	NW, Q	
TRPR5	*Tridax procumbens* L.	coat buttons	NW	L48 (I), HI (I), PR (I), VI (I)
URPA	*Urochloa panicoides* P. Beauv.	liverseed grass	NW	L48 (I)

†Code	Noxious Status
NW	Noxious weed
Q	Quarantine

*Code	Native Status
I	Introduced
N	Native
W	Waif

*Code	Native Status Jursdiction
L48	Lower 48 States
HI	Hawaii
PR	Puerto Rico
VI	Virgin Islands
CAN	Canada

1 Mediterranean clone

2 other than native or widely distributed species

Appendix B

Arizona Prohibited, Regulated and Restricted Noxious Weeds

PROHIBITED:

The following noxious weeds (includes, plants, stolons, rhizomes, cuttings and seed) are prohibited from entry into the state.

Acroptilon repens (L.) DC. -- Russian knapweed,
Aegilops cylindrica Host. -- Jointed goatgrass,
Alhagi pseudalhagi (Bieb.) Desv. -- Camelthorn,
Alternanthera philoxeroides (Mart.) Griseb. -- Alligator weed,
Cardaria pubescens (C.A. Mey) Jarmolenko -- Hairy whitetop,
Cardaria chalepensis (L.) Hand-Muzz -- Lens podded hoary cress,
Cardaria draba (L.) Desv. -- Globed-podded hoary cress (Whitetop),
Carduus acanthoides L. -- Plumeless thistle,
Cenchrus echinatus L. -- Southern sandbur,
Cenchrus incertus M.A. Curtis -- Field sandbur,
Centaurea calcitrapa L. -- Purple starthistle,
Centaurea iberica Trev. ex Spreng. -- Iberian starthistle,
Centaurea squarrosa Willd. -- Squarrose knapweed,
Centaurea sulphurea L. -- Sicilian starthistle,
Centaurea solstitialis L. -- Yellow starthistle (St. Barnaby's thistle),
Centaurea diffusa L. -- Diffuse knapweed,
Centaurea maculosa L. -- Spotted knapweed,
Chondrilla juncea L. -- Rush skeletonweed,
Cirsium arvense L. Scop. -- Canada thistle,
Convolvulus arvensis L. -- Field bindweed,
Coronopus squamatus (Forskal) Ascherson -- Creeping wartcress (Coronopus),
Cucumis melo L. var. Dudaim Naudin -- Dudaim melon (Queen Anne's melon),
Cuscuta spp. -- Dodder,
Drymaria arenarioides H.B.K. -- Alfombrilla (Lightningweed),
Eichhornia crassipes (Mart.) Solms – Floating water hyacinth,
Eichhornia azurea (SW) Kunth. -- Anchored water hyacinth,
Elytrigia repens (L.) Nevski -- Quackgrass,
Euphorbia esula L. -- Leafy spurge,
Halogeton glomeratus (M. Bieb.) C.A. Mey -- Halogeton,
Helianthus ciliaris DC. -- Texas blueweed,
Hydrilla verticillata Royale -- Hydrilla (Florida-elodea),
Ipomoea spp. -- Morning glory. All species except Ipomoea carnea, Mexican bush morning glory; Ipomoea triloba, three-lobed morning glory (which is considered a restricted pest); and Ipomoea aborescens, morning glory tree,
Ipomoea triloba L. – Three-lobed morning glory,
Isatis tinctoria L. – Dyers woad,
Linaria genistifolia var. dalmatica – Dalmation toadflax,
Lythrum salicaria L. – Purple loosestrife,
Medicago polymorpha L. -- Burclover,
Nassella trichotoma(Nees.) Hack. -- Serrated tussock,
Onopordum acanthium L. -- Scotch thistle,
Orobanche ramosa L. -- Branched broomrape,
Panicum repens L. -- Torpedo grass,
Peganum harmala L. -- African rue (Syrian rue),
Pennisetum ciliare (L.) Link – buffelgrass,
Portulaca oleracea L. -- Common purslane,
Rorippa austriaca (Crantz.) Bess. -- Austrian fieldcress,
Salvinia molesta – Giant salvina

Senecio jacobaea L. -- Tansy ragwort,
Solanum carolinense L. -- Carolina horsenettle,
Sonchus arvensis L. -- Perennial sowthistle,
Solanum viarum Dunal -- Tropical Soda Apple,
Stipa brachychaeta Godr. -- Puna grass,
Striga spp. -- Witchweed,
Trapa natans L. -- Water-chestnut,
Tribulus terrestris L. -- Puncturevine.

REGULATED:

The following noxious weeds are regulated (includes plants, stolons, rhizomes, cuttings and seed) and if found within the state may be controlled or quarantined to prevent further infestation or contamination.

Cenchrus echinatus L. -- Southern sandbur,
Cenchrus incertus M.A. Curtis -- Field sandbur,
Convolvulus arvensis L. -- Field bindweed,
Eichhornia crassipes (Mart.) Solms -- Floating water hyacinth,
Medicago polymorpha L. -- Burclover,
Pennisetum ciliare (L.) Link – buffelgrass,
Portulaca oleracea L. -- Common purslane,
Salvinia molesta– Giant Salvinia *
Tribulus terrestris L. -- Puncturevine.

* Added by Director's Administrative Order DAO 99-03 on 8/25/99

RESTRICTED:

The following noxious weeds are restricted (includes plants, stolons, rhizomes, cuttings and seed) and if found within the state shall be quarantined to prevent further infestation or contamination.

Acroptilon repens (L.) DC. -- Russian knapweed,
Aegilops cylindrica Host. -- Jointed goatgrass,
Alhagi pseudalhagi Bieb.) Desv. -- Camelthorn,
Cardaria draba (L.) Desv. -- Globed-podded hoary cress (Whitetop),
Centaurea diffusa L. -- Diffuse knapweed,
Centaurea maculosa L. -- Spotted knapweed,
Centaurea solstitialis L. -- Yellow starthistle (St. Barnaby’s thistle),
Cuscuta spp. -- Dodder,
Eichhornia crassipes (Mart.) Solms – Floating water hyacinth
Elytrigia repens (L.) Nevski -- Quackgrass,
Euryops sunbcarnosus subsp. vulgaris – Sweet resinbush,
Halogeton glomeratus (M. Bieb.) C.A. Mey -- Halogeton,
Helianthus ciliaris DC. -- Texas blueweed,
Ipomoea triloba L. -- Three-lobed morning glory,
Linaria genistifolia var. dalmatica -- Dalmation toadflax,
Onopordum acanthium L. -- Scotch thistle

Appendix C

Species targeted for treatment.

Buffelgrass was formally added to the Noxious Weed List for Arizona on December 6, 2005. It poses a threat to the Sonoran Desert ecosystem and increases the likelihood of fire and therefore steps to control the spread of buffelgrass are necessary. Conservation of Sonoran Desert plant species through eradication and control of invasive grasses is consistent with the SDCP. Current buffelgrass control efforts are underway at the Tucson Mountain Park, Saguaro National Park, Organ Pipe Cactus National Monument, Coronado National Forest, and along Interstate Highways 10 and 19, and Highway 86. Control methods are primarily chemical (application of the herbicide Round Up or equivalent) with minimal physical removal at Saguaro National Park and Coronado National Forest. Physical methods such as using volunteer labor to pull buffelgrass, is used at the Ironwood Forest National Monument, Tucson Mountain Park and Organ Pipe Cactus National Monument. The BLM's involvement is an essential component to the larger regional control effort that includes ongoing activities of Pima County, Federal agencies such as Saguaro National Park and Coronado National Forest, and private individuals.

The invasive Russian knapweed (*Acroptilon repens*) is in the San Pedro Riparian National Conservation Area (SPRNCA). Russian knapweed is an introduced, deep-rooted, long-lived perennial with rhizomatous roots. Russian knapweed also produces biochemical's that inhibit the growth of native plants (allelopathy). These features of Russian knapweed make cultural control difficult, and allow it to out compete native species and form monocultures that are not conducive to native plant or wildlife biodiversity.

Tamarisk (*Tamarix ramosissima* and other species) is a facultative phreatophyte (its roots extend deeply into the soil and depend on ground water for water supply). Mature tamarisk plants can have tap rooting depths of up to 30 m with a root spread of up to 50 m. It is also estimated that a mature tamarisk plant can consume ~7.7 acre/ft of ground water annually. Because mature tamarisk plants have a greater effective rooting depth than native species (e.g. Fremont cottonwood, Goodding's willow), establishment of dense stands of tamarisk can lower groundwater levels. Tamarisk may effectively dewater springs and seeps, potentially reduce surface water flows in adjacent stream channels, and replace desirable native riparian species.

Tamarisk also acts as a facultative halophyte, secreting salt on surrounding soils, effectively out-competing and inhibiting growth of native riparian species. Only extremely xeric or halophytic species of plants can tolerate the understory environment of tamarisk. Research has shown that tamarisk can tolerate up to 36,000 ppm salt salinity, whereas native floodplain species such as willow and cottonwood can only tolerate up to 1,500 ppm. As a result, the plant commonly forms a dense tamarisk monoculture.

Tamarisk is able to maintain high leaf gas exchange rates under extremely hot, dry conditions relative to native species. The high leaf gas exchange rate, deep roots, halophytic property, growth when water is abundant, drought tolerance, and maintenance of a viable canopy under dry conditions result in tamarisk's ability to outcompete native plants. When native species in riparian ecosystems of the southwest are exposed to seasonal water stress due to depression of floodplain water tables and elimination of annual floods, there is likely to be a community shift toward more stress-tolerant taxa such as tamarisk.

The deciduous nature and increasing population densities of tamarisk contribute to a heavy fuel load in infested areas, thus promoting riparian wildfire. Tamarisk is a fire-adapted species with more efficient recovery mechanisms than most native species. In this light, tamarisk thrives after a fire occurs and can thus exploit niches once occupied by native species such as cottonwood and willow.

Infestations of tamarisk within riparian zones may also have negative impacts on wildlife. Tamarisk seeds have almost no protein and are too small to be eaten by most animals. In addition, tamarisk possesses scale-like leaves that offer little suitable forage for browsing animals. Tamarisk is not favored habitat and supports fewer avian species.

Western soapberry (*Sapindus saponaria var. drummondii)*, mesquite (*Prosopis spp.*), and other woody tree species are a problem at the historic town site of Fairbank. The vegetative sprouts of these plant species emerge through cracks and holes in building foundations, exerting pressure on the foundation as they grow and become larger in

diameter. Subsequent damage to the foundation and structure of the building may result. Some buildings are scheduled for renovation (e.g. Fairbank Mercantile), and further damage to buildings may be prevented by controlling the vegetation that threatens foundations and/or structures. Vegetation would be removed at or below ground level using the cut-stump method, and cut stumps would be treated with herbicide. Some vegetation may be treated with a foliar application, if required for control. Only that vegetation that is threatening the foundation and/or structure of buildings will be treated. Retreatment may be required over subsequent years for maintenance purposes.

Giant reed (*Arundo donax*) is a tall perennial introduced from the Old World which may reproduce vegetatively by underground rhizomes or through rooting stem pieces. These rhizomes are tough and fibrous and form knotty, spreading mats that penetrate deep into the soil up to more than three feet deep. Even small stem and rhizome pieces may readily sprout. This vegetative growth appears to be well adapted to floods, which may break up individual reed clumps, spreading the pieces, which may then sprout and colonize further downstream. Giant reed uses large amounts of water from its wet habitat to supply a rapid rate of growth, up to 5 cm per day in spring. It is capable of growing in dense stands, which may crowd out other plants and prevent their recruitment. It is among the fastest growing terrestrial plants in the world, but does not provide any food sources or nesting habitat for wildlife. It damages riparian ecosystems by outcompeting native species, such as cottonwood and willow, for water. The stems and leaves contain a variety of harmful chemicals, including silica and various alkaloids, which protect it from most insect herbivores and deter wildlife from feeding on it. Giant reed appears to be highly adapted to fire and highly flammable throughout the year. During the drier months of the year, giant reed can increase the probability, intensity, and spread of wildfires through the riparian environment, changing the communities from flood-defined to fire-defined communities. After fires, rhizomes can resprout quickly, outgrowing native plants, which can result in large stands of giant reed along riparian corridors. Fire events thus push the system further toward mono-specific stands of giant reed. A waterside plant community dominated by giant reed may also have reduced canopy shading of the in-stream habitat, which may result in increased water temperatures. This may lead to decreased oxygen concentrations and lower diversity of aquatic animals. Giant reed grows in clumps near the San Pedro River in wet soils with a shallow groundwater depth. Giant reed may out-compete native grasses and shrubs, invade native plant communities, form large monocultures, degrade wildlife habitat, and reduce native biodiversity.

Tree of heaven (*Ailanthus altissima*) has been documented on SPRNCA at Boquillas. This rapidly growing clonal tree (Makings 2006) is listed as a prohibited, invasive, or noxious weed in four states.

Appendix D

7.0 CONSERVATION MEASURES

For all fire management activities (wildfire suppression, wildland fire use, prescribed fire, and mechanical, chemical, and biological vegetation treatments), the following Conservation Measures will be implemented as part of the proposed action. These Conservation Measures are intended to provide Statewide consistency in reducing the effects of fire management actions on Federally threatened, endangered, proposed, and candidate ("Federally protected") species.

Conservation Measures noted as "Recommended" are discretionary for implementation, but are recommended to help minimize effects to Federally protected species. Procedures within the Interagency Standards for Fire and Fire Aviation Operations 2003, including future updates, relevant to fire operations that may affect Federally protected species or their habitat are incorporated here by reference.[4]

Firefighter and public safety is the first priority in every fire management activity. Setting priorities among protecting human communities and community infrastructure, other property and improvements, and natural and cultural resources must be based on the values to be protected, human health and safety, and costs of protection (2001 Federal Wildland Fire Management Policy). However, implementing the following Conservation Measures during fire suppression to the extent possible, and during the proposed fire management activities as required, would minimize or eliminate the effects to Federally protected species and habitats.

During fire suppression actions, Resource Advisors will be designated to coordinate concerns regarding Federally protected species, and to serve as a liaison between the Field Office Manager and the Incident Commander/Incident Management Team. They will also serve as a field contact representative (FCR) responsible for coordination with the USFWS. The Resource Advisors will have the necessary information on Federally protected species and habitats in the area and the available Conservation Measures for the species. They will be briefed on the intended suppression actions for the fire, and will provide input on which Conservation Measures are appropriate, within the standard constraints of safety and operational procedures. The Incident Commander has the final decision-making authority on implementation of Conservation Measures during fire suppression operations.

Because of the number of species located within the action area for the proposed Statewide LUP Amendment, combined with a variety of fire suppression and proposed fire management activities, conflicts may occur in attempting to implement all Conservation Measures for every species potentially affected by a particular activity. Implementing these Conservation Measures effectively would depend on the number of Federally protected species and their individual life history or habitat requirements within a particular location that is being affected by either fire suppression or a proposed fire management activity. This would be particularly true for timing restrictions on fuels treatment activities, if the ranges of several species with differing restrictions overlap, making effective implementation of the activity unachievable. Resource Advisors (in coordination with the USFWS), Fire Management Officers or Incident Commanders, and other resource specialists would need to coordinate to determine which Conservation Measures would be implemented during a particular activity. If Conservation Measures for a species cannot be implemented, BLM would be required to initiate Section 7 consultation with the USFWS for that particular activity.

BLM will update their local Fire Management Plans and prepare implementation level plans to include site-specific actions for managing wildfire and fuels in accordance with the new Federal fire policies, based on guidance provided in the Decision Records for this Statewide LUP Amendment. These plans will be coordinated with the USFWS and the Arizona Game and Fish Department (AGFD) to address site-specific concerns for Federally protected species. The Fire Management Plans and implementation level plans will incorporate the Conservation Measures included in this Statewide LUP Amendment for Federally protected species occurring within each Fire Management Zone. Consultation with the USFWS will occur on implementation level plans, as necessary.

7.1 Conservation Measures for Fire Management Activities

7.1.1 Wildland Fire Suppression (FS)

The following Conservation Measures will be implemented during fire suppression operations, unless firefighter or public safety, or the protection of property, improvements, or natural resources, render them infeasible during a particular operation. Each Conservation Measure has been given an alphanumerical designation for organizational purposes (*e.g.*, FS-1). Necessary

modifications of the Conservation Measures or impacts to Federally protected species and habitat during fire suppression operations will be documented by the Resource Advisor, and coordinated with the USFWS.

FS-1 Protect known locations of habitat occupied by Federally listed species. Minimum Impact Suppression Tactics (M.I.S.T.) will be followed in all areas with known Federally protected species or habitat [Appendix U, *Interagency Standards for Fire and Aviation Operations 2003*, or updates].
FS-2 Resource Advisors will be designated to coordinate natural resource concerns, including Federally protected species. They will also serve as a field contact representative (FCR) responsible for coordination with the USFWS. Duties will include identifying protective measures endorsed by the Field Office Manager, and delivering these measures to the Incident Commander; surveying prospective campsites, aircraft landing and fueling sites; and performing other duties necessary to ensure adverse effects to Federally protected species and their habitats are minimized. On-the-ground monitors will be designated and used when fire suppression activities occur within identified occupied or suitable habitat for Federally protected species.
FS-3 All personnel on the fire (firefighters and support personnel) will be briefed and educated by Resource Advisors or designated supervisors about listed species and the importance of minimizing impacts to individuals and their habitats. All personnel will be informed of the conservation measures designed to minimize or eliminate take of the species present. This information is best identified in the incident objectives.
FS-4 Permanent road construction will not be permitted during fire suppression activities in habitat occupied by Federally protected species. Construction of temporary roads is approved only if necessary for safety or the protection of property or resources, including Federally protected species habitat. Temporary road construction should be coordinated with the USFWS, through the Resource Advisor.
FS-5 Crew camps, equipment staging areas, and aircraft landing and fueling areas should be located outside of listed species habitats, and preferably in locations that are disturbed. If camps must be located in listed species habitat, the Resource Advisor will be consulted to ensure habitat damage and other effects to listed species are minimized and documented. The Resource Advisor should also consider the potential for indirect effects to listed species or their habitat from the siting of camps and staging areas (*e.g.*, if an area is within the water flow pattern, there may be indirect effects to aquatic habitat or species located off-site).
FS-6 All fire management protocols to protect Federally protected species will be coordinated with local fire suppression agencies that conduct fire suppression on BLM-administered lands to ensure that the agency knows how to minimize impacts to Federally protected species in the area.
FS-7 The effectiveness of fire suppression activities and Conservation Measures for Federally protected species should be evaluated after a fire, when practical, and the results shared with the USFWS and AGFD. Revise future fire suppression plans and tactical applications as needed and as practical.

7.1.2 Fuels Treatments (prescribed burning and other fuels management) (FT)

The following Conservation Measures **are mandatory** when implementing wildland fire use, prescribed fires, and the proposed vegetation treatments (mechanical, chemical, biological):
FT-1 Biologists will be involved in the development of prescribed burn plans and vegetation treatment plans to minimize effects to Federally protected species and their habitats within, adjacent to, and downstream from proposed project sites. Biologists will consider the protection of seasonal and spatial needs of Federally protected species (*e.g.*, avoiding or protecting important use areas or structures and maintaining adequate patches of key habitat components) during project planning and implementation.
FT-2 M.I.S.T. will be followed in all areas with known Federally protected species or habitats.
FT-3 Pre-project surveys and clearances (biological evaluations/assessments) for Federally protected species will be required for each project site before implementation. All applicable Conservation Measures will be applied to areas with unsurveyed suitable habitat for Federally protected species, until a survey has been conducted by qualified personnel to clear the area for the treatment activity.
FT-4 Use of motorized vehicles during prescribed burns or other fuels treatment activities in suitable or occupied habitat will be restricted, to the extent feasible, to existing roads, trails, washes, and temporary fuelbreaks or site-access routes. If off-road travel is deemed necessary, any cross-country travel paths will be surveyed prior to use and will be closed and rehabilitated after the prescribed burn or fuels treatment project is completed.
FT-5 As part of the mandatory fire briefing held prior to prescribed burning, all personnel (firefighters and support personnel) will be briefed and educated by Resource Advisors or designated supervisors about listed species and the

importance of minimizing impacts to individuals and their habitats. All personnel will be informed of the Conservation Measures designed to minimize or eliminate take of the species present.

7.1.3 Rehabilitation and Restoration (RR)

RR-1 When rehabilitating important areas for Federally listed species that have been damaged by fire or other fuels treatments, the biologist will give careful consideration to minimizing short-term and long-term impacts. Someone who is familiar with fire impacts and the needs of the affected species will contribute to rehabilitation plan development. Appropriate timing of rehabilitation and spatial needs of Federally listed species will be addressed in rehabilitation plans.

RR-2 Seed from regionally native or sterile alien (non-native) species of grasses and herbaceous vegetation will be used in areas where reseeding is necessary following ground disturbance to stabilize soils and prevent erosion by both wind and water.

RR-3 Sediment traps or other erosion control methods will be used to reduce or eliminate influx of ash and sediment into aquatic systems.

RR-4 Use of motorized vehicles during rehabilitation or restoration activities in suitable or occupied habitat will be restricted, to the extent feasible, to existing roads, trails, or washes, and to temporary access roads or fuelbreaks created to enable the fire suppression, prescribed burn, or fuels treatment activities to occur. If off-road travel is deemed necessary, any cross-country travel paths will be surveyed prior to use and will be closed and rehabilitated after rehabilitation or restoration activities are completed.

RR-5 All temporary roads, vehicle tracks, skid trails, and off-road vehicle (ORV) trails resulting from fire suppression and the proposed fire management activities will be rehabilitated (water bars, etc.), and will be closed or made impassible for future use.

RR-6 Burned area emergency rehabilitation (BAER) activities and long-term restoration activities should be monitored, and the results provided to the USFWS and AGFD. Section 7 consultation for BAER activities will be conducted independently, if necessary.

7.2 Conservation Measures For Fire Management Activities In Riparian and Aquatic Habitats (RA)

7.2.1 Wildland Fire Suppression and Rehabilitation

The following Conservation Measures will be implemented during fire suppression operations in riparian, wetland, or aquatic habitats, unless firefighter or public safety, or the protection of property, improvements, or natural resources, render them infeasible during a particular operation. Necessary modifications of the Conservation Measures or impacts to Federally protected species and habitat during fire suppression operations will be documented by the Resource Advisor, and coordinated with the USFWS. The BLM's 1987 policy Statement on riparian area management defines a riparian area as "an area of land directly influenced by permanent water. It has visible vegetation or physical characteristics reflective of permanent water influence. Lakeshores and streambanks are typical riparian areas. Excluded are such sites as ephemeral streams or washes that do not exhibit the presence of vegetation dependent upon free water in the soil."

RA-1 During wildfire suppression, apply M.I.S.T. within riparian areas. Fire suppression actions in riparian areas should be prioritized to minimize damage to stands of native vegetation from wildfire or suppression operations. To the extent possible, retain large, downed woody materials and snags that are not a hazard to firefighters.

RA-2 Fire suppression and rehabilitation in riparian corridors will be coordinated with the Resource Advisor or qualified biologist approved by BLM.

RA-3 Site-specific implementation plans that include project areas with Federally protected aquatic or riparian-obligate species will specify fire management objectives and wildland fire suppression guidance, taking into account the special concerns related to these species.

RA-4 In riparian areas, use natural barriers or openings in riparian vegetation where possible as the easiest, safest method to manage a riparian wildfire. Where possible and practical, use wet firebreaks in sandy overflow channels rather than constructing firelines by hand or with heavy equipment.

RA-5 Construction or development of a crossing for motorized vehicles across a perennial stream will not be permitted, unless an established road already exists or where dry, intermittent sections occur.

RA-6 Avoid the use of fire retardants or chemical foams in riparian habitats or within 300 feet of aquatic habitats, particularly sites occupied by Federally protected species. Apply operational guidelines as Stated in the *Interagency Standards for Fire and Fire Aviation Operations 2003 (or updates)*, "Environmental Guidelines for Delivery of Retardant or Foam Near Waterways," Chapter 8 (pp. 8-13 through 8-15).

RA-7 Priority for placement of fire camps, fire staging areas, and aircraft landing or refueling sites will be outside riparian areas or river/stream corridors.
RA-8 When using water from sources supporting Federally protected species, care must be taken to ensure adverse impacts to these species are minimized or prevented. Unused water from fire abatement activities will not be dumped in sites occupied by Federally
protected aquatic species to avoid introducing non-native species, diseases, or parasites.
RA-9 If water is drafted from a stock tank or other body of water for fire suppression, it will not be refilled with water from another tank, lakes, or other water sources that may support non-native fishes, bullfrogs, crayfish, or salamanders.
RA-10 Use of containment systems for portable pumps to avoid fuel spills in riparian or aquatic systems will be required.

7.2.2 Fuels Treatments (prescribed fire; mechanical, chemical, and biological treatments)
The following Conservation Measures **are mandatory** when implementing wildland fire use, prescribed fires, and the proposed vegetation treatments (mechanical, chemical, and biological) within riparian, wetland, or aquatic habitats.

RA-12 All Conservation Measures for wildland fire suppression (**RA-1 to RA-11, Section 2.1**) also apply to fuels treatment activities (prescribed fire; mechanical, chemical, and biological treatments) in riparian, wetland, and aquatic habitats.
RA-13 Fire management treatments within or adjacent to riparian and aquatic habitats will be designed to provide long-term benefits to aquatic and riparian resources by reducing threats associated with dewatering and surface disturbance, or by improving the condition of the watershed and enhancing watershed function.
RA-14 For priority fire/fuels management areas (*e.g.*, WUIs) with Federally protected species or designated critical habitat downstream, BLM biologists and other resource specialists, as appropriate, in coordination with USFWS and AGFD, will determine:
A) The number of acres and the number of projects or phases of projects to occur within one watershed per year.
B) An appropriately-sized buffer adjacent to perennial streams in order to minimize soil and ash from entering the stream.
C) Where livestock grazing occurs in areas that have been burned, specialists will determine when grazing can be resumed. Such deferments from grazing will only occur when necessary to protect streams from increased ash or sediment flow into streams.[5]
If agreement cannot be reached or treatment will not meet fuel reduction objectives, BLM will re-initiate consultation. Our authority to make these types of changes is in the regulations at 43 CFR 4110.3-3(b).

7.3 Species Specific Conservation Measures
In addition to the general Conservation Measures listed in **Sections 1.0** and **2.0**, the following species-specific Conservation Measures will be applied during wildfire suppression to the extent possible, and will be required during fuels treatment activities (wildland fire use, prescribed fire, vegetation treatments). Necessary modifications of the Conservation Measures or impacts to Federally protected species and habitat during fire suppression operations will be documented by the Resource Advisor, and coordinated with the USFWS.

7.3.1 Amphibians [Chiricahua leopard frog (FT); Relict leopard frog (FC)]

AM-1 Implement the Conservation Measures for Fire Management Activities in Riparian and Aquatic Habitats.
AM-2 For fire management sites with habitat for the Chiricahua leopard frog, unsurveyed sites will be considered occupied unless surveyed prior to project implementation.
AM-3 Install sediment traps, as determined by a Resource Advisor or qualified biologist approved by BLM, upstream of tanks and ponds occupied by Chiricahua leopard frogs in order to minimize the amount of ash and sediment entering the water. Consultation with a qualified biologist during the planning phase will aid in determining sediment trap installation requirements (see Conservation Measures FT-1 and FT-3).
AM-4 All personnel performing fire management activities at any creek crossing will be informed of the potential presence of Chiricahua leopard frogs, their status, and the need to perform their duties to avoid impacts to the frog and its habitat.
AM-5 Except as needed in emergency situations to abate immediate fire threat or loss of life or property, no water will be drafted for fire suppression from bodies of water known to be occupied by the Chiricahua leopard frog.

7.3.2 Birds
7.3.2.1 Cactus ferruginous pygmy-owl (FE, Proposed CH)

FP-1 Treatment of riparian habitat, Sonoran desert/desertscrub, or mesquite-invaded grasslands under 4,000 feet in elevation that may support nesting cactus ferruginous pygmy owls will only occur during the non-nesting season of August 1 to January 31, unless pre-project surveys indicate the area does not support pygmy-owls or mitigation plans approved by the USFWS have alleviated negative consequences.
FP-2 Develop mitigation plans in coordination with the USFWS for fuels treatment projects (prescribed fire; vegetation treatments) that may adversely affect cactus ferruginous pygmy-owls or their habitat. Mitigation plans for prescribed fire shall limit to the extent practicable the possibility that fire would spread to riparian habitats. Mitigation plans will be approved by the USFWS.
FP-3 To the extent possible, maintain habitat features necessary to support breeding populations of the pygmy-owl within their historical range and review ongoing fire management activities for effects on essential habitat features needed by cactus ferruginous pygmy-owls. Modify activities, where necessary, to sustain the overall suitability of the habitat for the owls. Priority will be given to activities in or near occupied or recently (w/in the last 10 years) occupied habitat.
7.3.2.2 California brown pelican (FE)
BP-1 Implement the Conservation Measures for Fire Management Activities in Riparian and Aquatic Habitats.

7.3.2.3 California Condor (FE; 10(j) species)
The following Conservation Measures apply to BLM-administered lands within the designated 10(j) area for California condors and outside of the 10(j) area if BLM observes a condor or is informed of a condor in the vicinity of a fire suppression activity.
CC-1 All helicopter dip tanks containing water will be covered when not in use or personnel will be stationed nearby until a cover is in place.
CC-2 Any presence of condors in the project area will be recorded and reported immediately to the Resource Advisor.
CC-3 If condors arrive at any area of human activity associated with fire suppression or fuels treatment projects (wildland fire use, prescribed fire, vegetation treatments), the birds will be avoided. The assigned Resource Advisor or a qualified wildlife biologist approved by BLM will be notified, and only permitted personnel will haze the birds from the area.
CC-4 All camp areas will be kept free from trash.
CC-5 Aircraft use along the Vermilion Cliffs or sites where condors are attempting to breed or roost will be minimized
CC-6 The Resource Advisor will contact the Peregrine Fund daily (at 520-606-5155 or 520- 380-4667) to check on locations of condors during fire suppression or fuels treatment activities involving aviation. This information will be communicated to the Incident Commander and aviation personnel.
CC-7 If any fire retardant chemicals must be used in areas where condors are in the vicinity (see **CC-6**), the application area will be surveyed and any contaminated carcasses will be removed as soon as practical to prevent them from becoming condor food sources.
CC-8 Aircraft will remain 400 meters from condors in the air or on the ground unless safety concerns override this restriction. If airborne condors approach aircraft, aircraft will give up airspace to the extent possible, as long as this action does not jeopardize safety.
CC-9 Smoke from wildland fire use and prescribed fire projects will be managed to minimize negative effects to condor breeding. A potential wildland fire use event will not be initiated, or an existing event will be modified or terminated, to prevent or stop
significant amounts of smoke, or smoke that will remain in place for an extended period of time, or chronic smoke events, from occurring in area(s) where condors are attempting to breed.
CC-10 BLM will adhere to the air quality standards set by the Arizona Department of Environmental Quality.

7.3.2.4 Northern aplomado falcon (FE)
AF-1 If aplomado falcons are reestablished or are discovered on public lands, and they nest in a fuels management project area, BLM will implement temporary closures to human access and project implementation (wildland fire use, prescribed burning, and vegetation treatments) within ½ mile of nest sites during the breeding season. Wildland

fire use and prescribed burning will be conducted in a manner to ensure nest sites are more than ½ mile from downwind smoke effects.

7.3.2.5 Southwestern willow flycatcher (FE)
WF-1 Implement the Conservation Measures for Fire Management Activities in Riparian and Aquatic Habitats.
WF-2 Except where fires are active in occupied habitat, minimize unnecessary low-level helicopter flights during the breeding season (April 1 – September 30). Approach bucket dip sites at a 90-degree direction to rivers to minimize flight time over the river corridor and occupied riparian habitats. Locate landing sites for helicopters at least ¼ mile from occupied sites to avoid impacts to willow flycatchers and their habitat.
WF-3 Minimize use of chainsaws or bulldozers to construct fire lines through occupied or suitable habitat except where necessary to reduce the overall acreage of occupied habitat or other important habitat areas that would otherwise be burned.
WF-4 Implement activities to reduce hazardous fuels or improve riparian habitats (prescribed burning or vegetation treatments) within occupied or unsurveyed suitable habitat for southwestern willow flycatchers only during the non-breeding season (October 1 to
March 31).
WF-5 Avoid developing access roads that would result in fragmentation or a reduction in habitat quality. Close and rehabilitate all roads that were necessary for project implementation (see **RR-5**).
WF-6 Prescribed burning will only be allowed within ½ mile of occupied or unsurveyed suitable habitat when weather conditions allow smoke to disperse away from the habitat when birds may be present (breeding season of April 1 – September 30).
WF-7 Vegetation treatment projects adjacent to occupied or unsurveyed suitable habitat will only be conducted when willow flycatchers are not present (October 1 – March 31).

7.3.2.6 Yuma clapper rail (FE)
CR-1 Implement the Conservation Measures for Fire Management Activities in Riparian and Aquatic Habitats.
CR-2 Any prescribed fire or vegetation treatment project in occupied or suitable marsh habitat would only occur between September 1 and March 15 to avoid the Yuma clapper rail breeding and molting seasons.
CR-3 Mechanical removal of overstory habitat (*Tamarisk*) could occur as early as August 15, after the breeding season for Yuma clapper rails.
CR-4 Herbicide application would not occur in Yuma clapper rail habitat and drift-inhibiting agents would be used to assure that the herbicide does not enter adjacent marsh areas.

7.3.2.7 Bald eagle (FT)
BE-1 No human activity within ½ mile of known bald eagle nest sites between December 1 and June 30.
BE-2 No tree cutting within ¼ mile of known nest trees.
BE-3 No human activity within ¼ mile of known bald eagle winter roost areas between October 15 and April 15.
BE-4 No tree cutting within the area immediately around winter roost sites as determined by BLM biologists.
BE-5 No helicopter or aircraft activity or aerial retardant application within ½ mile of bald eagle nest sites between December 1 and June 30 or winter roost sites between October 15 and April 15.
BE-6 Conduct prescribed burn activities outside of nesting season in a manner to ensure nest and winter roost sites are more than ½ mile from downwind smoke effects.
BE-7 Provide reasonable protective measures so fire prescription or fuels treatment will not consume dominant, large trees as identified by the Resource Advisor or qualified biologist approved by BLM within ½ mile of known nests and roosts of bald eagles Pretreatment efforts should provide reasonable protection of identified nesting and roosting trees (see Conservation Measure FT-4).

7.3.2.8 Mexican spotted owl (FT, CH)
SO-1 BLM wildlife biologists will be involved early in the decision-making process for fuels management treatments (wildland fire use, prescribed fires, vegetation treatments) that are planned within suitable habitat or designated critical habitat for Mexican spotted owls (MSO).
SO-2 Suitable habitat and designated critical habitat for MSO will be surveyed prior to implementing prescribed fire or vegetation treatment activities on BLM-administered lands to determine MSO presence and breeding status. These fire management activities will only be implemented within suitable or critical habitat if birds are not present. If a spotted owl is discovered during these surveys, BLM will notify the USFWS to reinitiate consultation and will determine any additional Conservation Measures necessary to minimize or eliminate impacts to the owl.

SO-3 If a MSO is discovered during fire suppression or fuels treatment activities (wildland fire use, prescribed fire, vegetation treatments), the Resource Advisor or a qualified wildlife biologist will document the find and assess potential harm to the owl and advise the Incident Commander or project crew boss of methods to prevent harm. The information will include for each owl the location, date, and time of observation and the general condition of the owl. The Resource Advisor or biologist will contact the appropriate USFWS office, and BLM will reinitiate consultation for the fire suppression or project activities.
SO-4 Within MSO critical habitat designated on BLM-administered lands:
A) To minimize negative effects on the primary constituent elements of critical habitat, wildland fire use and prescribed fires will be managed primarily as low-intensity fires, with only scattered high-intensity patches. The BLM's objective will be to limit mortality of trees greater than 18 inches dbh to less than 5 percent, occasionally up to 10 percent, within critical habitat.
B) If fireline construction is necessary during fire suppression, wildland fire use, or prescribed fires, BLM will minimize the cutting of trees and snags larger than 18 inches dbh, and no trees or snags larger than 24 inches dbh will be cut unless absolutely necessary for safety reasons.
C) For mechanical vegetation treatments within critical habitat, BLM will minimize the cutting of trees and snags larger than 18 inches dbh, and no trees or snags larger than 24 inches dbh will be cut unless absolutely necessary for safety reasons.
D) Critical habitat disturbed during fire suppression or fuels treatment activities, such as fire lines, crew camps, and staging areas, will be rehabilitated to prevent their use by vehicles or hikers. Fire line rehabilitation will include pulling soil, duff, litter, woody debris, and rocks back onto the line to bring it up to grade and to make it blend in with the surrounding area. Such rehabilitation will be inspected one year after the event to ensure effectiveness.
SO-5 The following measures will be followed in suitable habitat (occupied or unoccupied) whenever consistent with objectives to reduce hazardous fuels:
A) Manage mixed-conifer and pine-oak forest types to provide continuous replacement nest habitat over space and time (Table III.B.1 of the Recovery Plan for Mexican Spotted Owl).
B) Incorporate natural variation, such as irregular tree spacing and various stand/patch sizes, into management prescriptions and attempt to mimic natural disturbance patterns.
C) Maintain all species of native vegetation in the landscape, including early seral species. To allow for variation in existing stand structures and provide species diversity, both uneven-aged and even-aged systems may be used as appropriate.
D) Allow natural canopy gap processes to occur, thus producing horizontal variation in stand structure.
E) Within pine-oak types, fuels treatment activities should emphasize retaining existing large oaks and promoting the growth of additional large oaks.
F) Retain all trees >24 inches dbh.
G) Retain hardwoods, large down logs, large trees, and snags. Emphasize a mix of size and age classes of trees. The mix should include large mature trees, vertical diversity, and other structural and floristic characteristics that typify natural forest conditions.
SO-6 The effects of fire suppression and fuels treatment activities on MSO and their habitat, and the effectiveness of these Conservation Measures, will be assessed after each fire event or fuels treatment project by the Resource Advisor or local biologist to allow evaluation of these guidelines and to allow the USFWS to track the species environmental baseline. Prescriptions for wildland fire use, prescribed fires, and vegetation treatments will be adjusted, if necessary.

7.3.2.9 Yellow-billed cuckoo (FC)
YC-1 Implement the Conservation Measures for Fire Management Activities in Riparian and Aquatic Habitats.

7.3.3 Fish
The following Conservation Measure will be implemented for all Federally protected fish species that may be affected by the Proposed Action during fire suppression to the extent possible, and are mandatory for wildland fire use, prescribed fire, and vegetation treatment activities:
FI-1 BLM will cooperate with other agencies to develop emergency protocols to decrease the impacts of fire suppression and fuels treatment activities on Federally listed fish species. Emergency protocols will include appropriate agency contacts, a list of facilities that can hold fish, sources of equipment needed (e.g., sampling gear, trucks) and how to address human health and safety issues.
In addition to implementing **FI-1**, the following species-specific Conservation Measures will also apply:

7.3.3.1 Bonytail chub (FE,CH)
BC-1 Implement the Conservation Measures for Fire Management Activities in Riparian and Aquatic Habitats to eliminate adverse effects from fire management activities to available spawning habitat along shorelines *(i.e.*, occupied reaches and critical habitat).

7.3.3.2 Desert pupfish (FE,CH)
DP-1 Implement the Conservation Measures for Fire Management Activities in Riparian and Aquatic Habitats for occupied reaches and critical habitat.
DP-2 Conduct prescribed burns such that no more than one-half of the watershed of each desert pupfish site is burned in a two-year period (excluding buffers to the streams and/or spring habitats) and repeat treatments at greater than two-year intervals.
DP-3 Monitor, where practical, for fish kill immediately following the first runoff event after prescribed fires in watersheds containing desert pupfish.
DP-4 When considering which creek crossings to use for fire management activities, avoid crossings that are known to be occupied by desert pupfish.

7.3.3.3 Gila topminnow (FE)
GT-1 Implement the Conservation Measures for Fire Management Activities in Riparian and Aquatic Habitats.
GT-2 Conduct prescribed burns such that no more than one-half of the watershed of each gila topminnow natural or reintroduction site is burned in a two-year period (excluding buffers to the streams and/or spring habitats) and repeat treatments at greater than two-year intervals.
GT-3 Monitor for fish kill, where practical, immediately following the first runoff event after prescribed fires in the watersheds containing gila topminnows.
GT-4 When considering which creek crossings to use for fire management activities, avoid crossings that are known to be occupied by Gila topminnow, when possible.
GT-5 Develop mitigation plans in coordination with the USFWS for each fuels management project (prescribed fire; vegetation treatments) that may adversely affect the gila topminnow. Mitigation plans for prescribed fire will limit to the extent practicable the possibility that fire would spread to riparian habitats. Mitigation plans will be approved by the USFWS.
GT-6 Cooperate with the USFWS and AGFD to identify site-specific measures, such as prescribed fires in grassland vegetation types to improve watershed conditions (*e.g.*, in the Cienega Creek watershed), to protect populations of gila topminnow from other resource program impacts.

7.3.3.4 Razorback sucker (FE, CH)
RS-1 Implement the Conservation Measures for Fire Management Activities in Riparian and Aquatic Habitats to minimize adverse effects from fire management activities to available spawning habitat along shorelines (*i.e.*, occupied sites and critical habitat).
RS-2 Project boundaries for fire management activities will avoid or protect sensitive habitats of the razorback sucker.

7.3.3.5 Virgin River chub (FE, CH)
VC-1 Implement the Conservation Measures for Fire Management Activities in Riparian and Aquatic Habitats for the stretch of the Virgin River within Arizona.

7.3.3.6 Woundfin (FE, CH; Future 10(j) populations)
WM-1 Implement the Conservation Measures for Fire Management Activities in Riparian and Aquatic Habitats for the stretch of the Virgin River within Arizona.

7.3.3.7 Little Colorado spinedace (FT, CH)
LS-1 Implement the Conservation Measures for Fire Management Activities in Riparian and Aquatic Habitats to minimize adverse effects from fire management activities on BLM lands to occupied reaches and critical habitat on adjacent lands.

7.3.3.8 Loach minnow (FT, CH); Spikedace (FT, CH)
LM-1 Implement the Conservation Measures for Fire Management Activities in Riparian and Aquatic Habitats for occupied reaches and critical habitat.

LM-2 All reasonable efforts shall be made to minimize disturbance within the wetted areas of Aravaipa Creek or tributary channels.
LM-3 No heavy equipment will be used off-road during wildfire suppression and fuels treatment projects within the wetted areas of Aravaipa Creek.
LM-4 All reasonable efforts will be made to ensure that no pollutants, retardants, or chemicals associated with wildfire suppression and fuels treatment projects or activities enter surface waters of reaches occupied by these two fish species.
LM-5 Develop mitigation plans in coordination with the USFWS for each fuels management project (prescribed fire; vegetation treatments) that may adversely affect the loach minnow and spikedace. Mitigation plans for prescribed fire will limit to the extent practicable the possibility that fire would spread to riparian habitats. Mitigation plans will be approved by the USFWS.
LM-6 Cooperate with the USFWS and AGFD to identify site-specific measures, such as prescribed fires in grassland vegetation types to improve watershed conditions (*e.g.*, in the Aravaipa Creek watershed), to protect populations of loach minnow and spikedace from other resource program impacts.

7.3.3.9 Gila chub (PE, Proposed CH)
GC-1 Implement the Conservation Measures for Fire Management Activities in Riparian and Aquatic Habitats for occupied reaches and proposed critical habitat.
GC-2 When considering which creek crossings to use for fire management activities, avoid crossings that are known to be occupied by Gila chub, when possible.
GC-3 Cooperate with the USFWS and AGFD to identify site-specific measures, such as prescribed fires in grassland vegetation types to improve watershed conditions (*e.g.*, in the Cienega Creek watershed), to protect populations of gila chub from other resource program impacts.

7.3.4 Flowering Plants
The following Conservation Measures for known locations and unsurveyed habitat of all Federally protected plant species within the planning area will be implemented during fire suppression to the extent possible, and are mandatory for wildland fire use, prescribed fire, and vegetation treatment activities:
PL-1 Known locations and potential habitat for plant populations will be mapped to facilitate planning for wildland fire use, prescribed fires, and vegetation treatments, and to ensure protection of these populations during fire suppression.
PL-2 BLM will coordinate with FWS to delineate buffer areas around plant populations prior to prescribed fire and vegetation treatment activities. BLM will coordinate with USFWS during any emergency response and wildland fire use activities to ensure protection of plant populations from fire and fire suppression activities.
PL-3 During fire suppression, wildland fire use, and prescribed fire in habitat occupied by Federally protected plant species, no staging of equipment or personnel will be permitted within 100 meters of identified individuals or populations, nor will off-road vehicles be allowed within the 100-meter buffer area, unless necessary for firefighter or public safety or the protection of property, improvements, or other resources (see **FS-7**). One of the primary threats to many of these plant species is trampling/crushing from personnel and vehicles.
PL-4 No prescribed burning will be implemented within 100 meters of identified locations or unsurveyed suitable habitat for Federally protected and sensitive plant populations unless specifically designed to maintain or improve the existing population. Holmgren milk-vetch (*Astragalus holmgreniorum*), Jones Cycladenia (*Cycladenia humilis* var. *jonesii*), Brady pincushion cactus (*Pediocactus bradyi*), Arizona cliffrose (*Purshia subintegra*), Nichol turk's head (*Echinocactus horizonthalonius* var. *nicholii*), and Peeble's Navajo cactus (*Pediocactus peeblesianus* var. *peeblesianus*) are six (6) native, vegetative T&E species that are comprised of distinct populations inhabiting specific ecological areas within BLM managed lands in Arizona, with historically low fire frequencies, and a lack of fine fuel (fine herbaceous vegetation) continuity. No known structures exist within the confines of or immediately adjacent to the habitat locations for each species. The primary reasons for decline/vulnerability for these plant species include off-road vehicle traffic, road construction, urban development, mining activities, and overuse by livestock.
PL-5 The BLM is reasonably certain that in the areas where these six species occur, it is extremely unlikely that fire suppression activity will be necessary for the reasons provided above. Consequently, the specific areas where populations of Holmgren milkvetch,
Jones Cycladenia, Brady pincushion cactus, Arizona cliffrose, Nichol turk's head, and Peeble's Navajo cactus occur on BLM managed land, will be identified, delineated, and avoided by BLM fire suppression crews in the unlikely event that fire suppression

activities are required in the immediate region. There are no additional species-specific conservation measures for the following Federallyprotected plant species: **Pima Pineapple Cactus** (*Coryphantha scheeri* var. *robustispina*), **Siler Pincushion Cactus** (*Pediocactus sileri*), **Acuña Cactus** (*Echinomastus erectocentrus* var. *acunensis*), **Fickeisen Plains Cactus** (*Pediocactus peeblesianus* var. *fickeiseniae*).

Huachuca Water Umbel (*Lilaeopsis schaffneriana* var. *recurva*) [FE, CH]
In addition to implementing **PL-1** through **PL-4**, the following species-specific ConservationMeasures will also apply:
WU-1 Implement the Conservation Measures for Fire Management Activities in Riparian and Aquatic Habitats.

7.3.4.2 Kearney's Blue Star (*Amsonia kearneyana*) [FE]
In addition to implementing **PL-1** through **PL-4**, the following species-specific Conservation Measures will also apply:
KB-1 No mechanical or chemical vegetation manipulation will be authorized by BLM, and no planting or seeding of nonnative plants will occur in the Brown Canyon watershed within the Baboquivari allotment.
KB-2 Planning and management for wildfire suppression in the watershed of Brown Canyon will be coordinated with the USFWS.

7.3.5 Mammals
7.3.5.1 Black-footed ferret (FE, 10(j) species)
If black-footed ferrets are discovered or re-established on public lands, then the following
Conservation Measures will apply:
BF-1 No heavy equipment operation off of existing roads within ¼ mile of prairie dog towns having documented occurrence of black-footed ferrets.
BF-2 No aerial retardant application within 300 feet of prairie dog towns having documented occurrence of black-footed ferrets.
BF-3 No surface disturbance of prairie dog towns having documented occurrence of black-footed ferrets.
BF-4 In Apache and Navajo counties, prairie dog complexes suitable for black-footed ferrets within ¼ mile of proposed project sites will either be surveyed prior to project implementation or will be protected using measures **BF-1** through **BF-3**, as if ferrets were present.

7.3.5.2 Hualapai Mexican vole (FE)
HV-1 All treatment areas will be surveyed for Hualapai Mexican vole occupancy prior to fuels management treatments (prescribed fire, vegetation treatments) in order to determine project modifications and/or avoidance and protection of occupied areas. Until surveyed, all potential vole habitat is considered occupied. Areas not considered suitable (e.g., areas dominated by thick pine needles and duff) will also be surveyed prior to treatment to protect existing snag habitat for potential future use by Mexican spotted owls.
HV-2 Fuels management treatments (prescribed fire or vegetation treatments), construction of fire breaks, and/or staging areas for fire suppression or fuels management treatments will not be located within a vole use area. Occupied vole sites within proposed burn areas
will be protected by firebreaks, precision ignition of fire around such sites, or total avoidance of the area. Fire plans will incorporate site-specific features (*e.g.*, rock outcroppings, game trails, etc.), fire behavior, and professional judgment to determine the most appropriate method to protect occupied vole habitat. Additionally, monitoring of fuel moisture and use of the appropriate minimum impact suppression tactics will be used to reach the desired objective at each site.
HV-3 To minimize impacts to Hualapai Mexican voles during the breeding season, prescribed burns and vegetation treatments in occupied or potential vole habitat will be implemented only between September 1 and March 15. Treatment in chaparral habitat will occur during the latter part of this time frame, in winter and/or early spring. These prescribed fires will follow the summer monsoon period to encourage additional herbaceous growth. Post-monsoon burns would help avoid the dry conditions that could result in extremely hot fires that reduce the recruitment of grasses and forbs. Areas not considered suitable for Hualapai Mexican voles (*e.g.*, dominated by thick pine needles and duff) may be burned prior to September 1, if surveyed prior to treatment.
HV-4 Provide a 75- to 100-foot, minimum, unburned vegetation buffer between fuels treatment sites and riparian and dry wash areas to decrease erosion into and sedimentation of the occupied or potentially occupied vole habitat. Within ponderosa pine treatment sites, use of dry washes as a fire line may be appropriate and result in less

disturbance than construction of a cup trench above the wash. Under such circumstances, BLM will prepare the wash as a fire line by raking duff and removing by hand dead branches and other debris.
HV-5 The terms and conditions from the Pine Lake Wildland/Urban Interface Biological Opinion (BLM Kingman Field Office; Consultation No. 02-21-01-F-241) continue to apply to the Pine Lake project.

7.3.5.3 Jaguar (FE)
JA-1 Implement the Conservation Measures for Fire Management Activities in Riparian and Aquatic Habitats to eliminate adverse effects to jaguars that may occur in dense riparian habitats on BLM-administered lands.
JA-2 Maintain dense, low vegetation in major riparian or xero-riparian corridors on BLM administered lands in identified locations south of Interstate 10 and Highway 86. Locations will be identified in site-specific fire management plans.

7.3.5.4 Lesser long-nosed bat (FE)
LB-1 Instruct all crew bosses (wildfire suppression, managed wildfire, prescribed fire, and vegetation treatments) in the identification of agave and columnar cacti and the importance of their protection.
LB-2 Prior to implementing any fuels treatment activities (prescribed fire, vegetation treatments), pre-project surveys will be conducted for paniculate agaves and saguaros that may be directly affected by fuels management activities.
LB-3 Protect long-nosed bat forage plants -- saguaros and high concentrations of agaves -- from wildfire and fire suppression activities, and from modification by fuels treatment activities (prescribed fire, vegetation treatments), to the greatest extent possible.

- "Agave concentrations" are contiguous stands or concentrations of more than 20 plants per acre.
- Avoid driving over plants, piling slash on top of plants, and burning on or near plants.
- Staging areas for fire crews or helicopters will be located in disturbed sites, if possible.

LB-4 No seeding/planting of nonnative plants will occur in any wildfire rehabilitation site or fuels treatment site with paniculate agaves or saguaros.
LB-5 A mitigation plan will be developed by the Bureau in coordination with the USFWS for prescribed fires or fuels management projects (mechanical, chemical, biological treatments) within 0.5 mi of bat roosts or in areas that support paniculate agaves or saguaros. The mitigation plan will ensure that effects to bat roosts and forage plants are minimized and will include monitoring of effects to forage plants. The plan will be approved by the USFWS.
LB-6 BLM personnel would examine concentrations of agaves (including shindagger – *A.schottii*) within each proposed fuels treatment area, and blackline or otherwise protect from treatments any significant concentrations of agaves that appear to be amidst fuel loads that could result in mortality greater than 20 percent (>50% for *A. schottii).* BLM personnel would determine which significant agave stands are prone to mortality greater than 20 percent (>50% for *A. schottii*) (see Conservation Measures FT-1 and FT-3).

7.3.5.5 Mexican gray wolf (FE; 10(j) species)
If Mexican gray wolves are re-established on public lands, then the following Conservation Measures will apply:
GW-1 No human disturbance associated with fire management activities will be within one mile of a den site from April1 to June 30.
GW-2 No human disturbance associated with fire management activities will be within one mile of known rendezvous sites from April 1 to June 30.

7.3.5.6 Ocelot (FE)
No species-specific Conservation Measures developed.

7.3.5.7 Sonoran pronghorn (FE)
No species-specific Conservation Measures developed.

7.3.5.8 Black-tailed prairie dog (FC)
If black-tailed prairie dogs are re-established on public lands, then the following Conservation Measures will apply:
PD-1 No heavy equipment operation off of existing roads within ¼ mile of black-tailed prairie dog colonies
PD-2 No aerial retardant application within ¼ mile of black-tailed prairie dog colonies.
PD-3 No surface disturbance of black-tailed prairie dog colonies.

7.3.6 Reptiles

7.3.6.1 Desert tortoise, Mojave population (FT)

DT-1 Take appropriate action to suppress all wildfires in desert tortoise habitat, based on preplanned analysis and consistent with land management objectives, including threats to life and property. Full suppression activities will be initiated within key desert tortoise habitat areas identified in site-specific Fire Management Plans.

DT-2 Suppress all wildfires in desert tortoise habitat with minimum surface disturbance, in accordance with the guidelines in Duck *et al.* (1995) and the 1995 programmatic biological opinion on fire suppression on the Arizona Strip (02-21-95-F-379).

DT-3 Pre-position suppression forces in critical areas during periods of high fire dangers.

DT-4 As soon as practical, all personnel involved in wildfire suppression (firefighters and support personnel) will be briefed and educated about desert tortoises and the importance of protecting habitat and minimizing take, particularly due to vehicle use. Fire crews will be briefed on the desert tortoise in accordance with Appendix II of Duck *et al.* (1995).

DT-5 If wildfire or suppression activities cannot avoid disturbing a tortoise, the Resource Advisor or monitor will relocate the tortoise, if safety permits. The tortoise will be moved into the closest suitable habitat within two miles of the collection site that will ensure the animal is reasonably safe from death, injury, or collection associated with the wildfire or suppression activities. The qualified biologist will be allowed some discretion to ensure that survival of each relocated tortoise is likely. If the extent or direction of movement of a fire makes sites within two miles of the collection site unsuitable or hazardous to the tortoise or biologists attempting to access the area, the tortoise may be held until a suitable site can be found or habitat is safe to access and not in immediate danger of burning. The Resource Advisor will contact the USFWS Arizona Ecological Services Field Office (AESFO) as soon as possible concerning disposition of any animals held for future release. Desert tortoises will not be placed on lands outside the administration of the Federal government without the written permission of the landowner. Handling procedures for tortoises, including temporary holding facilities and procedures, will adhere to protocols outlined in Desert Tortoise Council (1994).

DT-6 Upon locating a dead, injured, or sick desert tortoise, initial notification must be made to the appropriate USFWS Law Enforcement Office within three working days of its finding. Written notification must be made within five calendar days and include the date, time, and location of the animal, a photograph, and any other pertinent information. The notification will be sent to the Law Enforcement Office with a copy to the AESFO

DT-7 Care must be taken in handling sick or injured animals to ensure effective treatment and care and in handling dead specimens to preserve biological material in the best possible State. If possible, the remains of intact desert tortoises will be placed with educational or research institutions holding appropriate State and Federal permits. If such institutions are not available, the information noted above will be obtained and the carcass left in place. Arrangements regarding proper disposition of potential museum specimens will be made with the institution prior to implementing the action. Injured animals should be transported to a qualified veterinarian by an authorized biologist. Should any treated desert tortoise survive, the USFWS should be contacted regarding final disposition of the animal.

DT-8 The Resource Advisor or monitor(s) will maintain a record of all desert tortoises encountered during fire suppression activities. This information will include for each desert tortoise: 1) locations and dates of observation; 2) general condition and health, including injuries and State of healing, and whether animals voided their bladders; 3) location moved from and to; and 4) diagnostic markings (i.e., identification numbers of marked lateral scutes). No notching of scutes or replacement of fluids with a syringe is authorized.

DT-9 Prior to moving a vehicle, personnel will inspect under the vehicle for tortoises. If a tortoise is found under the vehicle, the tortoise will be allowed to move away from the vehicle on its own accord, if possible. Otherwise an individual will move the tortoise to a safe locality in accordance with **FS-2** and **DT-5**.

DT-10 Off-road vehicle activity will be restricted to the minimum necessary to suppress wildfires. Vehicles will be parked as close to roads as possible, and vehicles will use wide spots in roads or disturbed areas to turn around. Whenever possible, a biologist or crewperson trained to recognize tortoises and their shelter sites will precede any vehicle traveling off-road to direct the driver around tortoises and tortoise burrows. Whenever possible, local fire-fighting units should provide direction and leadership during off-road travel because of their expertise and knowledge of area sensitivities.

DT-11 Fire-related vehicles will drive slow enough to ensure that tortoises on roads can be identified and avoided.

DT-12 Fire crews or rehabilitation crews will, to the extent possible, obliterate off-road vehicle tracks made during fire suppression in tortoise habitat, especially those of tracked vehicles, to reduce future use.

DT-13 To the maximum extent practical, campsites, aircraft landing/fueling sites, and equipment staging areas will be located outside of desert tortoise habitat or in previously disturbed areas. If such facilities are located in desert tortoise habitat, 100 percent of the site will be surveyed for desert tortoises by a qualified biologist approved by

BLM, whenever feasible. Any tortoises found will be moved to a safe location in accordance with **FS-2** and **DT-5**. All personnel located at these facilities will avoid disturbing active tortoise shelter sites.
DT-14 Elevated predation by common ravens or other predators attributable to fire suppression activities will be reduced to the maximum extent possible. Work areas, including campsites, landing/fueling sites, staging areas, etc. will be maintained in a sanitary condition at all times. Waste materials at those sites will be contained in a manner that will avoid attracting predators of desert tortoises. Waste materials will be disposed of at an appropriate waste disposal site. "Waste" means all discarded matter including, but not limited to, human waste, trash, garbage, refuse, oil drums, petroleum products, ashes, and equipment.
DT-15 Backfiring operations are permitted where necessary in desert tortoise habitat. Burning out patches of identified habitat within or adjacent to burned areas is not permitted as a standard fire suppression measure unless necessary for firefighter or public safety or to protect property, improvements, or natural resources.
DT-16 Use of foam or retardant is authorized within desert tortoise habitat.
DT-17 Rehabilitation of vegetation in tortoise habitat will be considered, including seeding, planting of perennial species, etc.
DT-18 Recovery of vegetation will be monitored, including establishing and monitoring paired plots, inside and outside burned areas in tortoise habitat. Recovery plans will be coordinated with the USFWS and AGFD.
DT-19 The effectiveness of wildfire suppression activities and desert tortoise Conservation Measures will be evaluated after a wildfire. Procedures will be revised as needed.

7.3.6.2 New Mexico ridge-nosed rattlesnake (FT)
RN-1 To the extent possible, minimize surface disturbing activities from fire suppression and fuels treatment activities within New Mexico ridge-nosed rattlesnake habitat on BLM administered lands in the southern Peloncillo Mountains, particularly during active periods for snakes (July through October).
RN-2 Prior to using wildland fire for resource benefit, cool season (November – March) prescribed fire or other fuel treatments should be used to reduce unnatural fuel loads within suitable habitat to avoid catastrophic fires and loss of canopy cover.
RN-3 All fires that occur outside of prescriptions that will not result in low intensity, low severity burns will be fully suppressed within or near suitable New Mexico ridge-nosed rattlesnake habitat.

[4] BLM, NPS, USFWS, USFS. 2003. *Interagency Standards for Fire and Fire Aviation Operations 2003*. Department of the Interior, Bureau of Land Management, National Park Service, U.S. Fish and Wildlife Service; Department of Agriculture, U.S. Forest Service. These standards can be found at: http://www.fire.blm.gov/Standards/redbook.htm (*Note:* This document is updated annually. For BLM, this document is Handbook 9213-1).

[5] The Interagency Burned Area Emergency Stabilization and Rehabilitation Handbook, Exhibit 4-2, BLM supplemental guidance, page 5 of 9 (http://fire.r9.fws.gov/ifcc/ESR/handbook/4PolicyGuidance.htm) establishes the following policy for livestock exclusion following burns: Exclusion of livestock is critical for the recovery of burned vegetation or establishment and maintenance of new seedings and use of these areas should not be permitted until the vegetation recovers or is established. Both re-vegetated and, burned but not re-vegetated areas, will be closed
to livestock grazing for at least two growing seasons following the season in which the wildfire occurred to promote recovery of burned perennial plants and/or facilitate the establishment of seeded species. Livestock permitees must be informed of the closure early during the plan preparation process, and livestock closures will be made a condition or term on the grazing license or permit through the issuance of grazing decision (see 43 CFR 4160). Livestock closures for less than two growing seasons may be justified on a case-by-case basis based on sound resource data and experience. Livestock management following seedling establishment and/ or burned area recovery should maintain both non-native and/or native species to meet land use, (including Standards for Rangeland Health and Guidelines for Grazing Management) or activity plan objectives.

Appendix E

LESSER LONG-NOSED BAT (Leptonycteris curasoae yerbabuenae)

Conclusion After reviewing the current status of lesser long-nosed bat, the environmental baseline for the action area, the effects of the proposed Las Cienegas NCA RMP and the cumulative effects, it is the Service's biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the proposed endangered lesser long-nosed bat. No critical habitat has been designated, thus, none would be affected. We base these conclusions on the following:

1. The proposed action affects a small portion of the species' range;

2. All proposed actions that may affect the lesser long-nosed bat have conservation actions included which should minimize effects to the species; and

3. The ecological condition of the area should be maintained and improved during the 20-year life of the RMP.

Incidental Take Statement Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such
conduct. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by significant impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, and sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered prohibited taking under the Act if such taking meets the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by the BLM so that they become binding conditions of any grant or permit issued to any applicants, as appropriate, for the exemption in section 7(o)(2) to apply. The BLM has a continuing duty to regulate the activity covered by this incidental take statement. If the BLM (1) fails to assume and implement the terms and conditions or (2) fails to require any applicants to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant documents, the protective coverage of section 7(o)(2) may lapse. To monitor the impact of incidental take, the BLM must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR §402.14(I)(3)].

Amount or Extent of Take
We anticipate lesser long-nosed bats could be taken as a result of floral resources within core use-areas.

1. All lesser long-nosed bats, whose core use-areas include pastures or allotments that are grazed during the agave bolting season, by human visitation, or by prescribed burning, though harm.

We anticipate incidental take of lesser long-nosed bats as a result of harm will be difficult to detect for the following reasons: dead animals are difficult to find and cause of death may be difficult to determine. However, take of lesser long-nosed bat may occur from livestock grazing, prescribed burning, and human

visitation affects to floral resources. The level of take anticipated in the form of harm could be detected either by finding bats taken as a result of the grazing, burning, or recreation program, or if the following surrogate condition is met:

1. Flowering agave densities within core use-areas decline below the natural variability of the species (0.2-5.4 flowering plants /ha).

Effect of Take
In this biological opinion, the Service finds the anticipated level of take is not likely to jeopardize the continued existence of the endangered lesser long-nosed bat.

Reasonable and Prudent Measures and Terms and Conditions
The following reasonable and prudent measures are necessary and appropriate to minimize take of the lesser long-nosed bat. To be exempt from the prohibitions of section 9 of the Act, the BLM must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting and monitoring requirements. These terms and conditions are nondiscretionary.

1. The BLM shall continue to monitor the lesser long-nosed bat and its habitat to document levels of take and determine effectiveness of conservation measures.

1.1. The BLM shall develop with us a monitoring program to determine density of flowering agave stalks within core use-areas.

1.2. The BLM shall implement the monitoring plan.

1.3. An annual report will be done which summarizes the implementation of the proposed action and any incidental take that occurred. We are especially interested in an analysis of the effectiveness of the conservation measures and terms and conditions.

2. Measures shall be implemented to reduce the impacts of the proposed livestock grazing and recreation management actions on agaves.

2.1. For roads designated to be closed within lesser long-nosed bat core use-areas, close them before December 31, 2010;

2.2. Ensure that no more than 20 percent of agaves burned during prescribed fire are killed by the fire within lesser long-nosed bat core use-areas.

2.3. Do not impact more than one percent of the agaves present within 0.5 miles of any new road, trail, fence, recreational, or other infrastructure such as parking pullouts, repressos, and educational facilities within lesser long-nosed bat core use-areas. If more than one percent is impacted, plant and insure the survival of enough agaves so that the total number of agaves lost is less than one percent.

Conservation Recommendations Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

- We recommend that the BLM monitor livestock utilization within all pastures used during the agave-bolting season (Recovery plan task 2, USFWS 1997).

- We recommend that the BLM investigate and monitor the invasion of Lehmann lovegrass in the planning area and assist other agencies in developing methods for controlling this nonindigenous grass (Recovery plan task 2, USFWS 1997).

- We recommend that the BLM apply restrictions on the exposure of bolting agaves to livestock use, so that no allotment has more than 50 percent of the area accessible to livestock during the agave-bolting period (April 15 through September 15) during any one year (Recovery plan task 1, USFWS 1997).

- We recommend that the BLM continue support and cooperation in the investigations of agave relationships to livestock grazing, and of the effects of prescribed fire on paniculate agaves (Recovery plan task 1, USFWS 1997).

- We recommend that the BLM implement the Lesser Long-nosed Bat Recovery Plan, as appropriate.

For the Service to be kept informed of actions reducing or avoiding adverse effects or benefiting listed species or their habitat, the Service requests notification of the implementation of any conservation recommendations.

Appendix F

		Herbicides Approved for Use on BLM Lands in Accordance with the			
		17 Western States PEIS ROD and Oregon EIS ROD*			
					Update September 1, 2011
	STATES WITH APPROVAL				
ACTIVE	**BASED UPON CURRENT**			**EPA REG.**	**CA**
INGREDIENT	**EIS/ROD**	**TRADE NAME**	**MANUFACTURER**	**NUMBER**	**REG. ****
Bromacil	AK, AZ, CA, CO, ID, MT, ND,	Bromacil 80DF	Alligare, LLC	81927-4	Y
	NE, NM, NV, OK, OR-East, SD,	Hyvar X	DuPont Crop Protection	352-287	Y
	TX, UT, WA, WY	Hyvar XL	DuPont Crop Protection	352-346	Y
Bromacil +	AK, AZ, CA, CO, ID, MT, ND,	Bromacil/Diuron 40/40	Alligare, LLC	81927-3	Y
Diuron	NE, NM, NV, OK, OR-East, SD,	Krovar I DF	DuPont Crop Protection	352-505	Y
	TX, UT, WA, WY	Weed Blast Res. Weed Cont.	Loveland Products Inc.	34704-576	N
		DiBro 2+2	Nufarm Americas Inc.	228-227	Y
		DiBro 4+4	Nufarm Americas Inc.	228-235	N
		DiBro 4+2	Nufarm Americas Inc.	228-386	N
		Weed Blast 4G	SSI Maxim	34913-19	N
Chlorsulfuron	AK, AZ, CA, CO, ID, MT, ND,	Alligare Chlorsulfuron	Alligare, LLC	81927-43	N
	NE, NM, NV, OK, OR-East, SD,	Telar DF	DuPont Crop Protection	352-522	Y

	TX, UT, WA, WY	Telar XP	DuPont Crop Protection	352-654	Y
		NuFarm Chlorsulf SPC 75 WDG Herbicide	Nufarm Americas Inc.	228-672	N
		Chlorsulfuron E-Pro 75 WDG	Nufarm Americas Inc.	79676-72	N
Clopyralid	AK, AZ, CA, CO, ID, MT, ND,	Spur	Albaugh, Inc.	42750-89	Y
	NE, NM, NV, OK, OR, SD, TX,	Pyramid R&P	Albaugh, Inc.	42750-94	N
	UT, WA, WY	Clopyralid 3	Alligare, LLC	42750-94-81927	Y
		Cody Herbicide	Alligare, LLC	81927-28	Y
		Reclaim	Dow AgroSciences	62719-83	N
		Stinger	Dow AgroSciences	62719-73	Y
		Transline	Dow AgroSciences	62719-259	Y
		CleanSlate	Nufarm Americas Inc.	228-491	Y
	STATES WITH APPROVAL				
ACTIVE	**BASED UPON CURRENT**			**EPA REG.**	**CA**
INGREDIENT	**EIS/ROD**	**TRADE NAME**	**MANUFACTURER**	**NUMBER**	**REG. ****
Clopyralid +	AK, AZ, CA, CO, ID, MT, ND,	Commando	Albaugh, Inc.	42750-92	N
2,4-D	NE, NM, NV, OK, OR, SD, TX,	Curtail	Dow AgroSciences	62719-48	N
	UT, WA, WY	Cutback	Nufarm Americas Inc.	71368-72	N
2,4-D	AK, AZ, CA, CO, ID, MT, ND,	Agrisolution 2,4-D LV6	Agriliance, L.L.C.	1381-101	N
	NE, NM, NV, OK, OR,	Agrisolution 2,4-D Amine 4	Agriliance, L.L.C.	1381-103	N

	SD, TX,				
	UT, WA, WY	Agrisolution 2,4-D LV4	Agriliance, L.L.C.	1381-102	N
		2,4-D Amine 4	Albaugh, Inc./Agri Star	42750-19	Y
		2,4-D LV 4	Albaugh, Inc./Agri Star	42750-15	Y
		Solve 2,4-D	Albaugh, Inc./Agri Star	42750-22	Y
		2,4-D LV 6	Albaugh, Inc./Agri Star	42750-20	N
		Five Star	Albaugh, Inc./Agri Star	42750-49	N
		D-638	Albaugh, Inc./Agri Star	42750-36	N
		Alligare 2,4-D Amine	Alligare, LLC	81927-38	N
		2,4-D LV6	Helena Chemical Company	4275-20-5905	N
		2,4-D Amine	Helena Chemical Company	5905-72	N
		2,4-D Amine 4	Helena Chemical Company	42750-19-5905	N
		Opti-Amine	Helena Chemical Company	5905-501	N
		Barrage HF	Helena Chemical Company	5905-529	N
		HardBall	Helena Chemical Company	5905-549	N
		Unison	Helena Chemical Company	5905-542	N
		Clean Amine	Loveland Products Inc.	34704-120	N
		Low Vol 4 Ester Weed Killer	Loveland Products Inc.	34704-124	N
		Low Vol 6 Ester Weed Killer	Loveland Products Inc.	34704-125	N
		Saber	Loveland Products Inc.	34704-803	N
		Salvo	Loveland Products Inc.	34704-609	N
		Savage DS	Loveland Products Inc.	34704-606	Y
		Aqua-Kleen	Nufarm Americas Inc.	71368-4	N
		Aqua-Kleen	Nufarm Americas Inc.	228-378	N
		Esteron 99C	Nufarm	62719-	N

			Americas Inc.	9-71368	
		Weedar 64	Nufarm Americas Inc.	71368-1	Y
		Weedone LV-4	Nufarm Americas Inc.	228-139-71368	Y
		Weedone LV-4 Solventless	Nufarm Americas Inc.	71368-14	Y
	STATES WITH APPROVAL				
ACTIVE	**BASED UPON CURRENT**			**EPA REG.**	**CA**
INGREDIENT	**EIS/ROD**	**TRADE NAME**	**MANUFACTURER**	**NUMBER**	**REG. ****
2,4-D - cont.	AK, AZ, CA, CO, ID, MT, ND,	Weedone LV-6	Nufarm Americas Inc.	71368-11	Y
	NE, NM, NV, OK, OR, SD, TX,	Formula 40	Nufarm Americas Inc.	228-357	Y
	UT, WA, WY	2,4-D LV 6 Ester	Nufarm Americas Inc.	228-95	Y
		Platoon	Nufarm Americas Inc.	228-145	N
		WEEDstroy AM-40	Nufarm Americas Inc.	228-145	Y
		Hi-Dep	PBI Gordon Corp.	2217-703	N
		2,4-D Amine	Setre (Helena)	5905-72	N
		Barrage LV Ester	Setre (Helena)	5905-504	N
		2,4-D LV4	Setre (Helena)	5905-90	N
		2,4-D LV6	Setre (Helena)	5905-93	N
		Clean Crop Amine 4	UAP-Platte Chem. Co.	34704-5 CA	Y
		Clean Crop Low Vol 6 Ester	UAP-Platte Chem. Co.	34704-125	N
		Salvo LV Ester	UAP-Platte Chem. Co.	34704-609	N
		2,4-D 4# Amine Weed Killer	UAP-Platte Chem. Co.	34704-120	N
		Clean Crop LV-4 ES	UAP-Platte Chem. Co.	34704-124	N
		Savage DS	UAP-Platte Chem. Co.	34704-606	Y
		Cornbelt 4 lb. Amine	Van Diest Supply Co.	11773-2	N
		Cornbelt 4# LoVol Ester	Van Diest Supply Co.	11773-3	N
		Cornbelt 6# LoVol Ester	Van Diest	11773-4	N

			Supply Co.		
		Amine 4	Wilbur-Ellis Co.	2935-512	N
		Lo Vol-4	Wilbur-Ellis Co.	228-139-2935	N
		Lo Vol-6 Ester	Wilbur-Ellis Co.	228-95-2935	N
		Base Camp Amine 4	Wilbur-Ellis Co.	71368-1-2935	N
		Broadrange 55	Wilbur-Ellis Co.	2217-813-2935	N
		Agrisolution 2,4-D LV6	Winflied Solutions, LLC	1381-101	N
		Agrisolution 2,4-D Amine 4	Winfield Solutions, LLC	1381-103	N
		Agrisolution 2,4-D LV4	Winfield Solutions, LLC	1381-102	N
Dicamba	AK, AZ, CA, CO, ID, MT, ND,	Dicamba DMA	Albaugh, Inc./Agri Star	42750-40	N
	NE, NM, NV, OK, OR, SD, TX,	Vision	Albaugh, Inc.	42750-98	N
	UT, WA, WY	Cruise Control	Alligare, LLC	42750-40-81927	N
		Banvel	Arysta LifeScience N.A. Corp.	66330-276	Y
		Clarity	BASF Corporation	7969-137	Y
	STATES WITH APPROVAL				
ACTIVE	**BASED UPON CURRENT**			**EPA REG.**	**CA**
INGREDIENT	**EIS/ROD**	**TRADE NAME**	**MANUFACTURER**	**NUMBER**	**REG. ****
Dicamba - cont.	AK, AZ, CA, CO, ID, MT, ND,	Vision	Helena Chemical Company	5905-576	Y
	NE, NM, NV, OK, OR, SD, TX,	Rifle	Loveland Products Inc.	34704-861	Y
	UT, WA, WY	Banvel	Micro Flo Company	51036-289	Y
		Diablo	Nufarm	228-379	Y

			Americas Inc.		
		Vanquish Herbicide	Nufarm Americas Inc.	228-397	Y
		Vanquish	Syngenta	100-884	N
		Sterling Blue	Winfield Solutions, LLC	7969-137-1381	Y
Dicamba +	AK, AZ, CA, CO, ID, MT, ND,	Range Star	Albaugh, Inc./Agri Star	42750-55	N
2,4-D	NE, NM, NV, OK, OR, SD, TX,	Weedmaster	BASF Ag. Products	7969-133	Y
	UT, WA, WY	Brush-Rhap	Helena Chemical Company	5905-568	N
		Latigo	Helena Chemical Company	5905-564	N
		Outlaw	Helena Chemical Company	5905-574	N
		Rifle-D	Loveland Products Inc.	34704-869	N
		KambaMaster	Nufarm Americas Inc.	71368-34	N
		Veteran 720	Nufarm Americas Inc.	228-295	Y
		Weedmaster	Nufarm Americas Inc.	71368-34	Y
		Brash	Winfield Solutions, LLC	1381-202	N
Dicamba +	AZ, CO, ID, MT, ND, NE, NM,	Distinct	BASF Corporation	7969-150	Y
Diflufenzopyr	NV, OK, OR, SD, TX, UT,	Overdrive	BASF Corporation	7969-150	N
	WA, WY				
NOTE: In accordance with the Record of Decision for the *Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement* (PEIS), the aerial application of this herbicide is prohibited.					
Diquat	AK, AZ, CA, CO, ID, MT, ND,	Alligare Diquat	Alligare, LLC	81927-35	Y
	NE, NM, NV, OK, SD,	NuFarm Diquat SPC 2 L Herbicide	Nufarm Americas Inc.	228-675	N

	TX, UT,				
	WA, WY	Diquat SPC 2 L Herbicide	Nufarm Americas Inc.	79676-75	Y
		Diquat E-Ag 2L	Nufarm Americas Inc.	79676-75	Y
		Reward	Syngena Professional Products	100-1091	Y
	STATES WITH APPROVAL				
ACTIVE	**BASED UPON CURRENT**			**EPA REG.**	**CA**
INGREDIENT	**EIS/ROD**	**TRADE NAME**	**MANUFACTURER**	**NUMBER**	**REG. ****
Diuron	AK, AZ, CA, CO, ID, MT, ND,	Diuron 80DF	Agriliance, L.L.C.	9779-318	N
	NE, NM, NV, OK, OR, SD, TX,	Diuron 80DF	Alligare, LLC	81927-12	Y
	UT, WA, WY	Karmex DF	DuPont Crop Protection	352-692	Y
		Karmex XP	DuPont Crop Protection	352-692	Y
		Karmex IWC	DuPont Crop Protection	352-692	Y
		Direx 4L	DuPont Crop Protection	352-678	Y
		Direx 80DF	Griffin Company	1812-362	Y
		Direx 4L	Griffin Company	1812-257	Y
		Diuron 4L	Loveland Products Inc.	34704-854	Y
		Diuron 80 WDG	Loveland Products Inc.	34704-648	N
		Diuron 4L	Makteshim Agan of N.A.	66222-54	N
		Diuron 80WDG	UAP-Platte Chem. Co.	34704-648	N
		Vegetation Man. Diuron 80 DF	Vegetation Man., LLC	66222-51-74477	N
		Diuron-DF	Wilbur-Ellis	00352-00-508-02935	N
		Diuron 80DF	Winfield	9779-	N

			Solutions, LLC	318	
Fluridone	AK, AZ, CA, CO, ID, MT, ND,	Avast!	SePRO	67690-30	Y
	NE, NM, NV, OK, OR, SD, TX,	Sonar AS	SePRO	67690-4	Y
	UT, WA, WY	Sonar Precision Release	SePRO	67690-12	Y
		Sonar Q	SePRO	67690-3	Y
		Sonar SRP	SePRO	67690-3	Y
Glyphosate	AK, AZ, CA, CO, ID, MT, ND,	Aqua Star	Albaugh, Inc./Agri Star	42750-59	Y
	NE, NM, NV, OK, OR, SD, TX,	Forest Star	Albaugh, Inc./Agri Star	42570-61	Y
	UT, WA, WY	GlyStar Gold	Albaugh, Inc./Agri Star	42750-61	Y
		Gly Star Original	Albaugh, Inc./Agri Star	42750-60	Y
		Gly Star Plus	Albaugh, Inc./Agri Star	42750-61	Y
		Gly Star Pro	Albaugh, Inc./Agri Star	42750-61	Y
		Glyphosate 4 PLUS	Alligare, LLC	81927-9	Y
		Glyphosate 5.4	Alligare, LLC	81927-8	Y
		Glyfos	Cheminova	4787-31	Y
		Glyfos PRO	Cheminova	67760-57	Y
		Glyfos Aquatic	Cheminova	4787-34	Y
	STATES WITH APPROVAL				
ACTIVE	**BASED UPON CURRENT**			**EPA REG.**	**CA**
INGREDIENT	**EIS/ROD**	**TRADE NAME**	**MANUFACTURER**	**NUMBER**	**REG. ****
Glyphosate - cont.	AK, AZ, CA, CO, ID, MT, ND,	ClearOut 41 Plus	Chem. Prod. Tech., LLC	70829-3	N
	NE, NM, NV, OK, OR, SD, TX,	Accord Concentrate	Dow AgroSciences	62719-324	Y
	UT, WA, WY	Accord SP	Dow AgroSciences	62719-322	Y

		Accord XRT	Dow AgroSciences	62719-517	Y
		Accord XRT II	Dow AgroSciences	62719-556	Y
		Glypro	Dow AgroSciences	62719-324	Y
		Glypro Plus	Dow AgroSciences	62719-322	Y
		Rodeo	Dow AgroSciences	62719-324	Y
		Showdown	Helena Chemical Company	71368-25-5905	Y
		Mirage	Loveland Products Inc.	34704-889	Y
		Mirage Plus	Loveland Products Inc.	34704-890	Y
		Aquamaster	Monsanto	524-343	Y
		Roundup Original	Monsanto	524-445	Y
		Roundup Original II	Monsanto	524-454	Y
		Roundup Original II CA	Monsanto	524-475	Y
		Honcho	Monsanto	524-445	Y
		Honcho Plus	Monsanto	524-454	Y
		Roundup PRO	Monsanto	524-475	Y
		Roundup PRO Concentrate	Monsanto	524-529	Y
		Roundup PRO Dry	Monsanto	524-505	Y
		Roundup PROMAX	Monsanto	524-579	Y
		Aqua Neat	Nufarm Americas Inc.	228-365	Y
		Credit Xtreme	Nufarm Americas Inc.	71368-81	Y
		Foresters	Nufarm Americas Inc.	228-381	Y
		Razor	Nufarm Americas Inc.	228-366	Y
		Razor Pro	Nufarm Americas Inc.	228-366	Y
		GlyphoMate 41	PBI/Gordon Corporation	2217-847	Y
		AquaPro Aquatic Herbicide	SePRO Corporation	62719-324-67690	Y
		Rattler	Setre (Helena)	524-445-5905	Y
		Buccaneer	Tenkoz	55467-10	Y
		Buccaneer Plus	Tenkoz	55467-9	Y
		Mirage Herbicide	UAP-Platte Chem. Co.	524-445-34704	Y
		Mirage Plus Herbicide	UAP-Platte Chem. Co.	524-454-	Y

				34704	
	STATES WITH APPROVAL				
ACTIVE	**BASED UPON CURRENT**			**EPA REG.**	**CA**
INGREDIENT	**EIS/ROD**	**TRADE NAME**	**MANUFACTURER**	**NUMBER**	**REG. ****
Glyphosate - cont.	AK, AZ, CA, CO, ID, MT, ND,	Gly-4 Plus	Universal Crop Protection Alliance, LLC	72693-1	Y
	NE, NM, NV, OK, OR, SD, TX,	Gly-4 Plus	Universal Crop Protection Alliance, LLC	42750-61-72693	Y
	UT, WA, WY	Gly-4	Universal Crop Protection Alliance, LLC	42750-60-72693	Y
		Glyphosate 4	Vegetation Man., LLC	73220-6-74477	Y
		Agrisolutions Cornerstone	Winfield Solutions, LLC	1381-191	Y
		Agrisolutions Cornerstone Plus	Winfield Solutions, LLC	1381-192	Y
		Agrisolutions Rascal	Winfield Solutions, LLC	1381-191	N
		Agrisolutions Rascal Plus	Winfield Solutions, LLC	1381-192	N
Glyphosate +	AK, AZ, CA, CO, ID, MT, ND,	Landmaster BW	Albaugh, Inc./Agri Star	42570-62	N
2,4-D	NE, NM, NV, OK, OR, SD, TX,	Campaign	Monsanto	524-351	N
	UT, WA, WY	Landmaster BW	Monsanto	524-351	N
Hexazinone	AK, AZ, CA, CO, ID, MT, ND,	Velpar ULW	DuPont Crop Protection	352-450	N
	NE, NM, NV, OK, OR, SD, TX,	Velpar L	DuPont Crop Protection	352-392	Y
	UT, WA, WY	Velpar DF	DuPont Crop Protection	352-581	Y
		Velossa	Helena Chemical Company	5905-579	Y
		Pronone MG	Pro-Serve	33560-	N

				21	
		Pronone 10G	Pro-Serve	33560-21	Y
		Pronone 25G	Pro-Serve	33560-45	N
Hexazinone +	AK, AZ, CA, CO, ID, MT, ND, NE,	Westar	DuPont Crop Protection	352-626	Y
Sulfometuron methyl	NM, NV, OK, OR, SD, TX, UT,	Oustar	DuPont Crop Protection	352-603	Y
	WA, WY				
NOTE: In accordance with the Record of Decision for the *Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western*					
***States Programmatic Environmental Impact Statement* (PEIS), the aerial application of these herbicides is prohibited.**					
Imazapic	AZ, CO, ID, MT, ND, NE, NM,	Panoramic 2SL	Alligare, LLC	66222-141-81927	N
	NV, OK, OR, SD, TX, UT, WA,	Plateau	BASF	241-365	N
	WY				
Imazapic +	AZ, CO, ID, MT, ND, NE, NM,	Journey	BASF	241-417	N
Glyphosate	NV, OK, OR, SD, TX, UT, WA,				
	WY				
	STATES WITH APPROVAL				
ACTIVE	**BASED UPON CURRENT**			**EPA REG.**	**CA**
INGREDIENT	**EIS/ROD**	**TRADE NAME**	**MANUFACTURER**	**NUMBER**	**REG. ****
Imazapyr	AK, AZ, CA, CO, ID, MT, ND,	Imazapyr 2SL	Alligare, LLC	81927-23	N
	OR, NE, NM, NV, OK, SD, TX,	Imazapyr 4SL	Alligare, LLC	81927-24	N
	UT, WA, WY	Ecomazapyr 2SL	Alligare, LLC	81927-22	N

		Arsenal Railroad Herbicide	BASF	241-273	N
		Chopper	BASF	241-296	Y
		Arsenal Applicators Conc.	BASF	241-299	N
		Arsenal	BASF	241-346	N
		Arsenal PowerLine	BASF	241-431	N
		Stalker	BASF	241-398	N
		Habitat	BASF	241-426	Y
		Polaris	Nufarm Americas Inc.	228-534	Y
		Polaris AC	Nufarm Americas Inc.	241-299-228	Y
		Polaris AC	Nufarm Americas Inc.	228-480	Y
		Polaris AQ	Nufarm Americas Inc.	241-426-228	Y
		Polaris RR	Nufarm Americas Inc.	241-273-228	N
		Polaris SP	Nufarm Americas Inc.	228-536	Y
		Polaris SP	Nufarm Americas Inc.	241-296-228	Y
		Polaris Herbicide	Nufarm Americas Inc.	241-346-228	N
		Habitat Herbicide	SePRO	241-426-67690	Y
		SSI Maxim Arsenal 0.5G	SSI Maxim Co., Inc.	34913-23	N
		Ecomazapyr 2 SL	Vegetation Man., LLC	74477-6	N
		Imazapyr 2 SL	Vegetation Man., LLC	74477-4	N
		Imazapyr 4 SL	Vegetation Man., LLC	74477-5	N
Imazapyr +	AK, AZ, CA, CO, ID, MT, ND,	Mojave 70 EG	Alligare, LLC	74477-9-81927	N
Diuron	OR, NE, NM, NV, OK, SD, TX,	Sahara DG	BASF	241-372	N
	UT, WA, WY	Imazuron E-Pro	Etigra, LLC	79676-54	N
		SSI Maxim Topsite 2.5G	SSI Maxim Co., Inc.	34913-22	N
Imazapyr +	AK, AZ, CA, CO, ID, MT, ND,	Lineage Clearstand	DuPont Crop Protection	352-766	N
Metsulfuron methyl	OR, NE, NM, NV, OK, SD, TX,				

	UT, WA, WY				
	STATES WITH APPROVAL				
ACTIVE	**BASED UPON CURRENT**			**EPA REG.**	**CA**
INGREDIENT	**EIS/ROD**	**TRADE NAME**	**MANUFACTURER**	**NUMBER**	**REG. ****
Imazapyr +	AK, AZ, CA, CO, ID, MT, ND,	Lineage HWC	DuPont Crop Protection	352-765	N
Sulfometuron methyl +	OR, NE, NM, NV, OK, SD, TX,	Lineage Prep	DuPont Crop Protection	352-767	N
Metsulfuron methyl	UT, WA, WY				
NOTE: In accordance with the Record of Decision for the *Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western*					
***States Programmatic Environmental Impact Statement* (PEIS), the aerial application of these herbicides is prohibited.**					
Metsulfuron methyl	AK, AZ, CO, ID, MT, ND, OR,	MSM 60	Alligare, LLC	81927-7	N
	NE, NM, NV, OK, SD, TX, UT,	AmTide MSM 60DF Herbicide	AmTide, LLC	83851-3	N
	WA, WY	Escort DF	DuPont Crop Protection	352-439	N
		Escort XP	DuPont Crop Protection	352-439	N
		MSM E-Pro 60 EG Herbicide	Etigra, LLC	81959-14	N
		MSM E-AG 60 EG Herbicide	Etigra, LLC	81959-14	N
		Patriot	Nufarm Americas Inc.	228-391	N
		PureStand	Nufarm Americas Inc.	71368-38	N
		Metsulfuron Methyl DF	Vegetation Man., L.L.C.	74477-2	N
Metsulfuron	AK, AZ, CO,	Cimarron Extra	DuPont Crop	352-669	N

methyl +	ID, MT, ND,		Protection		
Chlorsulfuron	NE, NM, NV, OK, OR-East, SD,	Cimarron Plus	DuPont Crop Protection	352-670	N
	TX, UT, WA, WY				
Metsulfuron methyl +	AK, AZ, CO, ID, MT, ND,	Cimarron MAX	DuPont Crop Protection	352-615	N
Dicamba + 2,4-D	NE, NM, NV, OK, OR, SD, TX,				
	UT, WA, WY				
Picloram	AZ, CO, ID, MT, ND, NE, NM,	Triumph K	Albaugh, Inc.	42750-81	N
	NV, OK, OR, SD, TX, UT, WA,	Triumph 22K	Albaugh, Inc.	42750-79	N
	WY	Picloram K	Alligare, LLC	42750-81-81927	N
		Picloram K	Alligare, LLC	81927-17	N
		Picloram 22K	Alligare, LLC	42750-79-81927	N
		Picloram 22K	Alligare, LLC	81927-18	N
		Grazon PC	Dow AgroSciences	62719-181	N
	STATES WITH APPROVAL				
ACTIVE	**BASED UPON CURRENT**			**EPA REG.**	**CA**
INGREDIENT	**EIS/ROD**	**TRADE NAME**	**MANUFACTURER**	**NUMBER**	**REG. ****
Picloram - cont.	AZ, CO, ID, MT, ND, NE, NM,	OutPost 22K	Dow AgroSciences	62719-6	N
	NV, OK, OR, SD, TX, UT, WA,	Tordon K	Dow AgroSciences	62719-17	N
	WY	Tordon 22K	Dow AgroSciences	62719-6	N
		Trooper 22K	Nufarm	228-535	N

			Americas Inc.		
Picloram +	AZ, CO, ID, MT, ND, NE, NM,	GunSlinger	Albaugh, Inc.	42750-80	N
2,4-D	NV, OK, OR, SD, TX, UT, WA,	Picloram + D	Alligare, LLC	42750-80-81927	N
	WY	Picloram + D	Alligare, LLC	81927-16	N
		Tordon 101M	Dow AgroSciences	62719-5	N
		Tordon 101 R Forestry	Dow AgroSciences	62719-31	N
		Tordon RTU	Dow AgroSciences	62719-31	N
		Grazon P+D	Dow AgroSciences	62719-182	N
		HiredHand P+D	Dow AgroSciences	62719-182	N
		Pathway	Dow AgroSciences	62719-31	N
		Trooper 101	Nufarm Americas Inc.	228-561	N
		Trooper P + D	Nufarm Americas Inc.	228-530	N
Picloram +	AZ, CO, ID, MT, ND, NE, NM,	Trooper Extra	Nufarm Americas Inc.	228-586	N
2,4-D +	NV, OK, OR, SD, TX, UT, WA,				
Dicamba	WY				
Sulfometuron methyl	AK, AZ, CA, CO, ID, MT, ND,	SFM 75	Alligare, LLC	81927-26	Y
	OR, NE, NM, NV, OK, SD, TX,	Oust DF	DuPont Crop Protection	352-401	N
	UT, WA, WY	Oust XP	DuPont Crop Protection	352-601	Y
		SFM E-Pro 75EG	Etigra, LLC	79676-16	Y
		Spyder	Nufarm Americas Inc.	228-408	Y
		SFM 75	Vegetation Man., L.L.C.	72167-11-74477	Y

NOTE: In accordance with the Record of Decision for the *Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western*					
***States Programmatic Environmental Impact Statement* (PEIS), the aerial application of these herbicides is prohibited.**					
	STATES WITH APPROVAL				
ACTIVE	**BASED UPON CURRENT**			**EPA REG.**	**CA**
INGREDIENT	**EIS/ROD**	**TRADE NAME**	**MANUFACTURER**	**NUMBER**	**REG. ****
Sulfometuron methyl +	AK, AZ, CA, CO, ID, MT, ND,	Landmark XP	DuPont Crop Protection	352-645	Y
Chlorsulfuron	NE, NM, NV, OK, OR-East, SD,				
	TX, UT, WA, WY				
NOTE: In accordance with the Record of Decision for the *Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western*					
***States Programmatic Environmental Impact Statement* (PEIS), the aerial application of this herbicide is prohibited.**					
Sulfometuron methyl +	AK, AZ, CA, CO, ID, MT, ND,	Oust Extra	DuPont Crop Protection	352-622	N
Metsulfuron methyl	OR, NE, NM, NV, OK, SD, TX,				
	UT, WA, WY				
NOTE: In accordance with the Record of Decision for the *Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western*					
***States Programmatic Environmental Impact Statement* (PEIS), the aerial application of this herbicide is prohibited.**					
Tebuthiuron	AZ, CA, CO, ID, MT, ND, NE,	Alligare Tebuthiuron 80 WG	Alligare, LLC	81927-37	Y
	NM, NV, OK, OR-East, SD,	Alligare Tebuthiuron 20 P	Alligare, LLC	81927-41	Y

	TX,				
	UT, WA, WY	Spike 20P	Dow AgroSciences	62719-121	Y
		Spike 80DF	Dow AgroSciences	62719-107	Y
		SpraKil S-5 Granules	SSI Maxim Co., Inc.	34913-10	Y
Tebuthiuron +	AZ, CA, CO, ID, MT, ND, NE,	SpraKil SK-13 Granular	SSI Maxim Co., Inc.	34913-15	Y
Diuron	NM, NV, OK, OR-East, SD, TX,	SpraKil SK-26 Granular	SSI Maxim Co., Inc.	34913-16	Y
	UT, WA, WY				
Triclopyr	AK, AZ, CA, CO, ID, MT, ND,	Triclopyr 4EC	Alligare, LLC	72167-53-74477	Y
	OR, NE, NM, NV, OK, SD, TX,	Triclopyr 3	Alligare, LLC	81927-13	Y
	UT, WA, WY	Triclopry 4	Alligare, LLC	81927-11	Y
		Element 3A	Dow AgroSciences	62719-37	Y
		Element 4	Dow AgroSciences	62719-40	Y
		Forestry Garlon XRT	Dow AgroSciences	62719-553	Y
		Garlon 3A	Dow AgroSciences	62719-37	Y
		Garlon 4	Dow AgroSciences	62719-40	Y
		Garlon 4 Ultra	Dow AgroSciences	62719-527	Y
	STATES WITH APPROVAL				
ACTIVE	**BASED UPON CURRENT**			**EPA REG.**	**CA**
INGREDIENT	**EIS/ROD**	**TRADE NAME**	**MANUFACTURER**	**NUMBER**	**REG. ****
Triclopyr - cont.	AK, AZ, CA, CO, ID, MT, ND,	Remedy	Dow AgroSciences	62719-70	Y
	OR, NE,	Remedy Ultra	Dow	62719-	Y

	NM, NV, OK, SD, TX,		AgroSciences	552	
	UT, WA, WY	Pathfinder II	Dow AgroSciences	62719-176	Y
		Trycera	Helena Chemical Company	5905-580	Y
		Relegate	Nufarm Americas Inc.	228-521	Y
		Relegate RTU	Nufarm Americas Inc.	228-522	Y
		Tahoe 3A	Nufarm Americas Inc.	228-384	Y
		Tahoe 3A	Nufarm Americas Inc.	228-518	Y
		Tahoe 3A	Nufarm Americas Inc.	228-520	Y
		Tahoe 4E	Nufarm Americas Inc.	228-385	Y
		Tahoe 4E Herbicide	Nufarm Americas Inc.	228-517	Y
		Renovate 3	SePRO Corporation	62719-37-67690	Y
		Renovate OTF	SePRO Corporation	67690-42	Y
		Ecotriclopyr 3 SL	Vegetation Man., LLC	72167-49-74477	N
		Triclopyr 3 SL	Vegetation Man., LLC	72167-53-74477	N
Triclopyr +	AK, AZ, CA, CO, ID, MT, ND,	Everett	Alligare, LLC	81927-29	Y
2,4-D	OR, NE, NM, NV, OK, SD, TX,	Crossbow	Dow AgroSciences	62719-260	Y
	UT, WA, WY	Candor	Nufarm Americas Inc.	228-565	Y
		Aquasweep	Nufarm Americas Inc.	228-316	N
Triclopyr +	AK, AZ, CA, CO, ID, MT, ND,	Prescott Herbicide	Alligare, LLC	81927-30	Y
Clopyralid	OR, NE, NM, NV, OK, SD, TX,	Redeem R&P	Dow AgroSciences	62719-337	Y
	UT, WA, WY	Brazen	Nufarm Americas Inc.	228-564	Y

*** Refer to the complete label prior to considering the use of any herbicide formulation. Label changes can impact the intended use through, such things as,**					
creation or elimination of Special Local Need (SLN) or 24 (c) registrations, changes in application sites, rates and timing of application, county restrictions, etc.					
**** Just because a herbicide has a Federal registration, and is approved under the current EIS, it may or may not be registered for use in California. This**					
column identifies those formulations for which there is a California registration.					

Appendix G

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Ch 6 (page 65-71)

III. Treatment Methods

The treatments used by BLM for manipulating or restoring vegetation include fire, mechanical, manual, biological, and chemical. In-depth discussion of the various methods and techniques within these categories, including advantages, limitations, effectiveness, and relative costs, is described in the Vegetation Treatments on BLM Lands EIS/PER (USDI, BLM, 2007b) and Monsen et al. (2004). These or other sources of such information relevant to treatment methods and techniques should be consulted during the treatment selection process. For most vegetation treatment projects, pre-treatment surveys are conducted before selecting one or more treatment methods. These surveys involve consideration of all feasible treatments, including their potential effectiveness based on previous experience, local monitoring results and best available science, potential environmental impacts, and costs. Before vegetation treatment or ground disturbance would occur, BLM should consult specialists or databases for sensitive areas within the project area. Sites may require survey for listed or proposed federal threatened or endangered species, BLM sensitive species, and for evidence of cultural or historic sites. In some cases, areas may receive one or more treatments in combination, such as prescribed burning followed by an herbicide application. Some areas may be treated using one or more treatment methods over several years. The following general characteristics of each treatment category are summarized from the Vegetation Treatments on BLM Lands EIS/PER (USDI, 2007).

A. Fire

Fire applications can include using prescribed fire, wildland fire use, or other pyrrhic methods to achieve resource benefits. Prescribed fire is the intentional application of fire to wildland fuels under specified conditions of fuels, weather, and other variables. In areas where there is no threat to human life or property, wildland fires are used for resource benefit to maintain ecosystems that are functioning within their normal fire regime. These fires must meet specific environmental prescriptions and they are utilized only in pre-planned areas and when there are adequate fire management personnel and equipment available to achieve defined resource objectives. The Fire Management Plan (FMP) serves as the program strategy document for fuels treatments and prescribed fire activities. It identifies how fuels treatments, fire use, and other fire management strategies will be used to meet the overall land management goals identified in land-use plans. The FMP also identifies areas where the use of wildland fire for resource benefits is acceptable. The Prescribed Fire Plan is a stand-alone, legal document that provides the prescribed fire burn boss all the information needed to implement the project. Prescribed fire projects must be implemented in compliance with the written plan. A Wildland Fire Implementation Plan (WFIP) is prepared for all wildland fires that are managed for resource benefit. The WFIP is an operational plan for assessing, analyzing, and selecting strategies for wildland fire use. It is progressively developed, and documents appropriate management responses for any wildland fire managed for resource benefits.

Factors considered when designing a burn plan and implementing a prescribed burn include weather conditions, vegetation types and density, slope, fuel moisture content, time of year, risks to dwellings and property, alternative treatment methods, and potential impacts on air quality,

land use, cultural resources, and threatened and endangered species. Hand-held tools, such as drip torches, propane torches, diesel flame-throwers, and flares, may be used to start a prescribed fire. Mass ignition techniques include terra-torches and heli-torches, which release an ignited gelled fuel mixture onto the area to be treated. Helicopters may also be used to drop hollow polystyrene spheres containing potassium permanganate that are injected with ethylene glycol immediately before ignition. The sphere ignition method is best used for spot-firing programs. Prescribed fire can be used in some situations where some other treatment methods are not feasible due to soil rockiness, slope steepness, or terrain irregularity; although prescribed fire is limited to situations where adequate fuel is available to carry the fire. It is also relatively inexpensive to treat vegetation using fire, ranging from $20 to $500 per acre, with higher costs associated with treating forest lands in California and Oregon. The use of prescribed fire comes with a risk of the fire getting out of control and damaging property and endangering human life. Thus, chemical, biological, mechanical and manual methods, instead of fire, are often used to control vegetation near communities. In some situations, prescribed fire can encourage the germination and establishment of weeds if a treatment site is not treated with herbicides or re-vegetated after fire use.

B. Mechanical

Mechanical treatment involves the use of vehicles such as wheeled tractors, crawler-type tractors, or specially designed vehicles with attached implements designed to cut, uproot, or chop existing vegetation. The selection of a particular mechanical method is based upon characteristics of the vegetation, seedbed preparation and re-vegetation needs, topography and terrain, soil characteristics, climatic conditions, and an analysis of the improvement cost compared to the expected productivity (USDI, BLM, 1991a). Mechanical methods that may be used by BLM include chaining, root plowing, tilling and drill seeding, mowing, roller chopping and cutting, blading, grubbing, and feller-bunching. As new technologies or techniques are developed, they could be used if their impacts are similar or less than existing methods. Chaining consists of pulling heavy chains (40 to 90 pounds per link) in a “U” or “J” shaped pattern behind two crawler-type tractors. A chain is usually 250 to 300 feet long, and may weigh as much as 32,000 pounds. The width of each swath varies from 75 feet to 120 feet. Chain link size, modifications to links, and operation of the crawler tractors determine the number and size of trees and shrubs that are removed and the effects on understory species. Chaining can be conducted during the appropriate season to benefit soil stability and plant seeding, and reduce the invasion of weeds (Monsen et al., 2004). Chaining works best for crushing brittle brush and uprooting woody plants. Chaining can be done on irregular, moderately rocky terrain, with slopes of up to 20%. Chaining may cause soil disturbance, but the plant debris can be left in place to minimize runoff and erosion, shade the soil surface, and maintain soil moisture and nutrient recycling. Alternatively, the debris can be burned to facilitate seeding, improve scenic values, and eliminate potential rodent habitat. Chaining is a cost-effective means of incorporating seed into soil, especially in burned areas. Chaining provides a variety of seeding depths and microsites, as well as improves ground cover and forage production. Recent studies showed improved seedling establishment on chained sites resulted in less downy brome establishment three years after fire in sagebrush and pinyon-juniper habitats (Ott et al., 2003). Tilling involves the use of angled disks (disk tilling) or pointed metal-toothed implements (chisel plowing) to uproot, chop, and mulch vegetation. This technique is best used in situations where thinning or complete removal of vegetation is desired, and in conjunction with seeding operations. Tilling

leaves mulched vegetation near the soil surface, which encourages the growth of newly planted seeds. Tilling is usually done with a brushland plow, a single axle with an arrangement of angle disks that covers about 10-foot swaths. An offset disk plow, consisting of multiple rows of disks set at different angles to each other, is pulled by a crawler-type tractor or a large rubber tire tractor. This method is often used for removal of sagebrush and similar shrubs. It works best on areas with smooth terrain, and deep, rock-free soils. Chisel plowing can be used to break up soils such as hardpan. Often, drill seeding is conducted along with tilling. Seed drills, which consist of a series of furrow openers, seed metering devices, seed hoppers, and seed covering devices, are either towed by or mounted on tractors. A seed drill opens a furrow in the seedbed, deposits a measured amount of seed into the furrow, and closes the furrow to cover the seed. Mowing tools, such as rotary mowers or straight-edged cutter bar mowers, can be used to cut herbaceous and woody vegetation above the ground surface. Mowing is often done along highway rights-of-way (ROW) to reduce fire hazards, improve visibility, prevent snow buildup, or improve the appearance of the area. Mowing in sagebrush habitats can create mosaics of uneven-aged stands and enhance wildlife habitat. Mowing is most effective on annual and biennial plants (Rees et al. 1996). Weeds are rarely killed by mowing, and an area may have to be mowed repeatedly for the treatment to be effective. However, the use of a "wet blade," in which an herbicide flows along the mower blade and is applied directly to the cut surface of clipped plants, has greatly improved the control of some species. In addition, chipping equipment can be used to cut and chip vegetation in one pass. Roller-chopping tools are heavy-bladed drums that, through a rolling action, cut and crush vegetation up to five inches in diameter. The drums are pulled by crawler-type tractors, farm tractors, or a special type of self-propelled vehicle designed for forested areas or range improvement projects. Blading entails using a crawler-type tractor blade to shear small brush at ground level. Topsoil could be scraped with the brush and piled into windrows during this operation. Blading use is limited to areas where degradation to the soil is acceptable, such as along ROW or in roadside ditches (USDI BLM 1991a). Grubbing is done with a crawler-type tractor and a brush or root rake attachment. The rake attachment consists of a standard dozer blade adapted with a row of curved teeth projecting forward at the blade base. Brush is uprooted and roots are combed from the soil by placing the base of the blade below the soil surface. Grubbing greatly disturbs perennial grasses, so grubbed areas are usually reseeded to prevent extensive runoff and erosion (USDI BLM 1991a). Feller-bunchers are machines that grab trees, cut them at the base, pick them up, and move them into a pile or onto the bed of a truck (BPA, 2000). Feller-bunchers are used in forest and woodland thinning to remove potential hazardous fuels. Large chippers, or "tub-grinders," are often used to chip the limbs, bark, and wood of trees to generate mulch or biomass, which can be used in power generation facilities. Mechanical methods are effective for removing thick stands of vegetation. Some mechanical equipment can also mulch or lop and scatter vegetation debris, so debris disposal is taken care of while the vegetation is removed. Mechanical methods are appropriate where a high level of control over vegetation removal is needed, such as in sensitive wildlife habitats or near homesites, and are often used instead of prescribed fire or herbicide treatments for vegetation control in the WUI. Unless used with follow-up herbicide treatments, mechanical treatments have limited use for noxious weed control, because the machinery tends to spread seeds and not kill roots. Mechanical vegetation control costs from $100 to $600 per acre for equipment and labor (BPA, 2000). Additionally, repeated mechanical treatments are often necessary due to residual weed seed in the seed bank.

C. Manual

Manual treatment involves the use of hand tools and hand-operated power tools to cut, clear, or prune herbaceous and woody species. Treatments include cutting undesired plants above the ground level; pulling, grubbing, or digging out root systems of undesired plants to prevent sprouting and regrowth; cutting at the ground level or removing competing plants around desired species; or placing mulch around desired vegetation to limit competitive growth (USDI, BLM, 1991a). Hand tools used include the handsaw, axe, shovel, rake, machete, grubbing hoe, mattock (combination of cutting edge and grubbing hoe), pulaski (combination of axe and grubbing hoe), brush hook, and hand clippers. Power tools such as chain saws and power brush saws are also used, particularly for thickstemmed plants. Manual treatments, such as hand-pulling and hoeing, are most effective where weed infestation is limited and soil types allow for complete removal of the plant material (Rees et al., 1996). Additionally, pulling works well for annual and biennial plants, shallow-rooted plant species that do not re-sprout from residual roots, and plants growing in sandy or gravelly soils. Repeated treatments are often necessary due to soil disturbance and residual weed seeds in the seed bank.

Manual techniques can be used in many areas and usually with minimal environmental impacts. Although they have limited value for weed control over a large area, manual techniques can be highly selective. Manual treatment can be used in sensitive habitats such as riparian areas, areas where burning or herbicide application would not be appropriate, and areas that are inaccessible to ground vehicles (USDI, BLM, 1991a). Manual treatments are expensive and labor intensive, compared to other vegetation management methods such as prescribed burning and herbicide application. Typical manual vegetation control costs range from $70 to $700 per acre. Manual methods may also be more dangerous for the workers involved in implementation because of the use of sharp tools and the difficulties associated with working conditions, such as steep terrain with slippery ground cover. Also, some plants may contain potentially toxic or hazardous compounds. While manual techniques may not be highly efficient or cost effective over large acreages, they may be very useful, and necessary, for specific invasive species problems, and for educating public land users.

D. Biological Control

Biological control involves the intentional use of domestic animals, insects, nematodes, mites, or pathogens (agents such as bacteria or fungus that can cause diseases in plants) that weaken or destroy vegetation (USDI, BLM, 1991a, BPA, 2000). Biological control is used to reduce targeted weed populations to acceptable levels by stressing target plants and reducing competition with desired plant species. Domestic animals, such as cattle, sheep, or goats, control the top-growth of certain invasive and noxious weeds, which can help to weaken the plants and reduce the reproduction potential. Using the weeds as a food source, some animal species can consume 50% or more of their daily diet as target weeds after a brief adjustment period (Tu et al., 2001). They can also reduce the amount of flammable vegetation or alter the vertical and horizontal of the vegetation to alter wildfire behavior and effects. Cattle primarily eat grass, but also some shrubs and forbs. Sheep consume many forbs, as well as grasses and shrubs, but tend not to graze an area uniformly. Goats typically eat large quantities of woody vegetation as well as forbs, and tend to eat a greater variety of plants than sheep (USDI BLM 1991a; Tu et al. 2001). Goats and sheep are effective control agents for leafy spurge, Russian knapweed, toadflax, other weed species, and some types of shrubs. A successful treatment program can enhance habitat for wildlife. For example, cattle and sheep feeding in the spring and early

summer can thin understory forbs and grasses, reducing competition for light, nutrients, and water for desirable shrub species. The shrub species will increase their vegetative output for winter browsing by deer and other wildlife (USDI, BLM, 1991a). In order for this treatment to be effective, the right combination of animals, stocking rates, timing, and rest must be used. Grazing by domestic animals should occur when the target species is palatable and when feeding on the plants can damage them or reduce viable seeds. Additionally, grazing should be restricted during critical growth stages of desirable competing species. When desirable species are present, there must be adequate rest following the treatment to allow desirable species to recover. Whenever the use of livestock to control vegetation is being considered, the needs of the domestic animals as well as the other multiple-use objectives for the area must be considered. A herder, fencing, or mineral block may be required to keep livestock within the desired area. Many weed species are less palatable than desired vegetation, so livestock may overgraze desired vegetation rather than the target weeds. Additionally, some weeds may be toxic to certain livestock and not to others, which will influence the management option selected (Tu et al., 2001). Proper management of domestic animals is extremely important if this method of treatment is to be successful (Olson, 1999). Caution should be used whenever grazing or any other vegetation control is prescribed near riparian areas, in steep topography, or in areas with highly erodible soils. Weed seeds may still be viable after passing through the digestive tract of animals, so the animals should not be moved to weed-free areas until ample time has passed for all seeds to pass through their systems. Seeds can also travel on the animals' fur (Tu et al., 2001). Plant-eating insects, nematodes, mites, or pathogens affect plants directly, by destroying vital plant tissues and functions, and indirectly, by increasing stress on plants, which may reduce their ability to compete with other plants (BPA, 2000). Several biological control agents can be used together to reduce undesired vegetation density to an acceptable level. Biological control agents currently used by BLM have been tested by the USDA Agricultural Research Service to ensure that they are host-specific and will feed only on the target plant and not on crops, native flora, or endangered or threatened plant species. Once biological control agents become established, they can reproduce and increase in numbers and continue to affect target organisms. However, it may take as many as 15 to 20 years for agents to establish themselves and bring about the desired level of control. Biological control agents are most suitable for treating large sites where target plants are well established and very competitive with native species. Agents are also often fairly mobile and can seek out new host plants (Rees et al., 1996). It is unlikely that biological control agents will eradicate a pest plant, because as populations of the host plant decrease, populations of the agent will also decline. Treatment of noxious weeds using domestic animals is relatively inexpensive, costing about $12 to $15 per acre. Biological control costs using insects, nematodes, mites, or other pathogens range from $80 to $150 per release for ground applications and $150 to $300 for aerial releases (BPA, 2000). The cost reflects the limited availability of appropriate control agents and expertise required in dealing with the agents and treating areas. Biological treatments are most effective when followed with other treatments.

E. Herbicides

Herbicides are chemicals that kill or injure plants, and all herbicides interfere with plant metabolism in a variety of ways (Bussan and Dyer, 1999). They can be categorized as selective or non-selective. Selective herbicides kill only a specific type of plant, such as broad-leaved plants. Some herbicides used for noxious weed control are selective for broad-leaved plants, so that they can be used to control weeds while maintaining grass species. Non-selective herbicides

must be used carefully around desirable and non-target plants (Rees et al., 1996). Only those herbicides approved for BLM use can be used (See the Final Vegetation Treatments EIS (USDI, BLM, 2007b) for additional information the approval process. Some new chemicals may be used for experimental trials on three plots of no more than five acres each. Herbicide treatments must comply with USEPA label directions and follow BLM procedures outlined in BLM Handbook H-9011-1 (Chemical Pest Control), and manuals 1112 (Safety), 9011 (Chemical Pest Control), and 9015 (Integrated Weed Management), and meet or exceed states' label standards (USDI, BLM, 1991a). Application methods depend upon treatment objective(s) (removal or reduction); the accessibility, topography, and size of the treatment area; characteristics of the target species and the desired vegetation; location of sensitive areas and potential environmental impacts in the immediate vicinity; anticipated costs and equipment limitations; and meteorological and vegetative conditions of treatment areas at the time of treatment. A project file with NEPA documentation and a ROD is developed for each herbicide project. A pesticide use proposal (PUP) is then completed by a person whose certification by BLM course 9000-1 is current and sent to the State weed coordinator for signatures. The NEPA documentation includes information on project specifications, key personnel responsibilities, communication procedures, safety, spill response, and emergency procedures. The plan should also specify wind speeds and temperature ranges, minimum buffer widths between treatment areas and water bodies for non-aquatic use herbicides that comply with BLM policy and label restrictions (BLM Handbook H-9011-1). Herbicide application schedules are designed to maximize impacts to target species and minimize potential impacts to non-target plants and animals, while remaining consistent with the objective of the vegetation treatment program. Application rates depend upon the target species, the presence and condition of non-target vegetation, weather and site conditions, soil type, depth to the water table, presence of other water sources, the label requirements, approved BLM rates, and sensitivity of non-target species. A pesticide application report (PAR) must be filled out within 24 hours of application. Herbicides are applied aerially with helicopters or fixed-wing aircraft, and on the ground with vehicles or manual application devices. Although using helicopters is more expensive than fixed-wing aircraft, helicopters are more maneuverable and more effective in areas with irregular terrain. Helicopters also are more effective for treating target vegetation in areas with multiple vegetation types. Manual applications of herbicides are used only in small areas, in areas inaccessible by vehicle, and/ or to minimize potential impacts to non-target plants. Herbicides may be applied to green leaves with a backpack applicator or spray bottle, wick (wiped on), or wand (sprayed on). Herbicides can be applied to trees around the circumference of the trunk on the intact bark (basal bark), to cuts in the trunk or stem (frill, or "hack and squirt"), to cut stems and stumps (cut stump), or injected into the inner bark (Tu et al., 2001). Herbicides can be used selectively to control specific types of vegetation, or nonselectively to clear all vegetation on a particular area. Herbicides can be applied over large areas and in remote locations using aircraft, or applied using spot applications in environmentally sensitive areas. The cost of herbicide application generally ranges from $20 to $250 per acre (BPA, 2000). There are drawbacks and limitations to herbicide use. Herbicides can damage or kill non-target plants. Weeds may develop resistance to a particular herbicide over time. All herbicides must be applied by someone with the appropriate certification identified in state laws and BLM. The Forest Service has prepared interactive spreadsheets for some herbicides that allow the determination of exposure concentrations for plants and animals under different application rates and exposure scenarios for these herbicides. The Ecological Rise Assessments

(ERAs) are available at the Forest Service Pesticide Management and Coordination website http://www.fs.fed.us/foresthealth/pesticide/index.shtml.
Information contained in the ERAs was used by the BLM to characterize risks to non-target species from the specific chemicals and is incorporated by reference into the Vegetation Treatments PEIS. The BLM has completed risk assessments for all approved chemicals and will not approve any new ones until a risk assessment for their use is completed. The relationship between risk assessments prepared by the Forest Service and those prepared and updated by BLM is discussed in the Vegetation Treatment EIS, Volume 1, Chapter 2 (USDI, BLM, 2007).

Chapter 7 (page 71-81) - Best Management Practices
I. Introduction
Best Management Practices (BMPs) are defined by BLM Handbook H-1601-1 as a suite of techniques that guide or may be applied to management actions for achieving desired outcomes. The BMPs in this handbook are measures considered highly applicable to management actions related to integrated vegetation management that can be applied on a site-specific basis to reduce or avoid adverse environmental or social impacts. They should also be given consideration during the development of land use and activity plans. The following list of programmatic BMPs is not intended to be all inclusive, and other sources of BMPs, such as Manual Section 6840 (Special Status Species), H-4120-1 (Grazing Management), and H-8550-1 (Management of Wilderness Study Areas) should also be consulted when designing vegetation treatments. Many of the BMPs listed below are identified as Standard Operating Procedures (SOPs), Prevention Measures, or Mitigation Measures in the BLM Vegetation Treatments Using Herbicides Environmental Impact Statement Record of Decision (ROD) (USDI, BLM, 2007a) or as SOPs in the BLM Vegetation Treatments Programmatic Environmental Report (PER) (USDI, BLM, 2007b). These documents contain a much more extensive list relative to weed prevention and herbicide use. Those SOPs required by the ROD and included as BMPs in this section are identified with an asterisk. The ROD should be consulted for all required SOPs, Prevention Measures and Mitigation Measures when designing vegetation treatments. The associated Biological Assessment and Biological Opinion should also be consulted when designing vegetation treatments that use herbicides near federally listed species. The BMPs listed in this handbook should not be considered as a “one-size-fits-all” approach and don’t encompass all the effective BMPs currently required. They should be considered and applied where applicable to promote healthy, functioning native plant communities or to meet regulatory requirements. The appropriate BMPs for a particular site may vary to accommodate unique, site-specific conditions and local resource concerns. Specific BMPs should be evaluated by an interdisciplinary team to ensure they are not in conflict with resource goals and objectives. Regardless of the chosen practices, the final strategy used should ensure that the overarching goal of a healthy and functioning native plant community can be achieved by BLM vegetation management projects.
II. Best Management Practices
A. Invasive and Non-Native Species
The following BMPs focus on the prevention of further spread and/or establishment of invasive and nonnative species:
• * Before ground-disturbing activities begin, inventory weed infestation and prioritize areas for treatment in project operating areas and along access routes.
• * Minimize soil disturbance to the extent practical, consistent with project objectives.

• * Locate and use weed-free project staging areas. Avoid or minimize all types of travel through weed-infested areas or restrict travel to periods when the spread of seed or propagules is least likely.
• * Pre-treat high risk sites for weed establishment and spread before implementing projects.
• Design vegetation treatments to retain native vegetation in and around project activity areas.
• Begin project operations in areas without non-native or noxious weed species.
• Clean vehicles and equipment (remove soil and plant parts) before entering public land.
• * Clean all equipment before leaving the project site if operating in areas infested with weeds. Utilize standard contract provisions to ensure that contractors adhere to this guideline.
• Locate and manage vehicle and equipment wash stations to limit weed and invasive species spread into native plant communities.
• * Inspect and treat weeds that become established at equipment cleaning sites.
• Inspect sand, gravel and fill materials on site, and ensure that they are weed-free before use and transport. Treat weed-infested sources to eradicate weed seed and plant parts, and strip and stockpile contaminated material before using pit material offsite.
• * Survey the area where material from treated weed-infested sources is used for at least three years after project completion to ensure that any weeds transported to the site are promptly detected and controlled.
• Use caution when transporting vegetative materials and wood products from project sites to minimize the spread of invasive and non-native pests.
• *Locate project staging areas for refueling, maintenance equipment, materials and operating supplies in weed-free areas.
• Dispose of noxious weed and non-native vegetation properly to prevent unwanted spread.
• * Use certified weed-free and/or weed-seed-free hay or straw where certified materials are required and/or are reasonably available.
• * Use weed-free feed for horses and pack animals.
• Schedule management activities (e.g. livestock grazing) when they may be most detrimental to populations of noxious weeds and non-native species without harming preferred species.
• Utilize domestic animals to contain the target species in the treatment areas prior to weed seed set. If seed set has occurred, do not move the domestic animals to un-infested areas for seven days.
• Use sterile or non-persistent exotic plants at low planting densities as nurse crops for local natives to preclude the migration of noxious weeds into adjacent natural areas.
• Schedule and coordinate roadside maintenance activities in consultation with weed specialists.
• * Inspect and document all limited term ground-disturbing operations in noxious weed infested areas for at least three growing seasons following completion of the project.

B. Soil Resource

The following BMPs relate to the protection of soil structure and integrity as well as prevent erosion and compaction:
• Identify soil or site conditions that may dictate specific timing, treatment methods, or equipment, or that may lead to weather-related or seasonal closure of the operation.
• Minimize rutting on primary trails, roads, staging areas, and landings and avoid rutting in the general project area.
• Inspect soil-stabilization practices throughout all stages of operations to ensure they are successful and remain functional.
• Use heavy equipment on dry and/or frozen ground to minimize soil compaction and rutting.

• Minimize damage and/or impacts to biological soil crusts by limiting the use of heavy machinery or excessive traffic in sensitive areas.
• * Minimize use of domestic animals if removal of vegetation may cause significant soil erosion or impact biological soil crusts.
• Minimize site-disturbance on slopes with high erosion potential. Implement erosion control measures where necessary.
• Minimize soil disturbance by limiting the piling and burning of treated fuels.
• Minimize the amount of time between soil disturbance and remediation.
• Conduct mechanical treatments along topographic contours to minimize runoff and erosion.
• Minimize use of heavy equipment on slopes greater than 20%.

C. Native Plant Conservation and Revegetation

The following BMPs apply to the conservation of native plant species and communities. They also relate to the re-vegetation/reestablishment of native plants on disturbed and/or treated sites:
• Reestablish native vegetation on sites if natural regeneration is unlikely. Use native vegetation that is genetically appropriate (e.g. from the same seed zone and of similar elevation) to the area treated when conducting revegetation activities.
• Manage for a mosaic of native plant communities and successional stages across the landscape.
• *When available, use native seed of known origin, as labeled by state seed certification programs that is free of noxious and invasive weeds, as determined and documented by a seed inspection test by a certified seed laboratory.
• Mitigate and limit impacts to habitats with existing and healthy native plant populations. Consider site characteristics, environmental conditions, and application equipment in order to retain native vegetation in and around project areas to the maximum extent possible consistent with project objectives.
• Conduct pre-treatment surveys for special-status plants within or adjacent to proposed treatment areas
• Consider seasonal impacts of management actions (e.g. growing vs. dormant season disturbance effects) when developing objectives and strategies.
• Maintain proper stocking rates and livestock distribution to protect native plant communities. Manage the intensity and duration of containment by domestic animals to minimize over utilization of desirable plant species.
• Where possible, provide interim revegetation in areas being actively disturbed.
• *Limit fertilizer applications that favor annual grass growth over forb growth in newly seeded areas where invasive annuals are becoming established.
• *Use native or sterile species for rehabilitation and stabilization projects to compete with invasive species until desired vegetation establishes.
• Exclude livestock from revegetated areas for a minimum of two growing seasons or until vegetation has become established. Additional time may be required for the arid regions. Consult local policies and decisions to determine the appropriate amount of time.
• Avoid attracting bark beetles to forest and woodland areas where vegetation is being manipulated by removing the treatment residue or by burning or chipping it on site and by minimizing bark damage to residual trees. Chipping should be conducted in the fall to allow the chips to dry over the winter and before the spring bark beetle flight.
• *To support local pollinators use native seed mixes that maximize blooming times when pollinators are most active and include native nectar and pollen-producing plants.

D. Using Pesticides and Biological Controls

The following BMPs relate to the use of pesticides and/or biological controls for the purposes of integrated vegetation management (See SOPs, Prevention Measures or Mitigation Measures in the BLM Vegetation Treatments Using Herbicides Environmental Impact Statement Record of Decision (ROD) (USDI, BLM, 2007a) for complete list of required SOPs when implementing vegetation treatments using herbicides):

• Use only biological control agents on species that have been tested and have approval.
• *Select pesticides that are the least toxic, which will provide the most desired results.
• * Develop plans to thoroughly evaluate the need for chemical treatments and their potential for impact on the environment.
• * Use herbicides after considering the effectiveness of all potential methods or in combination with other methods or controls.
• * Select herbicide that is least damaging to the environment while providing the desired results.
• * 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.
• * To protect special status species, implement all conservation measures for plants, aquatic animals and terrestrial animals presented in the *Vegetation Treatments on Bureau of Land Management Lands in 17 Western States Programmatic Biological Assessment.*
• Evaluate soil characteristics prior to pesticide application to prevent unwanted transport or leaching.
• * Consider effects of wind, humidity, temperature inversions, and heavy rainfall on herbicide effectiveness and risks.
• * Use appropriate buffer zones based on label and risk assessment guidance.
• Minimize use of pesticides near wetlands and riparian areas.
• * 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.
• *Minimize impacts of pesticides on pollinators by utilizing typical application rates, maintaining chemical free buffers around important pollen/nectar sources and nesting habitats.
• Minimize damage to non-target plants by using non-broadcast treatments (e.g. spot treatments) and considering seasonality (e.g. treating during dormant periods) when possible.
• *Use chemicals only when they are the minimum method necessary to control weeds that are spreading within the wilderness or threaten lands outside the wilderness.
• * Use the “minimum tool” to treat noxious and invasive vegetation in wilderness, relying primarily on the use of ground-based tools, including backpack sprayers, hand sprayers, and pumps mounted on pack and saddle stock.
• Avoid using pesticides in areas actively grazed by livestock and/or wild horses and burros.
• Avoid using pesticides in areas of special wildlife consideration (see wildlife habitat section below).
• * Notify potentially affected parties of treatment activities that occur on public lands.
• *Post signs noting exclusion areas and the duration of exclusion, if necessary.
• * To minimize fears based on lack of information, provide public educational information on the need for vegetation treatments and the use of herbicides in an integrated pest management program for projects proposing local use of herbicides.

E. Air Quality

The following BMPs deal with the protection and maintenance of air quality. However, these BMPs are not tied directly to any air quality standards and thus, as explained earlier, are only suggestions to be considered when planning integrated vegetation management projects:

• Minimize dust impacts along roads to the extent possible.
• Manage treatments to prevent air quality violations and minimize impacts to smoke-sensitive areas.
• Consider weather-related factors such as wind when developing a smoke management plan for prescribed fire.
• Minimize burning pesticide treated vegetation for at least six months after application.

F. Wildlife Habitat

The following BMPs relate to the protection and maintenance of wildlife habitat. It is important to note that these BMPs were selected not because they minimized impacts directly to wildlife (e.g. direct take of wildlife species) but because they focused more on the habitat (i.e. the vegetation component of habitat). Therefore, any project that may directly impact wildlife should review programmatic BMPs and policies directly related to the take of individual animals:

• Follow standard procedures for compliance with Section 7 of the Endangered Species Act.
• Survey for species of concern when a project may impact sensitive or protected species (e.g. federally and state listed species) and/or their habitat.
• Consider all aspects of wildlife habitat needs (e.g. feeding, shelter, etc.) when developing management strategies. Use site-specific conservation measures from approved biological evaluations for listed species/species of special concern.
• Limit the size and intensity of disturbances within critical habitats or areas where protected/sensitive species are present that could be affected by disturbance. Limit activities which may result in long term and/or cumulative impacts to sensitive species habitats (e.g., creation of trails or roads in or adjacent to important wildlife habitat).
• Minimize direct impacts to species of concern through appropriate mitigation measures (e.g. season of activity, etc.). Avoid treatments during critical periods for wildlife (e.g. breeding, nesting, foaling, etc.).
• Consider habitat needs of bird populations (both migratory and non-migratory). Avoid activities that may disrupt nesting and breeding of sensitive bird species.
• Provide appropriate amounts of dead woody material following treatments for wildlife habitat (e.g. snags, downed logs, etc.). Take into consideration fuels management and insect pest species.
• When aircraft are used, plan flight paths and schedules to minimize impacts on wildlife.
• Minimize treatments on important forage areas necessary to sustain local livestock and wildlife populations unless they are required to stimulate growth. Use mosaic strategies to treat large areas grazed by animals.
• Design projects so that important food sources for pollinators are treated in patches and vegetation treatments are timed to occur before these sources bloom. Projects should also consider when pollinators are most actively foraging.

G. Cultural and Historical Resources

The following BMPs are related to protection and preservation of cultural and historical resources:

• *Follow standard procedures for compliance with Section 106 of the National Historic Preservation Act.

• Initiate necessary consultations with appropriate cultural resource staff, State Historic Preservation Offices, and Native American Tribes to locate any areas of significance (cultural or historical) that may be impacted.
• Conduct archeological surveys and soils tests in culturally sensitive areas where ground disturbance is possible.
• *Consider impacts to culturally significant plants and work with the appropriate federal, tribal, and state resources to plan mitigation.

H. Water Quality and Wetlands

The following BMPs deal with protection of water resources, maintenance and preservation of riparian areas, and protection of wetlands.
• Minimize crossing of streams (intermittent and perennial) and wetlands with vehicles and heavy machinery.
• Locate residue piles (sawdust, field chipping residue, etc.) away from drainages where runoff may wash residue into water bodies or wetlands.
• *Maintain appropriate vegetative/riparian buffers between treatment areas and water bodies to protect water quality.
• Manage riparian areas to provide adequate shade, sediment control, bank stability, and recruitment of wood into stream channels.
• Locate project staging areas for refueling, maintenance equipment, materials and operating supplies in areas not designated as riparian and/or streambank management zones.

I. Recreation, Visual, and Wilderness Resources

The following BMPs pertain to values and resources related to recreation, aesthetics, and wilderness values and integrity:
• Use the least-intrusive methods possible to achieve objectives in wilderness areas.
• * Use chemicals only when they are the minimum method necessary to control weeds that are spreading within the wilderness or threaten lands outside the wilderness.
• * Use the “minimum tool” to treat noxious and invasive vegetation, relying primarily on the use of ground-based tools, including backpack sprayers, hand sprayers, and pumps mounted on pack and saddle stock.
• Avoid staging areas and large clearings within the view of travel routes or recreation areas.
• Design activities that mimic the form, line, color, and texture of the natural landscape.
• Upon completion of a project remove all trash and human waste from project areas.
• Minimize visual and audible impacts in high use recreation areas.
• Design vegetation treatments to repeat natural openings and mosaic on the landscape.
• Avoid straight line edges by scalloping or feathering edges and creating irregular openings.
• Retain a mix of native plant species and sizes to create a more natural appearance.
• * Notify the public of treatment methods, hazards, time and nearby alternative recreation areas.

Appendix H.

TFO-only BLM Sensitive Species List. Most of the species' habitat descriptions are modified from Arizona Game and Fish Department, unpublished species abstract compiled and edited by the Heritage Data Management System, Arizona Game and Fish Department, Phoenix, AZ.

Common Name	Scientific Name	Habitat within TFO
Pima Indian mallow	*Abutilon parishii*	Lower Sonoran desertscrub, transition zone of Upper Sonoran grassland communities, and Sonoran deciduous riparian forest to Arizona Upland Desertscrub. Mesic situations in full sun within higher elevation Sonoran desertscrub. Higher bajadas or low in washes. Bouldery, rocky shallow soils. Found on rhyolite, granite, gneiss and Pleistocene alluvium with granite, rhyolite, limestone, slate at cliff base. On rocky hillsides, cliff bases, canyon bottoms, lower side slopes and ledges of canyons among rocks and boulders. Likes rocky substrate. Slopes can exceed 45 degrees, with fifty percent of sites on slopes of 45% or more. Occurs at 1,720 to 4,900 feet (525-1495 m). Usually in canyons with southern or western exposure; plants prefer a southern exposure even when in east- or west-facing canyons.
Aravaipa sage	*Salvia amissa*	Primarily riparian, in moist soil in the shade of boulders in mesic canyons. On riverbanks, seepage areas, and meadow habitats. Granite substrate with various exposure, but always in shade of boulders. Elevation 2,220 - 4,500 feet (677 - 1373 m).
Bartram stonecrop	*Graptopetalum bartramii*	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 with Madrean evergreen woodland. North exposure. Elevation 3,650 - 6,700 ft (1113-2044 m).
Dalhouse spleenwort	*Asplenium dalhousiae*	Shady, rocky ravines in moist soil among and at the bases of rocks, in Madrean oak woodland. Elevation 4,000 – 6,000 ft (1220-1830 m). Appears to be restricted to granitic substrates in southern Arizona. Mule, Huachuca, and Baboquivari Mts.
giant sedge	*Carex spissa var. ultra*	Aquatic/riparian woodland; oak-pinyon woodland in moist alluvial soil, sand, and gravel near perennially wet springs and streams; undulating rocky-gravelly terrain. Elevation 2,040 - 6,000 feet (610-1800 m). Southeast-facing, often shaded.
Huachuca golden aster	*Heterotheca rutteri*	Grassland and oak savanna with level, open grassland. Grows on road cuts, and disturbed sites. Based on records in the Heritage Data Management System (AGFD), elevation ranges from 3,560 - 5,275 ft (1086 - 1609 m) on various exposure and substrate.
Purple-spike coralroot	*Hexalectris warnockii*	Mixed oak woodland. Forest cover is mostly silver leaf oak with some pines, madrones, and manzanita. In humus beneath rocks and fallen oaks along streambeds. Shady canyon bottoms up to slope in oak-mixed conifer leaf litter. Elevation 5,000 - 7,000 feet (1525 - 2135 m). Rich humus soil. Quartzite in Oversight Canyon, McClure Canyon probably quartzite also. Huachuca and Mule Mts.
San Pedro River wild buckwheat	*Eriogonum terrenatum*	Creosote communities and Acacia constricta dominated Chihuahuan scrub. Gravelly clayey outcrops, slopes and flats. Also found in calcareous soil. In Pima County, the plant is restricted to clayey outcrops of the Pantano Formation, whereas in Cochise County, the plant is confined to the eroded, clay slopes and flats of the Saint David Formation. Elevation 3,520 – 3,914 ft (1073-1193 m).
Tumamoc globeberry	*Tumamoca macdougalii*	This species occurs in 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. Elevation below 3,000 feet (915 m). Various aspects, but apparently always in shrub shaded situations; slopes <5-10%. Ranges

		from sandy soils of valley bottoms to rocky soils of upper bajada slopes . Rocky alluvium from andesitic basalts
Huachuca springsnail	*Pyrgulopsis thompsoni*	Springs and cienegas inhabited by the snail, are typically marshy areas characterized by various aquatic and emergent plant species that occur within plains grasslands, oak and pine-oak woodlands, and coniferous forest vegetation communities. Typically occupies shallower areas within the cienega, which are often very limited. Often found in the rocky seep areas at the spring source. Elevation from 4,500 to 7,000 ft. (1373 – 2134 m). Monkey Canyon, Sonoita Creek, Santa Cruz River vicinity in the San Rafael Valley, Canelo Hills Cienega in the O'Donnell Canyon Area, and several canyons in the Huachuca Mountains to include: Scotia Canyon, Garden Canyon, McClure Canyon, Sawmill Canyon, Huachuca Canyon, Blacktail Canyon, Ramsey Canyon, Cienega Creek, and Redfield Canyon.
Great Plains narrow-mouthed toad	*Gastrophryne olivacea*	Mesquite semi-desert grassland to oak woodland, in the vicinity of streams, springs and rain pools. They are more terrestrial than aquatic in habits. 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. In Arizona, ranges from 1,400 – 4,700 ft (427-1434 m) within Madrean evergreen woodland, semi-desert grassland, and Sonoran Desert scrub.
lowland leopard frog	*Lithobates yavapaiensis*	Aquatic systems in desert grasslands to pinyon-juniper. Lower and Upper Sonoran Desert, grassland, oak and oak-pine woodland. Common overstory consisted of Fremont cottonwoods, willows, seepwillows, mesquite, and introduced salt cedars. Habitat generalists and breed in a variety of natural and man-made aquatic systems, including rivers, permanent streams, permanent pools in intermittent streams, beaver ponds, cienegas, springs, earthen cattle tanks, livestock drinkers, canals, irrigation sloughs, wells, mine adits, abandoned swimming pools, and ornamental backyard ponds. Elevation ranges from 480 – 6200 ft (146-2499 m), generally <6200 ft (1951 m)
Sonoran green toad	*Bufo retiformis*	Sonoran Desert scrub, in the Arizona upland and lower Colorado subdivisions. In mesquite-grassland, creosote bush desert, and upland saguaro-palo verde desert scrub. Inhabits rain pools, wash bottoms, and areas near water in semi-arid mesquite-grassland, creosote bush desert, and upland saguaro-palo verde desert scrub from 500 - 3,225 ft. (153- 983 m).
desert ornate box turtle	*Terrapene ornate*	Semidesert grasslands and Chihuahuan desertscrub. Found at elevations ranging from 2,000-7,100 ft., although most abundant at elevations from 3,000-6,500 ft.
Sonora mud turtle	*Kinosternon sonoriense sonoriense*	Springs, creeks, ponds and waterholes of intermittent streams. Sea level to about 6,700 ft. (2,044 m).
American peregrine falcon	*Falco peregrinus anatum*	Sonoran, Mohave, and Great Basin desertscrub up through areas of Rocky Mountain and Madrean Montane Conifer Forest, near cliffs that support sufficient abundance of prey. Optimum peregrine habitat is generally considered to be steep, sheer cliffs overlooking woodlands, riparian areas or other habitats supporting avian prey species in abundance. Elevation from around 400 ft (122 m) to 9,000 ft (2743 m).
Arizona Botteri's sparrow	*Peucaea botterii arizonae*	Savanna-type grassland habitats, especially those with scattered shrubs or trees. Giant sacaton or other tall grass with mesquite, graythorn, or catclaw.
Arizona grasshopper sparrow	*Ammodramus savannarum ammolegus*	Semiarid grasslands with a low, woody shrub component such as scattered young mesquite and mimosa. Desert grassland and Sonoran desert scrub -- Open to dense vegetation of shrubs, low trees, and succulents, dominated by palo verde, prickly pear, and saguaro. Chihuahuan Desert Scrub -- Open stands of creosote bush and large succulents in southern New Mexico. Desert Riparian Deciduous Woodland, Marsh -- Woodlands, especially of cottonwoods, that occur where desert streams provide sufficient moisture for a narrow band of deciduous trees and shrubs along the margins. Annual Grasslands, Farms -- Grasslands with less than 5 percent

		woody cover. River, Riparian Woodland, large expanses of intermediate height grass for nesting. The preferred habitat in Arizona is open grasslands between 3,800 and 5,300 feet (1159-1616.5 m).
bald eagle (non-listed DPS)	*Haliaeetus leucocephalus*	Lower and Upper Sonoran Life Zones, including Saguaro-palo verde, desert grassland, chaparral, and pinyon-juniper community types. Occur on the Gila River within TFO. areas with high water-to-land edge, and areas with unimpeded views including both horizontal and vertical aspects. Areas selected for as wintering habitat will have an adequate food supply, and have open water such as river rapids, impoundments, dam spillways, lakes, and estuaries. Elevation from 460 - 7,930 feet (140 - 2419 m).
cactus ferruginous pygmy-owl	*Glaucidium brasilianum cactorum*	Sonoran riparian deciduous woodland, within Arizona upland subdivision and Sonoran desertscrub, in streamside cottonwoods and willows and adjacent mesquite bosques, usually with saguaros on nearby slopes. Less often it has been found along dry washes where large mesquite, palo verde, ironwood, and saguaro thrive. Elevation from 1,300 - 4,000 ft (397 - 1,220 m).
desert purple martin	*Progne subis hesperia*	Upper Sonoran Desert closely associated with saguaro forests. Forage and roost in areas adjacent to cactus forests, including open grassy river valleys, pool or marsh edges, towns, parks, lake shores and ponds
ferruginous hawk (breeding population only)	*Buteo regalis*	Semidesert grassland in the northern and southeastern parts of Arizona. During winter, they select the same areas, along with agricultural areas statewide. Hunting areas are typically open grasslands, preferably those dotted with suitable low hills or short trees, which serve as perches. Elevation from 3,500 ft - 6,000 ft (1067.5-1830 m).
gilded flicker	*Colaptes chrysoides*	Sonoran desert primarily associated with saguaro and to a lesser extent with cottonwood at the edges of its range. Saguaros provide nesting substrate and food.
golden eagle	*Aquila chrysaetos*	Open country, open wooded country, and barren areas, especially in hilly or mountainous regions. Nest on rock ledges, cliffs, or in large trees. The pair may have several alternate nests and they may use the same nests in consecutive years or shift to alternate nest used in different years. Elevation from 4,000-10,000 ft (1219-3048 m).
Western burrowing owl	*Athene cunicularia hypugaea*	Open, well-drained grasslands, deserts, agricultural lands, open areas such as vacant lots, golf courses, airports. Elevation from 650 - 6,140 ft (198-1873 m).
desert sucker	*Catostomus clarki*	Rapids and flowing pools of streams and rivers primarily over bottoms of gravel-rubble with sandy silt in the interstices. Adults live in pools, moving at night to swift riffles and runs to feed. Young inhabit riffles throughout the day, feeding on midge larvae. Elevation from 146 to 2,696 meters (480 to 8,840 feet).
longfin dace	*Agosia chrysogaster*	From desert scrub to the lower end of conifer woodlands. Intermittent hot low-desert streams to clear and cool brooks at higher elevations. They tend to occupy relatively small or medium size streams, with sandy or gravely bottoms; eddies, pools near overhanging banks or other cover. Usually in water less than 0.6 ft (0.2 m) deep with moderate velocities of around 1.1f/s (0.3m/s). They are rarely abundant in large streams or above 5,000 ft (1524 m). Elevation generally less than 4,900 feet (1500 meters), but have been recorded ranging to 6,700 ft (2050 m).
Sonora sucker	*Catostomus insignis*	Variety of habitats from warm water rivers to trout streams. Affinity for gravelly or rocky pools, or at least for relatively deep, quiet waters. Adults tend to remain near cover in daylight, but move to runs and deeper riffles at night. Young live and utilize runs and quiet eddies. Elevation from 369 to 2663 m (1,210 to 8,730 ft.)
speckled dace	*Rhinichthys osculus*	Bottom dweller, found in rocky riffles, runs, and pools of headwaters, creeks, and small to medium rivers: rarely in lakes. Reside in water less than 0.5 m (1.6 ft.) deep, with current averaging about 0.4m/sec (1.3ft/sec). Often congregate below riffles and eddies. Breeding adults prefer swift water. Peak abundance found at elevation from 2,000 to 3,000 m (6562 - 9843 ft.), rarely below 1,500 m (4921 ft.).
Allen's big-eared	*Idionycteris*	Typically found in mountainous regions at higher elevations. Seasonal movements

bat	*phyllotis*	and cold season distribution unknown. Specimens taken across most of Arizona, but not known from the southwestern deserts of Arizona. Most Arizona specimens have been collected from the southern Colorado Plateau, the Mogollon Rim and adjacent mountain ranges. Most observations are at altitudes between 3,500 - 7,500 ft.
Arizona myotis	*Myotis occultus*	Generally observed at higher elevations in Apache, Coconino, Cochise, Gila, Greenlee, Mohave, Navajo, and Yavapai counties. Most observations from the Mogollon Plateau, generally from Alpine in the White Mountains northwest to near Flagstaff. Myotis occultus has also been observed in the Chiricahua Mountains, Sierra Ancha Mountains, Pinal Mountains, Mingus Mountain, the Verde Valley, Oak Creek Canyon, San Francisco Mountains, Coconino Plateau, and the Hualapai Mountains. Their elevation ranges from 3,200 ft to 8,620 ft .
California leaf-nosed bat	*Macrotus californicus*	Mostly found in Sonoran desertscrub; primary summer and winter range essentially the same; primarily roost in mines, caves, and rock shelters. Not known to hibernate, and although it may not occupy the same roost year-round it is not known to migrate. Remains active year-round. All Arizona records below 4,000 feet (1,220 m) with most below about 2,500 feet (7,625 m). Elevation ranges from 160 - 3,980 ft. (49 - 1,214 m).
cave myotis	*Myotis velifer*	Predominantly desertscrub of creosote, brittlebush, palo verde and cacti, but sometimes up to pine-oak communities. Roost in caves, tunnels, mineshafts, under bridges, and sometimes in buildings. Mostly between 300 and 5,000 feet (92 - 1,525 m).
greater western mastiff bat	*Eumops perotis californicus*	Lower and upper Sonoran desertscrub near cliffs, preferring rugged rocky canyons with abundant crevices. They prefer crowding into tight crevices a foot or more deep and two inches or more wide. Colonies prefer crevices even deeper, to ten or more feet. Considered a year-round resident in Arizona Whether or not this bat hibernates during winter is unclear. Many roost sites do not seem to be occupied year-round, although they are likely to be occupied periodically. Elevation ranges from 240 – 8,475 ft. (73 - 2583 m).
Mexican long-tongued bat	*Choeronycteris mexicana*	Mesic areas in canyons of mixed oak-conifer woodlands in mountains rising from the desert, semi-desert grasslands, and also found in palo verde-saguaro areas. Caves and abandoned mines are favored daytime retreats, and they are also often found in shallow caves or rock shelters. Near Tucson, they feed predominantly on cactus and agave species. Agave is the consistent floral characteristic of all sites visited, with Agave schottii observed blooming at occupied sites before mid-June, after which blooming A. palmeri was encountered. Elevation ranges from 2,540 - 7,320 ft. (774- 2,233 m), but most are from 4,000 - 6,000 ft. (1,220 - 1,830 m).
Townsend's big-eared bat	*Corynorhinus townsendii*	Desertscrub, oak woodland, oak/pine, pinyon/juniper, and coniferous forests. In Arizona, summer day roosts are found in caves and mines from desertscrub up to woodlands and coniferous forests. Night roosts may often be in abandoned buildings. Elevation ranges between 550 and 8,437 feet (168 - 5272 m). Most records range above 3,000 feet (915 m).