**United States Department of the Interior**
**Bureau of Land Management**
**Las Cruces District Office**
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**Las Cruces, NM 88005**

Environmental Assessment for
**Las Cruces District-Wide**
**Invasive Plant Management Plan**
Grant, Luna, Hidalgo, Otero, Dona Ana, and Sierra Counties
DOI-NM-BLM-L000-2011-0169-EA

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**Table of Contents**

Glossary ..... iv
1 INTRODUCTION ..... 1
1.1 Purpose and Need ..... 3
1.2 Decision to be Made ..... 4
1.3 Plan Conformance ..... 4
1.4 Relationship to Statutes, Regulations, or other Plans ..... 5
1.5 Scoping and Issues ..... 6
1.5.1 Internal Scoping ..... 6
1.5.2 Issues ..... 6
2 PROPOSED ACTION AND ALTERNATIVES ..... 7
2.1 ALTERNATIVE A -- Proposed Action ..... 7
2.1.1 Background ..... 7
2.1.2 Details of Proposed Action ..... 9
2.2 ALTERNATIVE B – No Weed Treatments ..... 19
2.3 ALTERNATIVE C – No Action, Continue Current Management ..... 19
2.4 Alternatives Considered, But Not Analyzed Further ..... 20
3 AFFECTED ENVIRONMENT ..... 20
3.1 Noxious and Invasive Plant Species ..... 20
3.2 Affected Habitats ..... 23
3.3 Native Vegetation ..... 26
3.4 Soils ..... 27
3.5 Water ..... 28
3.6 Wildlife ..... 28
3.7 Special Status Species ..... 30
3.8 Human Health and Safety ..... 32
4 ENVIRONMENTAL EFFECTS ..... 33
4.1 Impacts of Proposed Action on NIP Species ..... 33
4.1.1 Alternative A – Proposed Action - Direct and Indirect Effects ..... 33
4.1.2 Alternative B – No Treatments - Direct and Indirect Effects ..... 34
4.1.3 Alternative C – No Action, Current Management - Direct and Indirect Effects ..... 35

4.2 Affected Habitats ..... 35
4.2.1 Alternative A – Proposed Action - Direct and Indirect Effects ..... 35
4.2.2 Alternative B – No Treatments - Direct and Indirect Effects ..... 37
4.2.3 Alternative C – No Action, Current Management - Direct and Indirect Effects ..... 37
4.3 Native Vegetation ..... 38
4.3.1 Alternative A – Proposed Action - Direct and Indirect Effects ..... 38
4.3.2 Alternative B – No Treatment - Direct and Indirect Effects ..... 40
4.3.3 Alternative C – No Action, Current Management - Direct and Indirect Effects ..... 40
4.4 Soils ..... 41
4.4.1 Alternative A – Proposed Action - Direct and Indirect Effects ..... 41
4.4.2 Alternative B – No Treatment - Direct and Indirect Effects ..... 42
4.4.3 Alternative C – No Action, Current Management - Direct and Indirect Effects ..... 42
4.5 Water ..... 43
4.5.1 Alternative A – Proposed Action - Direct and Indirect Effects ..... 43
4.5.2 Alternative B – No Treatment - Direct and Indirect Effects ..... 44
4.5.3 Alternative C – No Action, Current Management - Direct and Indirect Effects ..... 44
4.6 Wildlife ..... 45
4.6.1 Alternative A – Proposed Action - Direct and Indirect Effects ..... 45
4.6.2 Alternative B – No Treatment - Direct and Indirect Effects ..... 47
4.6.3 Alternative C – No Action, Current Management - Direct and Indirect Effects ..... 47
4.7 Special Status Species ..... 48
4.7.1 Alternative A – Proposed Action - Direct and Indirect Effects ..... 48
4.7.2 Alternative B – No Treatment - Direct and Indirect Effects ..... 49
4.7.3 Alternative C – No Action, Current Management - Direct and Indirect Effects ..... 49
4.8 Human Health and Safety ..... 49
4.8.1 Alternative A – Proposed Action - Direct and Indirect Effects ..... 49
4.8.2 Alternative B – No Treatment - Direct and Indirect Effects ..... 50
4.8.3 Alternative C – No Action, Current Management - Direct and Indirect Effects ..... 50
4.9 Wilderness, Special management Areas, and Areas of Critical Environmental Concern ..... 50
4.9.1 Alternative A – Proposed Action - Direct and Indirect Effects ..... 51
4.9.2 Alternative B – No Treatment - Direct and Indirect Effects ..... 52
4.9.3 Alternative C – No Action, Current Management - Direct and Indirect Effects ..... 52

4.10 Cumulative Impacts of the Proposed Action ..... 52
5 MONITORING AND/OR COMPLIANCE ..... 54
5.1 Implementation/Compliance Monitoring ..... 54
5.2 Effectiveness and Validation Monitoring ..... 55
5.3 Site-Specific NIP Species Treatments ..... 55
6 TRIBES, INDIVIDUALS, ORGANIZATIONS OR AGENCIES CONSULTED ..... 56
7 LIST OF PREPARERS ..... 56
8 REFERENCES ..... 57
9 APPENDICES ..... 58
9.1 APPENDIX A - STANDARD OPERATING PROCEDURES ..... A-1
9.2 APPENDIX B - HERBICIDES ATTRIBUTES ..... B-1
9.3 APPENDIX C - MITIGATION MEASURES ..... C-1
9.4 APPENDIX D - STATUTES, REGULATIONS, DIRECTIVES ..... D-1
9.5 APPENDIX E - NOXIOUS AND INVASIVE PLANT SPECIES CHARACTERISTICS ..... E-1
9.6 APPENDIX F - PROJECT ANALYSIS CHECKLIST FOR NOXIOUS AND INVASIVE PLANT SPECIES ..... F-1
9.7 APPENDIX G - USFWS CONSULTATION MEMORANDUM ..... G-1
9.8 APPENDIX H - SPECIAL STATUS ANIMAL AND PLANT SPECIES OF THE LAS CRUCES DISTRICT OFFICE ..... H-1
9.9 APPENDIX I - MIGRATORY BIRD TREATY ACT SPECIES IN THE LAS CRUCES DISTRICT OFFICE ..... I-1
9.10 APPENDIX J - ECOLOGICAL RISK ASSESSMENTS ..... J-1
9.11 APPENDIX K – SPECIAL MANAGEMENT AREAS, LCDO - 2012 ..... K-1

**Glossary**

ACEC – Area of Critical Environmental Concern

A. I. – Active Ingredient

ATV – All Terrain Vehicle

BLM – Bureau of Land Management

CEQ – Council on Environmental Quality

EA – Environmental Assessment

ESA – Endangered Species Act

ERA – Ecological Risk Assessments

DNA – Determination of NEPA Adequacy

FWS – U.S. Fish and Wildlife Service

GIS – Geographic Information System

GPS – Global Positioning System

IPM – Integrated Pest Management

IPMP – Invasive Plant Management Plan

IMP-WR – Interim Management Policy for Lands Under Wilderness Review

LA – Landscape Area

LCDO – Las Cruces District Office

MBTA – Migratory Bird Treaty Act

MM – Mitigation Measures

MOU – Memorandum of Understanding

MRMP – Mimbres Resource Management Plan

MSDS – Material Safety Data Sheet

NEPA – National Environmental Policy Act

NIP – Non-native, Noxious and Invasive Plant

NM – New Mexico

NMDA – New Mexico Department of Agriiculture

NMDEQ – New Mexico Department of Environmental Quality

NMPIF – New Mexico Partners in Flight

PEIS – Programmatic Environmental Impact Statement

PUP – Pesticide Use Proposal

RNA – Research Natural Area

SHS – Standard Habitat Sites

SOP – Standard Operating Procedures

SSS – Special Status Species, includes threatened, endangered, and sensitive species (TES)

SMA – Special Management Area

SWCD – Soil and Water Conservation Districts

TDS – Total Dissolved Solids

USDA-APHIS – U.S. Department of Agriculture, Animal and Plant Health Inspection Service

USDI – United States Department of Interior

US-EPA – Unites States – Environmental Protection Agency

USFWS – U.S. Fish and Wildlife Service

WLS – Watch List Species

WSA – Wilderness Study Area

WSRMP – White Sands Resource Management Plan

# 1 INTRODUCTION

Invasive plants on the public lands can cause economic and environmental harm and impede the Bureau of Land Management's (BLM) ability to manage for healthy native ecosystems. This Environmental Assessment (EA) for the Las Cruces District Office (LCDO) proposes to eradicate or reduce non-native, noxious and invasive plant (NIP) species within the boundary of the entire district where such species occurs in Grant, Hidalgo, Luna, Otero, Dona Ana, and Sierra counties (Figure 1). The strategy to accomplish this task will utilize an integrated pest management (IPM) approach, using all available methods in combinations that are applicable under specific circumstances. The methods considered include cultural, physical, and chemical treatments to be applied in such a way that minimizes economic, health, and environmental risks (DOI Departmental Manual 517). The management objective is to control the proliferation of NIP species and reduce the established populations to acceptable levels determined through consultation and coordination with local, state, and other federal plans, policies, and agency agreements.

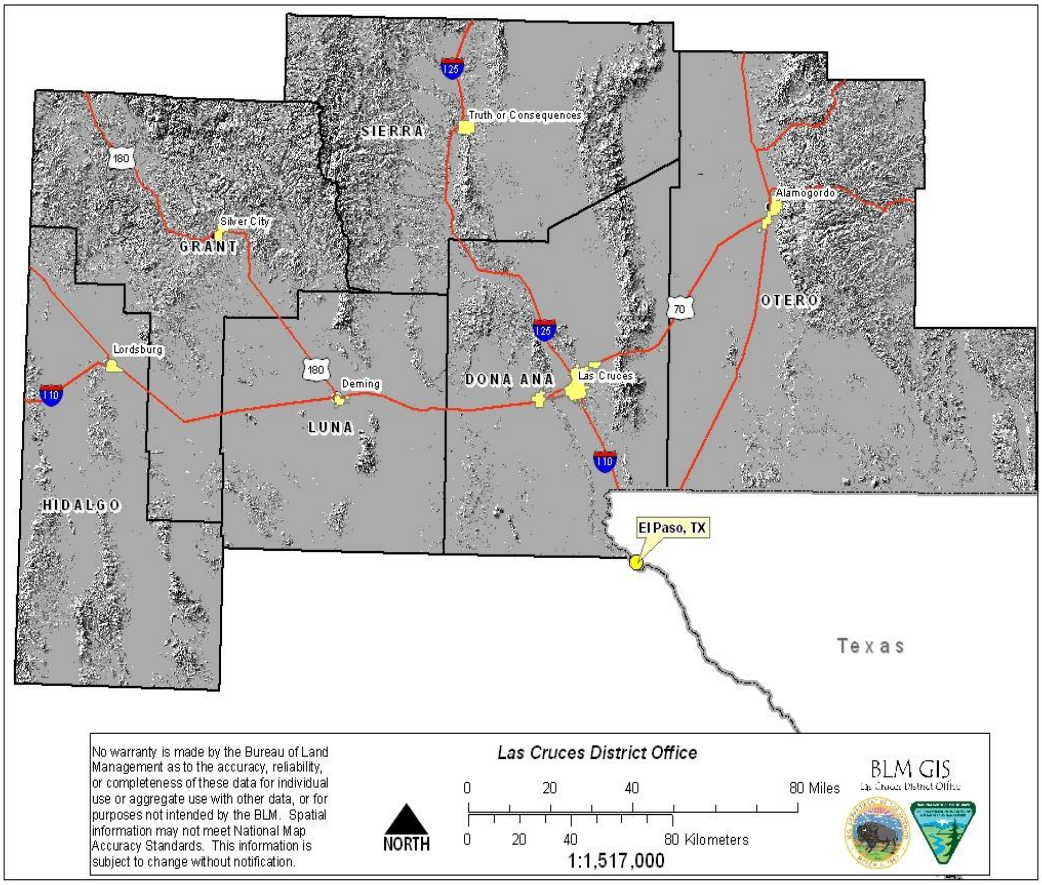


**Figure 1 Map of Las Cruces District Office**

LCDO Integrated Pest Management goals are:

- Reduce, if not eradicate, NIP species from BLM lands while benefitting native ecosystem's structure and function;
- Inventory for noxious and invasive plant species and maintain comprehensive records of infestation and treatment sites;
- Identify areas that require priority for treatment and/or rapid response to infestation to minimize, or avoid, the spread of noxious and invasive plant species;
- Conduct all operations for treatment with consideration and consultation with State and Federal regulatory agencies, such as, US Fish and Wildlife Service (USFWS) for consultation regarding federally listed species (flora and fauna).
- Implement cultural prevention practices, individually or in combination thereof, as described in Appendix "A", Standard Operating Procedures (SOPs).

Noxious and invasive plants are "non-native" plants (hereafter referred to as NIP species) whose introduction will cause, or are likely to cause, economic or environmental harm or harm to human health. NIP species can create a host of environmental and other effects, most of which are harmful to native ecosystem processes, including: displacement of native plants; reduction in functionality of habitat and forage for wildlife and livestock; increased potential for soil erosion and reduced water quality ("Vegetation Treatments Using Herbicides in 17 Western States", Programmatic Environmental Impact Statement, BLM, 2007); alteration of soil physical and biological properties; loss of long-term riparian area function; loss of habitat for culturally significant plants; increased cost (dollars spent) of controlling NIP species; and increased cost to maintaining transportation systems and recreational sites. NIP species are invasive plants that are designated and listed specifically by each state, and are considered harmful to agriculture and native ecosystems within the state. New Mexico Department of Agriculture (NMDA) is responsible for listing NIP species within the state.

LCDO has ongoing activities that deal with controlling and reducing plant densities of "native invasive species" such as mesquite, creosote bush, and other shrubs as part of the New Mexico BLM initiative to restore native grasslands and plant communities across the state. The "Restore New Mexico" initiative has a broader goal and is not part of this EA and Proposed Action, although the outcome of this EA may coincide with restoration work in the same locality during the implementation phase.

The amount of BLM lands currently infested by NIP species is estimated to be relatively low in the LCDO, thus providing an opportunity to aggressively treat new and existing infestations. The current untreated NIP species infested acreage is estimated at less than 20,000 acres which is less than 0.4% of the total lands within LCDO. The currently treated acres are estimated to be less than 5,000 acres, which is a combined total of BLM and NM State, or county, road maintanence crew activity. NM State or county road crews generally treat many of the roadways within LCDO that cross BLM lands. Much of the current treatment is a result of re-treating previously infested areas.

However, most of the LCDO has not been inventoried for NIP species; thus, the actual total acres needing treatment is not precise and may change as new information is gathered. Not all 5.4

million acres of LCDO administerd lands are expected to be treated for NIP species but it is uncertain where new populations may occur. Therefore, the analysis area for this EA encompasses all BLM lands within Grant, Hidalgo, Luna, Otero, Dona Ana, and Sierra counties located within the LCDO boundary.

This EA analyzes NIP species treatments by various methods and its effects on several resources within LCDO. Site-specific conditions are not thoroughly known for every acre but for the most part, the landscapes where NIP species that have been known to occur are repetitive and have been previously treated through authorization of existing EAs or site-specific EAs that had minimal controversy associated with infested areas. The effects analysis in this EA characterizes what is likely to occur if NIP species are encountered and treated in a generalized scenario. Prior to implementing a treatment, each individual proposed project will undergo a site-specific screening process utilizing a checklist that is intended to determine if the impacts of treating NIP species within a proposed project site is adequately covered in this EA's analysis or if a site-specific analysis (EA process) is needed to determine impacts that may not have been adequately analyzed in this EA.

If the screening process determines that the impacts of a proposed project has been adequately addressed by this EA, a Determination of National Environmental Policy Act (NEPA) Adequacy (DNA) will be completed which documents the screening process, with the checklist attached (Appendix F) and the proposed project will proceed.

Treatment projects within Wilderness Study Areas (WSA), use of biological control agents, or where special status plant species exist will be addressed through a separate EA and is not part of the Proposed Action in this EA due to other environmental concerns that need to be addressed in detail. Those EAs will require further coordination and consultation with interested publics and other regulatory agencies.

## 1.1 Purpose and Need

The purpose is to select a management approach in the context of IPM, to eradicate existing NIP species within the LCDO, or at least prevent the establishment or spread of existing NIP species populations using SOPs where applicable. In addition, the purpose for the action is to treat NIP species upon BLM lands within Hidalgo, Grant, Luna, and Sierra counties that have not been analyzed through an EA process. Luna and Sierra counties have been partially analyzed for NIP species treatment along highway rights-of-way. Otero and Dona Ana counties have county-wide EAs that authorize NIP species treatments within those counties. This EA will be superceding previous EAs for authorizing future NIP species treatments in all counties located within LCDO jurisdictional boundary.

LCDO cooperates with four Noxious Weed Districts that function through the Soil and Water Conservation Districts (SWCD) within the LCDO boundary. LCDO will use an IPM approach in cooperation with the SWCD as authorized by Memorandum of Understanding (MOU) to treat NIP species infestations that spread across jurisdictional boundaries. LCDO may provide funding to help SWCD treat for NIP species on various landscapes.

The need is: 1) prevent damage or harm to natural resources caused by the spread of NIP species currently in scattered, isolated infestations, usually in small acreage size; 2) eliminate the further establishment or expansion of NIP species across BLM administered lands and conduct control efforts aggressively and expeditiously as possible upon discovery of infestations; 3) establish a project-level screening criteria for selecting site-specific treatment methods to be used in all six counties within LCDO. The screening process may identify a DNA is adequate analysis for project implementation or a site-specific EA is necessary to determine treatment method.

This EA focuses on those NIP species currently listed by the NMDA, as well as any that may be potentially listed in the future by the State of New Mexico which adversely affects the integrity of natural ecosystems within the state. To achieve the eradication or reduction of NIP species, the BLM must comply with a variety of Federal laws, policies and guidelines that direct federal agencies to safely and efficiently manage these undesirable plants (Appendix D).

## 1.2 Decision to be Made

The BLM will decide to implement the best course of action, which is treatment methods, to control or eradicate NIP species that have invaded federal lands within the LCDO jurisdictional boundary and non-federal lands where federal funding has been provided to conduct similar actions. The decision will apply to those lands that have not been previously addressed by an EA to eradicate or control non-native, noxious and invasive plant species from BLM administered lands. The Decision would authorize the use of the best and appropriate available techniques to control or eradicate NIP species in a rapid response mode as NIP species infestations are discovered, subject to a site-specific project screening checklist, as well as further NEPA analysis, if needed.

## 1.3 Plan Conformance

The proposed action and alternatives described below are in conformance with vegetation objectives, goals, and decisions as stated in the Mimbres (MRMP) and White Sands Resource Management Plan (WSRMP), respectively.

The MRMP 1993 states (page 2-30) "chemical herbicides will be used for control of noxious weeds, during maintenance, and control of competing or unwanted vegetation consistent with New Mexico Record of Decision (ROD) for Vegetation Treatment on BLM lands in the Thirteen Western States (August 1991)." In addition, the MRMP recognized that such proposed control actions would be addressed through a site-specific environmental assessment using an interdisciplinary approach.
The use of buffer strips and other protective measures may be applied based on local conditions. A Desired Plant Community concept was also identified in the MRMP and management activities would be driven to achieve the desired plant community within the site's capability.

WSRMP 1986 states (page 2-33), under the Rangeland Management, General Management Guidance for Rangeland Improvements, the Standard Operating Procedures, Section 16 relating to use of herbicides "chemical treatment will consist of applying approved chemicals to control target

species of plants. Before chemicals are applied, the BLM will meet or exceed the EPA standards. All chemical applications will be preceded by an approved Pesticide Use Proposal. All applications of pesticides wil be under the supervision of a certified pesticide applicator and will be carried out in compliance with the New Mexico pesticide laws."

### 1.4 Relationship to Statutes, Regulations, or other Plans

The following provides a partial listing of the primary authorities that apply to the Proposed Action. All laws, regulations, and policies, including BLM manuals, handbooks and internal memoranda, will be followed unless otherwise stated. Refer to Appendix D for complete listing of authorities applicable to the Proposed Action.

Reducing the number of infested acres of invasive plants would meet the objective of sustaining biological communities as directed by the **BLM Operating Plan 2004-2008**. BLM's national plan identified the "long-term goal" of improving, restoring, and maintaining healthy ecosystems on federal lands. It recognized invasive species as one of the greatest obstacles to achieving healthy ecosystems and the need to eradicate or control the expansion of such species would further the sustainment of biological communities.

The following environmental decisions, agency policy and direction, as well as legislation authorize actions to treat invasive plant species:

"Vegetation Treatments Using Herbicides in 17 Western States", Programmatic Environmental Impact Statement, Record of Decision (BLM, 2007) approved the following actions:

- The use of 18 herbicide active ingredients;
- The use of a scientific protocol to guide the analytical methodology for consideration of the use or non-use of herbicides by the BLM.

"Federal Land Policy and Management Act (1976)", Directs the BLM to "take any action necessary to prevent unnecessary and/or undue degradation of public land".

"Carlson-Foley Act (1968)", Directs agency heads to enter upon land under their jurisdiction which are infested with noxious plants and to take action to destroy noxious plants growing on those lands.

"Federal Noxious Weed Act (1974)", as amended by Sec. 15, Management of Undesirable Plants on Federal Lands, 1990; Congress amended the "Federal Noxious Weed Act of 1974" and this amendment was signed into law November 28, 1990. This Act requires that each Federal Agency:

- designate a lead office and person trained in the management of undesirable plants;
- establish and fund an undesirable plant management program;
- complete and implement cooperative agreements with State Agencies;
- establish integrated management systems to control undesirable plant species.

"Executive Order 13112, Invasive Species (1999)", Directs federal agencies to prevent the introduction of invasive species and provide for control, and to minimize the economic, ecological, and human health impacts that invasive plants cause.

Invasive plant control on public lands within Wilderness Study Areas (WSAs) must comply with and be managed consistent with BLM's Interim Management Policy Handbook (H-8550-1) for Lands Under Wilderness Review. The law provides for, and the BLM's policy is to allow, invasive species control on lands under wilderness review in the manner and degree that does not degrade wilderness quality. Invasive plant control methods within WSAs are subject to reasonable regulations, policies, and practices. Proposed treatments in WSAs will be evaluated through a separate and site-specific EA when NIP species are discovered.

Table 1 displays the previously approved EAs that authorize treatments for NIP species within four counties.

**Table 1 Approved NIP Treatement EAs within LCDO.**

| County | EA# | Year | Area Analyzed | NIP Species |
|---|---|---|---|---|
| Otero | NM-037-97-001 | 1996 | Rights-of-way | NM Weed List, 19 species |
| Luna | NM-036-98-039 | 1998 | Rights-of-way | African rue, Malta starthistle |
| Sierra | NM-030-98-025 | 1998 | Rights-of-way | All species |
| Otero | NM-030-2003-0031 | 2003 | County-wide | All species |
| Dona Ana | NM-030-2003-0100 | 2003 | County-wide | All species |
| Otero | NM-2004-0134 | 2004 | County-wide | Salt cedar |

## 1.5 Scoping and Issues

### 1.5.1 Internal Scoping

The proposed action was presented to the LCDO interdisciplinary team in 2007 and then again in 2011. Resource experts indicated that the project could have impacts to soils, water, wilderness study areas, cultural resources, vegetation, range, wildlife, special status species, and special land use resources.

### 1.5.2 Issues

Key issues originally identified in the "Vegetation Treatments Using Herbicides in 17 Western States", Programmatic Environmental Impact Statement, BLM, 2007 (hereafter referred to as BLM 2007 PEIS) that will be further analyzed in this EA from a District-wide perspective are:

- Vegetation – What are the effects of herbicide treatments on native vegetation?

- Soil Productivity and Water Quality – Are there negative effects of herbicides in water quality (surface or groundwater)?
- Special Status Species (SSS) including – Will herbicide treatments adversely affect SSS species individually or their habitat?
- Ecosystem health – Can herbicide treatments of NIP species aid in restoring ecosystem health and function on the various plant communites within LCDO?
- Economics – Can treating NIP species reduce land management administrative costs when treated promptly upon discovery?
- Human health – Are there hazards to human health and safety from herbicide treatments?

An issue of concern to LCDO is described as follows:

- Will treating for NIP species within Special Management Areas (SMAs) change the character and management intent of those specially designated areas?

# 2 PROPOSED ACTION AND ALTERNATIVES

## 2.1 ALTERNATIVE A -- Proposed Action

### 2.1.1 Background

This chapter describes and compares the alternatives considered for IPM treatments in the LCDO. It describes the Proposed Action, the alternatives to the Proposed Action, the No Action alternative, and alternatives eliminated from detailed study. The Council on Environmental Quality (CEQ) regulations requires a No Action alternative be analyzed as a benchmark comparison for the Proposed Action or other alternatives which constitutes either: 1) no activity taking place; or, 2) to continue with the present course of action (current management).

This EA tiers to the Decisions in the BLM 2007 PEIS (http://www.blm.gov/wo/st/en/prog/more/veg_eis.html) and incorporates by reference the use of 18 herbicide active ingredients listed under the Proposed Action as well as the use of non-herbicide control methods listed in Section 2.1.2 of this EA. The BLM 2007 PEIS assessed five alternatives, of which, the Preferred Alternative selected was to expand herbicide use and allow use of new herbicides on BLM lands. The Proposed Action was selected because it allowed greater flexibility in treating infestations with new herbicides that have undergone a risk assessment. All of the herbicide active ingredients listed in BLM 2007 PEIS are considered for use within LCDO based on the analysis contained in the EIS. The treatment methods analyzed in this EA are summarized as follows:

<u>Cultural</u> – The use of cultural control methods primarily refers to the prevention of invasive plant establishment through the modification or elimination of land use practices by humans which may indirectly cause or aid in the spread of noxious weeds. There are generally five aspects to cultural control, which include: 1) prevention, 2) livestock manipulation, 3) wildlife manipulation, 4) soil disturbance activities and 5) public uses. This EA focuses on livestock manipulation, in effect, using grazing animals as a cultural treatment method for controlling or eradicating NIP species.

Chemical – A pesticide is any substance intended for: 1) preventing, destroying, repelling, or mitigating any pest, including weeds; 2) causing the leaves to drop from a plant; 3) artificially accelerating the drying of plant tissue; or 4) accelerating or retarding the rate of growth, maturation or otherwise altering the behavior of plants.

Pesticides include insecticides, herbicides, fungicides and other microbiocides, and certain disinfectants and sterilizers. They are classified (by United States – Environmental Protection Agency (US-EPA) and by NMDA) as either "general-use" or "restricted-use" pesticides. General-use pesticides are considered safe for use by the average person as long as they follow label directions. Using restricted-use pesticides requires more knowledge to prevent exposure or adverse effects on the environment.

Herbicides are chemicals that kill or injure plants. Herbicides can be categorized as selective or non-selective. Selective herbicides kill only a specific type of plant, such as broad-leaved plants, while non-selective herbicides kill all types of plants.

Physical – 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 re-growth; cutting at the ground level or removing competing plants around desired species; or placing mulch around desired vegetation to limit competitive growth. Mechanical involves accomplishing the same task as manual though using motor-driven machinery in lieu of manual labor to treat far greater acres than manual methods can accomplish.

Prescribed fire – This treatment method utilizes fire that is intentionally ignited under specific climatic conditions in conjunction with other treatment efforts to treat identified noxious weed or invasive plant species infestations. Prescribed fire is applied as either a pre- (fire thinning) or post-treatment (slash disposal) application to aid in the effectiveness of other treatment methods. Prescribed fire use will be applicable in limited circumstances and usually not as a sole treatment method.

This EA also incorporates by reference the environmental analysis contained in EAs for Otero (EA #NM-037-97-001, EA #NM-030-2003-0031, and EA #2004-0134) and Dona Ana counties (EA #NM-030-2003-0100). These EAs address all BLM lands within both counties for the NIP species to be treated and the methods to be used.
In addition, both EAs already addressed the effects of the No Action alternative for the county-wide EAs. The Proposed Action in this EA augments the county-wide EAs for Otero and Dona Ana counties by adding the use of a project-level screening checklist which analyzes resource concerns of the project site and aids in the selection of the appropriate treatment method for NIP species infestation. The Proposed Action also provides guidance and use of the project-level screening checklist in Hidalgo, Luna, Grant and Sierra counties to conduct NIP species control county-wide.

### 2.1.2 Details of Proposed Action

NIP species control would be accomplished using an IPM approach, utilizing a combination of cultural, physical, prescribed fire, and chemical treatment methods to control or eradicate populations of NIP species (refer to Appendix E). IPM is an approach for selecting methods for preventing, containing, controlling, and eradicating invasive plants in coordination with other resource management activities to achieve desired vegetation conditions. This approach uses a combination of treatment methods, when implemented together, to control or eradicate a particular invasive plant or infestation efficiently and effectively, with minimal adverse impacts to non-target organisms. IPM approach combines two or more treatment methods to provide better control of NIP species than any one action might provide alone.

Instituting preventative measures (cultural practices) to minimize the risk of NIP species introduction onto BLM lands is the first line of defense. Examples of preventative measures include: 1) minimizing the amount of surface disturbance to reduce the amount of area susceptible to NIP species establishment; 2) reestablish native vegetation on all disturbed soil caused by construction, reconstruction, and maintenance activities as soon as possible; 3) avoid trailing livestock through noxious weed infested areas; and, 4) require certified noxious weed-free straw or hay for use as mulch. Appropriate preventative measures, as outlined in the SOPs (Appendix "A"), are incorporated into all permitted actions on public lands to minimize the risk of NIP species introduction. Analysis of preventative measures, whether used individually or in combination, is not the subject of this EA but merely presented as tools that are available in implementing effective NIP species treatments.

Another important element of preventing the establishment of invasive plants is utilizing an early detection/rapid response strategy. Early detection/rapid response refers to the immediate treatment of newly discovered NIP species infestations. IPM also involves early detection through a systematic inventory process accomplished annually of habitats that are most likely to support NIP species based on known information about an invasive species. For example, drainage areas that may support salt cedar and Russian olive, disturbed right-of-way corridors for African rue and similar species, or springs and stock tanks that may support various thistle species are all sites that could be planned for inventory and documented in a Geographic Information System (GIS) as surveyed and cleared areas.

As stated in Section 2.1.1, this EA is tiered to the BLM 2007 PEIS which analyzed the effects of using herbicides for treating vegetation on public land in the western United States. The Record of Decision approved the use of 18 herbicide active ingredients which are sold by different commercial names (refer to Appendix B for listing). Treating NIP species with herbicides is only one aspect of the IPM approach, but this EA focuses on analyzing the effects of all treatment methods to control or edradicate NIP species in a collective manner.The use of these herbicides, for the purposes of this District-wide analysis, will usually occur as ground treatments although aerial application may be feasible depending on the NIP species of concern and if the project-level screening process indicates no risk to other resources.

The size of the treatment areas will be variable, possibly involving only a few acres to as much as several hundred acres depending on the extent of infestation, NIP species being treated, and

funding available. NIP species to be treated within this EA are mostly terrestrial although some species occur within floodplains adjacent to springs or free-flowing waters, and around impounded water sources. Only approved herbicides licensed and approved by New Mexico Department of Environmental Quality (NMDEQ) and US-EPA will be used adjacent to water sources according to manufacturer's label requirements.

The annual target for treating NIP species may vary depending on funding but will likely range between 1,000 to 7,500 acres per fiscal year. Total acres for NIP species treatment will be determined by ongoing annual inventories which will be used to formulate treatment projects as funding becomes available or where partnerships with NM State or county agencies have been established. Herbicides used currently, or in the future, are in the form of liquid, pellet, or granular.

**Treatment Areas**

The LCDO has been segregated into treatment areas that groups similar landscapes according to infestation and complexity of resource issues. These treatment areas coincide with the description of Affected Habitats discussed later in Section 3.2 of this EA. As a project site is developed, the proposed treatment area would be evaluated through the project-level screening checklist. The checklist will assess if the project is consistent with this EA or if a site-speciifc EA is necessary to analyze the potential effects of the proposed project.

"Landscape Area #1 (LA1)" contains lands associated with public roadways, railway corridors, and borrow ditches that traverse the LCDO. Roadways include all federal, state, county, and private roadways that traverse BLM administered lands, including military lands. These areas are the most common sites where NIP species establish and expand into adjacent landscapes. Some areas of LA1 have been analyzed through various existing County-wide or site-specific EAs for Otero, Dona Ana, Luna, and Sierra counties. All treatments within LA1 will be analyzed using the project-level screening checklist to ascertain the resources of concern. A rapid response treatment approach is likely to be used in these areas since infestations are similar to other sites encountered or if the sites become reinfested with the same NIP species.

Rapid response treatment will not be conducted along Hidalgo county roadways that contain known populations of Chihuahuan scurf pea or the potential for occupied habitat exist. Site-specific inventories will be conducted prior to implementing any treatments within scurf pea habitat. Treatments in scurf pea habitat may require multiple treatment methods to be employed.

"Landscape Area #2 (LA2)" is identified as Rangelands which comprises the bulk of the landscape within LCDO and generally characterized as the uplands (flat terrain, rolling hills, or mountains), shallow and predominantly dry drainages and washes located away from major riverine systems, larger drainages that feed directly into riverine systems, and all two-track, undeveloped roadways. These lands contain grazing lands, mineral pits, utility corridors, communication sites, dispersed recreational areas, wind and solar generating sites, and military training areas.

Treatments within these lands have been approved for Otero and Dona Ana counties in county-wide EAs. Though treatment of LA2 in those counties has been previously approved, this EA analyzes the treatment effects upon all LA2 sites within LCDO.

Treatments of LA2 sites will be analyzed using the project-level screening checklist to ascertain the resources of concern in all rangeland sites. A rapid response treatment approach is likely to be used in these areas as well, if the checklist does not indicate any conflicts or adverse effects to other resources and the project is within the scope of effects as analyzed in this EA.

The complexity of LA2 involves adjacent dwellings, archaeological sites, and water wells for public or agricultural use. LA2 is likely to contain new or longstanding NIP species infested sites with populations occupying small acreage (less than 20 acres), either in concentrated or scattered populations within the plant communities. Some of the infested sites can be larger in an area such as, along dry drainages containing salt cedar or in large expanses of grasslands with widely scattered populations of knapweeds or African rue. A rapid response (spot treatment) to eradicate small infestations is expected to remedy most sites but follow-up monitoring will be necessary to measure treatment effectiveness.

"Landscape Area #3 (LA3)" is composed of riparian areas along rivers, intermittently wet drainages, dry drainages that immediately feed into wet drainages, and playas. Though treatment of LA3 in Otero and Dona Ana has been previously approved, this EA analyzes the treatment effects upon all LA3 sites within LCDO. Treatments of LA3 sites will be analyzed using the project-level screening checklist to ascertain the resources of concern in all river/stream and adjacent dry drainages. A rapid response treatment approach is likely to be used in these areas as well, if the checklist does not indicate any conflicts or adverse effects to other resources and the project is within the scope of effects as analyzed in this EA. If the checklist indicates potential effects that are outside the scope of this EA, then a site-specific EA will be prepared for the project. Projects that are consistent with this EA will be documented through a DNA and the project will proceed.

Any portion of LA1 or LA2 that falls within the boundary or buffer zone of LA3 will be evaluated within the same context as LA3. The buffer zone boundary along drainages and river corridors will be limited to within ¼ mile (approximately) of the first floodplain level. Any areas beyond that boundary are treated as LA1 or LA2, respectively.

NIP species may be new populations consisting of a few scattered plants or a dense population that has existed for an extended period of time. Acreage size is likely to vary along drainage areas. A thorough inventory of the drainage area and tributaries may be necessary to define the extent of infestation and complexity of treatment which will aid in determining treatment methods. Spot treatments may be applicable in some cases, or they may be long-term integrated treatments to control NIP species and minimize non-target species affects. Some of these areas, due to their sensitivity may require a combination of manual, mechanical, and chemical treatment to accomplish a successful treatment of NIP species over the course of several years.
Treatment periods may extend longer than 3 years as inventory and monitoring may be necessary to insure populations have not spread beyond original infestation boundary.

"Landscape Area #4 (LA4)" is comprised of SMAs specifically designated for their biological, ecological, wilderness, cultural, geological, paleontological, or recreational attributes that emphasizes a different scale of resource management and goals, as well as regulatory protection. LA4 contains such areas as WSA, Areas of Critical Environmental Concern (ACEC), such as for special status species), Research Natural Areas (RNA), and SMAs for cultural, paleontological, and recreational management. LA4 may contain characteristics of all three Landscape Areas described above.

All areas within LA4 will be treated to protect the core values of the SMA designation as first priority and eradication or control of NIP species will be limited to methods that are most effective and least intrusive to the sites. In most cases, treatment will likely be spot treatments dealing with small acreages (estimated at < 20 acres) in isolated locations.

**Treatment Methods**

Proposed treatment methods may include hand pulling, cutting, mowing, hand/selective herbicide applications, stem injection, spot herbicide spraying, broadcast (ground) herbicide spraying, and grazing (as a cultural method). Aerial spraying will be used for NIP speices under circumstances that pose minimal risk to other resources and where the infestations are spread across large areas in a contiguous manner. An example of aerial spraying has been used for salt cedar infestations along river or drainage corridors in which infestations can be extremely dense and extensive along drainages.

The treatment methods are summarized in Table 2. The timing for herbicide treatments would be dependent on the NIP species, as well as any label restrictions which vary by herbicide.

**Table 2 Summary of Potential Treatment Methods.**

| Method | Description |
|---|---|
| **Manual** | |
| **Hand pulling** | Pulling or uprooting plants can be effective against some shrubs, tree saplings, and herbaceous invasive plants. Annuals and tap-rooted plants are particularly susceptible to control by hand pulling. It is not as effective against many perennial invasive plants with deep underground, lateral stems and roots that are often left behind to re-sprout. This method is limited to very small infestations, less than few square feet in size because it is not as cost effective and not thorough enough to control large populations.<br>The advantages of pulling include its small ecological impact, minimal damage to neighboring plants, and low (or no) cost for equipment or supplies. The key to effective hand pulling is to remove as much of the root as possible while minimizing soil disturbance. For many species, any root fragments left behind have the potential to re-sprout, and pulling is not effective on plants with deep and/or easily broken roots. |
| **Pulling Using Tools** | Most plant-pulling tools are designed to grip the plant stem and provide the leverage necessary to pull its roots out. Tools vary in their size, weight, and the size of the invasive plant they can extract. Selecting a pulling tool of the appropriate size is important to being effective in root pulling. Some of the tools may be cumbersome and difficult to carry to remote sites. Root pulling tools work best on firm ground as opposed to soft, sandy, or muddy substrates. Effectiveness is better than hand pulling since the entire root may be removed. |
| **Clipping** | "Clipping" means to cut or remove seed heads and/or fruiting bodies to prevent germination. This method is labor-intensive and effective for small and spotty infestations. Clipping may reduce annual seed production but long-term effect is that the NIP species will continue to survive and require multiple treatments in one growing season. |
| **Clipping and pulling** | "Clipping and pulling" means cutting a portion of the invasive plant stem and pulling it from its substrate, generally the bole of a tree. This method is labor intensive, but can be effective for larger infestations but size of area treated is only a couple of acres. |
| **Stabbing** | Some plants can be killed by severing or injuring (stabbing) the carbohydrate storage structure at the base of the plant. Depending on the species, this structure may be a root corm, storage rhizome (tuber), or taproot. These organs are generally located at the base of the stem and under the soil.<br><br>Cutting off access to these storage structures can help "starve" or greatly weaken some species. Treatment size is less than 1 acre. |
| **Mechanical** | |

| Method | Description |
|---|---|
| **Mowing, cutting, brushing, trimming, weed eating** | Mowing and cutting can reduce seed production and restrict invasive plant growth, especially in annuals cut before they flower and set seed. Some species however, re-sprout vigorously when cut, replacing one or a few stems with many that can quickly flower and set seed. These treatments are used as primary treatments to remove aboveground biomass in combination with herbicide treatments to prevent resprouting, or as follow up treatments to treat target plants missed by initial herbicide use. Also, mowing and cutting can be used, in conjunction with herbicide treatments, to reduce vegetative materials and to promote vigorous growth in order to decrease the amount of herbicide application needed, and to increase herbicide effectiveness. This method also includes use of chainsaws on tree-size plants to cut trunks and stems eliminating the live portion of the tree and preventing it from flowering and reproducing seed, as well as expending its above ground carbohydrate reserves. Treatment area is several acres in size and only limited by terrain features or accessibility hazards. |
| **Prescribed fire** | Involves intentionally igniting a fire under specific atmospheric and vegetative parameters that will allow a fire to carry through the affected area to accomplish control or eradication of non-native, invasive or noxious weeds. Most prescribed fires will involve “cleaning-up” site that has been treated by other methods and resulting in fuels consumption of the dead noxious weeds. This technique is typically applied to salt cedar treatments where cut stems are laying on the surface and impeding re-establishment of riparian native grasses, shrubs (willows), or trees (cottonwoods). Most burns would occur in the fall after plant dormancy, or early spring prior to new growth leafing-out. All prescribed fires will follow a BLM prepared burn plan. |
| **Cultural** | |

| Method | Description |
|---|---|
| **Grazing goats, sheep, livestock** | Grazing could either promote or reduce invasive plant abundance at a particular site. When grazing treatments are combined with other control techniques, such as herbicides, severe infestations could be reduced and small infestations may be eliminated. Grazing animals may be particularly useful in areas where herbicides cannot be applied (e.g., near water) or are prohibitively expensive (e.g., large infestations). Animals also could be used as part of a restoration program by breaking up the soil and incorporating in seeds of desirable native plants. Goats prefer broadleaf herbs and have been used to control leafy spurge (*Euphorbia esula*), Russian knapweed (*Acroptilon repens*), and toadflax (*Linaria spp.*). These animals appear to be able to neutralize the phytochemicals toxic to other animals that are present in these and other forbs. Goats could control woody species because they climb and stand on their hind legs (height limits is approximately 6 feet), and browse on vegetation other animals cannot reach. Treatment area can be several acres in size and likely requires several years of treatment to cause NIP species mortality. Collateral damage of non-target species is possible. Goat or sheep control of NIPs would not be conducted within 9 miles of Desert Bighorn Sheep habitat or without coordination and consultation with the NM Department of Game and Fish, because of disease risks and in conformance with BLM policy. |
| **Herbicide** | |
| **Selective Treatment** | Selective treatment of individual plants is done in a manner to avoid spraying other desirable plants. There is a low likelihood of drift or delivery of herbicides away from treatment sites. This method is used in sensitive areas, such as near water, to avoid getting any herbicide on the soil or in the water. Hand/Selective methods could be done under more variable conditions than spot spraying or broadcast spraying.<br><br>Specific methods include:<br>a) Wicking and Wiping - Involves using a sponge or wick on a long handle to wipe herbicide onto foliage and stems. Use of a wick eliminates the possibility of spray drift or droplets falling on non-target plants but incidental herbicide drips or dribble from some wicks may occur if the wick is overly saturated with herbicide. This method is often used in conjunction with cut stumps.<br>b) Foliar Application - These methods apply herbicide directly to the leaves and stems of a plant. An adjuvant or surfactant is often needed to enable the herbicide to penetrate the plant cuticle, a thick, waxy layer present on leaves and stems of most plants.<br>c) Basal Bark - This method applies a 6 to 12 inch band of herbicide around the circumference of the trunk of the target plant, approximately one foot above ground. The width of the sprayed band depends on the size of the plant and the species' susceptibility to the herbicide. |

| Method | Description |
|---|---|
| | The herbicide can be applied with a backpack sprayer, hand-held bottle, or wick.<br>d) Frill or Hack and Squirt - The frill method, also called the "hack and squirt" treatment, is often used to treat woody species with large, thick trunks. The tree is cut using a sharp knife, saw, or ax, or drilled with a power drill or other device. Herbicide is then immediately applied to the cut with a backpack sprayer, squirt bottle, syringe, or similar equipment.<br>e) Stem Injection - Herbicides can be injected into herbaceous stems using a needle and syringe. Herbicide pellets can also be injected into the trunk of a tree using a specialized tool.<br>f) Cut-stump - This method is often used on woody species that normally resprout after being cut. Cut down the tree or shrub, and immediately spray, wipe (wicked), or squirt herbicide on the exposed cambium (living inner bark) of the stump. The herbicide must be applied to the entire inner bark (cambium) within minutes after the trunk is cut. The outer bark and heartwood do not need to be treated since these tissues are not alive, although they support and protect the tree's living tissues. The cut stump treatment allows for a great deal of control over the site of herbicide application, and therefore, has a low probability of affecting non-target species or contaminating the environment. It also requires only a small amount of herbicide to be effective. Treatment area can be several acres in size. |
| **Spot Spraying** | Spot applicators spray herbicide directly onto small patches or individual target plants only and avoid spraying other desirable plants. These applications range from individual plant treatment with squirt bottles / hand sprayers to larger application methods such as backpack sprayers, All Terrain Vehicle (ATV) mounted units or motorized spray rigs with multiple spray hoses designed for individual plant treatment. Treatment areas can be limited to one plant or several acres in size. |
| **Broadcast (Boom) Spraying** | A boom, a long horizontal tube with multiple spray heads, may be mounted or attached to a tractor, ATV or other vehicle. The boom is then carried above the invasive plants while spraying herbicide, allowing large areas to be treated rapidly with each sweep of the boom. Offsite movement due to vaporization or drift and possible treatment of non-target plants can be of concern when using this method but it is often mitigated by the use of drift control agents, and close monitoring of weather conditions such as wind speed, direction, temperature, and relative humidity. The herbicide is carried in a tank and reaches the nozzles via tubing.<br><br>All herbicides are metered out from the nozzles in a controlled manner. The nozzle controls the droplet size, the area (or cone) being covered by the herbicide and it could be turned on/off with ease. Some nozzles could rotate. |

| Method | Description |
|---|---|
| | All this flexibility permits the operator to carefully apply herbicide at specific rates over specific areas.<br><br>Many of the new boom spray operations have very sophisticated electronic monitoring that delivers exact amounts of herbicides and keeps records on rates and areas covered. Offsite movement due to drift and possible treatment of non-target plants could be of concern when using this method. Not all broadcast methods include a boom; boom-less nozzles are currently in use that can reduce the risk of non-target effects. Backpacks may also be used as a broadcast tool, if not directed at individual plants. Treatment area can be several acres in size. |
| **Aerial Spraying** | This method utilizes a boom similar to the Broadcast Spraying description but is mounted on a fixed wing aircraft or helicopter. This method is used where the project area is inaccessible to ground vehicles or is large and continuous enough to justify the use of aircraft instead of an alternate method. Offsite movement due to vaporization or drift and possible treatment of non-target plants can be of concern when using this method, however the use of drift controls either as a design of the nozzles or as an adjuvant to the herbicide mix can reduce this effect. All herbicides are metered out from the nozzles in a controlled manner. The nozzle controls the droplet size, the area (or cone) being covered by the herbicide and it could be turned on/off with ease. Herbicides applied in pellet form from an aircraft can reduce or eliminate the drift hazard associated with liquid herbicides.<br><br>All this flexibility permits the operator to carefully apply herbicide at specific rates over specific areas. Many aircraft used in spray operations have very sophisticated electronic monitoring that delivers exact amounts of herbicides and keeps records on rates and areas covered using Global Positioning Systems (GPS) which aid in the treatment application. Special attention must be paid to application speed, wind speed, relative humidity, air temperature, and elevation as these factors play a key role in the accuracy of the treatment application in order to avoid drift onto non-target areas.<br><br>Treatment area can be many acres in size, either in linear fashion or large polygon. Collateral damage of non-target species is possible but can be mitigated by creating buffer zones of non-treatment areas. |

**Integrated Pest Management (IPM)**

IPM requires an ecologically based, interdisciplinary approach to selecting a treatment method that considers the biological information about an invasive plant species, the site location, proximity to water, and size of the infestation. Multiple treatments may be required to appropriately treat the invasive plants and meet the treatment goals for each treatment area. Implementing an IPM approach will entail evaluating the site-specific conditions and species involved through the project-screening checklist process to arrive at a treatment method, or combination of methods, to be used in some pre-determined order to optimize the effectiveness of a treatment.

Herbicides will be an integral part of the IPM approach and they can be used at various stages in the treatment process (beginning, middle, or final). It is recognized that herbicides are not the only method to control or eradicate invasive plants and may not always be the most effective. Research and anecdotal evidence have demonstrated that herbicide treatments have been effective in treating many of the invasive plants proposed for treatment in this EA, but it may not be the sole method to use in every case. IPM is species-specific, tailored to exploit the weaknesses of a particular invasive plant, and designed to be practical with minimal risk to other organisms and their habitats. Treatments are approved on an annual basis and treatment application may be repeated as needed during the growing season if plants indicate re-sprouting. Similarly, the herbicide used at a treatment area may change over time as the mixture of invasive plants present, and/or site conditions, change.

As per the BLM 2007 PEIS (Executive Summary- page 3), "the BLM will not only use the approved herbicides identified but may use new herbicides developed in the future if: 1) they are registered by the USEPA for use on one or more land types (e.g., rangeland, acquatic) managed by the BLM; 2) the BLM determines that the benefits of use on public lands outweigh the risks to human health and the environment; and 3) they meet the criteria to ensure that the decision to use the active ingredient is supported by scientific evaluation through human health and ecological risk assessments and NEPA documentation."

**Site Restoration**

After treatments take full effect, some areas may require the re-establishment of native vegetation if areas are predominantly bare ground. Re-vegetation of the site will be initiated if post-treatment monitoring indicates need for restoration. Actual restoration may take several years as the success will be determined by climate and restoration method used.

**Approval Process**

As per BLM Manual 9011 (Chemical Pest Control), all pesticide applications on BLM lands require the submission of a Pesticide Use Proposal (PUP). The PUP requires information on the target pests, chemical(s) to be used, rates of application, locations of applications, adjuvants to be used, description of site conditions, method of application, and identification of any issues of concern. For herbicides, only those formulations approved by the BLM PEIS 2007, as amended, and as listed in Appendix B will be used.

**Implementation Process**

Implementation will follow a site-specific assessment of project-level conditions to determine consistency with this EA. A project-level screening checklist will be utilized to evaluate the site of a proposed treatment project and ascertain the risk, if any, associated with the NIP species treatment. If the site is within the parameters of environmental effects as analyzed through this EA, the treatment can proceed. The checklist screening will facilitate documentation of the findings in a DNA. If the checklist screening identifies potential effects beyond the scope that has been analyzed in this EA, a site-specific EA will be prepared to analyze effects of the proposed treatment project.

**Minimizing Herbicide Effects**

This EA adopts the SOP and Conservation Measures, as well as the Mitigation Measures (MM) addressed in the BLM PEIS 2007. The SOP and MM are listed in this EA as Appendix A and C, respectively, and are to be used in the implementation of the Invasive Plant Management Plan (IPMP) when approved. Adherence to Appendix A and C will avoid adverse effects to the natural environment and provide for human health and safety.

In addition to the SOP and MM, herbicide application will be in accordance with label requirements. The herbicide label provides valuable information about proper handling, use, storage, potential risks, and instructions on minimizing risks. The Federal Insecticide, Fungicide, and Rodenticide Act of 1947 (P.L. 75-717, 7 U.S.C.) and as amended, mandates that pesticide applicators have legal responsibility to read, understand, and follow all label directions.

**Monitoring**

To ensure all mitigation measures are implemented and the treatment methods are achieving their goals, a monitoring protocol will be developed and implemented as part of each treatment project. Development of a monitoring protocol will incorporate procedures and concepts identified in Appendix C derived from the BLM 2007 PEIS which will be used as a framework in developing site-specific monitoring standards.

## 2.2 ALTERNATIVE B – No Weed Treatments

This alternative will cease all NIP species treatments on all BLM administered lands within Otero, Dona Ana, Sierra, Luna, Grant, and Hidalgo counties. Existing EAs for NIP species treatment will be terminated and no new treatment projects will be authorized regardless of treatment methods available.

## 2.3 ALTERNATIVE C – No Action, Continue Current Management

This alternative continues existing management efforts to control or eradicate NIP species within LCDO on a project by project basis for Luna, Grant, Sierra, and Hidalgo counties. Existing county-wide EAs (Otero and Dona Ana) and site-specific rights-of-way EAs (Luna and Sierra) will continue to be used to treat NIP infestations as they are discovered.

Implementation of this alternative does not prohibit the development of future county-wide EAs for Hidalgo, Luna, Grant, and Sierra counties, or the completion of EAs for site-specific treatment projects within those counties if county-wide EAs are not prepared. There would not be a project-level screening checklist approved to provide consistency in treating NIP species across all counties.

### 2.4 Alternatives Considered, But Not Analyzed Further

During the scoping of the BLM 2007 PEIS, many issues identified were considered, but not analyzed, and subsequently will not be analyzed in this EA. Alternatives specific to this EA that will not be analyzed in detail are discussed below.

**Biological, Cultural, Herbicide, Manual, Prescribed Fire, or Mechanical Control Alone**
As directed by various guidance documents, including the Department of Interior, Integrated Pest Management Policy; the Federal Insecticide, Fungicide, and Rodenticide Act; Partners Against Weeds: An Action Plan for the Bureau of Land Management (BLM 1996); federal agencies are directed to use an integrated pest management approach to managing invasive species. Thus, the use of any one technique, exclusively, was not considered in this EA. Use of biological control will require its own EA for site-specific conditions which requires coordination and consultation with Animal and Plant Health Inspection Service, Plant Protection and Quarantine, U.S. Department of Agriculture (USDA-APHIS) as well as New Mexico state agencies.

The use of prescribed fire as a sole method to control invasive plants was not considered in this EA. Prescribed fire is part of the Proposed Action to be used in conjunction with other treatment methods. Many of the invasive plants considered in this proposal would respond positively to burning, thus, exacerbating the existing situation. Additionally, the size of the treatment areas proposed is not conducive to successful burning. When situations arise where prescribed fire is an appropriate integrated pest management option, a site-specific analysis will be completed and documented accordingly through an appropriate environmental document.

## 3 AFFECTED ENVIRONMENT

### 3.1 Noxious and Invasive Plant Species

NIP species within the state of New Mexico (NM) are officially designated by the NMDA and placed on the NM Noxious Weed List (Table 3) due to their adverse effect on state or private agricultural lands. Those NIP species listed by the NM State are emphasized for control or eradication for which state or federal funding may be acquired through various sources for the treatment of such species.

The Watch List is also developed for NIP species located in adjoining states that may have potential for being a serious threat to agricultural lands within NM or the possibility for those species entering NM is eminent. These NIP species list are not comprehensive and they are

subject to change and updates as new information is gathered about the biology of the species, distribution, density, and threat to agricultural productivity of lands within the state of NM.

The current amount of NIP species treatments occurring within LCDO is about 750 acres annually. The majority of the currently treated acres are comprised of salt cedar infestations. Most of the treatments that occur at the present time are on sites that have been previously treated for NIP species, usually along roadways and borrow ditches, dry drainages, and around dry stock tanks or livestock gathering facitlities. Very few new areas are treated for NIP species within LCDO at the present time due to insufficient NIP species inventory data.

Appendix E describes the characteristics of several NIP species and other attributes related to those species. It is not an all-inclusive list but it reflects those species that are known to occur or likely to occur within LCDO jurisdictional boundary. NIP species can be found in various plant communities across different landscapes. Some NIP species are limited to specific soil characteristics (temperature, moisture, texture, or chemistry), land features, elevation, or land use patterns. Other NIP species are highly adaptable and may be found in various landscapes. It‘s rare to find more than one NIP species occupying the same landscape but it is possible that a myriad of species are encountered along riparian areas or borrow ditches.

Current information about NIP species (Appendix E) within LCDO indicates that a few species are occurring on BLM administered lands, which includes military lands within McGregor Range (Ft. Bliss, U.S. Army). This EA discusses the most common NIP species affecting LCDO but the management objective of the Proposed Action is to treat all species as they occur before they become a resource management problem.

The species most commonly found are African rue, knapweeds, starthistles, and salt cedar. NIP species that are infrequently encountered are camelthorn, hoary cress, Eurasian watermilfoil, leafy spurge, parrotfeather, purple loosestrife, Scotch thistle, musk thistle, tree-of-heaven, Russian olive, Siberian elm, and jointed goatgrass. These species may occur in only portions of the LCDO and without a comprehensive inventory it is uncertain to determine how widespread each species is across LCDO.

Limited amounts of NIP species inventory has occurred with current activities and re-infestation of treated sites has been problematic within LA1 and LA2. Safe havens may exist for NIP species along drainages, stock tanks, or river corridors, as well as railroad rights-of-way which contribute to the spread of NIP species within LCDO. Some areas within the LA3 habitat have been subjected to grazing, off road use, hunting, mining, dispersed recreation, and occasional utility corridor development. LA3 within Otero County has received treatment for salt cedar but has not occurred in other counties.

NIP species are a widespread threat to natural ecosystems across much of the western U.S., and the infestations of certain species have reached a severe ecological problem in other states. Native plant ecosystems have been replaced by NIP species and the potential exist for similar occurrences in NM. The BLM 2007 PEIS addressed the severity of the problem and recognized the need to use the best tools available for control and eradication of NIP species, therefore herbicides were

approved for use on BLM lands to impede NIP species from reaching epidemic proportions, if not eradicate them completely.

Table 3 contains the New Mexico Noxious Weed List of Class A, B, and C species as well as the, Watch List Species (WLS) which was updated in April 2009. For those interested in the most current and accurate listing of species, refer to: **http://www.nmda.nmsu.edu/animal-and-plant-protection/noxious-weeds.**

**Table 3 New Mexico Noxious Weed List (Updated April 2009).**

| Commom Name | Scientific Name | Class | Location in LCDO |
|---|---|---|---|
| Black henbane | *Hyoscyamus spp.* | A | None |
| Camelthorn | *Alhagi psuedalhagi* | A | Dona Ana and Sierra |
| Canada thistle | *Cirsium arvense* | A | None |
| Dalmation | *Linaria dalmatica* | A | Grant |
| Diffuse knapweed | *Centaurea diffusa* | A | None |
| Dyer's woad | *Isatis tinctoria* | A | None |
| Eurasian | *Myriophyllum* | A | Sierra |
| Giant salvinia | *Salvinia molesta* | A | None |
| Hoary cress | *Cardaria spp.* | A | Dona Ana, Grant, Hidalgo, Sierra, and Otero |
| Hydrilla | *Hydrilla verticllata* | A | None |
| Leafy spurge | *Euphorbia esula* | A | Otero |
| Oxeye daisy | *Leucanthemum* | A | Otero |
| Parrotfeather | *Myriophyllum aquaticum* | A | Grant |
| Purple loosestrife | *Lythrum salicaria* | A | Grant |
| Purple starthistle | *Centaurea* | A | None |
| Ravenna grass | *Saccharum ravennae* | A | Dona Ana |
| Scotch thistle | *Onopordum* | A | None |
| Spotted knapweed | *Centaurea biebersteinii* | A | Grant and Otero |
| Yellow starthistle | *Centaurea* | A | Districtwide |
| Yellow toadflax | *Linaria vulgaris* | A | None |
| African rue | *Peganum harmala* | B | Districtwide |
| Chicory | *Cichorium intybus* | B | Otero |
| Halogeton | *Halogeton* | B | None |
| Malta starthistle | *Centaurea melitensis* | B | Districtwide |
| Musk thistle | *Carduus nutans* | B | Otero |
| Perennial pepperweed | *Lepidium latifolium* | B | Sierra, Dona Ana, and Hidalgo |
| Russian knapweed | *Acroptilon repens* | B | Luna, Sierra, Dona Ana, and Otero |
| Poison hemlock | *Acroptilon rapens* | B | Grant and Otero |
| Teasel | *Dipsacus fullonum* | B | Otero |

| Commom Name | Scientific Name | Class | Location in LCDO |
|---|---|---|---|
| Tree of heaven | *Ailanthus altissima* | B | Districtwide |
| Bull thistle | *Cirsium vulgare* | C | Grant, Hidalgo, and Otero |
| Cheatgrass | *Bromus tectorum* | C | Districtwide |
| Jointed goatgrass | *Aegilops cylindrica* | C | Districtwide |
| Russian olive | *Elaeagnus* | C | Districtwide |
| Saltcedar | *Tamarix spp.* | C | Districtwide |
| Siberian elm | *Ulmus pumila* | C | Districtwide |
| Crimson fountaingrass | *Pennisetum setaceum* | WLS | Dona Ana |
| Giant cane | *Arundo donax* | WLS | Dona Ana, Luna, Hidalgo, Otero |
| Meadow | *Centaurea pratensis* | WLS | None |
| Pampas grass | *Cortaderia* | WLS | Dona Ana |
| Quackgrass | *Elytrigia repens* | WLS | Grant and Otero |
| Sahara mustard | *Brassica tournefortii* | WLS | Dona Ana and Sierra |
| Spiny cocklebur | *Xanthium spinosum* | WLS | Districtwide |
| Wall rocket | *Diplotaxis tenuifolia* | WLS | Otero |

**Class A Species --** Infestations of these species and eradicating existing infestations is the highest priority.

**Class B Species --** Class B species are limited to portions of the state. In areas with severe infestations, management should be designed to contain the infestation and stop any further spread.

**Class C Species --** Class C species are wide-spread in the state. Management decisions for these species should be determined at the local level, based on feasibility of control and level of infestation.
**Watch List Species --** Watch List species are species of concern in the state. These species have the potential to become problematic. More data is needed to determine if these species should be listed on the New Mexico Noxious Weed list.

### 3.2 Affected Habitats

Introduction

The habitats that are affected by NIP species occur on various landscapes. For management purposes, the habitats (plant communities) where NIP species may occur have been consolidated into four landscape areas that may include differing landform but will be treated collectively for NIP species treatment purposes. The landscapes are identified as follows: roadways and borrow ditches; rangelands; riparian areas; and special management areas. Certain NIP species occur in specific habitats whereas others are highly adaptable to a multitude of landscapes. Based on field

experience, the most common habitat infested by NIP species is along roadways and borrow ditches which receive added moisture from road surface runoff and seed deposition.
Other high impact areas that are readily invaded by NIP species are utility corridors (power-lines, buried optic or gas lines, and railroad rights-of way). River or drainage systems that hold permanent or intermittent water during the year are also highly susceptible to NIP species establishment. From these landscapes NIP species are found to spread into open rangeland (BLM 2007 PEIS).

Rangeland in this EA refers to all uplands that support grasslands, desert or mountain shrubs, and pinyon-juniper woodlands and savannas. Generally rangelands are impacted by livestock grazing, range improvements, special uses such as utility corridors or inter- and intra-state pipelines, recreational uses, and other activities that disturb the surface and expose the soil to infestation. African rue, knapweed species, and starthistle species are NIP species that can be found on upland sites and intermixed with native vegetation composed of grasses, forbs, and shrubs.

Native vegetation that is common in the rangeland landscape are warm-season grasses (black, blue, and sideoats grama; various species of bluestem, plains lovegrass, various dropseed species, various muhly species), cool-season grasses, forbs, and various shrub species (fourwing saltbush, ephedra, skunkbush sumac, littleleaf sumac, desert ceanothus; mountain mahogany, feathered dalea, sotol, nolina, various cacti species), and at higher elevation various woodland species can also be encountered (gray, Emory, wavyleaf oaks; alligator, oneseed, Rocky Mountain junipers; twoneedle pinyon). Native species occurring in similar rangelands that can also be invasive in some circumstances are creosote bush, tarbush, mesquite, rabbitbrush, spineless horsebrush, cholla, prickly-pear cactus, whitethorn acacia, and catclaw mimosa. These species can be found in a variety of landscapes within or adjacent to upland sites, such as roadways, borrow ditches, and riparian zones or drainage areas.

Drought is a natural disturbance that affects native vegetation densities and composition which allows NIP species to enter or expand their populations after drought mortality has occurred. Disturbance from natural fire in some localities also reduces competition between native vegetation and NIP species which provides opportunities for invasive species to establish and spread. In addition, fires generally provide a nutritional boost to plant species for a 3 to 5 year period following the burn which invigorates plant growth in most species, including NIP species.

<u>Landscape Area #1 (LA1), “Roadways, Railways, and Borrow ditches”</u>

The invasive species are intermixed with native vegetation composed of grass, forbs and shrubs, and occasional tree species at higher elevations or where additional water may accumulate resulting in site conditions favorable for some riparian species. The following NIP species are typically found along roadways and ditches where surface moisture runoff is increased by the adjoining road surface: African rue; knapweed species; starthistle species; Salt cedar; perennial pepperweed; Scotch thistle; musk thistle (Pinyon/Juniper plant community); camelthorn.

This site not only has a greater moisture advantage than the surrounding areas, it is also subjected to intense ground disturbance from road maintenance activities, such as road grading, mowing, re-

surfacing of paved roads, maintenance of utility corridors, or burial of pipelines or communication lines along roadways.

The continued disturbance aids in creating a seedbed for invasive species to establish and mature. The site also becomes a perpetual source for invasive species to expand into the adjoining native rangelands or drainage areas. Most species occur without the effect of grazing but occasional accidental wild fires along the borrow ditches may occur. These fires may reduce competition between NIP and native species, but often times the fire will stimulate NIP species growth due to nutrient cycling after a fire.

Landscape Area #2 (LA2), "Rangelands"

Rangelands, in this EA refer to all uplands and dry drainages that are distant from riverine systems or ephemeral/intermittent drainages that support grasslands, desert or mountain shrubs, and pinyon-juniper woodlands and savannas.
The following NIP species are typically found on upland sites and intermixed with native vegetation comprised of grasses, forbs and shrubs: African rue; knapweed species; cheatgrass; toadflax species; hoary cress; field bindweed; starthistle species; leafy spurge (P/J zone); camelthorn**.** Generally these sites are impacted by livestock grazing, range improvement construction, special uses such as utility corridors or inter- and intra-state pipelines, recreational uses, mineral pits, and other activities that disturb the surface and expose the soil to infestation.

The native vegetation is composed of warm and cool season grasses and forbs, various shrub species, and at higher elevation various woodland species. Natural and human caused disturbances also affect these sites and the intensity of the disturbance varies by elevation. The most common disturbances are livestock grazing, natural fires and drought. Vegetation densities shift with drought allowing opportunities for NIP species to enter or expand their populations after drought kill. Natural fire in some localities increases competition between native vegetation and NIP species for space and nutrients. In addition, fires generally provide a nutritional boost to plant species for a 3-5 year period following the burn which will invigorate plant growth in most species, including NIP species. Livestock grazing can vary by intensity and heavily grazed areas reduce native vegetation and exposes soil for NIP species establishment. NIP species may expand rapidly in the moderate to heavy grazed areas and may be difficult to eradicate in those areas.

Landscape Area #3 (LA3), "Riparian zones, rivers, streams, and stock tanks"

These areas are very sensitive, complex ecosystems because of the adjacent water sources or shallow water table. Water sources, and lands that drain into those sources, are subject to regulation by Clean Water Act and NM State water laws, in addition to BLM authorities.

Riparian zones include free-flowing rivers and streams, as well as springs and seeps. Ephemeral and intermittent drainages may also be classified as riparian zones if the area is saturated or inundated at a frequency and duration sufficient to produce vegetation typically adapted for life in saturated soils. Stock tanks are man-made catchments that accumulate run-off from winter or summer moisture storms and can support NIP species.

The following NIP species are typically found along drainages or other moist sites and intermixed with native vegetation composed of grasses, forbs, shrubs, and occasional tree species: Canada thistle; musk thistle (P/J zone); knapweed species; cheatgrass; toadflax species; hoary cress; field bindweed; starthistle species; Eurasian watermilfoil; perennial pepperweed; Siberian elm; Russian olive; and salt cedar.

Riparian areas containing perennial flowing water are of highest concern, such as the Gila River, the Rio Grande, Percha Creek, and Blue Creek. However, all riparian zones and their affected area would be mapped for site-specific analysis if treatments are needed. Riparian zones and stock tanks by their nature attract a substantial amount of use that includes humans, livestock, and wildlife. These sites have been heavily impacted by grazing use along with recreational uses (motor vehicles). These sites can produce a substantial amount of vegetation, not only in terms of production but also plant diversity.

Soils can be readily exposed to invasive species establishment and competition will often occur between invasive and native vegetation. Soils are generally fine textured and susceptible to erosion. The complexity that surrounds these sites is that native riparian species (cottonwoods, black walnut, willows, and hackberry) would occur alongside NIP species making eradication very difficult without suffering some loss of native species. In addition, several SSS, plants or animals, may coexist with NIP species in these areas, further complicating treatment opportunities.

<u>Landscape Area #4 (LA4), “Special Management Areas”</u>

These areas are the most complex ecosystems because they contain special management objectives and authorities to sustain the native plant communities which are in conflict with controlling NIP species.

SMAs are established through the land use planning process or are specially designated by the legislative process. The SMAs are inclusive of all ACEC, RNA, WSA, or SMA for cultural, scenic, paleontological, recreational, or other special emphasis that requires specific administrative control of human activity within its boundaries. ACEC areas may contain habitat for SSS as well as unique plant communities which have been subjected to various human disturbances prior to its official designation, therefore, such areas can be safe havens for NIP species. SSS can also occur in other zones that are not designated as ACEC, such as in the case of Chihuahuan scurf pea.

### 3.3 Native Vegetation

Vegetation resources within the LCDO are diverse and in some areas unique. Native vegetation occurs in rangeland settings comprised of a mix of grasses, forbs and shrubs and in some areas with tree cover that can be described as woodland or savanna to riparian wooded galleries. The precipitation, elevation, and temperature extremes, combined with soil and geology variability, create a variety of vegetation habitat types. The desert areas provide habitat for a variety of hearty plants tolerant of low precipitation, temperature extremes, and saline soils. At higher elevation plants are adapted to very low temperatures, an extremely short growing season, and with some snow accumulation. Plant communities currently containing invasive plants are varied, but the

most common occurrences include riparian areas infested with salt cedar, Siberian elm, or Russian olive; desert grassland and shrub plant communities infested with African rue, starthistles, and knapweeds species. In many cases, weed populations are established where previous disturbance has occurred disrupting the existing native plant community; however, NIP species have also moved into undisturbed native plant communities.

The native vegetation is comprised of warm season grasses (black, blue, and sideoats grama; various species of bluestem, plains lovegrass, various dropseed species, various muhly species), cool and warm season forbs; and various desirable shrub species (fourwing saltbush, Ephedra, desert ceanothus; mountain mahogany, feathered dalea, sotol, Nolina, various cacti species), and at higher elevation various woodland species can also be encountered (gray, Emory, wavyleaf oaks; alligator, oneseed, Rocky Mountain junipers; twoneedle pinyon). Native shrub species that also occur on these sites are creosote bush, tarbush, mesquite, rabbitbrush, spineless horsebrush, cholla, prickly-pear cactus, whitethorn acacia, catclaw mimosa.

These native shrub species can invade the upland sites as a result of intense livestock grazing and drought effects in which they may dominate rangelands or dry drainages. These native-invasive shrub species are found in all four landscape areas and they may coexist with NIP species in some localities. Management objectives for treating native-invasive species is different than treating for NIP species and this EA is limited to only treating NIP species.

LA2 and LA3 are currently most at risk of degradation due to NIP species. Several of the more aggressive, tenacious NIP species often occur in riparian areas (LA3). These areas are also subject to disturbances, natural and human caused (flooding, road crossings, dispersed recreation use, grazing, etc.), creating favorable sites for NIP species establishment. Riparian areas are highly important for native plant and wildlife diversity.

The greatest threat to LA2 (Rangelands) is changes in plant composition in the desert shrub and grassland communities resulting from disturbances such as roads, trails, gravel pits, fire, utility corridors, and concentration areas (water troughs, salting locations, supplemental feeding locations, resting areas) and other range improvement construction sites. Disturbances reduce native plant density in the affected area and allow NIP species to enter without competition. Over time, this can potentially lead to changes that negatively affect, and may exclude, native plant species from the disturbance sites resulting in complete vegetation type conversion to a NIP species plant community. NIP species competition with native plant species eventually will affect plant diversity and wildlife habitat quality.

### 3.4 Soils

Soils across the LCDO are quite variable. They include shallow-to-deep and fine-to-coarse-textured soils. They vary in salt content, organic matter content, and parent material, along with rock content, erosion hazard, and infiltration rates. These areas are distinguished by varying amounts of precipitation, elevation, soil moisture and temperature regimes, and soil parent material.

Soil productivity is the most important soil value in the LCDO because it determines stocking rates for livestock through the amount of vegetation produced, it dictates the kinds of plant communities on which wildlife habitat is based, and it determines reclamation potential in areas of surface disturbance. The lands ability to produce native vegetation also determines its ability to protect soil from erosion (wind and water). Most soils in the LCDO support vegetation that is used by livestock and that also serves as wildlife habitat. Soil characteristics and environmental factors that affect soil productivity include organic matter content, salt content, precipitation, soil temperature, aspect, soil depth, and soil parent material.

### 3.5 Water

The LCDO is topographically divided by the Continental Divide, which means that streams in the western portion of the LCDO drain to the west eventually reach the Pacific Ocean via the Sea of Cortez. Those streams that drain to the east side of the Divide eventually reach the Atlantic Ocean via the Gulf of Mexico. The river systems that convey these waters are interstate streams within the project area, and they involve such rivers as the Gila and the Rio Grande.
These rivers are of special concern because of the potential effect across state and international borders. Surface water quality within the LCDO is largely influenced by rock and soil type, vegetation, groundwater interaction, and pollutants discharged into water bodies from point and non-point sources.

Water quality impacts within the LCDO may be associated with agricultural runoff, road maintenance, increased sedimentation (including water erosion derived from removal of riparian vegetation, degraded uplands, channel modification, and/or stream bank destabilization), atmospheric deposition, resource extraction, urban runoff, logging, fire, Border Patrol activities, and grazing activities. Transportation of a wide range of pollutants, such as heavy metals, nutrients, sediments, waste products, and saline deposits can impact water quality within the project area. Groundwater depth, quantity and quality in the LCDO can be highly variable between aquifers, in part reflecting the complex geologic history of the region. In general, groundwater quality throughout the project area is adequate for domestic, irrigation, and livestock uses. Additionally, groundwater quality typically increases with depth. However, some of these waters can be only marginally suitable or even unsuitable for domestic or irrigation uses, mainly due to high total-dissolved solids (TDS) concentrations.

### 3.6 Wildlife

There is a high amount of wildlife species diversity in the LCDO based on vegetation, soil, and landform. Plants and wildlife throughout the district are mainly influenced by the Chihuahuan Desert ecoregion, but the Arizona Pine, Sierra Madre Occidental, and Sonoran ecoregions are also apparent in the district. Mountain ranges such as the Peloncillo Mountains provide a corridor for migration and genetic mixing between wildlife found in the Rocky Mountains and Sierra Madre Range in Mexico. Due to the connectivity and blending of these ecoregions, several different habitat types are found in the district and thus species diversity in parts of the LCDO is higher than would be expected. In other areas of the district, sky island ranges (isolated mountain ranges) exist and have provided opportunities for divergent evolution to take place; thus many endemic plant and animal species occur on several mountain ranges.

Throughout these broad types of ecosystems are a variety of habitats that are dependent on the local soil, topography, precipitation, and vegetation. The BLM conducted an inventory of wildlife habitats in the LCDO using the Integrated Habitat Inventory and Classification System in 1981. Table 4 shows the different types of standard habitat sites (SHS) found on BLM lands in the LCDO.

As indicated in Table 4, creosote rolling upland and mesquite sand dune sites are by far the most extensive SHS. These SHS's are grazing disclimax (stable state) communities that at one time were mostly desert grasslands. Creosote rolling upland and mesquite rolling upland are the least diverse SHS's in terms of vegetative species composition in the LCDO (Inventory Report, American Ag International, no date). These areas are mostly found in LA1, LA2, and LA4. The lack of diversity is especially apparent for grass species (4 perennial, 2 annual species). In contrast, the report lists 15 grass species for the grass rolling upland SHS across the District.
Even though NIP species have the potential to invade into any type of SHS where surface disturbances, roads, livestock grazing, or recreation occur, this is especially true for SHS's that are lacking plant diversity such as the creosote rolling uplands and mesquite sand dunes.

**Table 4 Standard Habitat Sites LCDO.**

| Standard Habitat Site | Acres | Percentage |
|---|---|---|
| Arroyo | 55,971 | 1.04% |
| Conifer Mountain | 1,494 | 0.03% |
| Creosote Breaks | 130,227 | 2.41% |
| Creosote Hills | 106,650 | 1.97% |
| Creosote Rolling Uplands | 1,523,887 | 28.22% |
| Grass Flat | 265,865 | 4.92% |
| Grass Hills | 136,001 | 2.52% |
| Grass Mountains | 377,935 | 7.00% |
| Grass Rolling Uplands | 464,872 | 8.61% |
| Half-shrub Hills | 11,128 | 0.21% |
| Half-shrub Rolling Uplands | 252,470 | 4.67% |
| Malpais- Rock | 29,108 | 0.54% |
| Mesquite Rolling Uplands | 177,769 | 3.29% |
| Mesquite Sand Dunes | 709,292 | 13.13% |
| Mixed Shrub Hills | 248,918 | 4.61% |
| Mixed Shrub Mountains | 251,722 | 4.66% |
| Mixed Shrub Rolling Uplands | 280,363 | 5.19% |
| Oak Draw | 1,106 | 0.02% |
| Pinon-Juniper Grass Mountains | 75,912 | 1.41% |
| Riparian | 4,377 | 0.08% |
| Salt Flats | 20,560 | 0.38% |
| Unknown (approximate) | 275,000 | 5.09% |
| Total | 5,400,627 | |

While riparian and arroyo habitat sites (LA3) make up less than 2% of the LCDO, they provide important habitat for many bird and plant species as well as forage opportunities and cover not often found in other desert habitat types. Riparian areas are naturally more at risk for invasion than other types of ecosystems due to the fact that they are natural sinks for landscapes. Water, nutrients, and sediments from the uplands accumulate in these areas, all of which accelerate plant

growth. These areas also experience a high amount of disturbance due to the natural forces of flooding, which provide opportunities for NIP species to become established (Zedler 2004).

The Migratory Bird Treaty Act (MBTA) of 1918 prohibits the take, capture or killing of any migratory birds, any parts, nest or eggs of any such bird (16 U.S.C. 703 (a)). In addition, Executive Order 13186 (January 2001) requires the BLM to ensure MBTA compliance, evaluate Bureau actions and agency plans on migratory birds, initiate actions to minimize take of migratory birds and contribute to the conservation of migratory birds. BLM participates in the New Mexico Partners in Flight (NMPIF) partnership and participated in the production and implementation of the New Mexico Bird Conservaton Plan.

In the New Mexico Bird Conservation Plan Version 2.1 (June 2007) and NMPIF, defines 20 separate habitat types within the state, based on both bird assemblages and vegetative associations. Nine of those habitat types can be found in the LCDO, with 86 priority species occurring in those habitat types. A complete listing of the species, the conservation priority and the habitat types they occur in can be found in Appendix I.

### 3.7 Special Status Species

The BLM 2007 PEIS evaluated potential effects on listed species and their habitat in a programmatic approach. As part of the BLM 2007 PEIS, U.S. Fish and Wildlife Service (USFWS) was consulted under Section 7 of the Endangered Species Act (ESA) and concurred with BLM's determination that the proposed action from the EIS "may affect, but not likely adversely affect" listed species. USFWS issued concurrence on the BLM 2007 EIS acknowledging BLM's established conservation measures and standard operating procedures to be implemented to protect listed species and their habitat. The service concluded that the proposed action "would not likely adversely affect any threatened or endangered species". It was also acknowledged that any implementation action carried out under the PEIS, especially those that do not conform to the standards, may require a site-specific consultation at the project level prior to treatment (Appendix G). The BLM 2007 PEIS consultation process is incorporated by reference into this EA which is identified as "Appendix C" in the PEIS.

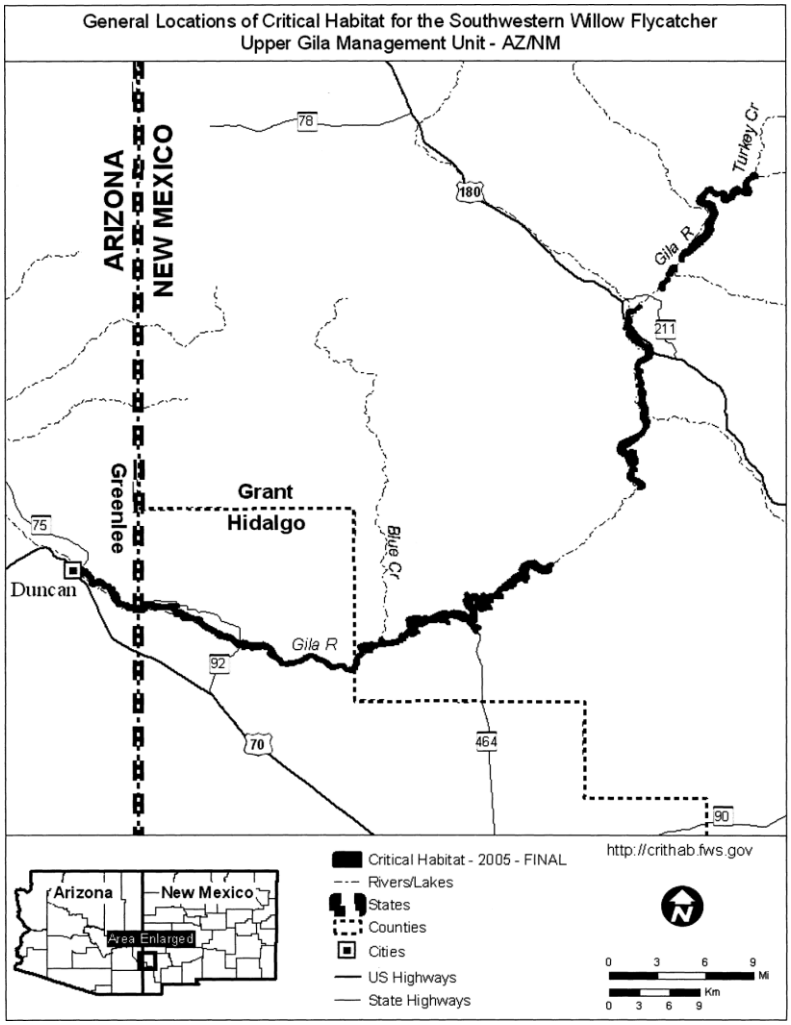


**Figure 2Southwestern willow flycatcher critical habitat in LCDO.**

The connectivity of ecoregions and the opportunities for endemism to occur, as well as the fact that LCDO is the northern limit of geographic distribution for many species suggests that SSS can be found throughout the district in large numbers. Appendix H contains lists of SSS plants and animals found in the LCDO at the time of analysis. Current lists of these species can be found at http://nmrareplants.unm.edu , http://www.fws.gov/southwest/es/EndangeredSpecies/lists/ and http://www.bison-m.org/index.aspx, and at the Las Cruces District Office. SSS includes federally listed threatened, endangered, candidate, or proposed species as well as species designated by the BLM as sensitive species.

BLM sensitive species are species designated by the State Director requiring special management consideration to promote conservation and reduce the likelihood and need for future listing under the Endangered Species Act. Federal candidate species, proposed species, and delisted species in the 5 years following delisting are also BLM sensitive species. SSS could be present or have potential to be present in proposed treatment areas. They are mostly likely to occur in LA3 and LA4 (discussed in Section 3.2), however they have the potential to occur in any zone.

In LA4, SMA's have been designated in certain areas to provide additional protection for SSS species. Any actions that occur in these areas require adherence to the particular area's management guidelines. Appendix K lists the SMA's in the district and the feature(s) that the area is being managed for.

A SSS that occurs in the Las Cruces District that is associated with NIP species is the Southwestern willow flycatcher (*Empidonax traillii extimus*). A U.S. Geological Survey study showed that while nearly half of southwestern willow flycatcher territories studied are found in riparian patches consisting primarily (greater than 90 percent) of native trees, 6 percent of known breeding territories are in monotypic (greater than 90 percent) salt cedar, 22 percent are in habitats dominated by salt cedar (50–100 percent), and another 28 percent are in native habitats where salt

cedar and other invasive species (Russian olive and Siberian Elm) provide 10–50 percent of the habitat structure. However, "much of the salt cedar along riparian systems is not used by flycatchers and is presumably unsuitable" (Shafroth 2009). The U.S. Fish and Wildlife Service (USFWS) have designated the Gila River in Grant and Hidalgo counties as Critical Habitat (Figure 2). The USFWS published a notice in the federal register to revise Critical Habitat for the flycatcher to include a segment of the Rio Grande from the Caballo Reservoir in Sierra County to Leasburg Dam in Dona Ana County (Vol. 76 No. 157 FR 50,542-50,628 August 15, 2011).

The yellow-billed cuckoo (*Coccyzus americanus*) is another bird species that is known to associate with salt cedar, especially on the Pecos River in New Mexico (Shafroth 2009). Populations from eastern slopes of the Rio Grande drainage towards the west are a candidate for listing under the Endangered Species Act, and are consequently a BLM sensitive species.

### 3.8 Human Health and Safety

The BLM 2007 PEIS addressed the potential effects of herbicides on human health and safety and that analysis is incorporated by reference in this section. The BLM 2007 PEIS recognized it is difficult to correlate injury, disease or illness caused by specific chemical treatments on human health. Based on the BLM's injury breakout report (USDI BLM 2005b), only one minor injury from use of herbicides was recorded during FY 2005 (BLM 2007 PEIS).

In general, vehicular traffic is continuously occurring along roadways. Annually during mid to late summer, NM Department of Highways and County agencies spray roadsides for NIP species. The conditions under which spraying occurs appears to be consistent with protocols for safety procedures. Most spraying is a vehicular boom-spraying apparatus mounted on a large truck. The spray is directed toward ground level and drift is minimized by size of nozzle discharge, vehicle speed, and direction of spray. Spraying generally occurs within approximately 12-15 feet of the roadway's edge.

Scattered and isolated ranch dwellings occur adjacent to BLM lands across LCDO. Predominately these dwellings occur on upland habitats, although there are occurrences along drainages and river corridors associated with the Rio Grande, Tularosa Creek, Gila River, Mimbres River, as well as other large drainages. Some of the adjoining non-federal lands may be comprised of rangeland or croplands. Some of the croplands derive irrigation water from river corridors for grain, hay, food, or commodity production.
Livestock may water along river or stream drainages; as well as water wells or spring water sources which may be drawn from drainage aquifers. These water sources are likely conveyance channels where NIP species can migrate from federal lands onto non-federal lands where they will eventually infest agricultural. These lands may be subjected to herbicide treatments to control or eradicate the invading plant species. Herbicide treatments in close proximity to dwellings, livestock, potable water systems, and human food chain may pose a threat to human health and safety if not conducted properly, both on federal and non-federal lands.

# 4 ENVIRONMENTAL EFFECTS

## 4.1 Impacts of Proposed Action on NIP Species

### 4.1.1 Alternative A – Proposed Action - Direct and Indirect Effects

The Proposed Action proposes to treat between 1,000 to 7,500 acres of NIP species annually on BLM lands, depending on funding. This amounts to less than 0.1% of all LCDO lands. In addition, the BLM may fund treatments on non-federal lands within LCDO through cooperative agreements where such actions may be beneficial to the adjoining federal lands. Re-treatment may also occur as needed to eradicate or control NIP species in previously treated sites. A combination of manual, mechanical, cultural, prescribed fire, and herbicide methods may be used. Initially, the landscape areas to be treated annually will occur within roadways, railways, borrow ditches, and rangelands (LA1 and LA2).

Future treatments may occur within riparian corridors, drainages, and/or Special Management Areas (LA3 and LA4) pending inventory results. In the event NIP species are located within sensitive areas such as SMAs for SSS or in aquatic ecosystems, a site-specific analysis will be conducted through the project-level screening checklist (Appendix F). Pending the screening checklist results, a determination will be made whether a proposed project needs to be analyzed in a site-specific EA in accordance with NEPA or if the action is consistent with the analysis in this EA and the project is documented in a DNA and allowed to proceed with stipulations if so required. The treatment methods can be a combination of those described in Section 2.1.2, Table 2.

**Manual** – treatment will occur in limited situations to small, isolated populations of invasive species. This method will be easy to control use and minimize or avoid collateral damage to non-target species. Ground disturbance should not be such that it will disrupt other activities or damage cultural resources since the treatment will be very site-specific.

**Mechanical** – This treatment can affect larger areas and potentially cause greater ground disturbance. This method can be effective in treating larger areas and reduce infestations more rapidly than manual method. Collateral damage to non-target species can be substantial. Damage to cultural resources is greater, and disruption of wildlife activity may also occur due to greater human activity, even for short period of time.

**Cultural** – This method can be effective on selected species for short periods of time. Its use may occur in conjunction with other treatment methods, either prior to or after other methods have been applied. The impacts of this method most likely will not eradicate the species, but prevent it from flowering or going to seed, therefore reducing its ability to reproduce. The predominant effect is weakening the invasive plant during its growth cycle which allows herbicide treatment to be more effective in entering the NIP species and adversely affecting its regrowth, and likely killing the plant. Some collateral damage may occur as result of this treatment. Depending on grazing intensity of NIP species, desirable species, where present, may also be severely grazed during the treatment period. The combination of these treatments may have a high degree of success

therefore reducing the probability of repeated treatment, unless a new generation of invasive species occupies the site.

**Herbicide** – This alternative would result in eradication of most NIP species where herbicides are applied on very small populations. Herbicide combined with biological, cultural or manual treatments can reduce, if not eradicate larger or scattered populations of NIP species. Collateral damage to native vegetation may occur on a site-by-site basis when using herbicides in intermixed stands of vegetation. In LA2, LA3, and LA4, the objective is to be selective in treating NIP species but incidental drift may occur in mixed stands causing reduction of native grasses, forbs, or shrubs at the treated site. The duration of the chemicals in the soil will range between a few days to a little over one year depending on the rate of application and the chemical being used (refer to Appendix B for herbicide half-life). Though some native plants may be adversely affected in one growing season, native plant seeds exist or they can be reseeded to occupy the open space. The site is expected to recover within 1 to 2 years to a plant community dominated by native species depending on precipitation, lack of human disturbance, and lack of NIP species competition. Native plant species composition and density may vary between sites relative to the species that existed prior to NIP species treatment.

There is a slight risk of damage to native plants from unforeseen environmental conditions. Severe thunderstorms or windstorms, for example, could move some herbicides away from their intended target species during the life span of the herbicide. Because of the protection of non-target species by the direct application method; the implementation of the Standard Operating Procedures; following the herbicide label requirements; the relatively short degradation time of the herbicides; and the small amount of herbicide being used; no long-term adverse effects are expected from the Proposed Action.

**Prescribed Fire** – This method is not successful on its own to control NIP species, since many infested sites lack sufficient cover to carry a fire or if a fire does occur, it may not be at the right intensity or duration to cause damage to NIP species of concern. Prescribed fire may be used to prepare a site for other treatment methods or to clean-up a site after other treatment methods have been completed. Fire will provide the benefit to recycle nutrients which gives native vegetation a growth boost to out compete NIP species. Prescribed fire has been used to dispose of Salt Cedar slash that has been cut when combined with spot-herbicide stump treatments. It is likely that NIP species may regenerate which will require follow-up treatment of the site by other means such as, manual, mechanical, or herbicidal.

### 4.1.2 Alternative B – No Treatments - Direct and Indirect Effects

No existing invasive plants or populations would be controlled, eradicated, or reduced under this alternative within LCDO. Counties with existing EAs for treating NIP species will be terminated and no further treatment actions would be allowed upon BLM administered lands within Luna, Sierra, Grant, Hidalgo, Dona Ana, and Otero counties. The lack of control efforts, would allow NIP species to continue to spread and increase, eventually becoming difficult, if not impossible to eradicate in the future, if such action was authorized. Seeds from weed populations will continue to accumulate on the soil surface and may also be transported to infest new sites in adjoining lands.

Invasive plants will increasingly impact native ecosystems, affecting flora and fauna diversity, including special status plant species.

Reductions in native plant composition are expected to occur due to inter-species competition for space and nutrients. Some NIP species may have allelopathic properties which may be toxic to native vegetation. These toxic properties will aid NIP species to dominate the habitat where it occurs.

There is a high risk that seeds or reproductive parts from invasive plants will migrate off-site through the normal course of other land use activities (i.e.: recreational use, livestock grazing, wildlife movement, utility corridor maintenance, fire suppression, road maintenance) resulting in the spread of invasive species off of federal lands. Increased populations and subsequent spread onto non-BLM lands will result in greater herbicide use on non-federal lands over the long term, versus eradication of weed sources on the BLM now.

Herbicide use in the region could potentially be higher overall as weeds spread off BLM land, and control efforts are implemented on adjacent lands, resulting in an increased risk of non-target species exposure to herbicides and/or residues. As a collateral effect, the BLM may be subject to liability claims (Tort) as a source for contamination and loss of site productivity of non-federal lands due to NIP species invasion. Cost for such claims, if successfully litigated, would likely exceed the cost of eradication and control measures on public lands.

### 4.1.3 Alternative C – No Action, Current Management - Direct and Indirect Effects

This alternative allows treatments to continue under existing County-wide EAs for Otero and Dona Ana Counties, as well as treatments along rights-of-way within Luna and Sierra counties. The remaining areas within Hidalgo, Luna, Sierra, and Grant counties containing NIP species infestations would be dealt with on a project-by-project basis resulting in site-specific EAs for each treatments area. This alternative would not prohibit future development and implementation of county-wide EAs for the remaining counties (Hidalgo, Luna, Sierra, and Grant) which may result in similar effects as the Proposed Action, albeit in a longer time-frame for it to occur. The delayed effect of completing other County–wide EAs will result in NIP species expansion or new populations being established across Hidalgo, Luna, Sierra, and Grant Counties. Approving treatments on a project by project basis is not only time consuming in managing natural resources but it creates greater expense and difficulty in controlling or eradicating NIP species where they have gained a foothold on landscapes not previously infested.

## 4.2 Affected Habitats

### 4.2.1 Alternative A – Proposed Action - Direct and Indirect Effects

The treatment of NIP species along roadways and borrow ditches (LA1) will continue to occur as a means to impede NIP species invasion of adjoining public lands. Treating other disturbed areas (corrals and water tanks), utility corridors, and uplands within rangeland sites will aid in the

eradication of NIP species before they become extensive populations across large areas. Some rangeland areas (LA2) may be infested with a NIP species that are so prolific (extensive root systems or high volume seed production) that controlling the spread of the population may be the only effect from treatment. Repetitive treatments of some infestation sites may be necessary and will likely result in a long-term treatment process for those sites that support very tenacious NIP species.

Rapid and aggressive treatment of riparian areas (LA3) and SMAs (LA4) will be necessary to prevent the spread of NIP species across the landscape, as well as prevent an increase in density which may cause inter-species competition. Competition between NIP species and SSS or riparian native plants can result in irrevocable change in the habitat character.

Collateral damage of some non-target species is a hazard within LA1 and may be an indirect effect from treatment. The use of an appropriate application method can minimize losses of non-target species. The short half-life of some herbicides (See Appendix B) will aid in recovery because the herbicide will leach out of the soil within a short time-frame. Some desirable wildlife forage species (four-wing saltbush, desert ceanothus, Mormon teabush, mountain mahogany, and various forbs) may be lost by foliar herbicide spray drift along roadways.

Other species that may be impacted are native invasive species such as mesquite, creosote bush, prickly pear or cholla cactus, tarbush, and whitethorn acacia to name a few. Most roadway spraying involves treating NIP species shrubs or half-shrubs and the chemicals used can cause mortality to native forage shrubs. Foliar spraying is directed at the road's edge and does not extend beyond 12-15 feet from road surface. Minimal collateral damage is expected. Generally liquid herbicides, rather than pellet form, are used for this treatment and off-site contamination is not likely.

No significant decreases in non-target species have been identified across the LCDO from past treatments. Most non-target shrubs survive and persist along the rights-of-way. Treatment in LA2, LA3, and LA4 would be much more selective due to the treatment method used. Where applicable, hand tool grubbing may be used for incidental NIP plants when encountered. Spot herbicide treatment from a backpack or ATV mounted sprayer may be used but the treatment would be directed at a single NIP species plant, which eliminates or substantially minimizes drift onto non-target species. Losses of desirable wildlife forage species (four-wing saltbush, desert ceanothus, Mormon teabush, mountain mahogany, and various forbs) as well as grasses is expected to be very minimal, if at all. Herbicides will likely be in liquid form and less likely to move off site from the point of application.

Mechanical treatments are less likely to occur in LA3 and LA4 although some post treatment work may be necessary for removing or piling herbicide treated Salt Cedar along drainages to dispose of by burning or chipping. Salt Cedar treatments may receive a second-level of analysis and site-specific EA pending the site conditions encountered for a specific project.

Cultural treatments are not feasible for LA1 areas, since the infested areas can extend several miles, and grazing would not be a safe approach to treating within a public highway corridor. Mechanical treatments would create a seed bed for re-infestation of the habitat by NIP species as

well as spread seeds across a larger area. Prescribed fire as a sole method would not be an effective tool due to lack of continuous fuels and likely invigorate NIP species growth. Prescribed fire, if used, would be conducted in associteion with other treatemtn methods such as, grubbing or following a herbicide treatment to dispose of dead plant material and seeds

### 4.2.2 Alternative B – No Treatments - Direct and Indirect Effects

Without NIP species treatments in all six counties, NIP species has the potential to spread across all landscapes within LCDO. LA2 (Rangelands) would be the most vulnerable where NIP species would expand into all plant communities found adjacent to road ways. Federal highways, especially those crossing BLM lands will become safe havens for NIP species. New Mexico state highways and county roads that do not cross federal land may continue to be treated as a result of BLM cooperative funding projects. The indirect effect will create deteriorated agency cooperation in future activities because federal lands may be the source of contamination for NM State and county roadways where treatment has previously occurred.

In LA1, NIP species will be the dominant plants often out-competing native shrubs and grasses. Any fire occurrences along roadways will accelerate NIP species growth. In time, NIP species will expand through LA2 and LA3 as those areas become heavily infested. Riparian areas could become heavily infested with NIP species resulting in native plant communities being converted to NIP species dominated plant communities. SSS habitat will become infested through time and native plant species will likely be suppressed by NIP species, with potential for decreases in SSS density and loss of habitat.

### 4.2.3 Alternative C – No Action, Current Management - Direct and Indirect Effects

Within LA1, much of the treatments along roadways and borrow ditches would continue as in the past within Otero and Dona Ana counties according to existing noxious weed control EAs. Site-specific EAs that currently authorize treatments within Luna and Sierra county rights-of-way for control of salt cedar, African rue, Russian knapweed, and Malta starthistle will continue to be executed. As NIP species are encountered within LA2, LA3, and LA4 in Luna, Sierra, Grant, and Hidalgo counties, a site-specific EA, or county-wide landscape EAs will be prepared to deal with the NIP species infestation. The direct effect is the time delay between analyzing infestations at a smaller scale and implementing treatments will allow NIP species to gain a foothold in new areas which may make eradication difficult to obtain in the future. The inability to respond quickly and conduct spot treatments when initially discovered makes this approach to NIP species management marginally effective.

Overall effects are that success may still be realized in LA1 comparable to the Proposed Action. The effects in LA2 may not result in eradication of NIP species but treatments may only achieve controlling the expansion NIP species populations. NIP species establishment is likely to occur undetected, if not continue, in LA3 and LA4 with future eradication being unfeasible.

## 4.3 Native Vegetation

### 4.3.1 Alternative A – Proposed Action - Direct and Indirect Effects

The Proposed Action provides the best long-term protection overall for native vegetation communities, due to the greater effectiveness of integrating NIP species treatment methods. Treatment in LA3 will require closer scrutiny to insure non-target species are protected and the effect from treatments does not result in violations of the Clean Water Act through sedimentation or herbicide contamination of the stream which may be used for irrigation downstream. Treatments in LA3 may require a second-level of analysis through a site-specific EA if the project-level screening checklist finds substantial resource concerns needing resolution or mitigation before a treatment project can proceed. Under this alternative, approximately 1,000 to 7,500 acres of NIP species infested areas could be treated annually upon BLM administered lands with eradication or control determined through long-term monitoring. Additional acres of non-federal lands may also be treated through cooperative BLM funding projects on State, county, or private lands.

**Herbicide** – The most common NIP species being targeted with herbicide are: African rue, yellow and Malta starthistles, Russian and spotted knapweed, and salt cedar. These NIP species have been treated in mostly LA1 (edge of roadways) and LA2 (corrals, water wells, powerline corridors, and dry drainages/washes). LA3 has been treated for salt cedar within Otero county in accordance with existing EA. Most of the treatments have occurred in semi-desert grassland or grass-shrub mixed plant communities within the Chihuahuan desert.

The herbicides most commonly used have been Imazapyr for salt cedar, Imazapyr or Tebuthiuron for African rue, and 2,4-D for starthistles and knapweeds. Non-target species that may, or may not, be affected are desert shrubs such as four-wing saltbush, Mormon teabush, desert ceanothus, feather Dalea, and mariola. Some warm season bunch grasses and forbs may be affected if Glyphosate is used along roadways and borrow ditches.

The short lifespan (25 to 47 days) of the herbicide will not affect future natural seeding of desirable vegetation on the site and the treated area should fully recover in one to two years with favorable response from native vegetation. Areas along drainages when treated with Imayapyr may also impact some grasses and shrubs (fourwing saltbush and Apache plume) near treated salt cedar but the duration of the toxicity ranges normally between 25 to 142 days. It may extend to two years depending on the application rate (See Appendix B & E). Four-wing saltbush and Apache plume seeds are available in the soil and should enable these native species to fully recover with a new generation of plants without competition from salt cedar.
Areas around corrals and livestock tanks are generally heavily impacted by livestock, therefore, very little if any desirable vegetation occurs close to these sites. Eradicating NIP species at these sites reduces seed dispersal by livestock; although some NIP species seeds may remain viable in the soil for long periods waiting for optimum soil moisture to germinate resulting in re-infestation of the treated site. Where NIP species exist, generally the site is void of other perennial vegetation except for mesquite, yuccas, or cacti. Tumbleweeds and other annuals may be found at such areas. NIP species thrive in the absence of plant competition. No affect is expected on native species except possible reduction of native invasive species (mesquite, cacti) may occur.

The size of the infestation and the application method will determine the level of risk associated with the treatment. Spraying individual plants is appropriate for the small or scattered infestations in localized circumstances, such as around mineral extraction sites or livestock congregation areas. A roadway or utility corridor may require truck or ATV mounted boom spraying. Some infestations can be handled with a grub hoe or shovel if the occurrence is just a few plants in an isolated instance. The risk of herbicide applications to non-target plants is minimized due to the use of ground application equipment.

There is a slight risk of damage to native plants from accidental herbicide spills under this alternative. In the event of a spill, effects would range from decreased productivity or injury, to plant death. This risk is minimized through the use of the Standard Operating Procedures (Appendix A) and following label requirements when applying herbicides.

Some SSS plants may be susceptible to herbicides which makes herbicide treatment very difficult. Widespread application would not be feasible due to potential loss of SSS plants. Individual treatment coupled with manual removal may be feasible in small, isolated infected areas. The potential to lose SSS species is not likely although it could still occur if herbicides travel through the soil or drifting spray mist encounters a SSS plant. Site-specific treatment and minimizing collateral damage is far more beneficial to the SSS species, and population as whole, than allowing these species to succumb to NIP species competition mortality.

**Mechanical/Manual** – This treatment method would be least favored for most infestations, except for salt cedar. The effects to other vegetation are substantial by removing or damaging plant parts (above and below ground level). The probability of spreading seed is greater than other methods, not only to surrounding areas but through transport of heavy machinery as residual plant parts may remain attached to the equipment. Manual treatments (such as cutting salt cedar) coupled with herbicide follow-up treatments may be effective in eradicating the species from drainage systems as well as along river corridors. Ultimately, manual treatments must be prioritized in order to achieve optimum results for the amount of effort employed, such as in the case of salt cedar. Manual treatment of salt cedar may be used in lieu of chemical treatments where NIP species are interspersed with riparian species (cottonwood, and willows) to avoid herbicide impact to native riparian species. Where salt cedar is the dominant species, herbicide treatments may be most effective in controlling or eradicating salt cedar with little to no impact to native species.

**Cultural** – Grazing animals, such as sheep or goats, consume both weeds and desirable species. Both have been shown to selectively graze leafy spurge therefore reducing seed production. Goats are likely to browse more heavily on shrubs that may provide important wildlife food and habitat within riparian areas (such as fourwing saltbush, Apache plume, cottonwoods, willows). The level of management will determine impact of grazing animals on non-target species. NIP species seeds can be spread to non-infested sites by adhering to grazing animals or passing through their digestive tract. Restricting livestock use in weed infested areas during seed ripening and dispersal will help reduce weed spread to uninfected sites.

### 4.3.2 Alternative B – No Treatment - Direct and Indirect Effects

No direct impacts to native vegetation would occur from herbicides or other control methods since NIP species would be allowed to proliferate on BLM administered lands within all six counties. Treatments on non-federal lands would continue on adjacent lands that have been cooperatively funded by the BLM.

Indirect effects to native vegetation would result from NIP species populations increasing within the LCDO in the absence of control efforts which will cause interspecies competition for space and nutrients. The ensuing plant competition will eventually cause overall degradation of native ecosystems and hinder native plants from reproducing and maintaining densities. Eventually, some native plant ecosystems will convert to NIP species dominated sites and native plants may disappear from some of the ecosystems entirely.

Current NIP species population levels will expand and eventually spread across various landscapes. LA1 and LA2 will eventually become infested with NIP species resulting in competition with native invasive species (grasses, forbs, and shrubs). LA1 and LA3 will become primary sources for the spread of NIP species onto non-federal rangelands. The acreage infested with NIP species will far exceed current levels and become a significant ecological problem in the future. If future corrective actions are initiated long after NIP species are well established across a wider area, the overall herbicide use and risk to non-target species in the region will likely increase substantially on all infested lands, regardless of jurisdiction.

### 4.3.3 Alternative C – No Action, Current Management - Direct and Indirect Effects

Alternative C would treat many of the same areas as in the Proposed Action, at least in those areas already approved by previous EAs (Otero and Dona Ana counties) and the direct effects would be similar to the Proposed Action. The existing EAs for Luna and Sierra counties to treat rights-of-way would also continue. All other areas not covered by existing EAs would be subject to future analysis through site-specific EAs. Future EAs would likely address isolated occurrences of NIP species, although if opportunity arises that LCDO has sufficient resources available, a county-wide EA may be developed to address NIP species treatments in Luna or Sierra counties.

Native vegetation will be in competition with NIP species and the rate of expansion would be more so than in the Proposed Action but less than in Alternative B. Collateral damage may occur from re-treatment of NIP species in some areas of Luna, Sierra, Otero, and Dona Ana counties but the effect will vary by landscape areas.

Desert uplands have low forage species densities in some areas due to historical land use practices and competition with native invasive shrubs (mesquite, creosote bush, tarbush). Treatments for African rue and knapweeds will not significantly affect native shrubs, and minor affects would occur on grasses due to the very low density of that plant group within infested areas. Within LA1 areas, native shrubs may be adversely affected by herbicides if there is more than one NIP species being treated and those species are closely intermixed with native species. Treatment methods may vary in some cases to minimize hazard to native vegetation.

The native species from roadways and borrow ditches that could be lost are four-wing saltbush, mariola, yuccas, cacti, mesquite, creosote bush and tarbush. Riparian area species (cottonwood, willows) may have greater susceptibility to herbicide treatment but such areas may require alternative treatment methods (manual and/or spot herbicide treatment).

## 4.4 Soils

### 4.4.1 Alternative A – Proposed Action - Direct and Indirect Effects

**Herbicide Use** – The effect of an herbicide treatment on the soil depends on the characteristics of the herbicide used, how it is applied, and soil physical, chemical and biological conditions. Herbicides may indirectly affect soil through plant removal which will result in changes to the physical and biological soil parameters.
As vegetation is removed, there is less plant material to intercept rainfall and less to contribute to organic material in the soil. Loss of plant material and soil organic matter can increase the risk of soil susceptibility to wind and water erosion. The risk for increased erosion would be temporary, lasting only until native vegetation is reestablished. If herbicide treatments lead to revegetation with native plants, soil stability may be improved relative to sites dominated by invasive plants. Of the herbicides most often used by the BLM, chlorsulfuron, picloram, and tebuthiuron are persistent in the soil for a year or more, while glyphosate and 2,4-D are relatively non-persistent in soil. None of these herbicides appear to result in severe adverse impacts to soil constituents. Of these, glyphosate has been shown to have little or no impact on biological crusts cover after one year. Soil organisms are important to the human environment because they could affect soil productivity.

None of the herbicides under consideration has notable effects to overall long-term soil productivity or permanent impairment of soil ecosystems. Information about specific herbicide effects to each of the myriad of soil organisms is scarce. Therefore, caution will be used when applying these chemicals to soils supporting biological soil crusts. To reduce the impacts to soil productivity, treatments would be minimized or eliminated in areas of the LCDO that have steep slopes or the potential for significant soil mobility. Herbicide treatments would benefit soil by removing NIP species and allowing restoration of native vegetation and return of natural fire regimes.

In many situations, herbicides are the most effective method for controlling NIP species. For many of the small or spot treatments of NIP species along roadways in the LCDO, manual or physical treatments may not be the most cost effective and efficient treatment option.

**Manual/ Mechanical** – Mechanical treatments would result in soil disturbance and compaction at localized treatment sites. The specific effects to soils would depend on the type and area of treatment, site soil texture and structure, and soil moisture at the time of treatment. Use of certain mechanical treatments would directly disrupt biological soil crusts. Crusts are sensitive to compaction by vehicles and other heavy equipment. The removal or destruction of biological soil crusts could adversely affect soil quality by increasing susceptibility to erosion, reducing nitrogen inputs, infiltration, and potentially encouraging weed establishment.

In general, use of heavy equipment on treatment sites would be expected to result in increased soil compaction, and heavy equipment can shear and rut wet soils. Compaction by vehicles and other heavy machinery can reduce soil pores and limit water infiltration, soil aeration, and root penetration. Although the manual treatment of NIP species removes vegetation, loosens soil and creates a potential source for wind and water erosion and stream sedimentation, the planned amount of treatments in the LCDO is very limited and site specific. There is a low risk that treatment would result in adverse effects to soil quality. Replacement of NIP species with native plants would maintain soil quality in the long-term. Implementation of appropriate project designs would result in maintaining water quality and not cause an adverse effect. Mechanical treatments that ultimately result in improved plant cover and diversity can improve habitat for soil organisms.

**Cultura**l – Cultural treatments would result in soil disturbance, trailing, minor terracing, and compaction at localized treatment sites depending on the intensity and duration of the treatment (goats or sheep). The impacts from grazing would occur in one season as pre-treatment to herbicide application. The effect of combined treatments is expected to result in greater invasive species mortality therefore minimizing the need for follow-up treatment.

Reduction of NIP species and reestablishment of native vegetation to the sites will benefit soil stability and maintain productivity long-term.

### 4.4.2 Alternative B – No Treatment - Direct and Indirect Effects

NIP species may have minor direct effects on soil properties if the plants occupying the site are toxic to native plants. Mortality of native plants either by toxicity or competition for space and nutrients would reduce native plant densitities therefore exposing more soil to wind and water erosion. NIP species are likely to increase in density and indirectly lead to increase in bare soil due to decrease in native plant densities. Some of these changes may be difficult to reverse and could lead to long-term soil degradation and difficulty in re-establishing native vegetation.

### 4.4.3 Alternative C – No Action, Current Management - Direct and Indirect Effects

Direct and indirect effects of herbicide treatment on the soil resources depend on herbicide type, concentration, and time of application or treatment. Anticipated loss or reduction in soil fertility should be minimal. Depending on the application rate and the soil environment, herbicides can either stimulate or inhibit soil organisms.

Although herbicides would not alter a soil's physical properties, there may be indirect effects on soil micro-organisms and soil biological activities that play an important role in soil environment condition by affecting soil quality and productivity, especially in desert soils by releasing soil minerals, and makes it readily available to plant roots.

NIP species will likely out-compete the native plants in some areas for soil nutrients because under this alternative, the infested sites will be treated at a slower rate than Alternative A due to the time consumed in completing the administrative processes to approve NIP species treatment projects. However, none of the herbicides under consideration has long term effect on soil productivity or

permanent impairment of soil ecosystems due to leaching of chemical and physical soil properties that will reduce such effect over time.

As NIP species are removed, there is less plant cover on the top soil that is important to prevent the impacts of wind and rainfall erosion. The risk for increased erosion would be temporary, and will be reduced as soon as native plants are reestablished. To mitigate this, herbicide treatments can be followed by reseeding with native plants. This will enhance soil infiltration, increase soil moisture content, and leads to better soil stability and enhance soil quality and productivity; due to increased herbaceous vegetation species that would generate more litter and organic material on site and improving soil stability.

Within Otero and Dona Ana counties, beneficial effects to soil integrity would continue to be realized as treatments for NIP species continues. Luna and Sierra counties would also see some improvement but limited to roadways and borrow ditiches. Other areas within Luna, Sierra, Grant, and Hidalgo counties may increase in NIP species density and result in indirect effects on soils due to soil surface exposure to erosion until site-specific project EAs are completed for treatment. If county-wide EAs are completed for Hidalgo, Grant, Luna, and Sierra counties, the effects to soils may be comparable to the Proposed Action.

## 4.5 Water

### 4.5.1 Alternative A – Proposed Action - Direct and Indirect Effects

**Herbicide** – Invasive plants can create conditions that modify water quantity and quality. Directly or indirectly, invasive plants can affect streambank stability, sediment, turbidity, shade and stream temperature, dissolved oxygen, and pH levels in stagnant water sources. It is expected that water quality and quantity would only be impacted for treatments along surface waters, riparian zones, and locations with very shallow groundwater.

Vegetation treatments could affect both surface water and shallow groundwater quality and quantity. While water quantity would be expected to increase as the result of vegetation treatment, the opposite would be expected for water quality. Invasive plant eradication has the potential to temporarily leave treatment areas with reduced ground cover which in turn has the potential for decreased soil moisture and increased bare ground resulting in higher potential for increased erosion and non-point source pollutants. Additionally, excess chemical not utilized by the plant could contaminate nearby surface and ground water sources.
However, these impacts are typically short term and less likely to adversely impact a large area due to the small size of the treatment areas. Repeated treatments over several successive years are often needed for invasive plant eradication, containment, and control of larger populations.

Multiple treatments of the same infected area could increase the chances for water quality degradation, but these impacts are not expected to be significant given the small treatment areas and relatively short half-life of the active chemical ingredient. Short-term erosion would be mitigated by creation of a restoration plan that would identify specific measures to ensure

protection against erosion and non-point source pollutants. These measures would be implemented as part of the project.

The LCDO currently uses two herbicides in riparian and aquatic habitats, which are Imazapyr and Glyphosate, with 2,4-D and triclopyr also available for use in similar sites. The remaining herbicides available to the LCDO, or proposed for use, are registered for use on terrestrial sites. The aquatic labeled herbicides would not impact water quality if used according to label rates of application and the Material Safety Data Sheet (MSDS). Herbicides registered for use in terrestrial habitats may affect surface and shallow ground water as a result of unintentional spills or movement of herbicides from the upland sites into aquatic systems.

**Manual/Mechanical/Cultural** – Proposed manual, mechanical, and cultural, treatment measures such as pulling, mowing, weed whacking, or grazing by goats would have less direct impacts on water quality than herbicide treatments. However, these more invasive methods tend to cause more surface disturbance, increasing the potential for water quality degradation due to erosion and non-point source pollutants such as sediment. Some surface soil may be exposed during these processes, but the amount of off-site sediment movement would be expected to be insignificant due to the small proposed treatment areas.

### 4.5.2 Alternative B – No Treatment - Direct and Indirect Effects

The most pronounced effect of the No Treatment alternative on aquatic organisms and ecosystems is the continued existence and spread of invasive plants that could out-compete native vegetation. Severe infestations of some invasive plants could negatively affect a variety of riparian functions at the site-specific scale including shade and soil stability. Although not every infestation would reduce aquatic habitat quality, there is an increase in the risk of accelerated impairment without aggressive treatment. Increases in NIP species will out-compete native herbaceous plants for space along streambanks which will lead to reduced ground cover and eventually contribute to accelerated runoff or erosion adjacent to water's edge.

### 4.5.3 Alternative C – No Action, Current Management - Direct and Indirect Effects

Site-specific analysis would have to occur for each individual proposed treatment site. The direct and indirect impacts to water resources would be similar to those in Alternative A. A key feature of successful integrated pest management is early detection, followed by rapid response to the infestation. Compared to Alternative A, it is likely that fewer projects would be implemented over time and those new discoveries of NIP species infestations would not be treated in a timely manner to prevent further damage to native vegetation due to the time needed to prepare numerous site-specific analysis documents.

By implementing Alternative C, it is likely that control efforts will not keep up with the rate of infestation, allowing water resources to degrade further and likely increase in rate of degradation and size of the impacted area. If county-wide EAs are completed, then the effects on water reosurces may be comparable to the Proposed Action, yet it may lag behind the rate of progress anticipated for the Proposed Action.

## 4.6 Wildlife

### 4.6.1 Alternative A – Proposed Action - Direct and Indirect Effects

Integrated pest management uses different techniques that have varying effects on wildlife and habitat. Each has their advantages and disadvantages depending on factors such as the size of the treatment area, terrain type, density of the plant being targeted (as well as non-target plants), and more. Regardless of the method chosen to control NIP species, short-term impacts will occur in the treatment area. Wildlife will be disturbed and possibly displaced during treatment activities due to vehicle and human activity. This will be limited to the individual level and will not approach the local population or species level since projects will be limited in geographic size. Wildlife habitat and plants are also likely to be disturbed with the associated human activity that will occur. There is the potential for plants to be crushed by applicators or vehicles performing the treatment, but will occur at minimal levels necessary to treat the project site. In some treatment areas (such as an area heavily encroached with salt cedar) habitat characteristics will be altered significantly, which may cause wildlife to disperse from the local area.
Any loss of wildlife will occur on a local, individual level and not approach the population level. However, as native species naturally recolonize the area, wildlife will return to the area and will likely increase in numbers.

Projects will be designed with wildlife values in mind. Areas of important habitat would be treated using a method (or a mixture of methods) that would cause the least amount of disturbance. For example, if some trees of heaven were found growing around a spring heavily intermixed with willows and cottonwoods, the trees of heaven would likely be cut down and the stumps treated with a herbicide, leaving the desirable native species unharmed. Other important areas such as browse species or nesting habitat (varying in size from an arroyo to a single tree) would be buffered out of treatment completely. SMA's that have been designated for SSS or wildlife resources will follow the guidelines of the specific management area.

As mentioned earlier, any areas proposed for the treatment of NIP species that have special wildlife issues will be analyzed in a separate, site specific analysis based on wildlife resources present or other potential issues revealed during the initial decision process and subsequent scoping.

**Chemical Treatments** – BLM completed a PEIS to analyze the potential impacts of herbicide use on BLM managed public lands (BLM 2007 PEIS). The analysis included ecological risk assessments (ERAs). The risk assessments analyzed endpoint effects of herbicides including mortality levels as well as effects on growth, reproduction and other ecologically important sub-lethal processes. A variety of exposure scenarios were considered in order to assess both acute and chronic effects (direct spray of individual or water body, indirect contact with foliar residue, ingestion of contaminated food items, off-site drift of spray, surface runoff, deposition of contaminated dust and accidental spills to water bodies). Information used in the analysis consists mostly of toxicity studies conducted in conjunction with the EPA pesticide registration process. Tables from the BLM 2007 PEIS summarizing risks to wildlife have been included in Appendix J. For a complete analysis of the impacts of specific herbicides approved for use by BLM, refer to the BLM 2007 PEIS.

The potential direct impacts to wildlife (including migratory birds) from chemical treatments include short-term disturbance and displacement associated with all of the treatment methods as well the potential for effects from exposure to the chemicals, which could occur through direct or indirect contact or ingestion. Direct chemical effects depend on the sensitivity of each species to the chemical used, differences in sensitivity among individuals (life stage), rate and degree of exposure and pathway of exposure. SOPs and MM have been developed by BLM to protect wildlife resources and SSS (Appendix A and C). These measures will be included during the planning stage and treatment will be monitored for adherence.

**Mechanical and Manual Treatments** – Mechanical and manual treatments will cause minimal impacts to wildlife and habitat. Many of the mechanical and manual methods (such as blading or mowing) are not very practical for treatment of large areas. In some cases, manual treatments would be part of a protective measure incorporated into other treatment method proposals to protect adjacent habitat or other resources.

Large-scale techniques using heavy equipment (mowing, blading, or grubbing) used for removing invasive species will have the potential to crush burrows or nests of rodents and migratory birds and cause mortality. These techniques also have the potential to cause more impacts to habitat since they are "rough" treatment techniques; non-target plants are likely to be crushed, bladed or mowed along with the target plant species. They are also likely to cause more noise disturbance in the local area to wildlife compared to small-scale techniques. Large scale techniques will be used minimally in controlling invasive plant species, likely in areas where other treatment methods are not feasible.

Small-scale techniques such as cutting, trimming, or hand pulling would cause fewer disturbances compared to large scale techniques and would allow for finer detail in treatment. Impacts would be from human and vehicle activity in the local area and would be limited in time, proportionate to the number of plants to be treated. Manual and mechanical treatment methods would be preferred to minimize impacts to wildlife and their habitat.

**Cultural Treatments** – Cultural treatment methods include prevention and livestock manipulation. Typically goats or sheep would be used for targeted grazing of NIP species. Livestock would likely be placed in an enclosure surrounding the target species. This treatment method would probably have to take place several times or be used in conjunction with other methods in order to eliminate the target species. There is the potential for SSS plants and non-target plant species to be grazed along with the target species. As described in the SOP, proposed treatment areas will be surveyed for the presence of SSS plants and proper protection measures will be implemented to ensure there are no impacts.

Desert bighorn sheep are susceptible to diseases carried by domestic sheep and goats. In conformance with existing BLM policy, as amended in the future, control of NIP species using goats or sheep will not be allowed within 9 miles of desert bighorn sheep habitat. Mountain ranges that contain occupied desert bighorn sheep habitat are: Caballo; Fra. Cristobal;San Andres; Organ; Big and Little Hatchets; Alamo Hueco; Peloncillos; and, Animas.

A minimum of a 9 mile buffer around these mountain ranges leaves very little area where domestic sheep and goats can be used for NIP species control. The use of domestic sheep and goats would have to be evaluated on a project by project basis with concensus from potentially affected agencies. Impacts to other wildlife with this method would be minimal and would result from increased activity in the local area associated with the livestock. Disturbance would occur with loading/unloading the livestock at the site and placing them in the enclosure (or other control methods). The livestock would also have to be provided water daily, provided supplements and may be monitored for protection from predators, all of which would increase human activity in the area.

The potential for indirect impacts to wildlife is through changes to the habitat in time. By implementing the proposed action, the LCDO will be able to eliminate degradation of wildlife habitat by invasive species. While complete elimination of invasive plants is not possible, controlling species already present and preventing the spread of them will benefit wildlife over time.
While some areas such as along roads will always be at risk for invasion due to continuous disturbance, early detection and rapid response techniques will ensure that invasive plants that do appear in these areas will not spread into the surrounding landscape. Desired native plant communities would be able to re-establish in previously NIP species infested areas as well as be maintained in other areas that have not yet been degraded, thus improving or maintaining habitat quality in the LCDO.

### 4.6.2 Alternative B – No Treatment - Direct and Indirect Effects

NIP species that are present within the LCDO would likely spread, further degrading wildlife habitat. Some areas would become monocultures of invasive plants, outcompeting native plants for resources and reducing species diversity. This would have a detrimental effect on wildlife and migratory birds by further altering habitat characteristics in the absence of complying with Bureau policy to control or eradicate NIP species.

Control efforts of NIP species on private and State Trust land would continue independent of actions on public land. Wildlife habitat quality (forage and cover composed of native vegetation) will be significantly reduced over time due to increasing dominance of NIP species.

### 4.6.3 Alternative C – No Action, Current Management - Direct and Indirect Effects

Site specific analysis would occur for each treatment site proposed. The direct and indirect impacts to wildlife would be similar to those in Alternative A. A key feature of successful integrated pest management is early detection, followed by rapid response to the infestation. Compared to Alternative A, it is likely that fewer projects would be implemented over time and those new discoveries of NIP species infestations will not be treated in a timely manner to prevent further damage to native vegetation due to the time needed to prepare numerous site specific analysis documents. By implementing Alternative C, it is likely that control efforts will not keep up with the rate of infestation, allowing wildlife habitat to degrade further. .

## 4.7 Special Status Species

### 4.7.1 Alternative A – Proposed Action - Direct and Indirect Effects

All of the herbicides used for control of NIP species pose risks to plant SSS and other non-target plants that provide important wildlife habitat. Potential direct impacts to non-target plants would be through exposure to herbicide, and to a much lesser degree, crushing of individual plants by equipment or foot traffic associated with the project.
Plants may be at greater risk from tank mixed applications, such as Remedy and Reclaim, than from the active ingredient alone because herbicides in tank mixes may not interact in an additive manner. In addition, other products may also be included in tank mixes which could contribute to the potential risk to non-target species (BLM 2007 PEIS). Proposed treatments will be designed using the SOP's and MM's (Appendix A and C) to minimize impacts to non-target vegetation by using design features such as buffering non-target species, slope restrictions, spot-treating target plants, and timing treatments to avoid heavy rainfall events.

Treatments within, or adjacent to, SSS plant species habitat will be designed to maintain consistency with BLM's SOPs which have been concurred with by the USFWS, and as contained in the BLM 2007 PEIS.

Controlling invasive species also has potential to affect SSS animals within LCDO, regardless of the treatment method. These effects would be the same as those discussed in the previous section of this EA. As discussed in Section 3.6, both the Southwestern Willow Flycatcher (*E. t. extimus*) and the Yellow Billed Cuckoo (*C. americanus*) occur in LCDO and are known to associate with salt cedar in riparian corridors in LA3 or LA4. Proposed treatments, regardless of the treatment areas it occurs in, will be analyzed for potential impacts to SSS (and their critical habitat) and wildlife and will be documented in the project checklist and appropriate NEPA document, if applicable. Existing data will be reviewed and surveys of the area for SSS will be conducted. Treatments in SMA's (LA4) where SSS plants exist will also follow the management guidelines of the particular SMA in order to protect the SSS from adverse impacts.

Treatments will be designed to eliminate or reduce the risk to SSS using applicable SOP's and MM's. A project-level screening checklist will be utilized to evaluate proposed projects within or adjacent to SSS areas. The checklist will determine if SSS or habitat exists and if a pre-treatment inventory is necessary. If an inventory indicates SSS or habiat exist which may be affected by NIP treatments, a site-specific analysis and possible Section 7 consultation, pursuant to ESA, with the USFWS may be initiated for federally listed species. If the project-level screening checklist determines that the project design will not affect SSS or habitat, then consultation will not be initiated. If Section 7 consultation is initiated, no treatment actions will occur until consultation is completed.

For BLM sensitive species, LCDO would also employ the applicable SOP's and MM's to ensure treatments would not contribute to the listing of such species under ESA protection. For State listed plant species, LCDO would ensure that any treatment method would provide for conservation of the species. By ensuring each project proposal is consistent with BLM policy;

impacts from treatments for NIP species would not jeopardize listed species or contribute to the need for listing candidate and BLM sensitive species, and would conserve SSS plants.

### 4.7.2 Alternative B – No Treatment - Direct and Indirect Effects

SSS plants and animal will be negatively impacted by Alternative B. Since all attempts to control NIP species would cease to occur, existing infestations would likely expand and new ones would become established. Habitat for SSS, especially in riparian areas, would be degraded with some plant species being eliminated through direct competition with NIP species.

### 4.7.3 Alternative C – No Action, Current Management - Direct and Indirect Effects

SSS plants and animals would continue to be impacted by NIP species at current or increasing levels through time. Detection of new populations and rapid response to those infestions may not be possible everywhere within LCDO boundary on an annual basis, which will allow NIP species to become established and spread. These effects would combine cumulatively with other issues affecting habitat quality for SSS, and thus would have an overall negative impact.

## 4.8 Human Health and Safety

### 4.8.1 Alternative A – Proposed Action - Direct and Indirect Effects

The effect of roadway spraying to human health and safety is a potential for motor vehicle accident while the spraying operation is occurring. The risk is minimal as operations are conducted with the vehicle sprayer moving at very slow speed and with emergency flashing lights on. The site being sprayed is usually posted with warning signs at both ends of the treatment area. The vehicle sprayer operates at the farthest edge of the highway shoulder or road surface which allows oncoming traffic to slow down and pass safely on the left side. A very slight risk may exist of herbicide spray coming in contact with passing vehicles, but it is highly unlikely since the boom sprayer is directed towards ground level, passing vehicles are away from the spray nozzle, and wind conditions are very minimal for drift to occur.

Spraying along river corridors would impact first floodplain and the actual water's edge immediately adjacent to the floodplain. Treatment along both areas would be with approved herbicides and adjuvants for water courses and target specifically species infesting those sites. Examples of NIP species of concern and herbicides that would be applied are: salt cedar using Imazapyr; Russian olive using Triclopyr; and Siberian elm using Glyphosate. The half-life of those herbicides is as follows: Glyphosate ranges between 25 to 47 days; Triclopyr ranges between 10 to 46 days in the ester formulation (although Triclopyr in the amine formulation is water soluble and with adequate sunlight may degrade in several hours); and Imazapyr ranges between 25 to 142 days but sometimes up to 2 years depending on the application rate. Hazard to crops or livestock are not anticipated and pre-treatment precautions would be exercised. The site-specific project will be presented to the public for input and gain public support to proceed. A site-specific analysis and EA may occur prior to implementation pending the results of the project-level screening checklist; otherwise the project may be documented in a DNA. Post-treatment

monitoring would be associated with the project to validate extent of herbicide distribution and duration of the herbicide by collecting water samples for lab testing along a portion of the river corridor if determined necessary through the project-level analysis.

### 4.8.2 Alternative B – No Treatment - Direct and Indirect Effects

The No Treatment alternative would not affect human health and safety since no chemicals would be applied. Infestation is likely to continue along areas normally infested with NIP species. NIP species may eventually enter agricultural fields and food crops along irrigation canals, and other areas that have connectivity to riparian corridors and roads.
Seeds can be transported through food crops and livestock feed, and though it may not pose a direct threat to human health, the farmlands that produce food for human consumption become areas where NIP species may become persistent. Such infestation eventually may require herbicidal treatments to reduce or control infestations on private lands which in turn may indirectly affect human health by chemicals entering the human food chain to some extent. The indirect effect could also be a decrease in farm commodity production due to concerted efforts to treat NIP species on private lands. Farmland may be laid out from production for one growing season to eradicate NIP species.

### 4.8.3 Alternative C – No Action, Current Management - Direct and Indirect Effects

Infestations at current levels would persist, but control actions will retard the rate of spread in some counties where routine treatment actions are in place. Effects on human health are not likely to occur since many areas treated have little to no human contact. Most treatments under current management occur along roadways and borrow ditches and not directly related to dwellings or potable water systems. Very few instances occur where treatments occur on uplands sites and those treatments that do occur are spot treatments affecting only small acreage (<1 acre size) or a few plants. Salt cedar treatment that occurs is along dry drainages and not associated with any free-flowing waters, therefore no direct contact with food crops or potable water systems is expected.

Treatments would continue in Otero and Dona Ana counties consistent with current landscape EAs. Treatments along roadways would also continue within Luna and Sierra counties. Future site-specific EAs may be developed as new NIP species populations are found and treated, usually away from dwellings within LA1 and LA2. NIP species are highly likely to occur in LA3 due to the lack of resources and effort to complete broadscale inventories and rapid response treatments of new infestations. These areas could be sources of downstream contamination of private crop lands and may indirectly affect human health and safty due to the need for chemical treatment of NIP species on private land.

## 4.9 Wilderness, Special management Areas, and Areas of Critical Environmental Concern

There are 79 special management areas within the LCDO, consisting of wilderness, ACEC, RNA, and SMA.

In LCDO there are no designated Wilderness Areas, however there are 24 designated WSA totaling about 472,000 acres (9% of total LCDO acres). FLPMA and BLM Interim Management Policy for Lands Under Wilderness Review (IMP-WR) is to manage these lands in a manner so as not to impair the suitability of such areas for preservation as wilderness.

Generally this is interpreted by BLM manuals to mean that no permanent, surface disturbing activities will be authorized. Exceptions to this can be considered when the proposed action would clearly protect or enhance the land's wilderness values. Those exceptions would be evaluated on a case-by-case basis and would require review of the original wilderness inventory for baseline or benchmark data concerning the particular wilderness value(s).
The BLM's IMP-WR allows for vegetative manipulation: "Noxious weeds may be controlled by grubbing or with chemicals when they threaten lands outside the WSA or are spreading within the WSA, provided the control can be affected without serious adverse impacts on wilderness values."

Treating within a WSA will require a separate EA to evaluate site-specific conditions and approve best course of action to eradicate or control NIP species. A proposed project within a WSA will be scoped with the interested publics identified in the LCDO mailing list.

### 4.9.1 Alternative A – Proposed Action - Direct and Indirect Effects

Impacts to wilderness values from proposed action are described as follows:

**Regarding Landscape Area #1 -** any roadway that follows the boundary of a WSA is to be treated only following a case-by-case evaluation and subsequent IMP-WR notification (30 day review/comment period). This is due to the fact that the edge of the road disturbance is in fact the edge of the WSA, so treatments along the roadway may have an impact on the WSA. Projects adjacent to the WSA boundary will be evaluated according to the project-level screening checklist to ascertain if the project is consistent with this EA or a site-specific EA may be necessary to evaluate the impacts.

**Regarding Landscape Area #4** - Any proposal for treatments within WSAs will be evaluated through a site-specific EA in accordance with NEPA standards and BLM directives and policy guidance. Generally, treatments such as hand pulling, hand/selective or spot treatment (with backpack sprayers), would be considered to have little if any impact on the wilderness values and would generally be the preferred approach when treating within WSA. Other methods such as aerial spraying and prescribed burning would have only short-term effects due to the activity during the treatment and long-term effects would be evident if the landscape is greatly changed via removal of major plant species that can be seen in blocks. These treatments effects can be greatly minimized with special attention on blurring the lines between treatment and non-treatment areas with buffers and mosaic treatments. This would greatly reduce any sharp contrast that might otherwise be evident.

Impacts to ACECs for SSS:

The project-level screening checklist will be utilized to evaluate proposed projects within LA4 sites relative to an ACEC for SSS (plants or animals). The screening checklist will evaluate if a treatment project will impact SSS or its habitat. If there are no impacts anticipated, the project will proceed. Otherwise, if the potential exists for impacts on SSS as determined by the project checklist, a second level, site-specific EA may be necessary to evaluate those impacts in detail and provide an alternative with a project design that minimizes or mitigates those impacts. Any SSS that occurs within LA2 or LA3 will undergo the same level of screening as indicated for LA4.

### 4.9.2 Alternative B – No Treatment - Direct and Indirect Effects

The No Treatment alternative would allow NIP species to expand their range into areas that provide habitat for SSS within the LCDO. The spread of NIP species will result in inter-species competition for space and nutrients between NIP species and SSS. Not only will the long-term effect result be losses or decreases of SSS species but also a deterioration of habitat that may preclude future restoration of the areas for the benefit of SSS.

### 4.9.3 Alternative C – No Action, Current Management - Direct and Indirect Effects

Impacts to ACECs for SSS:
This alternative would allow treatment within Otero and Dona Ana counties under existing approved NIP species EAs consistent with ACEC management guidelines. In Luna, Hidalgo, Grant, and Sierra counties, site-specific EAs would have to be conducted for each individual ACEC project area that may contain NIP species infestations. Each EA will set the standards for treatment and methods approved to control or eradicate the NIP species of concern in compliance with the ACEC management guidelines.

## 4.10 Cumulative Impacts of the Proposed Action

Past actvities within LCDO have occurred at different time-frames. Recognizing that New Mexico statehood occurred in 1912 and some locations within LCDO may have been disturbed prior to statehood by roads or trails, homesteads, and even livestock grazing, but the time-frame for “past” activities is narrowed to the period between the inception of the BLM agency and enactment of the current RMPs. The “present” time-frame is defined as the period since the last approved RMPs and present date of this EA. “Future” actions are those actions currently approved but not implemented or those foreseeable actions that are currently in a planning process.

Past activities within the LCDO has encompassed a wide array of actions, such as: livestock grazing; range improvement projects (fences, waters, pipelines); construction of utility corridors (powerlines, pipelines, fiber optic lines, and associated roads); mining development; oil and gas exploration; transportation systems (railroads, paved highways, developed gravel roads); wildlife habitat improvement projects; US border protection activities; herbicide treatment of invasive native plant species; and limited amounts of herbicide treatment of NIP species. All of these activities, with the exception of herbicide treatment projects, have caused substantial ground disturbance and has contributed to the establishment and spread of NIP species.

Project-specific mitigations have been and will continue to be incorporated into all new projects as well as preventative measures are stipulated and attached to mineral operation plans to reduce the risk of new infestations and the spread of weeds associated with new disturbance. Mining Operation Plans also require inspections during and after mining is completed to locate and treat for NIP species. Other prevention measures required are as follows: equipment cleaning; weed free hay/mulch for re-vegetating a site; and weed-free seed mixtures. Past herbicide treatments on BLM lands have been for isolated occurrences of African rue, salt cedar, and starthisle species, as well as treatment for invasive native shrub species (mesquite, creosote bush, and tarbush).

Past activities in LA1 habitat has been road construction and maintenance and mowing vegetation along the roadways for aesthetics and fire hazard reduction. The adjoining borrow ditches have been subjected to repeated scarification of the soil surface and vegetation by heavy equipment for maintenance of roadways, construction of parallel utility corridors, and construction of right-of-way fences. Loss of non-target shrubs along LA1 has not been significant and has not been a long-term effect according to casual observations.
Based on interpreting current GIS data for roads, trails, and railroad rights-of-way, there has been approximately 134,848 acres (2.5%) of disturbed landscape, both past and present, associated with these features. There is no current data available that summarizes the amount of disturbance, past and present, for utility corridors (powerlines, gas lines, and buried communication lines) within LCDO. The potential for NIP species to occur on past disturbed sites is highly likely although the extent of the infestations requires a thorough inventory of all sites.

LA2 past and present activities are extensive and diverse, ranging from livestock grazing, utility corridor construction, off-highway vehicle travel, mining, recreational uses (ATV, hunting), herbicide treatment of invasive native species (mesquite, tarbush, creosote bush, cactus species, and whitethorn acacia), law enforcement, and range improvement construction (pipelines, tanks, fences). Maintenance of these structures is expected to continue along with livestock grazing and off-highway vehicle use.

Abandoned mineral material mining sites (sand, gravel, rock quarries) persist and as well as new sites are established as needed by county or NM State road departments. At present, there are 4,798,510 acres (89%) within grazing allotments across the LCDO. Excluding areas that are greater than 60% slope, approximately 4,755,894 (88%) acres may actually be subjected to grazing.

Within the grazing allotments, approximately 8,933 acres (0.2%) have been disturbed by stock tanks, 15 acres have been disturbed by water storage tanks, and 21,675 (0.4%) acres have been disturbed by water pipelines and fences. There are many areas within LCDO that are not included in grazing allotments that may be disturbed by other human activity, such as recreational sites.

Current activities on BLM lands are the same as in the past with further development of communication sites (radio, microwave, and cell towers) along with their access roads. Future special uses that may occur in addition to more gas lines, powerlines, and communication lines are developments for solar and wind farm sites across LCDO. The extent of disturbance from such developments may amount to several hundred acres. Current grazing levels will likely continue

into the future with additional watering facilities and fences being installed. New roads may be developed along with many two-track roads/trails developing over time. Some roads may be abandoned and rehabilitated. Mineral material pits may also increase as urban sprawl increases the demand for more sand and gravel material. The potential for increased landscape disturbance is likely and the potential for increases in NIP infestation will be commensurate, requiring an active IPMP.

Treatments for invasive native shrubs (mesquite, creosote bush, tarbush, and others) will continue across various areas within LCDO to accomplish long-term restoration of native grasslands and mixed shrub desert ecosystems. The goals and objectives for grassland restoration are different than for NIP species eradication. Grassland restoration will continue regardless of the actions taken for NIP species treatment. NIP species are not part of the native ecosystems and stopping their invasion is essential in maintaining native ecosystems within their natural range of variability.

NIP species treatments in the future should not interfere with other restoration treatments though such activities may coincide in time or space. Any coincidental occurrences on the same landscape will be clearly segregated by project objectives and duration as well as treatment method and project timing.

Though NIP species have originated from past and present activities which allowed NIP species to spread into various areas within LCDO, the long-term effect of an active IPMP will result in eradication of NIP species from sites and have reduced densities in other areas. The existence of county-wide EAs for Otero and Dona Ana counties has aided in reductions of NIP species in those counties, although that is not the case in the other counties within LCDO. The Proposed Action when implemented should result in a decreasing trend for NIP species within LCDO.
Over time, NIP species occurrence should decline substantially and the remaining populations would be small and kept under control in such habitats as LA1 and LA3. NIP species are expected to be eradicated from LA2 and LA4, or have incidental occurrences due to rapid response treatment.

# 5 MONITORING AND/OR COMPLIANCE

The monitoring standards for the Proposed Action are listed below as an initial protocol, which may be modified in the future as “on-the-ground” conditions warrant. These standards are intended to insure that the desired future conditions and treatment strategies are achieved. The standards include implementation /compliance and effectiveness monitoring components.

## 5.1 Implementation/Compliance Monitoring

- Develop a project work plan for herbicide use.
- Ensure contracts and agreements include appropriate prescriptions and that herbicide ingredients and application rates meet label requirements and that all SOP are followed.
- Document and report herbicide use and certified applicator information in the Pesticide Use Proposals and Pesticide Application Records.

## 5.2 Effectiveness and Validation Monitoring

Monitoring will occur to ensure objectives of the Proposed Action are implemented as planned. Effectiveness monitoring verifies that treatments were implemented to meet the objective. Effectiveness monitoring will occur on a sample basis to determine whether treatments were effective at eradicating or controlling the spread of NIP species in an infested area or onto other lands (e.g. achieving 50, 75 or 100% NIP species mortality).

The Validation Monitoring is the same as long-term goal monitoring, and it's intended to measure if the eradication of the NIP species infestation has restored the contaminated plant community back to its original function and structure as it once dominated the ecological site. The site treated should be free of any reoccurring infestations for a 5 to 10 year period to be considered restored and fully functioning ecosystem.

A protocol for validating projections (Validation Monitoring) of long-term effects will be incorporated into the monitoring plan to measure whether ecosystems and watersheds are restored through Integrated Plant Management operations. Validation monitoring objective is to measure plant community structure and function relative to a target plant community in the Ecological Site Description for the site.

- Post-treatment monitoring would be used to detect whether the SOP were appropriately applied.
- Contract and agreement administration and other existing mechanisms would be used to correct deficiencies.
- Herbicide use would be reported (to be compiled annually by the National Technology Center) to the Environment Protection Agency, as required by BLM regulations.
- Re-treatment and active restoration prescriptions would be developed based on post treatment results. Changes in treatment methods would occur based on effectiveness of treating the invasive plant infestations. For example, an invasive plant population treated with a broadcast herbicide may be retreated with a spot spray or hand pulled, once the size of the infestation is reduced.

## 5.3 Site-Specific NIP Species Treatments

Monitoring requirements would be accomplished using trained BLM employees or through partnership agreements, such as the County Road Departments located within the LCDO, and/or private applicators, when contracted. Currently, the herbicide applicators who work on BLM lands complete an herbicide treatment and Pesticide Application Record that documents and monitors the site treated, treatment methods, herbicide used, and method of application. The monitoring records require a follow-up visit and an assessment of effects on non-target species. Similar records may be developed in the future to meet the monitoring needs. Additional monitoring would be completed as part of the BLM National Monitoring Strategy (2006) and other required monitoring processes.

## 6 TRIBES, INDIVIDUALS, ORGANIZATIONS OR AGENCIES CONSULTED

| Name | Purpose & Authorities for Consultation or Coordination | Findings & Conclusions |
|---|---|---|
| U.S. Fish & Wildlife Service (US FWS) | Section 7 Consultation, Endangered Species Act (16 USC 1531) for the BLM 2007 Programmatic EIS | The Service agrees, by letter dated 9/1/06, that the proposed action may affect but would not likely adversely affect listed species because conservation measures and standard operating procedures would be employed and site-specific consultation will occur at the project level. (Refer to Appendix G, BLM 2007 PEIS) |

## 7 LIST OF PREPARERS

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| Jennifer Montoya | Environmental Planner | Final review of EA |
| Douglas Haywood | Project Manager | Final review of EA |

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# 9 APPENDICES

Appendix A – Standard Operating Procedures

Appendix B – Herbicides and Their Attributes

Appendix C – Mitigation Measures

Appendix D – Resource Management Statutes

Appendix E – Noxious and Invasive Plant Species Characteristics

Appendix F – Project Analysis Checklist for Noxious and Invasive Plant Species

Appendix G – USFWS Consultation Memorandum

Appendix H – Special Status Animal and Plant Species of the Las Cruces District Office

Appendix I – Migratory Bird Treaty Act Species in the Las Cruces District Office

Appendix J – Ecological Risk Assessments

Appendix K – Special Management Areas - LCDO

## 9.1 APPENDIX A - STANDARD OPERATING PROCEDURES

**Project Planning**

1. Incorporate prevention measures into project layout and design, alternative evaluation, and project decisions to prevent the introduction or spread of weeds.
2. Determine prevention and maintenance needs, including the use of herbicides, at the onset of project planning.
3. Before ground-disturbing activities begin, inventory weed infestations and prioritize areas for treatment in project operating areas and along access routes.
4. Remove sources of weed seed and propagules to prevent the spread of existing weeds and new weed infestations.
5. Pre-treat high-risk sites for weed establishment and spread before implementing projects.
6. Post Noxious Weed awareness messages and prevention practices at strategic locations such as trailheads, roads, boat launches, and public land kiosks.
7. Coordinate project activities with nearby herbicide applications to maximize the cost effectiveness of weed treatments.

**Project Development**

1. Minimize soil disturbance to the extent practical, consistent with project objectives.
2. Avoid creating soil conditions that promote weed germination and establishment.
3. To prevent weed germination and establishment, retain native vegetation in and around project activity areas and keep soil disturbance to a minimum, consistent with project objectives.
4. 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 seeds or propagules is least likely.
5. Prevent the introduction and spread of weeds caused by moving weed-infested sand, gravel, borrow, and fill material.
6. Inspect material sources 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 any use of pit material.
7. Survey the area where material from treated weed-infested sources is used for at least 3 years after project completion to ensure that any weeds transported to the site are promptly detected and controlled.
8. Prevent weed establishment by not driving through weed-infested areas.
9. Inspect and document weed establishment at access roads, cleaning sites, and all disturbed areas; control infestations to prevent weed spread within the project area.
10. Avoid acquiring water for dust abatement where access to the water is through weed-infested sites.
11. Identify sites where equipment can be cleaned. Clean equipment before entering public lands.
12. Clean all equipment before leaving the project site if operating in areas infested with weeds.
13. Inspect and treat weeds that establish at equipment cleaning sites.

14. Ensure that rental equipment is free of weed seed.
15. Inspect, remove, and properly dispose of weed seed and plant parts found on workers' clothing and equipment. Proper disposal entails bagging the seeds and plant parts and incinerating them.
16. Evaluate each site-specific project according to the project-level screening checklist and confirm if the project is within the scope of this EA; determine appropariate level of documentation needed to approve the project.

**Revegetation**

1. Include weed prevention measures, including project inspection and documentation, in operation and reclamation plans.
2. Retain bonds until reclamation requirements, including weed treatments, are completed based on inspection and documentation.
3. To prevent conditions favoring weed establishment, reestablish vegetation on bare ground caused by project disturbance as soon as possible using either natural recovery or artificial techniques.
4. Maintain stockpiled, uninfested material in a weed-free condition.
5. Re-vegetate disturbed soil (except travel ways on surfaced projects) in a manner that optimizes plant establishment for each specific project site. For each project, define what constitutes disturbed soil and objectives for plant cover revegetation. Revegetation may include topsoil replacement, planting, seeding, fertilization, liming, and weed-free mulching, as necessary.
6. Where practical, stockpile weed-seed-free topsoil and replace it on disturbed areas (e.g., road embankments or landings).
7. Inspect seed and straw mulch to be used for site rehabilitation (for wattles, straw bales, dams, etc.) and certify that they are free of weed seed and propagules.
8. 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.
9. Use native material where appropriate and feasible. Use certified weed-free or weed-seed-free hay or straw where certified materials are required and/or are reasonably available.
10. Provide briefings that identify operational practices to reduce weed spread (for example, avoiding known weed infestation areas when locating fire lines).
11. Evaluate options, including closure, to regulate the flow of traffic on sites where desired vegetation needs to be established. Sites could include road and trail rights-of-way (ROW), and other areas of disturbed soils.

**Herbicide Application Protocol**

Chemical Pest Control (BLM Handbook H-9011-1); Safety (Manual 1112); Chemical Pest Control (Manual 9011); Expenditure of Rangeland Insect Pest Control Funds (Manual 9012); Integrated Weed Management (Manual 9015); Integrated Pest Management (Manual 9220)

1. Prepare operational and spill contingency plan in advance of treatment.
2. Conduct a pretreatment survey before applying herbicides.
3. Select herbicide that is least damaging to the environment while providing the desired results.
4. Select the herbicide products carefully to minimize additional impacts from degradates, adjuvants, inert ingredients, and tank mixtures.

5. Apply the least amount of herbicide needed to achieve the desired result.
6. Follow herbicide product label for use and storage.
7. Have licensed applicators apply herbicides.
8. Use only USEPA-approved herbicides and follow product label directions and "advisory" statements.
9. Review, understand, and conform to the "Environmental Hazards" section on the herbicide product label. This section warns of known pesticide risks to the environment and provides practical ways to avoid harm to organisms or to the environment.
10. Consider surrounding land use before assigning aerial spraying as a treatment method and avoid aerial spraying near agricultural or densely populated areas.
11. Minimize the size of application area, when feasible.
12. Comply with herbicide-free buffer zones to ensure that drift will not affect crops or nearby residents/landowners.
13. Post treated areas and specify reentry or rest times, if appropriate.
14. Notify adjacent landowners prior to treatment.
15. Keep a copy of Material Safety Data Sheets (MSDSs) at work sites. MSDSs are available for review at ttp://www.cdms.net/.
16. Keep records of each application, including the active ingredient, formulation, application rate, date, time, and location.
17. Avoid accidental direct spray and spill conditions to minimize risks to resources.
18. Consider surrounding land uses before aerial spraying.
19. Avoid aerial spraying during periods of adverse weather conditions (snow or rain imminent, fog, or air turbulence).
20. Make helicopter applications at a target airspeed of 40 to 50 miles per hour (mph), and at about 30 to 45 feet above ground.
21. Take precautions to minimize drift by not applying herbicides when winds exceed >10 mph (>6 mph for aerial applications), or a serious rainfall event is imminent.
22. Use drift control agents and low volatile formulations.
23. Conduct pre-treatment surveys for sensitive habitat and special status species within or adjacent to proposed treatment areas.
24. Consider site characteristics, environmental conditions, and application equipment in order to minimize damage to non-target vegetation.
25. Use drift reduction agents, as appropriate, to reduce the drift hazard to non-target species.
26. Turn off applied treatments at the completion of spray runs and during turns to start another spray run.
27. Refer to the herbicide product label when planning revegetation to ensure that subsequent vegetation would not be injured following application of the herbicide.
28. Clean OHVs to remove seeds.

**Air Quality --** Soil, Water, and Air Management, (BLM Manual 7000)

1. Consider the effects of wind, humidity, temperature inversions, and heavy rainfall on herbicide effectiveness and risks.
2. Apply herbicides in favorable weather conditions to minimize drift. For example, do not treat when winds exceed 10 mph (>6 mph for aerial applications) or rainfall is imminent.
3. Use drift reduction agents, as appropriate, to reduce the drift hazard.
4. Select proper application equipment (e.g., spray equipment that produces 200- to 800-micron diameter droplets [spray droplets of 100 microns and less are most prone to drift]).
5. Select proper application methods (e.g., set maximum spray heights, use appropriate buffer distances between spray sites and non-target resources).

**Soil --** Soil, Water, and Air Management, (BLM Manual 7000)

1. Minimize treatments in areas where herbicide runoff is likely, such as steep slopes when heavy rainfall is expected.
2. Minimize use of herbicides that have high soil mobility, particularly in areas where soil properties increase the potential for mobility.
3. Do not apply granular herbicides on slopes of more than 15% where there is the possibility of runoff carrying the granules into non-target areas.

**Water Resources --** Soil, Water, and Air Management, (BLM Manual 7000), Consider climate, soil type, slope, and vegetation type when developing herbicide treatment programs.

1. Select herbicide products to minimize impacts to water. This is especially important for application scenarios that involve risk from active ingredients in a particular herbicide, as predicted by risk assessments.
2. Use local historical weather data to choose the month of treatment. Considering the phenology of the target species, schedule treatments based on the condition of the water body and existing water quality conditions.
3. Plan to treat between weather fronts (calms) and at appropriate time of day to avoid high winds that increase water movements, and to avoid potential stormwater runoff and water turbidity.
4. Review hydro-geologic maps of proposed treatment areas. Note depths to groundwater and areas of shallow groundwater and areas of surface water and groundwater interaction.
5. Minimize treating areas with high risk for groundwater contamination.
6. Conduct mixing and loading operations in an area where an accidental spill would not contaminate an aquatic body.
7. Do not rinse spray tanks in or near water bodies. Do not broadcast pellets where there is danger of contaminating water supplies.
8. 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.
9. Minimize the potential effects to surface water quality and quantity by stabilizing terrestrial areas as quickly as possible following treatment.

**Wetlands and Riparian Areas**

1. Use a selective herbicide and a wick or backpack sprayer.
2. Use appropriate herbicide-free buffer zones for herbicides not labeled for aquatic use based on risk assessment guidance, with minimum widths of 100 feet for aerial, 25 feet for vehicle, and 10 feet for hand spray applications.

**Vegetation --** National Range Handbook (BLM Handbook H-4410-1); Forest Management (BLM Manual 5000); Integrated Weed Management (BLM Manual 9015)

1. Refer to the herbicide label when planning revegetation to ensure that subsequent vegetation would not be injured following application of the herbicide.
2. Use native or sterile species for revegetation and restoration projects to compete with invasive species until desired vegetation establishes.
3. Use weed-free feed for horses and pack animals. Use weed-free straw and mulch for revegetation and other activities.
4. Identify and implement any temporary domestic livestock grazing and/or supplemental feeding restrictions needed to enhance desirable vegetation recovery following treatment. Consider adjustments in the existing grazing permit, to maintain desirable vegetation on the treatment site.

**Pollinators**

1. Complete vegetation treatments seasonally before pollinator foraging plants bloom.
2. Time vegetation treatments to take place when foraging pollinators are least active both seasonally and daily.
3. Design vegetation treatment projects so that nectar and pollen sources for important pollinators and resources are treated in patches rather than in one single treatment.
4. Minimize herbicide application rates. Use typical rather than maximum rates where there are important pollinator resources.
5. Maintain herbicide free buffer zones around patches of important pollinator nectar and pollen sources.
6. Maintain herbicide free buffer zones around patches of important pollinator nesting habitat and hibernacula.
7. Make special note of pollinators that have single host plant species, and minimize herbicide spraying on those plants (if invasive species) and in their habitats.

**Fish and Other Aquatic Organisms --** Wildlife and Fisheries Management (BLM Manual 6500) and Habitat Management Plans (BLM Manual 6780)

1. Use appropriate buffer zones based on label and risk assessment guidance.
2. Minimize treatments near fish-bearing water bodies during periods when fish are in life stages most sensitive to the herbicide(s) used, and use spot rather than broadcast or aerial treatments.
3. Use appropriate application equipment/method near water bodies if the potential for off-site drift exists.
4. For treatment of aquatic vegetation, 1) treat only that portion of the aquatic system necessary to achieve acceptable vegetation management, 2) use the appropriate application

method to minimize the potential for injury to desirable vegetation and aquatic organisms, and 3) follow water use restrictions presented on the herbicide label.

**Wildlife --** Wildlife and Fisheries Management (BLM Manual 6500) and Habitat Management Plans (BLM Manual 6780)

1. Use herbicides of low toxicity to wildlife, where feasible.
2. Use spot applications or low-boom broadcast operations where possible to limit the probability of contaminating non-target food and water sources, especially non-target vegetation over areas larger than the treatment area.
3. Use timing restrictions (e.g., do not treat during critical wildlife breeding or staging periods) to minimize impacts to wildlife.

**Threatened, Endangered, and Sensitive Species** -- Special Status Species (BLM Manual 6840)

1. Survey for special status species before treating an area. Consider effects to special status species when designing herbicide treatment programs.
2. Use a selective herbicide and a wick or backpack sprayer to minimize risks to special status plants.
3. Avoid treating vegetation during time-sensitive periods (e.g., nesting and migration, sensitive life stages) for special status species in area to be treated.
4. To protect special status plant species, implement all conservation measures for plants presented in the Vegetation Treatments on Bureau of Land Management Lands in 17 Western States Programmatic Biological Assessment.
5. Use buffers, slope restrictions and time application to avoid high/heavy rainfall events around SSS plants to minimize or eliminate the potential for negative impacts.

**Livestock** -- Grazing Management (BLM Handbook, H-4120-1)

1. Whenever possible and whenever needed, schedule treatments when livestock are not present in the treatment area. Design treatments to take advantage of normal livestock grazing rest periods, when possible.
2. As directed by the herbicide product label, remove livestock from treatment sites prior to herbicide application, where applicable.
3. Use herbicides of low toxicity to livestock, where feasible.
4. Take into account the different types of application equipment and methods, where possible, to reduce the probability of contamination of non-target food and water sources.
5. Avoid use of diquat in riparian pasture while pasture is being used by livestock.
6. Notify permittees of the herbicide treatment project to improve coordination and avoid potential conflicts and safety concerns during implementation of the treatment.
7. Notify permittees of livestock grazing, feeding, or slaughter restrictions, if necessary.
8. Provide alternative forage sites for livestock, if possible.

**Cultural Resources and Paleontological Resources** -- Guidelines for Conducting Tribal Consultation (BLM Handbook, H8120-1) and General Procedural Guidance for Paleontological Resource Management (BLM Handbook, H8270-1), and The Foundations for Managing Cultural Resources (BLM Manual 8100), Tribal Consultation Under Cultural Resource Authorities (BLM Manual 8120), and Paleontological Resource Management (BLM Manual 8270):

1. The BLM will will meet its responsibilities under the National Historic Preservation Act by adhering to the agreement among the Bureau of Land Management, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers.
2. Follow standard procedures for compliance with Section 106 of the National Historic Preservation Act as implemented through the Programmatic Agreement among the Bureau of Land Management, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers Regarding the Manner in Which BLM Will Meet Its Responsibilities Under the National Historic Preservation Act and state protocols or 36 Code of Federal Regulations Part 800, including necessary consultations with State Historic Preservation Officers and interested tribes.
3. Follow BLM Handbook H-8270-1 (General Procedural Guidance for Paleontological Resource Management) to determine known Condition 1 and Condition 2 paleontological areas, or collect information through inventory to establish Condition 1 and Condition 2 areas, determine resource types at risk from the proposed treatment, and develop appropriate measures to minimize or mitigate adverse impacts.
4. Consult with tribes to locate any areas of vegetation that are of significance to the tribe and that might be affected by herbicide treatments.
5. Work with tribes to minimize impacts to these resources.
6. Follow guidance under Human Health and Safety in areas that may be visited by Native peoples after treatments.

**Visual Resources --** Visual Resource Inventory (BLM Handbook H-8410-1); Visual Resource Contrast Rating (BLM Handbook H-8431-1); and Visual Resource Management (BLM Manual 8400)

1. Minimize the use of broadcast foliar applications in sensitive watersheds to avoid creating large areas of browned vegetation.
2. Consider the surrounding land use before assigning aerial spraying as an application method.
3. Minimize off-site drift and mobility of herbicides (e.g., do not treat when winds exceed 10 mph; minimize treatment in areas where herbicide runoff is likely; establish appropriate buffer widths between treatment areas and residences) to contain visual changes to the intended treatment area.
4. If the area is a Class I or II visual resource, ensure that the change to the characteristic landscape is low and does not attract attention (Class I), or if seen, does not attract the attention of the casual viewer (Class II).
5. Lessen visual impacts by: 1) designing projects to blend in with topographic forms; 2) leaving some low-growing trees or planting some low-growing tree seedlings adjacent to the treatment area to screen short-term effects; and 3) revegetating the site following treatment.
6. When restoring treated areas, design activities to repeat the form, line, color, and texture of the natural landscape character conditions to meet established Visual Resource Management objectives.

**Wilderness and Other Special Areas** -- Management of Wilderness Study Areas (Handbook H-8550-1); Management of Designated Wilderness Study Areas (H-8560-1); Wild and Scenic Rivers (Manual 8351)

1. Encourage backcountry pack and saddle stock users to feed their livestock only weed-free feed for several days before entering a wilderness area.
2. Encourage stock users to tie and/or hold stock in such a way as to minimize soil disturbance and loss of native vegetation.
3. Re-vegetate disturbed sites with native species if there is no reasonable expectation of natural regeneration.
4. Provide educational materials at trailheads and other wilderness entry points to educate the public on the need to prevent the spread of weeds.
5. Use the "minimum tool" to treat noxious and invasive vegetation, relying primarily on the use of ground-based tools, including backpack pumps, hand sprayers, and pumps mounted on pack and saddle stock.
6. 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.
7. Give preference to herbicides that have the least impact on non-target species and the wilderness environment.
8. Implement herbicide treatments during periods of low human use, where feasible.
9. Address wilderness and special areas in management plans.
10. Maintain adequate buffers for Wild and Scenic Rivers ¼ mile on either side of river.

**Recreation --** Land Use Planning Handbook, Appendix C (Handbook H1601-1)

1. Schedule treatments to avoid peak recreational use times, while taking into account the optimum management period for the targeted species.
2. Notify the public of treatment methods, hazards, times, and nearby alternative recreation areas.
3. Adhere to entry restrictions identified on the herbicide product label for public and worker access.
4. Post signs noting exclusion areas and the duration of exclusion, if necessary.
5. Use herbicides during periods of low human use, where feasible.

**Social and Economic Values**

1. Consider surrounding land use before selecting aerial spraying as a method, and avoid aerial spraying near agricultural or densely-populated areas.
2. Post treated areas and specify reentry or rest times, if appropriate.
3. Notify grazing permittees of livestock feeding restrictions in treated areas, if necessary, as per herbicide product label instructions.
4. Notify the public of the project to improve coordination and avoid potential conflicts and safety concerns during implementation of the treatment.
5. Control public access until potential treatment hazards no longer exist, per herbicide product label instructions.
6. Observe restricted entry intervals specified by the herbicide product label.
7. Notify local emergency personnel of proposed treatments.

8. Use spot applications or low-boom broadcast applications where possible to limit the probability of contaminating non-target food and water sources, especially vegetation over areas larger than the treatment area.
9. Consult with Native American tribes to locate any areas of vegetation that are of significance to the tribes and that might be affected by herbicide treatments.
10. To the degree possible within the law, hire local contractors and workers to assist with herbicide application projects and purchase materials and supplies, including chemicals, for herbicide treatment projects through local suppliers.
    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.

**Rights-of-way**

1. Coordinate vegetation management activities where joint or multiple use of a ROW exists.
2. Notify other public land users within or adjacent to the ROW proposed for treatment.
3. Use only herbicides that are approved for use in ROW areas.

**Human Health and Safety**

1. Establish a buffer between treatment areas and human residences based on guidance given in the HHRA, with a minimum buffer of ¼ mile for aerial applications and 100 feet for ground applications, unless a written waiver is granted.
2. Use protective equipment as directed by the herbicide product label.
3. Post treated areas with appropriate signs at common public access areas.
4. Observe restricted entry intervals specified by the herbicide product label.
5. Provide public notification in newspapers or other media where the potential exists for public exposure.
6. Have a copy of MSDSs at work site.
7. Notify local emergency personnel of proposed treatments.
8. Contain and clean up spills and request help as needed.
9. Secure containers during transport.
10. Follow label directions for use and storage.
11. Dispose of unwanted herbicides promptly and correctly.

## 9.2 APPENDIX B - HERBICIDES ATTRIBUTES

| HERBICIDE | PRODUCT NAME | CONTROL PLANTS | HALF-LIFE, FIELD | APPLIC. RATE | CHEMICAL MIX |
|---|---|---|---|---|---|
| **2,4-D** | 2,4-D | Broad-leaf weeds<br><br>Yellow/Malta Starthistle | 10 days | 1.5-6 pints/acre<br><br>2 quarts/acre | |
| **Bromacil** | Hyvar | Grass, weeds, shrubs | 60 days, hi rates 1 year | 5-12 lbs./acre | |
| **Chlorsulfuron** | Telar XP | Broad-leaf weeds | 40 days | 0.18-0.75 oz./acre | |
| **Clopyralid** | Stinger; Reclaim; Clopyr Ag; Transline | Broad-leaf weeds | 12-70 days | 0.125-0.25 lb./acre; 2/3 pint /acre | |
| **Diflufenzopyr** | Distinct | Broad-leaf weeds | 14 days | 0.25-2.0 lbs./acre | Dicamba |
| **Dimethylamine** | Dicamba Banvel | Broad-leaf weeds | <14 days | 0.25-2.0 lbs./acre | |
| **Diquat** | Weedtrine | Aquatic plants | 1000 days | 2 lbs./100 gallons water | |
| **Diuron** | Diuron 4L | Broad-leaf weeds | 90 days, low rates; high rates 1 year | | |
| **Fluridone** | Sonar | Aquatic plants | 20-270 days | 2 lbs./acre | |
| **Glyphosate** | Accord XRT Roundup Pro Rodeo Kleenup | Broad-leaf weeds; shrubs | 25-47 days | 1-1.5 quart/acre | |
| **Hexazinone** | Velpar | Grass, weeds, shrubs | 90 days | 2-13 lbs./acre | |
| **Imazapic** | Cadre Plateau | Broad-leaf weeds | 120 days | 2 lbs./gallon | |
| **Imazapyr** | Arsenal | Grass, weeds, shrubs | 25-142 days; 3 mo.-2 yr depending on appl. rate | 2-4 lbs./ 100 gallons | Non-Aquatic Label |

| HERBICIDE | PRODUCT NAME | CONTROL PLANTS | HALF-LIFE, FIELD | APPLIC. RATE | CHEMICAL MIX |
|---|---|---|---|---|---|
| | | | | | |
| **Imazapyr** | | African Rue | | 2 quarts/acre =1 lb. A.I. per acre | Non-Aquatic Label |
| | | Salt Cedar | | 2 quarts/acre =1 lb. A.I. per acre | Aquatic Label |
| | | Russian/Spotted Knapweed | | 1-3% mixed in water | Non-Aquatic label |
| **Metsulfuron methyl** | Ally Escort | Grass, weeds | 7-42 days | 0.06-0.18 oz./acre | |
| **Picloram** | Tordon K Tordon22K | Broad leaf weeds, brush, conifer trees | Avg. 90 days, but ranges 20-300 days | 0.48 gallons/acre; 1 pint/acre | |
| | | Russian/Spotted knapweed | | | Picloram + 2,4-D |
| | | | | | |
| **Sulfometuron methyl** | Oust XP | Grass, weeds | 30 days, in silt loam | 0.75-3 oz./acre | |
| **Tebuthiuron** | Spike | Grass, weeds, shrubs | 12-15 months | 0.75-4 lb./acre | |
| | | African Rue | | 2-3 lbs. A.I. per acre | |
| **Triclopyr** | Remedy Garlon 3A Garlon 4 Pathfinder-II Redeem | weeds, shrubs | 30 days, range 10-46 days | 1.5-3 lbs./100-400 galllons | |

## 9.3 APPENDIX C - MITIGATION MEASURES

**Air Quality**
No mitigation measures proposed

**Soil Resources**
No Mitigation Measures Proposed

**Water Resources and Quality**

- Establish appropriate (herbicide-specific) buffer zones to downstream water bodies, habitats, and species/populations of interest.
- Areas with potential for groundwater for domestic or municipal water use shall be evaluated through the appropriate, validated USEPA model(s) to estimate vulnerability to potential groundwater contamination, and appropriate mitigation measures shall be developed if such an area requires the application of herbicides and cannot otherwise be treated with nonchemical methods.

**Wetland and Riparian Areas**
See mitigation for Water Resources and Quality and Vegetation.

**Vegetation**

- Minimize the use of terrestrial herbicides (especially bromacil, diuron, and sulfometuron methyl) in watersheds with down-gradient ponds and streams if potential impacts to aquatic plants are identified.
- Establish appropriate (herbicide-specific) buffer zones around downstream water bodies, habitats, and species/populations of interest. Consult the ecological risk assessments prepared for the PEIS for more specific information on appropriate buffer distances under different soil, moisture, vegetation, and application scenarios.
- Limit the aerial application of chlorsulfuron and metsulfuron methyl to areas with difficult land access, where no other means of application are possible. Do not apply sulfometuron methyl aerially.
- To protect special status plant species, implement all conservation measures for plants presented in the Vegetation Treatments on Bureau of Land Management Lands in 17 Western States Programmatic Biological Assessment.

**Fish and Other Aquatic Organisms**

- Limit the use of diquat in water bodies that have native fish and aquatic resources.
- Limit the use of terrestrial herbicides (especially diuron) in watersheds with characteristics suitable for potential surface runoff that have fish-bearing streams during periods when fish are in life stages most sensitive to the herbicide(s) used.

- To protect special status fish and other aquatic organisms, implement all conservation measures for aquatic animals presented in the Vegetation Treatments on Bureau of Land Management Lands in 17 Western States Programmatic Biological Assessment.
- Establish appropriate herbicide-specific buffer zones for water bodies, habitats, or fish or other aquatic species of interest.
- Consider the proximity of application areas to salmonid habitat and the possible effects of herbicides on riparian and aquatic vegetation. Maintain appropriate buffer zones around salmonid-bearing streams.
- Avoid using the adjuvant R-11® in aquatic environments and either avoid using glyphosate formulations containing polyoxyethyleneamine (POEA), or seek to use formulations with the least amount of POEA, to reduce risks to aquatic organisms in aquatic environments.

**Wildlife**

- To minimize risks to terrestrial wildlife, do not exceed the typical application rate for applications of dicamba, diuron, glyphosate, hexazinone, tebuthiuron, or triclopyr, where feasible.
- Minimize the size of application areas, where practical, when applying 2,4-D, bromacil, diuron, and Overdrive® to limit impacts to wildlife, particularly through contamination of food items.
- Where practical, limit glyphosate and hexazinone to spot applications in rangeland and wildlife habitat areas to avoid contamination of wildlife food items.
- Avoid using the adjuvant R-11® in aquatic environments and either avoid using glyphosate formulations containing POEA, or seek to use formulations with the least amount of POEA, to reduce risks to amphibians.
- Do not apply bromacil or diuron in rangelands, and use appropriate buffer zones to limit contamination of off-site vegetation, which may serve as forage for wildlife.
- Do not aerially apply diquat directly to wetlands or riparian areas.
- To protect special status wildlife species, implement all conservation measures for terrestrial animals presented in the Vegetation Treatments on Bureau of Land Management Lands in 17 Western States Programmatic Biological Assessment.

**Livestock**

- Minimize potential risks to livestock by applying diuron, glyphosate, hexazinone, tebuthiuron, and triclopyr at the typical application rate, where feasible.
- Do not apply 2,4-D, bromacil, dicamba, diuron, Overdrive®, picloram, or triclopyr across large application areas, where feasible, to limit impacts to livestock, particularly through the contamination of food items.
- Where feasible, limit glyphosate and hexazinone to spot applications in rangeland.
- Do not aerially apply diquat directly to wetlands or riparian areas used by livestock.
- Do not apply bromacil or diuron in rangelands, and use appropriate buffer zones to limit contamination of off-site rangeland vegetation.

**Visual Resources**

No mitigations measured proposed.

**Wilderness and Other Special Areas**
Mitigation measures that may apply to wilderness and other special area resources are associated with human and ecological health and recreation (see mitigation measures for Vegetation, Fish and Other Aquatic Resources, Wildlife Resources, Recreation, and Human Health and Safety).

**Recreation**
Mitigation measures that may apply to recreational resources are associated with human and ecological health (see mitigation measures for Vegetation, Fish and Other Aquatic Organisms, Wildlife, and Human Health and Safety).

**Human Health and Safety**

- Use the typical application rate, where feasible, when applying 2,4-D, bromacil, diquat, diuron, fluridone, hexazinone, tebuthiuron, and triclopyr to reduce risk to occupational and public receptors.
- Avoid applying bromacil and diuron aerially. Do not apply sulfometuron methyl aerially.
- Limit application of chlorsulfuron via ground broadcast applications at the maximum application rate.
- Limit diquat application to ATV, truck spraying, and boat applications to reduce risks to occupational receptors; limit diquat applications to areas away from high residential and subsistence use to reduce risks to public receptors.
- Evaluate diuron applications on a site-by-site basis to avoid risks to humans. There appear to be few scenarios where diuron can be applied without risk to occupational receptors.
- Do not apply hexazinone with an over-the-shoulder broadcast applicator.

## 9.4 APPENDIX D - STATUTES, REGULATIONS, DIRECTIVES

### AIR QUALITY

The **Clean Air Act (1990)**, as amended (42 U.S.C. 7401, 7642), requires BLM to protect air quality, maintain federal- and state-designated air quality standards, and abide by the requirements of the State Implementation Plans.

**New Mexico Air Quality Standards and Regulations** specify the requirements for air permitting and monitoring to implement Clean Air Act and state ambient air quality standards.

### CULTURAL RESOURCES

The **Historic Sites Act**, (16 U.S.C. 461) declares national policy to identify and preserve historic sites, buildings, objects, and antiquities of national significance, thereby providing a foundation for the National Register of Historic Places.

The **National Historic Preservation Act** (**1966**), as amended (16 U.S.C. 470) expands protection of historic and archeological properties to include those of national, state, and local significance. It also directs federal agencies to consider the effects of proposed actions on properties eligible for or included in the National Register of Historic Places.

The **Archaeological Resources Protection Act** (**1979)**, as amended (16 U.S.C. 470a, 470cc, 470ee), requires permits for the excavation or removal of federally administered archeological resources, encourages increased cooperation among federal agencies and private individuals, provides stringent criminal and civil penalties for violations, and requires federal agencies to identify important resources vulnerable to looting and to develop a tracking system for violations.

The **Native American Graves Protection and Repatriation Act (1990)** (Public Law 101-601) provides a process for federal agencies to return certain Native American cultural items (e.g., human remains, funerary objects, sacred objects, and objects of cultural patrimony) to lineal descendants and culturally affiliated Native American tribes.

**Protection and Enhancement of the Cultural Environment (EO 11593)** directs federal agencies to locate, inventory, nominate, and protect federally owned cultural resources eligible for the National Register of Historic Places and to ensure that their plans and programs contribute to preservation and enhancement of non-federally owned resources.

### HAZARDOUS MATERIALS

The **Comprehensive Environmental Response, Compensation, and Liability Act (1980)** (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (42 U.S.C. 9601–9673), provides for liability, risk assessment, compensation, emergency response, and cleanup (including the cleanup of inactive sites) for hazardous substances.

The Act requires federal agencies to report sites where hazardous wastes are or have been stored, treated, or disposed and requires responsible parties, including federal agencies, to clean up releases of hazardous substances.

The **Resource Conservation and Recovery Act** (RCRA), as amended by the Federal Facility Compliance Act of 1992 (42 U.S.C. 6901–6992), authorizes the Environmental Protection Agency (EPA) to manage, by regulation, hazardous wastes on active disposal operations. The Act waives sovereign immunity for federal agencies with respect to all federal, state, and local solid and hazardous waste laws and regulations. Federal agencies are subject to civil and administrative penalties for violations and to cost assessments for the administration of the enforcement.

The **Emergency Planning and Community Right-To-Know Act (1986)**, (42 U.S.C. 11001–11050) requires the private sector and federal, state, local, and tribal governments to inventory chemicals and chemical products, to report those in excess of threshold planning quantities, to inventory emergency response equipment, to provide annual reports and support to local and state emergency response organizations, and to maintain a liaison with the local and state emergency response organizations and the public.

## PESTICIDE REGULATIONS

**Federal Insecticide, Fungicide, and Rodenticide Act** *(EPA),* provides for the registration of pesticides, certification of applicators to apply restricted use pesticides, and enforcement of pesticide regulations. The Act also provides for individual states to obtain primacy for enforcement of FIFRA regulations as long as the states' requirements are at least equal to federal requirements.

## WATER QUALITY

The **Clean Water Act** (**1987**), as amended (33 U.S.C. 1251) establishes the objectives to restore and maintain the chemical, physical, and biological integrity of the nation's water supply. The Act also requires permits for point source discharges to navigable waters of the United States and the protection of wetlands and includes monitoring and research provisions for protection of ambient water quality.

**New Mexico Water Quality Regulations** exist for managing water flow quality within the Rio Grande River Basin as well as ground water quality standards statewide.

**Floodplain Management (EO 11988)** provides for the restoration and preservation of national and beneficial floodplain values, and enhancement of the natural and beneficial values of wetlands in carrying out programs affecting land use.

**Protection of Wetlands (EO 11990)** requires federal agencies to take action to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands.

**WILDLIFE**

**Migratory Bird Treaty Act (1918)** (16 U.S.C. 703–711) manages and protects migratory bird species through consultation with state and local governments and protection of land and water resources necessary for the conservation of migratory birds. Under the Act, taking, killing, or possessing migratory birds is unlawful.

The **Bald Eagle Protection Act (1940)** (16 U.S.C. 668), amended in 1962 to include the golden eagle, prohibits the taking or possession of and commerce in bald and golden eagles, with limited exceptions.

**Fish and Wildlife Coordination Act (1958)** (16 U.S.C. 661 et seq.) provides that, whenever the waters or channel of a body of water are modified by a department or agency of the United States, the department or agency first will consult with the U.S. Fish and Wildlife Service and with the head of the agency exercising administration over the wildlife resources of the state where construction will occur, with a view to the conservation of wildlife resources.

The **Sikes Act (1960)** (16 U.S.C. 670a–670o), as amended, Public Law 86-797, provides for cooperation by the Departments of the Interior and Defense with state agencies in planning, development, and maintenance of fish and wildlife resources on military reservations throughout the United States. Public Law 93-452, signed in 1974, authorized conservation and rehabilitation programs on BLM lands. Public Law 97-396, approved in 1982, provided for the inclusion of endangered plants in conservation programs developed for BLM lands. It also defined "cooperative agreements" with states and clarified section 209 concerning purchases and contracts for property and services from states.

The **Endangered Species Act (1973)** (ESA), as amended (16 U.S.C. 1531, et seq.), directs federal agencies to ensure that their actions do not jeopardize threatened and endangered species (plants and animals), and that through their authority they help bring about the recovery of such species.

**Fish and Wildlife Improvement Act (1978)** (16 U.S.C. 742l) authorizes the Secretary of the Interior and the Secretary of Commerce to assist in training of state fish and wildlife enforcement personnel, to cooperate with other federal or state agencies for enforcement of fish and wildlife laws, and to use appropriations to pay for rewards and undercover operations.

**Fish and Wildlife Conservation Act (1980)**, as amended, (16 U.S.C. 2901–2911, commonly known as the Nongame Act) encourages states to develop conservation plans for nongame fish and wildlife of ecological, educational, aesthetic, cultural, recreational, economic, or scientific value. The states may be reimbursed for a percentage of the costs of developing, revising, or implementing conservation plans approved by the Secretary of the Interior. Amendments adopted in 1988 and 1989 also direct the Secretary to undertake certain activities to research and conserve migratory nongame birds.

## VEGETATION MANAGEMENT AUTHORITIES

**Public Rangelands Improvement Act (1978)**, requires the BLM to manage, maintain, and improve the condition of the public rangelands so that they become as productive as feasible.

**BLM Manual 9011** and **Manual Handbook H-9011-1**, Chemical Pest Control, this manual and handbook outline policy and provide guidance for conducting pest control programs on public land.

**BLM Manual 9014**, Use of Biological Control Agents of Pests on Public Lands, this manual outlines policy, defines responsibilities, and provides guidance for the release, maintenance, and collections of biological control agents for integrated pest management programs on the lands administered by the BLM.

**BLM Manual 9015 Integrated Weed Management**, this manual addresses BLM's policy in managing and coordinating noxious weed activities along with BLM's activities associated with organizations and individuals.

**BLM Manual 9220**, Integrated Pest Management, this manual outlines policy, defines responsibilities, and provides guidance for implementing integrated pest management programs on lands administered by the BLM.

## STATE REGULATION

**New Mexico Weed and Pest Act (1973)***,* requires the federal government to control undesirable plant species by use of an integrated weed management approach.

**New Mexico Noxious Weeds Management Act (1998)***, d*irects NMDA to develop a noxious weed list for the state, identify methods of control for designated species, and educate the public about noxious weeds. NMDA coordinates weed management among local, state, and federal land managers as well as private land owners.

## 9.5 APPENDIX E - NOXIOUS AND INVASIVE PLANT SPECIES CHARACTERISTICS

**#1 Camelthorn** (Alhagi psuedaihagi)
This plant is a spiny, many-branched, hairless, creeping perennial. It reproduces by seed borne in reddish brown, jointed seed pods and by an extensive, deep-penetrating, horizontally spreading root system. Greenish stems have slender, yellow tipped, greenish spines 0.25 to 1.75 inches long. Leaves are alternate, wedge-shaped, hairless on the upper surface, and hair-v on the underside.
*Location:* Dona Ana and Sierra Counties
*New Mexico Noxious Weed:* Yes
*Treatment method used and herbicide:* No biological agent has been identified for this species. Herbicides typically used are Tordon 22K and 2,4-D at the rates of 0.48 gal./acre for Tordon up to 1.5 gal./acre; 6 pints/acre for 2,4-D.

**#2 Eurasian Watermilfoil** (Myriophyllum spicatum)
This species is an attractive aquatic plant with feathery underwater foliage. It was once commonly sold as an aquarium plant. It has the potential to invade waterways such as lakes and ponds, but also river systems. Watermilfoil is very difficult to eradicate.
*Location*: Sierra County
*New Mexico Noxious Weed*: Yes
*Treatment method used and herbicide*: No biological agent has been identified for this species. Herbicide typically used is 2,4-D (granular) at the rate of 100 lbs. per acre foot of water or 2,4-D (liquid) at a rate of 2.0 parts per million.

**#3 Hoary Cress** (Cardaria draba)
This species is a perennial forb in the mustard family that can grow up to 2 feet tall. The leaves are soft, gray-green and finely-hairy with heart-shaped bases. The upper leaves clasp to the stem of the plant. The four-petaled flowers are white and the heart-shaped seed pods occur in flattened clusters. Hoary cress invades rangelands, pastures, streambanks, and open forests primarily in the western United States, although it does occur in the East. It can form large infestations that can displace native species and reduce grazing quality. Hoary cress is native to Central Europe and Western Asia and was first introduced into the United States in the early 20th century.
*Location:* Luna County
*New Mexico Noxious Weed:* Yes
*Treatment method used and herbicide:* No biological agent has been identified for this species. Herbicides typically used are Milestone, 2,4-D, Escort, Telar, Tordon. Application rates are 2,4-D at 2 quarts/acre; Escort and Telar at 1 ounce/acre.

**#4 Leafy Spurge** (Euphorbia esula, L.)
Leafy spurge is an erect, perennial herbaceous plant that grows from 2 to 3.5 feet tall. The plant is easily identified by its showy yellow flower bracts and the milky sap that flows if the stem is broken or a leaf is removed. Flower parts are in threes and the stem is smooth. Leaves are oval-shaped and smooth. Large infestations give the landscape a yellowish tinge due to the yellow bracts.

Leafy spurge invades prairies, pastures and other open areas. It can completely overtake large areas of land and displace native vegetation. Leafy spurge is native to Europe and was introduced accidentally into America in the early 1800s as a seed contaminate.
*Location:* Sacramento Mountains, Otero County
*New Mexico Noxious Weed:* Yes
*Treatment method used and herbicide:* Leafy spurge has a specific biological agent that has been applied but whether it would be effective on the species within the LCDO climatic zones needs to be determined. Herbicides typically used are Tordon, Plateau, Banvel, and Roundup at the rates ranging from 0.48 gal./acre for Tordon to 0.25-2.0 lbs./acre for Banvel.

**#5 Parrot Feather** (Myriophyllum aquaticum)
Parrot feather is native to the Amazon River in South America, but now it's found nearly worldwide. It's estimated that was introduced to North America around the late 1800s. It prefers a warmer climate, it is chiefly found in the southern parts of the United States. Parrot feather is a fresh-water plant; it can be found in lakes, ponds, and streams.

Parrot feather is a perennial plant. As the water warms in the spring, parrot feather begins to flourish. Most plants flower in the spring; however, some also flower in the fall. Flowers of this plant are very small and white in color. Almost all plants of this species are female, in fact there are no male plants found outside of South America. Seeds are not produced in any North American plants. Parrot feather reproduces asexually. New plants grow from fragments of already rooted plants. This rhizomenous perennial exhibits an annual pattern of growth. In the spring, shoots begin to grow rapidly from overwintering rhizomes as water temperatures increase. Rhizomes function as a support structure for adventitious roots and provide buoyancy for emergent growth during the summer.

Parrot feather spreads easily and has become an invasive and noxious species in many areas. The plant can be introduced to new areas when sections of its rhizome are dug up and moved. The parrot feather grows abundantly, shades out naturally-occurring algae, and clogs irrigation ducts and canals. The emergent stems can survive on wet banks of rivers and lake shores, so it is well adapted to moderate water level fluctuations.
*Location:* Grant County
*New Mexico Noxious Weed:* Yes
*Treatment method used and herbicide:* Herbicides have not been found very useful in controlling its growth, partly because the plant has a waxy cuticle that seals out the poison. Cutting and chopping can actually promote the plant's spread. In some states, parrot feather is a declared noxious weed and is therefore banned from sale.
Response to Herbicides -- Although parrot feather is considered by some to be susceptible to herbicides, it is difficult to achieve complete control. The emergent stems and leaves have a thick waxy cuticle and it requires a wetting agent to penetrate this cuticle. Often the weight of the spray will cause the emergent vegetation to collapse into the water where the herbicide is washed off before it can be trans-located throughout the plant. Westerdahl and Getsinger report excellent control of parrot feather with several herbicides including 2,4-D, diquat, and endothall. Fair control was obtained with glyphosate.

The Monsanto Company suggested that applying a 1 3/4 percent solution of Rodeo® (aquatic version of Roundup®) with surfactant to the plants in the summer or fall when water levels are low would give about 95 percent control of the plants. Control of parrot feather may be achieved with low-volatility ester of 2,4-D at 4.4-8.9 kg ha, sprayed onto the emergent foliage. The granular formulation of 2,4-D was needed to control parrot feather for periods greater than 12 months. It is more effective when applied to young, actively growing plants. More recently imazapyr and triclopyr have been used to manage parrot feather.

In actual practice, repeated treatments are needed with herbicide to make any permanent progress. In Yakima, where their goal is eradication, they have used multiple herbicides, multiple times per treatment season, over a number of years and still have persistent plants. However, each year the biomass is reduced and with time and persistence, they should achieve their eradication goal.

Response to Cultural Methods -- Parrot feather's exceedingly robust rhizomes can survive overwinter water level draw downs in California irrigation canals as rhizomes are buried in the sediment.

Response to Mechanical Methods -- Because this plant can spread readily through fragmentation of rhizomes, mechanical controls such as cutting, harvesting, and rotovation (underwater rototilling) should be used only when the extent of the infestation is such that all available niches have been filled. Using mechanical controls while the plant is still invading will tend to enhance its rate of spread. Parrot feather populations can be successfully harvested, but the dense tough rhizomes are very heavy and the plant regrows rapidly. In Longview, the Diking District relies on a dragline to remove infesting parrot feather plants. A truck-mounted crane with a special attachment plucks weeds out of the ditch. They conduct the drag line operation from August to December in each year with control generally lasting for one growing season.

Bio-control method -- Parrot feather has high tannin content, so most grazers, including grass carp, find it unpalatable. Grass carp also prefer soft plants, like Elodea canadensis and the tough, woody parrot feather stems are not preferred. While biological control agents are not presently available, potential agents do exist in the wild, such as Lysathia flavipes (Boheman), a flea beetle and Listronotus marginicollis (Hustache), a weevil feeds only on parrot feather in its native range.

Additional insects in the U.S. and Caribbean have been found on parrot feather: Lysathia ludoviciana (Fall.), a flea beetle is native to the southern U.S. and Caribbean; two members of the Tortricidae family, Argyrotaenia ivana (Fernald) and Choristoneura parallela (Robison) have also been found on parrot feather in Florida, but their effect on the plant is unknown. In addition, larvae of the caterpillar, Parapoynx allionealis (Walker), mine parrot feather leaves, but the impact these larvae could have on parrot feather is also unknown. Fungal control options exist with an isolate of Pythium carolinianum Matt. collected in California has shown some promise as a potential bio-control agent.

**#6 Purple Loosestrife** (Lythrum salicaria)
This species is considered a Class A weed; it is rhizomatous creeping perennial, often reaching heights of 6 to 8 feet. Usually associated with moist or marshy sites, this semi-aquatic plant has stems that usually have four sides and many branches. A single plant can produce more than 2.5 million seeds per year. Currently has limited distribution but dense populations can alter an ecosystem.
*Location:* Grant County
*New Mexico Noxious Weed:* Yes
*Treatment method used and herbicide:* Treat Purple Loosestrife as follows: Glyphosate mixed at 1 to 1.5% in water and spray foliage until wet for individual plants or apply 4 pints/acre to broadcast spray an area; Imazapyr mixed at 1% in water and spray foliage until wet or 2-4 pints/acre for broadcasting spraying.

**#7 Scotch Thistle (**Onopordum acanthium)
This plant can reach a height of 8 feet with large, coarsely lobed, hairy leaves have a velvety-gray appearance. The rosette forms the first year and can have leaves up to 2 feet long and 1 foot wide. The spiny-edged, alternate leaves form leaf wings that extend down onto the stem. This branching plant has reddish-purple to violet flowers and a large, fleshy taproot. It is found primarily along roadsides and railroads, but can become an impassable obstacle to livestock on rangeland and pastures.
*Location:* Grant County
*New Mexico Noxious Weed:* Yes
*Treatment method used and herbicide:* No biological agent has been identified for this species. Herbicides typically used are Tordon, Banvel, 2,4-D with application rates comparable to other species previously mentioned.

**#8 Spotted Knapweed (**Centaurea stoebe ssp. micranthos**)**
Spotted knapweed is an herbaceous biennial or perennial plant that invades open areas throughout most of the United States. Its name is derived from the black margins of the flower bract tips which give the flower heads a spotted look. A basal rosette of deeply lobed leaves is produced the first year. Flowering stems are 8-50 inches tall and branched. Stem leaves are alternate and may be slightly lobed or linear. Flowers are purple to pink in color and occur on small flower heads. Spotted knapweed invades a wide variety of habitats including pastures, open forests, prairies, meadows, old fields, and disturbed areas.
It displaces native vegetation and reduces the forage potential for wildlife and livestock. Spotted knapweed is native to Europe and western Asia. It was accidentally introduced into the United States in contaminated alfalfa and clover seed in the late 1800s.
*Location:* Grant County within Gila National Forest. This species has the potential to invade lower elevations in the Chihuahuan desert.
*New Mexico Noxious Weed:* Yes
*Treatment method used and herbicide:* Spotted knapweed has a specific biological agent that has been applied but whether it would be
effective on the species within the LCDO climatic zones needs to be determined. Herbicides typically used are Tordon at the rate of
0.25-0.5 pounds per acre and Banvel at 1-2 lbs./acre.

**#9 Yellow Starthistle** (Centaurea solstitialis)
Yellow starthistle is an annual, germinating either in the fall or spring that grows 2 to 3 feet tall. Deeply lobed basal leaves form a rosette, while stem leaves are linear or tapered at both ends. Stem leaves attach directly to the stem. An extension, of the leaf runs down the stem, giving it a winged appearance. Flower heads are made up of yellow flowers. The flower heads have bracts with a stiff, sharp, 0.75-inch thorn. Round in cross section, the long spine has one or more shorter lateral spine, at its base. Seed produced from ray flower, are dark-colored and lack bristles, while seed from disk flowers are lighter colored and have a tuft of white bristles.
*Location:* Hidalgo, Grant, Luna, Dona Ana, Sierra, and Otero Counties
*New Mexico Noxious Weed:* Yes
*Treatment method used and herbicide:* Yellow Starthistle has a specific biological agent that has been applied but whether it would be effective on the species within the LCDO climatic zones needs to be determined. Herbicide typically used is Transline, Garlon, and 2,4-D, at the rates of 0.125-0.25 lb./acre for Transline to 1.5-3 lbs./100-400 gallons of water for Garlon.

**#10 African Rue** (Peganum harmala)
African rue is a many-branched perennial that has an aggressive, woody root system. Height rarely exceeds 1 to 1.5 feet. Stems are fleshy. When crunched, the stems have a bitter, acrid taste and a disagreeable odor. Leaves are alternate, smooth, and divided into linear segments. Flowers consisting of five white petals are borne singly in leaf axils along the stems. The fruiting structure has two to four cells, with a many-seeded capsule. With origins in North Africa, the first reported infestation in the United States occurred near Deming, New Mexico, in the 1920s.
*Location:* Hidalgo, Grant, Luna, Dona Ana, Sierra, and Otero Counties
*New Mexico Noxious Weed:* Yes
*Treatment method used and herbicide:* No biological agent has been identified for this species. Herbicides typically used are Spike 20P, Velpar L, and Arsenal at the rates ranging from 0.75 to 4 lbs./acre for Spike to 2-13 lbs./acre for Velpar.

**#11 Malta Starthistle** (Centaurea melitensis)
Stems are erect, branched, rough, and hairy. Stem leaves are alternate, narrow, and unlobed, with the attached leaf bases continuing down the ridged stems. The small, yellow flowers are about ½ inch in height, and have a wooly appearance in the bud stage. Straw colored spines tinged with purple or brown are produced below the flower head. Seeds are light brown with longitudinal lines and a pappus of unequal bristles. The base has a slight hook. Appearance often mistaken for Yellow starthistle, Malta's spines are shorter and tightly arranged around the seedhead.
*Location:* Hidalgo, Grant, Luna, Dona Ana, Sierra, and Otero Counties
*New Mexico Noxious Weed:* Yes
*Treatment method used and herbicide*: Starthistle has a biological agent that has been applied but whether it would be effective on the species within the LCDO climatic zones needs to be determined. Herbicides typically used are Transline, Tordon, 2,4-D, Banvel, at the rates ranging from 0.125-0.25 lb./acre for Transline to 1.5-6 pints/acre for 2,4-D.

**#12 Musk Thistle** (Carduus nutans)
It is an herbaceous biennial plant that grows to 6 feet tall. It has become a serious invader of open lands throughout the continental United States. It can be recognized by its showy, red-purple flowers and very spiny stem and leaves. The large disk-shaped terminal flower heads droop when

mature giving this plant its other common name, nodding thistle. Musk thistle invades a variety of disturbed areas. Pastures are particularly at risk because musk thistle is unpalatable to livestock. Once established it can spread rapidly due to high seed production (as much as 120,000 seed per plant). Musk thistle is native to Western Europe and was accidentally introduced into the United States in the early 1900s.
*Location:* Sacramento Mountains, Otero County. It is currently moving into lower elevations.
*New Mexico Noxious Weed:* Yes
*Treatment method used and herbicide:* No biological agent has been identified for this species. Herbicides typically used are Tordon, Transline, 2,4-D, Escort, and Telar, with application rates being comparable to other species previously mentioned.

**#13 Perennial Pepperweed** (Lepidium latifolium)
Forms dense colonies by adventitious shoots from roots and deep-seated rhizomes and spreads vigorously. It also produces abundant highly germinable seeds which can survive in the soil for at least 1 year. Fluctuating temperature regimes produce optimum germination. It can grow at altitudes of 4,000 to 8,000 feet. Perennial pepperweed is an aggressive invader of moist to wet ecosystems, even invading ecologically healthy areas. Perennial pepperweed spreads aggressively by both seeds and root sprouts. Mechanical removal has been shown to be ineffective because plants form clonal stands and continue to sprout from extremely deep roots, and from root fragments.
*Location:* In the Rio Grande River basin in Sierra and Dona Ana Counties.
*New Mexico Noxious Weed:* Yes
*Treatment method used and herbicide:* No biological agent has been identified for this species. Herbicides typically used are Telar and 2,4-D. Application rates are: Telar at 1 ounce/acre; 2,4-D at 2 quarts/acre.

**#14 Russian Knapweed** (Acroptilon repens)
This species is a long-lived perennial herb that can spread root system or by seed. Roots can grow 6 to 8 feet deep during the first growing season, and 16 to 23 feet deep in the second growing season. The primary method of reproduction is vegetative from the creeping root system.

In addition to these traits, it exhibits allelopathic effects, suppressing other plant species. Hand pulling of this species reportedly has limited effectiveness and repeated pulling may not eradicate the infestation.
*Location:* Dona Ana, Otero, Sierra Counties
*New Mexico Noxious Weed:* Yes
*Treatment method used and herbicide:* Knapweed has a biological agent that has been applied but whether it would be effective on the species within the LCDO climatic zones needs to be determined. Herbicides typically used are similar to Spotted and Diffuse Knapweeds in addition to Telar, Curtail, and Roundup. Application rates range from 0.18-0.75 oz./acre for Telar XP to 1.5-6 pints/acre for 2,4-D.

**#15 Tree of Heaven** (Ailanthus altissima)
Tree-of-heaven is a rapidly growing, deciduous tree in the mostly tropical quassia family of Simaroubaceae. Mature trees can reach 80 feet or more in height. It has smooth stems with pale gray bark, twigs which are light chestnut brown and large compound leaves. Small yellow-green

flowers have 5-6 petals and are borne in dense clusters near ends of upper stems. Pink to tan fruit is winged with a single seed in the middle. Roots have aggressive rhizomes. All parts of the tree, especially the flowers, have a strong, offensive odor similar to peanuts or cashews. Tree-of-heaven reproduces both sexually (seeds) and asexually (vegetative sprouts). Established trees also produce numerous suckers from the roots and re-sprout vigorously from cut stumps and root fragments.
*Location*: Found throughout the LCDO area, especially Grant and Dona Ana Counties
*New Mexico Noxious Weed*: Yes
*Treatment method used and herbicide*: No biological agent has been identified for this species. Herbicide typically used is Roundup Pro or Rodeo applied to fresh cut stump.

**#16 Cheatgrass** (Bromus tectorum)
Cheatgrass is an annual grass that forms tufts up to 2 feet tall. The leaves and sheathes are covered in short, soft hairs. The flowers occur as drooping, open, terminal clusters that can have a greenish, red, or purple hue. These annual plants will germinate in fall or spring (fall is more common), and senescence usually occurs in summer. Cheatgrass invades rangelands, pastures, prairies, and other open areas. Cheatgrass has the potential to completely alter the ecosystems it invades. It can completely replace native vegetation and change fire regimes. It occurs throughout the United States and Canada, but is most problematic in areas of the western United States with lower precipitation levels. Cheatgrass is native to Europe and parts of Africa and Asia. It was first introduced into the United States accidentally in the mid-1800s.
*Location*: Throughout the LCDO in small populations at present
*New Mexico Noxious Weed*: Yes
*Treatment method used and herbicide*: No biological agent has been identified for this species. Herbicides typically used are Roundup with application rate of 0.37-0.5 lb./acre, and Plateau at a rate of 0.24-0.75 lb./acre.

**#17 Jointed Goatgrass (Aegilops cylindrical)**
This species is a winter annual grass and it has expended its range in the last 25 years as winter wheat farming has changed which affords Jointed goatgrass opportunity to spread. It shares similar growth habits as winter wheat and it competes with winter wheat for space and soil nutrients, as well as contaminating winter wheat harvests with seed. The species can occur wherever winter wheat is grown, but there is no specific data if it is limited by differences in soil types or climatic conditions.
*Location*: District-wide
*New Mexico Noxious Weed*: Yes
*Treatment method used and herbicide*: No biological agent has been identified for this species. Herbicide typically used can be a pre-emergence type. Roundup or Rodeo can be effective on the species and more so if combined with other post-emergent herbicides.

**#18 Russian Olive (Elaeagnus angustifolia)**
This species is a deciduous shrub or small tree, with deep taproot an extensive lateral root system. Russian olive is comparable to Buffaloberry which is a native species. The species can inhabit lowlands and along drainages where it competes with native riparian species and displaces climax species such as Plains Cottonwood. Control of this species is extremely difficult and eradication is almost impossible, but better results have occurred with very young plants especially when shrub or trees are cut then treated with herbicide.

*Location*: District-wide
*New Mexico Noxious Weed*: Yes
*Treatment method used and herbicide*: No biological agent has been identified for this species. Herbicide typically used is Garlon 4 preceded by cutting or mowing. Other herbicides are 2,4-D ester, Roundup, and Arsenal, or combination of 2,4-D and Garlon 4.

**#19 Salt Cedar** (Tamarix ramosissima and other species)
Salt cedar is deciduous shrub that can grow up to 15 feet in height. Leaves are small, scale-like, gray-green in color, and overlap along the stem. The bark is smooth and reddish on younger plants, turning brown and furrowed with age. Several species are considered invasive in the United States and distinguishing the species can often be difficult. Salt cedar invades streambanks, sandbars, lake margins, wetlands, moist rangelands, and saline environments. It can crowd out native riparian species, diminish early successional habitat, and reduce water tables and interferes with hydrologic process. Salt cedar is native to Eurasia and Africa and was introduced into the western United States as an ornamental in the early 1800s.
*Location*: District-wide
*New Mexico Noxious Weed*: Yes
*Treatment method used and herbicide*: Salt cedar has a biological agent that has been applied but whether it would be effective on the species within the LCDO climatic zones needs to be determined. Herbicides typically used are Arsenal, Garlon 3A and 4, Pathfinder II, Rodeo, Roundup Pro. Application rates are 2-4 lbs./100 gallon of water for Arsenal; 1.5-3 lbs./100-400 gallons of water for Garlan 3A and 4, also Pathfinder.

**#20 Siberian Elm (Ulmus pumila)**
The Siberian elm is usually a small to medium-sized, often bushy, tree growing to 30 to 60 feet tall, with a trunk up to 31 inches in diameter at breast height. The leaves are deciduous in cold areas, but semi-evergreen in warmer climates. The tree flowers in the spring; the wind-dispersed fruit develops in a flat, oval membranous wing. The tree is short-lived in temperate climates, rarely reaching more than 60 years of age, but in its native environment may live to between 100 and 150 years. The tree has considerable variability in resistance to Dutch elm disease. Moreover, like many other elms in North America, it is highly susceptible to damage from many insects and parasites, including the elm leaf beetle Xanthogaleruca luteola, powdery mildew, cankers, aphids, and leaf spot.
*Location*: District-wide
*New Mexico Noxious Weed*: Yes
*Treatment method used and herbicide*: There a few hericides applicable for treating Siberian Elm: Glyphosate mixed at 1-2% in water spray foliage until wet; Imazapyr mixed at 1-3% in water and spray foliage until wet; Tebuthiuron for areas with < 20 inches of precipitation, apply Spike 20P at a rate of 3/8 oz./100 sq. ft. area (broadcast equivalent is 10# lbs./acre); Hexazinone mixed 50:50 with water at a rate of 2-4 milliliter for each inch of stem diameter at breast height.

**#21 Canada Thistle** (Cirsium arvense)
It is a tall, erect, spiny herbaceous plant that grows to 4 feet tall. It has an extensive creeping rootstock. The leaves are lance-shaped and irregularly lobed with very prickly margins. The stems are ridged and hairy. The flowers are purple to white and can be up to 0.5 inches in diameter. The small seeds, called achenes, are 1 to 1.5 inches long and have a feathery structure attached to the base which lets them float through the air. Numerous species of thistle occur in America, and while some are invasive, many are native. Often the species are difficult to distinguish. Canada thistle can invade a variety of open habitats including prairies, savannas, fields, pastures, wet meadows, and open forests. It forms dense stands which can shade out and displace native vegetation. Once established it spreads rapidly and is difficult to remove. Canada thistle is native to Europe and Asia and was first introduced accidentally during the 1600s.
*Location:* Otero County, potential to spread throughout the LCDO.
*New Mexico Noxious Weed:* Yes
*Treatment method used and herbicide:* No biological agent has been identified for this species. Herbicides typically used are Roundup at a rate of 1-1.5 quart/acre or Stinger at 2/3 pint/acre.

**#22 Field Bindweed** (Convolvulus arvensis)
This species is a member of the Morning glory family. This creeping perennial was introduced from Europe. It reproduces by seeds and horizontal roots. The stems are smooth, slender, slightly angled, 1 to 4 feet long, and spread thickly over the ground or wind around erect plants or other objects. The leaves are alternate, 1 to 2 inches long, with great variation in shape. They are somewhat arrow-shaped with spreading, pointed, or blunt lobes at the base. The flowers are bell or trumpet-shaped, white, pink, or variegated, and about 3/4 to 1 inch broad. It is one of the most competitive perennial weeds. A two or three-year food supply is stored in the extensive underground root system. This makes it hard to kill by cultivation because roots will live as long as their food reserve lasts. Seeds can also stay viable in the soil for up to 40 years.
*Location:* Scattered throughout the LCDO
*New Mexico Noxious Weed:* Yes
*Treatment method used and herbicide*: No biological agent has been identified for this species. Herbicides typically used are Roundup, Banvel, 2,4-D. Application rates are: Roundup at 4-5 quarts/acre; Banvel at 1 pint-1 quart/acre; 2,4-D 2-3 quarts/acre.

**#23 Dalmatian Toadflax** (Linaria dalmatica macedonica)
It is a member of the Figwort family. It was introduced as an ornamental from Europe, and is now rapidly invading dry rangeland from 5,000 to 6,500 feet in elevation. It is a creeping perennial that closely resembles yellow toadflax. The leaves are waxy, heart-shaped, and clasp the stem. The stems are from 2 to 4 feet tall. The flowers are snapdragon-shaped, bright yellow, sometimes with orange centers. Dalmatian toadflax is especially well adapted to arid sites and can spread rapidly once established. Because of its deep, extensive root system, waxy leaf, and heavy seed production, this plant can be difficult to manage.
*Location*: Grant County, potential to invade lower elevations of the Chihuahuan desert.
*New Mexico Noxious Weed*: Yes
*Treatment method used and herbicide*: No biological agent has been identified for this species. Herbicides typically used are Tordon 22K, Telar, Plateau, with application rates for Tordon 22K at 1 pint/acre and 0.18-0.75 oz./acre for Telar.

## 9.6 APPENDIX F - PROJECT ANALYSIS CHECKLIST FOR NOXIOUS AND INVASIVE PLANT SPECIES

**Preliminary Screening for Integrated Pest Management**
**Project Checklist**

To be used in ascertaining if DNA or site-specific EA is needed (in conjunction with Las Cruces District Office DNA worksheet) for (all Integrated Weed Management) proposed treatment projects in the LCDO. Use additional pages as needed to answer all questions.

I. Project Introduction:

A. Project Name:

B. Project Location:
*Describe specific location information such as: County; Allotment name and number; Pasture name; Legal description; UTMs; drainage name; Right-of-way name or number; Landscape Area 1, 2, 3, or 4 with location(s) GPS'd and GIS Map attached*

C. Project Description

D. NIP Target Species

E. Project Size:

F. Target Date for Treatment:

G. Treatment methods proposed (mechanical, herbicide, manual, fire):

H. Herbicide application method (aerial, backpack, ATV/vehicle):

I. Commercial herbicide name and active ingredient to be used (liquid or pellet form):

II. Identify interdisciplinary team members involved:

III. Why is treatment needed?
*For example: retreat existing infestation area; isolated population; new population; high probability of population spread onto other publics lands or off of BLM lands due to site conditions; located in SMA; conflicting resource issues.*

A. Need for the treatment:

B. Purpose for the treatment:

C. Explain (Issues) how treatment would be consistent with LCDO Noxious Weed and Invasive Plant Management Decision Record:

*Important to identify issues up front, it would determine if a DNA is the right tool to use to analyze and lead to approving treatment – what is currently being affected (soils, water, vegetation, etc).*

1. Eradicate small or new population.
2. Control NIP species from invading other habitats (define habitat in jeopardy).
3. Reduce spread of NIP species into non-federal lands.
4. Reduce or control NIP species from degrading other resources (soils, plant community structure, wildlife habitat, T&E habitat).

D. Distance to nearest body of water (impounded; free-flowing natural water)? How is NIP species infestation connected to nearest body of water (adjacent, upslope, dry drainage, flowing stream drainage)?

E. Is the site readily accessible for treatment and monitoring?

F. Special Status Species: Do SSS exist within or adjacent to treatment area, Yes or No?

G. If SSS do exist within or adjacent to treatment area, follow process below:

1. Attach list of special status species (SSS) with potential to occur in the project area or be affected by the project. Include an affect determination and rationale for determination for each species.

2. Survey needed (plants and/or animal)? Yes☐ No☐ If yes, date of survey and results:

3. How will proposed NIP species treatment avoid impacting SSS plants? (i.e.: SSS plants not present at treatment site; SSS plants present but scattered, use modified methods; SSS plants intermixed with NIP species).

4. For non-federally listed or proposed SSS, is the proposal consistent with BLM policy? Yes☐ No☐ Explain why.

H. Is consultation, conference or notification with Fish and Wildlife Service required? Yes☐ No☐ Attach all documentation. Summarize results and date of consultation.

I. Is cultural clearance required? Yes☐ No☐ If yes, Date completed (Attach additional pages):

J. Is the treatment within (wholly or partially) a Special Management Area (RNA, HMP, ACEC, WSA etc.) or have potential to indirectly impact a Special Management Area. Yes☐ No☐

1. List all applicable:

2. Explain how the treatment is consistent with the management goals specific to the SMA.

K. List all protective measures, stipulations, SOP's and/or mitigation measures specific to this proposal (Wildlife buffer areas, water points or arroyo habitat, timing restrictions, reseeding requirements, etc.):

L. If treatment requires burning attach FMO/Fuels Specialist recommendations for burn strategy (includes ID need for burn plan, season for burning, intensity of burn, pre-and post-burn actions needed).

M. Identify monitoring schedule and methods to be used?

N. Is re-treatment of this site anticipated?

O. If Biological control is considered, what is target species, what is biological agent (B-Ag) considered, what is life cycle of B-Ag, how will B-Ag be removed from habitat once treatment is complete? Is there a threat to non-target species of plants? Is B-Ag approved by USDA-APHIS and NMDA? Is research for B-Ag available for review?

P. If cultural treatment is recommended (Goats or sheep), state how long treatment will occur, and if repeated treatments are needed. What is distance to nearest Desert Bighorn population? Have you consulted with USFWS and State Game agencies about proposed use of grazing goats or sheep to control/eradicate NIP species?

_____ _____

Prepared by and Title Date

## 9.7 APPENDIX G - USFWS CONSULTATION MEMORANDUM

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Washington, D.C. 20240

In Reply Refer To:
FWS/AES/DCHRS/027171

SEP 1 2006

Memorandum

To: Assistant Director - Renewable Resources and Planning
Bureau of Land Management

From: Chief - Branch of Consultation and HCPs

Subject: Draft Vegetation Treatments Using Herbicides on BLM lands in 17 Western State Programmatic EIS

In a letter sent April 24, 2006, you clarified the Draft Vegetation Treatments Using Herbicides on Bureau of Land Management lands in 17 Western State Programmatic Environmental Impact Statement (PEIS), including the Draft Vegetation Treatments Using Herbicides on BLM lands in 17 Western State Programmatic Environmental Report (PER) and the Vegetation Treatments on BLM lands in 17 Western States Programmatic Biological Assessment (BA). With consideration of that clarification, you requested concurrence that the Vegetation Treatments on BLM lands in 17 Western states is not likely to adversely affect proposed or listed endangered or threatened species or proposed or designated critical habitat.

In general, we would prefer to follow an alternative consultation process for evaluating a program such as the Vegetation Treatments Using Herbicides on BLM lands in 17 Western States. However, given the available specificity for the nature of the subsequent projects to be implemented under this program and, more importantly, the nature of the conservation measures to be incorporated, we will respond to your request herein. As clarified in your April 24, 2006, memorandum, any proposed actions carried out under this PEIS will follow all Standard Operating Procedures (SOPs) and conservation measures contained within the PEIS, PER, BA, the Ecological Risk Assessments and additional conservation measures may be developed as a result of site-level consultation. Under this circumstance, we concur that the proposed action would not likely adversely affect any threatened or endangered species under the jurisdiction of the Service. In addition, all specific actions carried out under this PEIS would also undergo consultation. Thus, if any subsequent action does not conform to these standards, it may be necessary to conduct formal consultation on that particular action.

In this particular consultation, we were able to obtain a level of detail and incorporation of conservation measures, such that we are able to make a determination as to the likely effects that would result from implementation of the Draft Vegetation Treatments Using Herbicides on BLM lands in 17 Western State Programmatic EIS. However in future, the Service believes a different

approach for program-level consultations, as described below, would be more efficient and more meaningful.

The ESA states that "each Federal agency shall, in consultation with and with the assistance of the Secretary, insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered or threatened species or result in the adverse modification of critical habitat." The ESA does not define "consultation". Although, "consultation" is typically used to describe the section 7(a)(2) process by which federal agencies ensure their actions do not jeopardize listed species, the term consultation is used in both section 7(a)(1) and 7(a)(2). Consultation under section 7(a)(1) would entail federal agencies designing and implementing programs within their authorities that promote the conservation of listed species. This consultation would ensure that overarching federal programs incorporate conservation actions appropriate for listed species. The federal agency would then subsequently consult under 7(a)(2) to insure its actions conducted under the program do not jeopardize listed species.

In general, programs such as the vegetation management PEIS, are better described as a "strategy" for completing specific projects. A fundamental component of this type of strategy is the identification of conservation elements (supporting ecosystem restoration and function) of the subsequent specific actions and by itself has no effect on listed species or designated critical habitat that can be meaningfully identified and evaluated. Since ultimately there would be specific actions that may affect listed species, those individual projects would be subject to section 7(a)(2) consultation. However, any review of the strategy itself under section 7(a)(2) would be meaningless given the multiple layers of assumptions that would need to be made about implementation of the strategy and the potential affects to listed species and designated critical habitat.

The specific review of actions that follow the strategy will be evaluated against the jeopardy and adverse modification/destruction standards. At this smaller scale, a more focused review of impacts and potential effects to species is possible because it takes into consideration relevant information at the local level.

The conservation elements identified as part of the strategy would be subsequently incorporated at the project-level as Best Management Practices (BMPs) or Project Design Criteria (PDCs). The action agency would then consult with the Service to seek advice on crafting BMPS or PDCs that best contribute to the conservation of listed species. Thus, the resulting 7(a)(1) consultation would entail recommendations to the action agency on how to contribute to 7(a)(1) responsibilities. This information would frame the subsequent project-level consultations. The project-level consultation would need to contain all relevant information in a BA including species lists, incorporation of BMPs, and information on conditions within the action area--this would help provide sufficient information for the Services to conduct an evaluation of jeopardy and adverse modification/destruction of critical habitat at that scale.

## 9.8 APPENDIX H - SPECIAL STATUS ANIMAL AND PLANT SPECIES OF THE LAS CRUCES DISTRICT OFFICE

### Special Status Animals Species and County Occurrence

| Common Name | Scientific Name | Doña Ana | Grant | Hidalgo | Luna | Otero | Sierra | Special Status |
|---|---|---|---|---|---|---|---|---|
| Allen's lappet-browed bat | *Idionycteris phyllotis* | | X | | | | X | BLM Sensitive |
| Anthony Blister Beetle | *Lytta mirifica* | X | | | | | | BLM Sensitive |
| Arizona Grasshopper Sparrow | *Ammodramus savannarum ammolegus* | | | X | | | | BLM Sensitive |
| Baird's Sparrow | *Ammodramus bairdii* | X | X | X | X | X | X | BLM Sensitive |
| Bald Eagle | *Haliaeetus leucocephalus alascanus* | X | X | X | X | X | X | BLM Sensitive |
| Beautiful Shiner | *Cyprinella formosa* | | X | | | | | Federally Threatened |
| Bell's Vireo | *Vireo bellii arizonae (NM,AZ);medius (NM)* | X | X | X | X | X | X | BLM Sensitive |
| Bendire's Thrasher | *Toxostoma bendirei* | X | X | X | X | X | X | BLM Sensitive |
| Big Bend Slider | *Trachemys gaigeae gaigeae* | | | | | | X | BLM Sensitive |
| Black-footed Ferret | *Mustela nigripes* | | X | | | X | X | Federally Endangered |
| Black-tailed Prairie Dog | *Cynomys ludovicianus* | | | X | | X | X | BLM Sensitive |
| Chestnut-collared Longspur | *Calcarius ornatus* | | | X | | | | BLM Sensitive |
| Chihuahua Chub | *Gila nigrescens* | | X | | | | | Federally Threatened |
| Chiricahua Leopard Frog | *Rana chiricahuensis* | | X | X | X | | X | Federally Threatened |
| Gila Chub | *Gila intermedia* | | X | | | | | Federally Endangered |
| Gila Topminnow | *Poeciliopsis occidentalis* | | X | | | | | Federally Endangered |
| Gray-checkered Whiptail | *Aspidoscelis dixoni* | | | X | | | | BLM Sensitive |
| Jaguar | *Panthera onca* | | | X | | | | Federally Endangered |
| Least Tern (interior pop) | *Sterna antillarum* | X | | | | X | | Federally Endangered |
| Lesser Long-nosed Bat | *Leptonycteris curasoae yerbabuenae* | | | X | | | | Federally Endangered |
| Loach Minnow | *Tiaroga cobitis* | | X | X | | | | Federally Threatened |
| Lowland Leopard Frog | *Lithobates (Rana) yavapaiensis* | | X | X | | | | BLM Sensitive |

| Common Name | Scientific Name | Doña Ana | Grant | Hidalgo | Luna | Otero | Sierra | Special Status |
|---|---|---|---|---|---|---|---|---|
| Lynch's Tadpole Shrimp | *Lepidurus lemmoni* | X | | | X | | X | BLM Sensitive |
| Meadow (New Mexico) Jumping Mouse | *Zapus hudsonius luteus* | | | | | X | | BLM Sensitive Federal Candidate |
| Mexican Garter Snake | *Thamnophis eques megalops* | | X | X | | | | BLM Sensitive Federal Candidate |
| Mexican Long-nosed Bat | *Leptonycteris nivalis* | | | X | | | | Federally Endangered |
| Mexican Long-tongued Bat | *Choeronycteris mexicana* | | | X | | | | BLM Sensitive |
| Moore's Fairy Shrimp | *Streptocephalus moorei* | X | | | X | | X | BLM Sensitive |
| Narrow-headed Garter Snake | *Thamnophis rufipunctatus* | | X | X | | | | BLM Sensitive |
| New Mexico Ridgenose Rattlesnake | *Crotalus willardi obscurus* | | | X | | | | Federally Threatened |
| Northern Aplomado Falcon* | *Falco femoralis septentrionalis* | X | X | X | X | X | X | Federally Endangered |
| Painted Bunting | *Passerina ciris pallidior* | X | X | X | | X | X | BLM Sensitive |
| Piñon Jay | *Gymnorhinus cyanocephalus* | X | X | X | X | X | X | BLM Sensitive |
| Reticulate Gila Monster | *Heloderma suspectum suspectum* | | X | X | X | | | BLM Sensitive |
| Roundtail Chub | *Gila rubusta* | | X | X | | | | Federal Candidate |
| Southwestern Toad | *Anaxyrus (Bufo) microscaphus* | | X | | | | X | BLM Sensitive |
| Southwestern Willow Flycatcher | *Empidonax trailloo extimus* | X | X | X | X | X | X | Federally Endangered |
| Spikedace | *Meda fulgida* | | X | X | | | | Federally Threatened |
| Spotted Bat | *Euderma maculatum* | X | X | | | X | | BLM Sensitive |
| Sprague's Pipit | *Anthus spragueii* | X | X | X | X | X | X | BLM Sensitive Federal Candidate |
| Sublette's Fairy Shrimp | *Phallocryptus (Branchinella) sublettei* | X | | | X | | X | BLM Sensitive |
| Townsend's Big-eared Bat | *Corynorhinus townsendii* | X | X | X | X | X | X | BLM Sensitive |
| Western Burrowing Owl | *Athene cunicularia hypugaea* | X | X | X | X | X | X | BLM Sensitive |
| Western Red Bat | *Lasiurus blossevillii* | X | X | X | X | | | BLM Sensitive |
| Western Yellow Bat | *Lasiurus xanthinus* | | | X | | | | BLM Sensitive |
| Western Yellow-billed Cuckoo | *Coccyzus americanus occidentalis* (western pop) | X | X | X | X | | X | BLM Sensitive Federal Candidate |

| Common Name | Scientific Name | Doña Ana | Grant | Hidalgo | Luna | Otero | Sierra | Special Status |
|---|---|---|---|---|---|---|---|---|
| White-nosed Coati | *Nasua narica* | | X | X | | | | BLM Sensitive |
| White-sided Jack Rabbit | *Lepus callotis* | | | X | | | | BLM Sensitive |

*****Aplomado Falcons in New Mexico have been ruled a non-essential experimental population by the U.S. Fish and Wildlife Service under Section 10(j) of the Endangered Species Act. There are no restrictions to activities and land uses, however they are still protected from intentional take or harm under the Endangered Species Act.

## Special Status Plant Species and County Occurrence

| Common Name | Scientific Name | Doña Ana | Grant | Hidalgo | Luna | Otero | Sierra | Special Status |
|---|---|---|---|---|---|---|---|---|
| Alkaligrass, Parish's | *Puccinellia parishii* | | X | X | | | | BLM Sensitive |
| Beardtongue , Alamo | *Penstemon alamosensis* | | | | | X | | BLM Sensitive |
| Cactus, Duncan's Pincushion | *Escobaria duncanii* | | | | | | X | BLM Sensitive |
| Cactus, Grama Grass | *Sclerocactus papyracanthus* | X | X | X | X | X | X | BLM Sensitive |
| Cactus, Roetter's Hedgehog | *Echinocereus x roetteri var. roetteri* | X | | | | X | | BLM Sensitive |
| Cactus, Sneed's Pincushion | *Escobaria sneedii var. Sneedii* | X | | | | | | Federally Endangered |
| Cactus, Villard's Pincushion | *Escobaria villardii* | | | | | X | | BLM Sensitive |
| Cereus, Night-Blooming | *Peniocereus greggii var greggii* | X | X | X | X | | | BLM Sensitive |
| Cliff Daisy, Nodding | *Perityle cernua* | X | | | | | | BLM Sensitive |
| Columbine, Chapline's | *Aquilegia chrysantha var. chaplinei* | | | | | X | | BLM Sensitive |
| Figwort, Mimbres | *Scrophularia macrantha* | | X | | X | | | BLM Sensitive |
| Hedgehog Cactus, Kuenzler's | *Echinocereus fendleri var. kuenzleri* | | | | | X | | Federally Endangered |
| Mescalbean, Guadalupe | *Sophora gypsophila var. guadalupensis* | | | | | X | | BLM Sensitive |
| Milkvetch, Coppermine | *Astragalus cobrensis var. maguirei* | | | X | | | | BLM Sensitive |
| Pennyroyal, Todson's | *Hedeoma todsenii* | | | | | X | X | Federally Threatened |
| Pricklypear, Sand | *Opuntia arenaria* | X | | | X | | | BLM Sensitive |
| Prickly-Poppy, Sacramento | *Argemone pinnatisecta* | | | | | X | | Federally Endangered |
| Ringstem, Howard's Gyp | *Anulocaulis leiosolenus var. howardii* | | | | | X | | BLM Sensitive |
| Scalebroom, Gypsum | *Lepidospartum burgessii* | | | | | X | | BLM Sensitive |
| Scurfpea, Chihuahua | *Pediomelum pentaphyllum* | | X | X | X | | | BLM Sensitive |

| Common Name | Scientific Name | Doña Ana | Grant | Hidalgo | Luna | Otero | Sierra | Special Status |
|---|---|---|---|---|---|---|---|---|
| Stickleaf, Guadalupe | *Mentzelia humilus var. guadalupensis* | | | | | X | | BLM Sensitive |
| Thelypody, Texas; Sibara, Gray | *Sibara grisea* | | | | | X | | BLM Sensitive |
| Thistle, Wright's Marsh | *Cirsium wrightii* | | | | | X | | Federal Candidate |

## 9.9 APPENDIX I - MIGRATORY BIRD TREATY ACT SPECIES IN THE LAS CRUCES DISTRICT OFFICE

More information on prioritization can be found in the New Mexico Bird Conservation Plan Version 2.1 (2007)

| Species | Conservation Priority Listing | Primary Breeding Habitats | Additional Breeding Habitats |
|---|---|---|---|
| Ferruginous Hawk | SC1 | PMG | **PJW**, GBS, PMS, AGR |
| Mountain Plover | SC1 | PMG | **CDG** |
| Flammulated Owl | SC1 | **MCF**, **PPF** | **MPO** |
| Lewis's Woodpecker | SC1 | **PPF**, **MER** | MOR, AGR |
| Southwestern Willow Flycatcher | SC1 | **MER**, **SWR** | MOR |
| Bell's Vireo | SC1 | **MER**, **SWR** | **CDS** |
| Gray Vireo | SC1 | **PJW**, MOS | GBS, **CDS** |
| Pinyon Jay | SC1 | **PJW** | **PPF** |
| Juniper Titmouse | SC1 | **PJW** | **MPO** |
| Bendire's Thrasher | SC1 | | **PJW**, GBS, PMG, **CDS** |
| Virginia's Warbler | SC1 | **PPF**, MOS | **MCF**, **PJW**, **MPO** |
| Lucy's Warbler | SC1 | **SWR** | **MER** |
| Grace's Warbler | SC1 | **PPF** | **MCF**, **MPO** |
| Red-faced Warbler | SC1 | **MCF**, **PPF** | MOR |
| Black-chinned Sparrow | SC1 | MOS | **PJW** |
| Grasshopper Sparrow (ammolegus) | SC1 | **CDG** | |
| McCown's Longspur (winter) | SC1 | (**CDG**) | (AGR) |
| Mississippi Kite | SC2 | URB | AGR, **MER** |
| Swainson's Hawk | SC2 | | PMG, PMS, **CDG**, **CDS**, AGR, GBS |
| Prairie Falcon | SC2 | **CLI** | (Forages widely) |
| Scaled Quail* | SC2 | PMG, **CDG** | GBS, PMS, **CDS**, AGR |
| Montezuma Quail* | SC2 | **PJW**, **MPO** | **PPF** |
| Band-tailed Pigeon | SC2 | **MCF**, **PPF** | SFF, **MPO** |
| Northern Pygmy-Owl | SC2 | **MCF**, **PPF** | SFF, **MPO** |
| Elf Owl | SC2 | **MPO**, **SWR** | |
| White-throated Swift | SC2 | **CLI** | (Forages widely) |
| Black-chinned Hummingbird | SC2 | **MER**, **SWR** | URB |
| Broad-tailed Hummingbird | SC2 | **MCF**, **PPF** | SFF, **PJW**, MOR, WMG |
| Williamson's Sapsucker | SC2 | **MCF** | **PPF** |
| Red-naped Sapsucker | SC2 | **MCF** | SFF, **PPF**, MOR |
| Cordilleran Flycatcher | SC2 | **MCF** | SFF, **PPF**, MOR |
| Cassin's Kingbird | SC2 | | **PPF**, **PJW**, **MPO**, **MER**, **SWR**, AGR |
| Loggerhead Shrike | SC2 | | **PJW**, GBS, PMS, PMG, **CDS**, **CDG**, AGR |
| Plumbeous Vireo | SC2 | **MCF**, **PPF** | **PJW**, MOR, **MPO**, **SWR** |

| Species | Conservation Priority Listing | Primary Breeding Habitats | Additional Breeding Habitats |
|---|---|---|---|
| Warbling Vireo | SC2 | **MCF**, MOR | SFF, **PPF**, **MER** |
| Western Scrub-Jay | SC2 | **PJW** | **MPO**, MOS, URB |
| Western Bluebird | SC2 | **PJW**, **MPO** | **PPF**, MOR |
| Mountain Bluebird | SC2 | **PJW** | MOR, WMG, GBS |
| Crissal Thrasher | SC2 | **PJW**, **CDS** | MOS, **MER**, **SWR** |
| Black-throated Gray Warbler | SC2 | **PJW**, **MPO** | |
| Vesper Sparrow | SC2 | GBS, PMG | **PJW**, WMG, PMS |
| Black-throated Sparrow | SC2 | **CDS** | GBS, PMS |
| Lazuli Bunting | SC2 | MOS, **MER** | |
| Bullock's Oriole | SC2 | **MER** | **SWR**, **CDS**, AGR |
| Common Black-Hawk | BC1 | **SWR** | **MER** |
| Aplomado Falcon | BC1 | **CDG** | |
| Peregrine Falcon | BC1 | **CLI** | (Forages widely) |
| Common Ground-Dove | BC1 | **SWR** | **CDS**, AGR |
| Yellow-billed Cuckoo | BC1 | **MER**, **SWR** | AGR, URB |
| Violet-crowned Hummingbird | BC1 | **SWR** | |
| Lucifer Hummingbird | BC1 | MOS, **CDS** | |
| Elegant Trogon | BC1 | MOR, **SWR** | |
| Red-headed Woodpecker | BC1 | **MER** | AGR |
| Northern Beardless-Tyrannulet | BC1 | **SWR** | |
| Thick-billed Kingbird | BC1 | **SWR** | |
| Bank Swallow | BC1 | **MER** | PMS (Forages widely) |
| Sprague's Pipit (winter) | BC1 | (**CDG**) | |
| Abert's Towhee | BC1 | **SWR** | |
| Botteri's Sparrow | BC1 | **CDG** | |
| Baird's Sparrow (winter) | BC1 | (**CDG**) | |
| Yellow-eyed Junco | BC1 | **MCF** | **PPF** |
| Painted Bunting | BC1 | **MER**, **CDS** | AGR |
| Neotropic Cormorant | BC2 | WET | **MER** |
| Snowy Egret | BC2 | WET | **MER** |
| Golden Eagle | BC2 | **CLI** | |
| Bald Eagle | BC2 | **MER**, WET, **SWR** | |
| Northern Harrier | BC2 | WET | PMG, **CDS**, **CDG** |
| Whiskered Screech-Owl | BC2 | **MPO**, MOR, **SWR** | |
| Whip-poor-will | BC2 | **PPF** | **MCF**, **MPO** |
| Broad-billed Hummingbird | BC2 | **SWR** | |
| Magnificent Hummingbird | BC2 | **PPF**, **MPO** | **MCF**, **SWR** |
| Costa's Hummingbird | BC2 | MOS, **CDS** | **SWR** |
| Belted Kingfisher | BC2 | **MER** | MOR, **SWR**, WET |

| Species | Conservation Priority Listing | Primary Breeding Habitats | Additional Breeding Habitats |
|---|---|---|---|
| Gila Woodpecker | BC2 | **SWR** | |
| Arizona Woodpecker | BC2 | **MPO**, **SWR** | |
| Olive-sided Flycatcher | BC2 | **MCF** | SFF, **PPF** |
| Greater Pewee | BC2 | **MCF**, **PPF** | |
| Mexican Jay | BC2 | **MPO** | **SWR** |
| Bridled Titmouse | BC2 | **MPO**, **SWR** | **PJW** |
| Mexican Chickadee | BC2 | **MCF** | **PPF**, **MPO** |
| Olive Warbler | BC2 | **MCF**, **PPF** | |
| Painted Redstart | BC2 | MOR | **MCF**, **MPO**, **SWR** |
| Summer Tanager | BC2 | **MER**, **SWR** | |
| Grasshopper Sparrow | BC2 | PMG | **CDG**, AGR |
| Varied Bunting | BC2 | **CDS** | **SWR** |
| Hooded Oriole | BC2 | **SWR** | **MER**, **CDS** |

**Table Key**

Species marked with * indicate species that are not a migratory species but are a priority species in the NM PIF

**Conservation Priority Listing:**

- BC Biodiversity Conservation
- SC Species Conservation
- 1 Species of High Conservation Concern
- 2 Species of Moderate Conservation Concern

**Habitat Types:**

SFF Spruce-Fir Forest; **MCF** Mixed Conifer Forest; **PPF** Ponderosa Pine Forest; **PJW** Pinyon-Juniper Woodland; MOR Montane Riparian; **MPO** Madrean Pine-Oak Woodland; MOS Montane Shrub; WMG Wet Meadows and Montane Grasslands; **MER** Middle-Elevation Riparian; **SWR** Southwest Riparian; WET Emergent Wetlands and Lakes; GBS Great Basin Shrub; PMS Plains-Mesa Sand Shrub; PMG Plains-Mesa Grassland; **CDS** Chihuahuan Desert Shrub; **CDG** Chihuahuan Desert Grassland; **CLI** Cliff/Cave; AGR Agricultural; URB Urban.

Habitats in **Bold** indicate those that occur in LCDO.
Habitats in parentheses indicate winter habitats.

## 9.10 APPENDIX J - ECOLOGICAL RISK ASSESSMENTS

The following tables summarize the results of Ecological Risk Assessments (ERAs) prepared to analyze the effects on wildlife and special status species. They appear in the 2007 Final Programmatic Environmental Impact Statement for Vegetation Treatments using Herbicides on Bureau of Land Management Lands in 17 Western States, which can be referenced for detailed information on methodology and impacts.

**Risk Categories Used to Describe BLM-evaluated Herbicide Effects on Non Special Status Fish and Aquatic Invertebrates According to Exposure Scenario**

| Application Scenario | BROM[1] | | CHLOR[1] | | DICAMBA | | DIFLU[1] | | DIQUAT | | DIURON | | FLUR[1] | | IMAZ[1] | | OVER[1] | | SULFM[1] | | TEBU[1] | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Typ[2] | Max[2] | Typ | Max | Typ | Max | Typ | Max | Typ | Max | Typ | Max | Typ | Max | Typ | Max | Typ | Max | Typ | Max | Typ | Max |
| **Direct Spray** | | | | | | | | | | | | | | | | | | | | | | |
| Fish pond | L[3] | L | 0 | 0 | 0 | 0 | 0 | 0 | L | L | M | M | 0 | O | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Fish stream | L | M | 0 | 0 | 0 | 0 | 0 | 0 | L | M | H | H | 0 | L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Aquatic invertebrates pond | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | M | H | M | H | 0 | L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | L |
| Aquatic invertebrates stream | 0 | L | 0 | 0 | 0 | 0 | 0 | 0 | H | H | M | H | 0 | L | 0 | 0 | 0 | 0 | 0 | 0 | L | M |
| **Accidental Spill to Pond** | | | | | | | | | | | | | | | | | | | | | | |
| Fish pond | NE | M | NE | 0 | NE | 0 | NE | 0 | NE | H | NE | H | NE | M | NE | 0 | NE | 0 | NE | 0 | NE | L |
| Aquatic invertebrates pond | NE | L | NE | 0 | NE | 0 | NE | 0 | NE | H | NE | H | NE | H | NE | 0 | NE | 0 | NE | 0 | NE | L |
| **Off-Site Drift** | | | | | | | | | | | | | | | | | | | | | | |
| Fish pond | L[3] | L | 0 | 0 | 0 | 0 | 0 | 0 | NE | NE | 0 | 0 | NE | NE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Fish stream | L | M | 0 | 0 | 0 | 0 | 0 | 0 | NE | NE | 0 | 0 | NE | NE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Aquatic invertebrates pond | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NE | NE | 0 | 0 | NE | NE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Aquatic invertebrates stream | 0 | L | 0 | 0 | 0 | 0 | 0 | 0 | NE | NE | 0 | 0 | NE | NE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Surface Runoff** | | | | | | | | | | | | | | | | | | | | | | |
| Fish pond | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NE | NE | 0 | L | NE | NE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Fish stream | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NE | NE | 0 | 0 | NE | NE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Aquatic invertebrates pond | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NE | NE | 0 | 0 | NE | NE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Aquatic invertebrates stream | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NE | NE | 0 | 0 | NE | NE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

[1] BROM = Bromacil; CHLOR = Chlorsulfuron; DIFLU = Diflufenzopyr; FLUR = Fluridone; IMAZ = Imazapic; OVER = Overdrive®; SULFM = Sulfometuron methyl; and TEBU = Tebuthiuron.
[2] Typ = Typical application rate; and Max = Maximum application rate.
[3] Risk categories: 0 = No risk (majority of RQs < most conservative LOC for non special status species); L = Low risk (majority of RQs 1-10x most conservative LOC for non special status species); M = Moderate risk (majority of RQs 10-100x most conservative LOC for non special status species); H = High risk (majority of RQs >100 most conservative LOC for non special status species); and NE = Not evaluated. The risk category is based on the risk level of the majority of risk quotients observed in any of the scenarios for a given exposure group and receptor type. The reader should consult the risk tables in Chapter 4 of the ERAs (ENSR 2005b-k) to determine the specific scenarios that result in the displayed level of risk for a given receptor group.

**Risk Categories Used to Describe BLM-evaluated Herbicide Effects on Non Special Status Wildlife According to Exposure Scenario**

| Application Scenario | BROM[1] | | CHLOR | | DICAMBA | | DIFLU | | DIQUAT | | DIURON | | FLUR | | IMAZ | | OVER | | SULFM | | TEBU | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Typ[2] | Max | Typ | Max | Typ | Max | Typ | Max | Typ | Max | Typ | Max | Typ | Max | Typ | Max | Typ | Max | Typ | Max | Typ | Max |
| **Direct Spray of Terrestrial Wildlife** | | | | | | | | | | | | | | | | | | | | | | |
| Small mammal – 100% absorption | 0[3] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pollinating insect – 100% absorption | L | L | 0 | 0 | 0 | L | 0 | 0 | L | L | L | M | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Small mammal – 1st order dermal absorption | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Indirect Contact with Foliage After Direct Spray** | | | | | | | | | | | | | | | | | | | | | | |
| Small mammal – 100% absorption | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pollinating insect – 100% absorption | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | L |
| Small mammal – 1st order dermal absorption | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Ingestion of Food Items Contaminated by Direct Spray** | | | | | | | | | | | | | | | | | | | | | | |
| Small mammalian herbivore – acute | 0 | L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | L | 0 | L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Small mammalian herbivore – chronic | 0 | L | 0 | 0 | 0 | L | 0 | 0 | L | M | L | M | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | L |
| Large mammalian herbivore – acute | 0 | L | 0 | 0 | 0 | L | 0 | 0 | 0 | M | 0 | L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | L |
| Large mammalian herbivore – chronic | L | M | 0 | 0 | 0 | L | 0 | 0 | L | M | M | H | 0 | 0 | 0 | 0 | L | M | 0 | 0 | 0 | L |
| Small avian insectivore – acute | 0 | 0 | 0 | 0 | L | M | 0 | 0 | 0 | M | 0 | L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | L |
| Small avian insectivore – chronic | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | M | 0 | L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Large avian herbivore – acute | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | L | 0 | L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Large avian herbivore – chronic | 0 | L | 0 | 0 | 0 | 0 | 0 | 0 | L | H | 0 | M | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Large mammalian carnivore – acute | 0 | L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Large mammalian carnivore – chronic | 0 | 0 | 0 | 0 | L | L | 0 | 0 | 0 | 0 | L | L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

[1] BROM = Bromacil; CHLOR = Chlorsulfuron; DIFLU = Diflufenzopyr; FLUR = Fluridone; IMAZ = Imazapic; OVER = Overdrive®; SULFM = Sulfometuron methyl; and TEBU = Tebuthiuron.
[2] Typ = Typical application rate; and Max = Maximum application rate.
[3] Risk categories: 0 = No risk (majority of RQs < most conservative LOC for non special status species); L = Low risk (majority of RQs 1-10x most conservative LOC for non special status species); M = Moderate risk (majority of RQs 10-100x most conservative LOC for non special status species); and H = High risk (majority of RQs >100 most conservative LOC for non special status species). The risk category is based on the risk level of the majority of risk quotients observed in any of the scenarios for a given exposure group and receptor type. The reader should consult the risk tables in Chapter 4 of the ERAs (ENSR 2005b-k) to determine the specific scenarios that result in the displayed level of risk for a given receptor group.

**Risk Categories[1] Used to Describe BLM-evaluated Herbicide Effects on Special Status Wildlife According to Exposure Scenario**

| Application Scenario | BROM[1] | | CHLOR[1] | | DICAMBA | | DIFLU[1] | | DIQUAT | | DIURON | | FLUR[1] | | IMAZ[1] | | OVER[1] | | SULFM[1] | | TEBU[1] | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Typ[2] | Max[2] | Typ | Max | Typ | Max | Typ | Max | Typ | Max | Typ | Max | Typ | Max | Typ | Max | Typ | Max | Typ | Max | Typ | Max |
| **Direct Spray of Terrestrial Wildlife** | | | | | | | | | | | | | | | | | | | | | | |
| Small mammal – 100% absorption | 0[3] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pollinating insect – 100% absorption | L | L | 0 | 0 | L | L | 0 | 0 | L | M | L | M | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | L | M |
| Small mammal – 1st order dermal absorption | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Indirect Contact with Foliage After Direct Spray** | | | | | | | | | | | | | | | | | | | | | | |
| Small mammal – 100% absorption | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Pollinating insect – 100% absorption | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | L | 0 | L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | L |
| Small mammal – 1st order dermal absorption | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Ingestion of Food Items Contaminated by Direct Spray** | | | | | | | | | | | | | | | | | | | | | | |
| Small mammalian herbivore – acute | 0 | L | 0 | 0 | 0 | L | 0 | 0 | 0 | L | 0 | L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | M |
| Small mammalian herbivore – chronic | 0 | L | 0 | 0 | 0 | L | 0 | 0 | L | M | L | M | 0 | L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | L |
| Large mammalian herbivore – acute | 0 | M | 0 | 0 | 0 | L | 0 | 0 | L | M | 0 | M | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | L |
| Large mammalian herbivore – chronic | L | M | 0 | 0 | L | M | 0 | 0 | L | M | M | H | 0 | 0 | 0 | 0 | L | M | 0 | 0 | 0 | L |
| Small avian insectivore – acute | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | L | M | 0 | L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Small avian insectivore – chronic | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | M | 0 | L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Large avian herbivore – acute | 0 | L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | M | 0 | M | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | L |
| Large avian herbivore – chronic | 0 | L | 0 | 0 | 0 | 0 | 0 | 0 | L | H | 0 | M | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Large mammalian carnivore – acute | 0 | L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | L | 0 | L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Large mammalian carnivore – chronic | 0 | 0 | 0 | 0 | L | L | 0 | 0 | 0 | 0 | L | L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

[1] BROM = Bromacil; CHLOR = Chlorsulfuron; DIFLU = Diflufenzopyr; FLUR = Fluridone; IMAZ = Imazapic; OVER = Overdrive®; SULFM = Sulfometuron methyl; and TEBU = Tebuthiuron.
[2] Typ = Typical application rate; and Max = Maximum application rate.
[3] Risk categories: 0 = No risk (majority of RQs < most conservative LOC for special status species); L = Low risk (majority of RQs 1-10x most conservative LOC for special status species); M = Moderate risk (majority of RQs 10-100x most conservative LOC for special status species); H = High risk (majority of RQs >100 most conservative LOC for special status species); and NE = Not evaluated. The Risk Category is based on the risk level of the majority of risk quotients observed in any of the scenarios for a given exposure group and receptor type. The reader should consult the risk tables in Chapter 4 of the ERAs (ENSR 2005b-k) to determine the specific scenarios that result in the displayed level of risk for a given receptor group.

**Risk Categories Used to Describe BLM-evaluated Herbicide Effects on Special Status Fish and Aquatic Invertebrates According to Exposure Scenario**

| Application Scenario | BROM[1] | | CHLOR | | DICAMBA | | DIFLU | | DIQUAT | | DIURON | | FLUR | | IMAZ | | OVER | | SULFM | | TEBU | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Typ[2] | Max | Typ | Max | Typ | Max | Typ | Max | Typ | Max | Typ | Max | Typ | Max | Typ | Max | Typ | Max | Typ | Max | Typ | Max |
| **Direct Spray** | | | | | | | | | | | | | | | | | | | | | | |
| Fish pond | L[3] | L | 0 | 0 | 0 | 0 | 0 | 0 | L | H | M | H | 0 | M | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Fish stream | M | M | 0 | 0 | 0 | 0 | 0 | 0 | M | M | H | H | 0 | L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Aquatic invertebrates pond | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | M | H | M | M | 0 | H | 0 | 0 | 0 | 0 | 0 | 0 | L | L |
| Aquatic invertebrates stream | 0 | L | 0 | 0 | 0 | 0 | 0 | 0 | H | H | M | H | 0 | L | 0 | 0 | 0 | 0 | 0 | 0 | L | M |
| **Accidental Spill to Pond** | | | | | | | | | | | | | | | | | | | | | | |
| Fish pond | NE | M | NE | 0 | NE | L | NE | 0 | NE | H | NE | H | NE | M | NE | 0 | NE | 0 | NE | 0 | NE | M |
| Aquatic invertebrates pond | NE | M | NE | 0 | NE | M | NE | 0 | NE | H | NE | H | NE | H | NE | 0 | NE | 0 | NE | 0 | NE | L |
| **Off-Site Drift** | | | | | | | | | | | | | | | | | | | | | | |
| Fish pond | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NE | NE | 0 | 0 | NE | NE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Fish stream | 0 | M | 0 | 0 | 0 | 0 | 0 | 0 | NE | NE | 0 | 0 | NE | NE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Aquatic invertebrates pond | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NE | NE | 0 | 0 | NE | NE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Aquatic invertebrates stream | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NE | NE | 0 | 0 | NE | NE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Surface Runoff** | | | | | | | | | | | | | | | | | | | | | | |
| Fish pond | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NE | NE | 0 | L | NE | NE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Fish stream | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NE | NE | 0 | 0 | NE | NE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Aquatic invertebrates pond | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NE | NE | 0 | 0 | NE | NE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Aquatic invertebrates stream | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NE | NE | 0 | 0 | NE | NE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

[1] BROM = Bromacil; CHLOR = Chlorsulfuron; DIFLU = Diflufenzopyr; FLUR = Fluridone; IMAZ = Imazapic; OVER = Overdrive®; SULFM = Sulfometuron methyl; and TEBU = Tebuthiuron.
[2] Typ = Typical application rate; and Max = Maximum application rate.
[3] Risk categories: 0 = No risk (majority of RQs < most conservative LOC for special status species); L = Low risk (majority of RQs 1-10x most conservative LOC for special status species); M = Moderate risk (majority of RQs 10-100x most conservative LOC for special status species); H = High risk (majority of RQs >100 most conservative LOC for special status species); and NE = Not evaluated. The risk category is based on the risk level of the majority of risk quotients observed in any of the scenarios for a given exposure group and receptor type. The reader should consult the risk tables in Chapter 4 of the ERAs (ENSR 2005b-k) to determine the specific scenarios that result in the displayed level of risk for a given receptor group.

The following information for eight herbicides used by the BLM is taken from ERAs prepared by the Forest Service to support their assessment of the environmental consequences of using these herbicides in Forest Service vegetation management programs. The BLM previously evaluated and approved these eight herbicides in an earlier EIS—*Vegetation Treatment on BLM Lands in Thirteen Western States* (USDI BLM 1991a).

**Risk Categories Used to Describe Forest Service-evaluated Herbicide Effects on Fish and Aquatic Invertebrates According to Exposure Scenario[1]**

| | 2,4-D | | Clopyralid | | Glyphosate[2] | | Hexazinone | | Imazapyr | | Metsulfuron Methyl | | Picloram[3] | | Triclopyr[4] | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Application Scenario** | Typ[5] | Max | Typ | Max | Typ | Max | Typ | Max | Typ | Max | Typ | Max | Typ | Max | Typ | Max |
| **Acute/Accidental Exposures** | | | | | | | | | | | | | | | | |
| Fish (sensitive species) – accidental spill | L[6] | M | L | L | H | H | NE | NE | M | H | 0 | L | H | H | L/H | M/H |
| Fish (tolerant species) – accidental spill | NE | NE | 0 | 0 | H | H | NE | NE | 0 | L | 0 | 0 | L | L | NE/NE | NE/NE |
| Fish (sensitive species) – acute exposure, peak EEC | 0 | 0 | 0 | 0 | M | M | 0 | 0 | 0 | 0 | 0 | 0 | L | L | 0/M | 0/H |
| Fish (tolerant species) – acute exposure, peak EEC | NE | NE | 0 | 0 | L | M | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NE/NE | NE/NE |
| Aquatic Invertebrates – accidental spill | L | M | L | M | M | H | NE | NE | 0 | L | 0 | 0 | L | M | L/M | H/H |
| Aquatic Invertebrates – acute exposure, peak EEC | 0 | 0 | 0 | 0 | L | L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0/L | 0/M |
| **Chronic Exposures** | | | | | | | | | | | | | | | | |
| Fish – chronic exposure | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0/0 | 0/0 |
| Aquatic invertebrates – chronic exposure | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0/0 | 0/0 |

[1] Risk levels are presented for the maximum application rate in aquatic applications.
[2] Risk levels for the more toxic glyphosate formulation are presented here.
[3] Sensitive and tolerant aquatic invertebrates were evaluated for picloram. Information is presented for sensitive aquatic invertebrates.
[4] Fist value is for triclopyr acid formulation (TEA) and second value is for triclopyr butoxythel formulation (BEE).
[5] Typ = typical application rate; and Max = maximum application rate.
[6] Risk categories: 0 = No risk (HQ < LOC); L = Low risk (HQ = 1 to 10 x LOC); M = Moderate risk (HQ = 10 to 100 x LOC); H = High risk (HQ > 100 LOC); and NE = Not evaluated. Risk categories are based on upper estimates of hazard quotients and the BLM LOCs of 0.1 for acute scenarios and 1.0 for chronic scenarios. The reader should consult the text of this section of the individual Forest Service risk assessments to evaluate risks at central estimates of hazard quotients.

Fish sensitive species include coldwater fish, such as trout and salmon, while fish tolerant species include warmwater fish, such as fathead minnows.

**Risk Categories[1] Used to Describe Forest Service-evaluated Herbicide Effects on Wildlife According to Exposure Scenario**

| | 2,4-D | | Clopyralid | | Glyphosate[2] | | Hexazinone | | Imazapyr | | Metsulfuron | | Picloram | | Triclopyr[2] | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Typ[3] | Max | Typ | Max | Typ | Max | Typ | Max | Typ | Max | Typ | Max | Typ | Max | Typ | Max |
| **Acute/Accidental Exposures** | | | | | | | | | | | | | | | | |
| Direct spray, small mammal, 1st order absorption | L[4] | L | 0 | 0 | 0 | 0 | 0 | L | 0 | 0 | 0 | 0 | 0 | 0 | L | M |
| Direct spray, small animal, 100% absorption | M | M | L | L | L | M | L | M | 0 | L | 0 | L | L | L | L | M |
| Direct spray, bee, 100% absorption | M | M | 0 | L | L | M | L | M | 0 | L | 0 | 0 | 0 | L | L | M |
| Consumption of contaminated fruit, small mammal | L | L | 0 | 0 | 0 | L | 0 | L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Consumption of contaminated grass, large mammal | M | M | L | L | L | M | L | M | 0 | L | 0 | L | L | M | L | M |
| Consumption of contaminated grass, large bird | M | H | 0 | L | L | L | L | M | 0 | L | 0 | 0 | 0 | 0 | L | M |
| Consumption of contaminated water, small mammal, spill | L | L | 0 | 0 | 0 | L | 0 | L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | L |
| Consumption of contaminated water, small mammal, stream | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Consumption of contaminated insects, small mammal | M | H | L | L | L | M | 0 | 0 | 0 | L | 0 | L | L | M | L | M |
| Consumption of contaminated insects, small bird | H | H | 0 | L | L | M | M | M | L | L | 0 | 0 | 0 | 0 | L | M |
| Consumption of contaminated small mammal, predatory mammal | L | L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | L |
| Consumption of contaminated small mammal, predatory bird | L | L | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Consumption of contaminated fish, predatory bird, spill | H | H | 0 | 0 | 0 | 0 | L | M | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Chronic Exposures** | | | | | | | | | | | | | | | | |
| Consumption of contaminated vegetation, small mammal, on-site | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Consumption of contaminated vegetation, small mammal, off-site | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Consumption of contaminated vegetation, large mammal, on-site | M | M | 0 | L | 0 | L | L | M | 0 | 0 | 0 | 0 | 0 | 0 | L | M |
| Consumption of contaminated vegetation, large mammal, off - site | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | L |
| Consumption of contaminated vegetation, large bird, on-site | M | M | 0 | L | 0 | L | L | M | 0 | 0 | 0 | 0 | 0 | L | L | M |
| Consumption of contaminated vegetation, large bird, off-site | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Consumption of contaminated water, small mammal | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Consumption of contaminated fish, predatory bird | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |

[1] Risk categories are based on upper estimates of hazard quotients and the BLM LOCs of 0.1 for acute scenarios and 1.0 for chronic scenarios. The reader should consult the text of this section of the individual Forest Service risk assessments to evaluate risks at central estimates of hazard quotients.
[2] Risk categories are the same for both evaluated formulations.
[3] Typ = Typical application rate; and Max = maximum application rate.
[4] Risk categories: 0 = No risk (HQ < LOC); L = Low risk (HQ = 1 to 10 x LOC); M = Moderate risk (HQ = 10 to 100 x LOC); and H = High risk (HQ > 100 LOC).

## 9.11 APPENDIX K – SPECIAL MANAGEMENT AREAS, LCDO - 2012

| ***Special Area Name (ACEC, WSA, SMA, etc.)*** | **County** | **Total Acres** | **Managing Resource Field** | **Species/ Feature of Concern** | **Habitat Mgt. Objective LA2** | **Habitat Mgt. Objective LA3** |
|---|---|---|---|---|---|---|
| *Aden Lava Flow WSA* | Dona Ana | 25,287 | Wilderness | Geologic | 100% | |
| *Alamo Hueco Mountains WSA* | Hidalgo | 16,264 | Wilderness | Wldf, T&E, CR | 90% | 10% |
| *Apache Box WSA* | Grant | 7,161 | Wilderness | Riparian, CR, Plant SSS | 10% | 90% |
| *Big Hatchet Mountains WSA* | Hidalgo | 65,872 | Wilderness | Desert BH | 100% | |
| *Blue Creek WSA* | Hidalgo & Grant | 14,896 | Wilderness | Plant T&E | 100% | |
| *Brokeoff Mountains WSA* | Otero | 31,606 | Wilderness | Scenic | 100% | |
| *Cedar Mountains WSA* | Luna | 14,911 | Wilderness | SSS plant, CR | 100% | |
| *Cooke's Range WSA* | Luna | 19,608 | Wilderness | SSS plant, CR | 95% | 5% |
| *Cowboy Springs WSA* | Hidalgo | 6,699 | Wilderness | SSS both | 95% | 5% |
| *Culp Canyon WSA* | Otero | 10,937 | Wilderness | SSS both, CR | 100% | |
| *Florida Mountains WSA* | Luna | 22,336 | Wilderness | Scenic | 95% | 5% |
| *Gila Lower Box WSA* | Hidalgo & Grant | 8,555 | Wilderness | SSS plant, CR | 90% | 10% |
| *Gray Peak WSA* | Hidalgo | 14,678 | Wilderness | SSS plant | 95% | 5% |
| *Guadalupe Canyon WSA* | Hidalgo | 4,146 | Wilderness | SSS, plants & animals | 100% | |
| *Hoverrocker WSA* | Grant | 22 | Wilderness | | | |
| *Jornada del Muerto WSA* | Sierra | 4,106 | Wilderness | Geologic, scenic | 95% | 5% |
| *Las Uvas Mountains WSA* | Dona Ana | 11,067 | Wilderness | SSS plant | 100% | |
| *Mount Riley WSA* | Dona Ana | 8,488 | Wilderness | SSS plant | 100% | |
| *Organ Mountains WSA* | Dona Ana | 7,283 | Wilderness | Scenic, veg | 95% | 5% |
| *Organ Needles WSA* | Dona Ana | 7,604 | Wilderness | Scenic, geologic | 100% | |
| *Peloncillo Mountains WSA* | Hidalgo | 4,061 | Wilderness | Desert BH | 100% | |
| *Pena Blanca WSA* | Dona Ana | 4,780 | Wilderness | CR | 95% | 5% |
| *Robledo Mountains WSA* | Dona Ana | 12,946 | Wilderness | Paleo, T&E, CR | 95% | 5% |
| *West Potrillo WSA Mountains* | Dona Ana & Luna | 148,697 | Wilderness | SSS plant | 100% | |
| *Three Rivers ACEC* | Otero | 1,036 | Cultural | CR | 100% | |
| *Sacramento Escarpment ACEC* | Otero | 5,365 | SSS plants, scenic | T&E plants, Scenic | 100% | |
| *Cornudas Mountain ACEC* | Otero | 850 | SSS animals, cultural | T&E Animals, CR | 100% | |
| *Alamo Mountain ACEC* | Otero | 2,690 | Cultural | CR | 100% | |
| *Wind Mountain ACEC* | Otero | 256 | Cultural | CR | 100% | |
| *Alkali Lakes ACEC* | Otero | 6,359 | SSS plants | T&E plants | 100% | |
| *Alamo Hueco ACEC* | Hidalgo | 13,020 | Biological, scenic, cultural, | Scenic,CR, Paleo | 100% | |

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|---|---|---|---|---|---|---|
| | | | paleo resc. | | | |
| *Apache Box ACEC* | Grant | 2,630 | Biological, scenic, cultural, SSS, riparian | Riparian, CR, SSS, Scenic | 50% | 50% |
| *Bear Creek ACEC* | Grant | 1,480 | Riparian | Riparian | | 100% |
| *Big Hatchet Mountains ACEC* | Hidalgo | 29,180 | Biological, scenic | Scenic, Veg | 100% | |
| *Central Peloncillo Mountains ACEC* | Hidalgo | 12,750 | Biological, scenic, research | Scenic, Veg | 100% | |
| *Cooke's Range ACEC* | Luna | 17,160 | Biological, scenic, cultural | Scenic, CR | 90% | 10% |
| *Cowboy Springs ACEC* | Hidalgo | 6,740 | Biological | | 100% | |
| *Dona Ana Mountains ACEC* | Dona Ana | 1,490 | Biological, scenic, cultural | Veg, scenic, CR | 100% | |
| *Florida Mountains ACEC* | Luna | 15,660 | Scenic, biological | Scenic, veg | 100% | |
| *Gila Lower Box ACEC* | Hidalgo & Grant | 6,490 | Riparian | Riparian | 80% | 20% |
| *Gila Middle Box ACEC* | Grant | 840 | Riparian | Riparian | | 100% |
| *Granite Gap ACEC* | Hidalgo | 1,750 | Biological, scenic | Veg, scenic | 100% | |
| *Guadalupe Canyon ACEC* | Hidalgo | 4,170 | Biological, riparian | Veg, scenic | 100% | |
| *Los Tules ACEC* | Dona Ana | 20 | Cultural | CR | 100% | |
| *Northern Peloncillo Mountains ACEC* | Hidalgo | 760 | Biological | Veg, scenic | 100% | |
| *Old Town ACEC* | Luna | 320 | Cultural | CR | 100% | |
| *Organ/Franklin Mountains ACEC* | Dona Ana | 56,480 | Biological, scenic, cultural, SSS, riparian | | 100% | |
| *Rincon ACEC* | Dona Ana | 840 | Cultural | | 100% | |
| *Robledo Mountains ACEC* | Dona Ana | 9,190 | Biological, scenic, research, paleo- resources | | 100% | |
| *San Diego Mountain ACEC* | Dona Ana | 640 | Cultural | | 100% | |
| *Uvas Valley ACEC* | Luna | 1,570 | Biological | | 100% | |
| *Black Grama Grassland ACEC* | Otero | 3,556 | Biological | | 100% | |
| *Butterfield Trail* | Otero, Dona Ana, Luna, Grant, Hidalgo | | Historic | | 100% | |
| *CDNST* | Hidalgo, Grant | | Scenic | | 100% | |
| *El Camino Real de Tierra Adentro National Historic Trail* | Dona Ana, Sierra | | Cultural | | 100% | |
| *Aden Lava Flow RNA* | Dona Ana | 3,930 | Biological, scenic, | | 100% | |

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|---|---|---|---|---|---|---|
| | | | geological, research | | | |
| *Antelope Pass RNA* | Hidalgo | 8,710 | Biological, research | | 100% | |
| *Kilbourne Hole NNL* | Dona Ana | 5,480 | Geologic | | 100% | |
| *Lordsburg Playa RNA* | Hidalgo | 4,510 | Biological, research | | 100% | |
| *Prehistoric Trackways National Monument* | Dona Ana | 5,280 | Paleo-resc, research | | 100% | |
| *Dona Ana Mts SRMA* | DA | 8,344 | Recreation | | 100% | |
| *Ft. Cummings SRMA* | L | 50 | Historic, Recreation | | 100% | |
| *Organ & Franklin Mts SRMA* | DA | 60,807 | Recreation | | 100% | |
| *Picacho Peak SRMA* | DA | 1,000 | Recreation | | 100% | |
| *Tortugas Mt. SRMA* | DA | 1,936 | Recreation | | 100% | |
| | | | | | 100% | |
| *Red Sands Open Area* | Ot | 40,000 | OHV-Recreation | | 100% | |
| *Aden Hils Open Area* | DA | 8,000 | OHV-Recreation | | 100% | |
| *Aguirre Springs Campground* | DA | 40 | Recreation | | 100% | |
| *Dripping Springs Natural Area* | DA | 400 | Recreation, Historical | | 50% | 50% |
| *Lake Valley Historic Townsite* | Si | 100 | Recreation, Hist. | | 100% | |
| *Three River Petroglyph Site* | Ot | 100 | Recreation, Cult. | | 100% | |
| *Soledad Canyon Day Use Area* | DA | 200 | Recreation | | 100% | |
| *Cuchillo Mt. Nut Area* | Si | 1000 | Recreation | | 100% | |
| *Lake Valley Scenic Byway* | Si, L | 14 mi. | Recreation | | 100% | |
| *Florida Mt. Side Trail* | L | 57 mi. | Recreation | | 100% | |
| *Mormon Battalion Trail* | Si. | ? | Hist. | | 100% | |
| *Aden Crater* | DA | 200 | Recreation | | 100% | |
| *Caballo Mt.* | Si. | 24,117 | Recreation | | 100% | |
| *Broad Canyon* | DA | 5,000 | Recreation - OHV | | 100% | |
| *Cornucopia* | Ot | 16,037 | Recreation | | 100% | |
| *E. Potrillo Mts.* | DA | 11,460 | Recreation | | 100% | |
| *Jarilla Mts.* | Ot. | 6,219 | Recreation | | 100% | |
| *Mud Mt.* | Si. | 2,579 | Recreation | | 100% | |
| *Nut Mt. Grasslands* | Si | 10,690 | | | 100% | |
| *Gila Lower Box* | Hi | 300 | Riparian, Recreation | | | 100% |
| *Percha Creek* | Si | | Riparian, Recreation | | 100% | |
| *Tularosa Creek* | Ot | | Riparian, Recreation. | | 10% | 90% |
| *Mexican Border Zone* | DA,L,Hi | | Border Prot. | | 100% | |
| *McGregor Range* | Ot | | Military | | 95% | 5% |