U.S. Department of the Interior
Bureau of Land Management
Taos Field Office

Programmatic Treatment Plan for the Rapid Response to Weeds

and

Unsigned Finding of No Significant Impact

DOI-BLM-NM-F020-2010-0008-EA

U.S. Department of the Interior
Bureau of Land Management
Taos Field Office
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FINDING OF NO SIGNIFICANT IMPACT

Programmatic Treatment Plan for the Rapid Response to Weeds

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This unsigned FONSI and the attached EA DOI-BLM-NM-F020-2010-0008-EA for the Programmatic Treatment Plan for the Rapid Response to Weeds is available for public review and comment for 30 days beginning on April 1, 2011.

Based on the analysis of potential environmental impacts in the attached EA and consideration of the significance criteria in 40 CFR 1508.27, It is determined that with applicable mitigating measures, the Proposed Action (Alternative A) would not result in significant impacts on the human environment. An environmental impact statement (EIS) is not required.

The decision to approve or not approve the Proposed Action and, if appropriate, sign this FONSI will be made after consideration of public comments and completion of the EA.

Table of Contents

Chapter 1: Purpose and Need 5
1.1 Introduction 5
1.2 Purpose and Need for Action 5
1.3 Land Use Plan Conformance 6
1.4 Identification of Issues 6

Chapter 2: Description of Alternatives 7
2.1 Alternative A: Proposed Action 7
2.2 Alternative B: No Action 13
2.3 Alternative C: No Herbicide Use 13
2.4 Alternatives Considered but not Analyzed in Detail 13

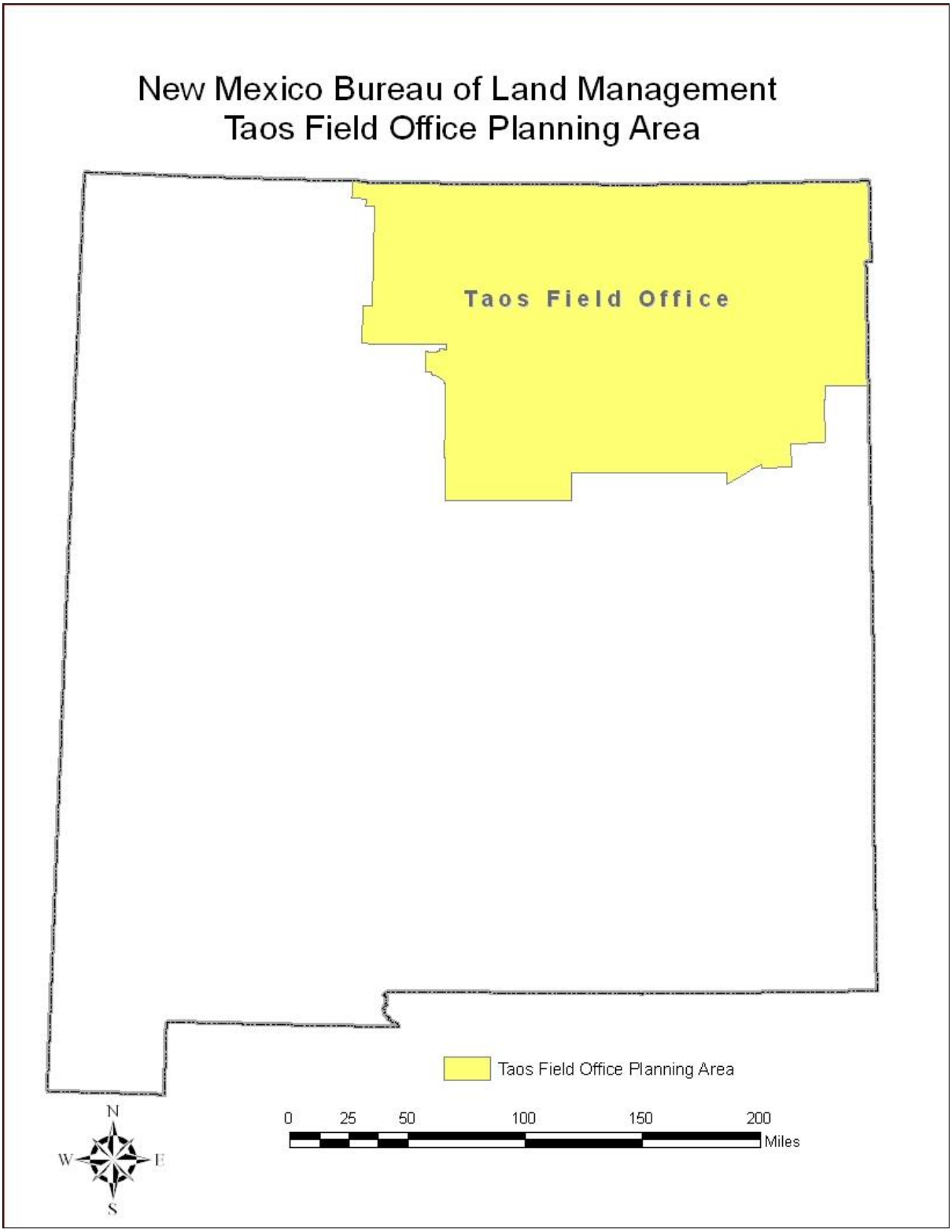
Chapter 3: Affected Environment 13
3.1 Air Quality 19
3.2 Climate Change 19
3.3 Areas of Critical Environmental Concern 20
3.4 Cultural Resources 20
3.5 Livestock Management 20
3.6 Riparian Vegetation 21
3.7 Soils 21
3.8 Migratory Birds 22
3.9 Special Status Species 22
3.10 Vegetation 28
3.11 Visual Resources 28
3.12 Water Quality 29
3.13 Wildlife 31
3.14 Human Health and Hazardous Materials 34

Chapter 4: Environmental Effects 34
4.1 Direct and Indirect Effects -- Assumptions for Analysis 34
4.2 Cumulative Effects Analysis 45

Chapter 5: Consultation and Coordination 49
5.1 Summary of Consultation and Coordination 49
5.2 Summary of Public Participation 51
5.3 List of Preparers 51

Chapter 6: References 52

Appendix A: Mitigation Measures 55
Appendix B: USFWS Listed, Proposed, and Candidate Species by NM Counties 58
Appendix C: Standard Operating Procedures for Applying herbicides on BLM Lands 62
Appendix D: General Soil Map Units by Planning Unit 69
Appendix E: Project Maps 71
Appendix F: Herbicides Proposed for Use of Taos Field Office Lands 72
Appendix G: Protective Measures 74



Project Map and Planning Area.
Figure 1. Project Planning Area.

Programmatic Treatment Plan for Rapid Response to Weeds
DOI-BLM-NM-F020-2010-0008-EA

Chapter 1: Purpose and Need

1.1 Introduction

The New Mexico Bureau of Land Management proposes to treat state-listed noxious weeds and other invasive plant species, as defined by the New Mexico Department of Agriculture Noxious Weed List or the BLM National List of Invasive Weed Species of Concern (hereinafter referred to as "weeds"), found on public lands managed by the Taos Field Office. The Programmatic Treatment Plan for Rapid Response to Weeds is prepared to provide programmatic guidance and criteria for treating these species. If approved, treatments would begin within one month of signing the Finding of No Significant Impact (FONSI) and Decision Record.

Within portions of the Taos Field Office, weeds have become established. Their presence on the landscape has had an adverse effect on watersheds, forage for livestock and wildlife, wildlife habitat and the health of the land. The presence of these plant species and their continued spread affects the ability of ecosystems to sustain a healthy biodiversity and ability to provide for quality wildlife habitat.

The BLM considers plants as weeds if they have been introduced into an environment where they did not evolve. As a result, they usually have no natural enemies to limit their reproduction and spread (Westbrooks, 1998). Some invasive plants can produce significant changes to vegetation, composition, structure, or ecosystem function. (Cronk and Fuller, 1995). In some cases noxious weeds are poisonous to wildlife and livestock. Weeds are designated and regulated by various state and Federal laws.

1.2 Purpose and Need for Action

The purpose of the Taos Field Office Programmatic Treatment Plan for Rapid Response to Weeds is to meet the goals and objectives of ecological site descriptions (USDA NRCS 2010) and the desired plant communities by eradicating or controlling plant species that are state-listed as weeds. Eradication and/or controlling the spread of these species would provide for the stabilization of both the biotic and hydrologic components of watersheds, and restore and support habitat requirements for flora and fauna.

This plan is needed to control the spread of weeds on public lands managed by the Taos Field Office with rapid response spot treatments and techniques. Rapid response is necessary because weeds are highly competitive and, over time, can crowd out desirable perennial or annual native plants causing a loss in biodiversity, wildlife habitat and a decrease in ecosystem health. These weeds also diminish the ability of the land to support wildlife and livestock and in the long term may lead to increased runoff and soil erosion. Aesthetic values, as well as wilderness and recreational opportunities, may also be negatively impacted. Invasive vegetation and noxious weeds degrade or reduce soil productivity, water quality and quantity, native plant communities, wildlife habitat, wilderness values, recreational opportunities, and livestock forage and are detrimental to agriculture and commerce of the U.S. and public health (National Academy of Sciences 1968).

This plan is also needed to reduce wildfire hazards due to altered fire regimes. Weeds can alter fire regimes by increasing fuel loading levels. These species are prone to wildfire due to increased stand densities in woody fuels and high concentrations of continuous fuels usually found in invasions of grass and brush weed species. The most well known effects of plant invasions on fire regimes involve those

that increase the frequency, intensity, or length of the fire season. Collectively, these changes increase what are commonly referred to as fire hazards (Brooks and Lusk 2008).

The Taos Field Office proposes to implement integrated pest management to address the introduction and spread of weeds. Increased use of public land has also contributed to habitat degradation as weed species replace native vegetation. The percentage of land infested by weeds is relatively low in the Taos Field Office, thus providing an opportunity to aggressively treat new and existing infestations. The current untreated, known weed-infested acreage is estimated at less than 10,000 acres. However, most of the Taos Field Office has not been inventoried for weed species; thus, the actual number of acres needing treatment has not been established. The current treatment focus is on New Mexico state-listed and BLM listed noxious weeds however, controlling other weed species that cause management problems related to livestock, wildlife, riparian habitat, and human activities (recreation) is a secondary focus. Surface disturbing activities associated with rights-of-way and other authorized activities are increasing the presence of these weed species.

1.3 Land Use Plan Conformance

The proposed project is in conformance with the current land use plan, *1988 Taos Resource Management Plan* (RMP), which specifically provides for the management actions considered in this programmatic plan. This RMP is undergoing revision by the BLM, and in June 2010 the Taos Field Office released for public review and comment a Draft RMP and Draft Environmental Impact Statement. While the Draft RMP is not yet completed and in effect, the programmatic plan would be consistent with its management goals, objectives, and proposed prescriptions.

The proposed project is also consistent with the *2010 Farmington District Fire Management Plan*, and the *Final Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement (2007)* (hereinafter referred to as the PEIS) and Final Vegetation Treatments on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Report (2007) (hereinafter referred to as the PER).

The Proposed Action conforms to the *1994 U.S. DOI Bureau of Land Management and U.S. Department of Agriculture Forest Service Rangeland Reform Final Environmental Impact Statement;* the *Federal Land Policy and Management Act of 1976* (FLPMA) (43 U.S.C. 1700 et seq.); the *Taylor Grazing Act of 1934* (TGA) (43 U.S.C. 315 et seq.); the *Public Rangelands Improvement Act of 1978* (PRIA) (43 U.S.C. 1901 et seq.); the *Federal Noxious Weed Act of 1974* (7 U.S.C. 2801-2813), as amended by Section 15, *Management of Undesirable Plants on Federal Lands*, 1990; and the *Carson-Foley Act of 1968* (P.L. 90-583) as required by 43 CFR 1610.5-3.

The Taos Field Office is proposing to treat weeds in accordance to the *Federal Land Policy and Management Act of 1976*, which directs the BLM to manage public lands "in a manner that will protect the quality of scientific, scenic, historic, ecological, environmental, air and atmospheric, water resources, and archeological value." This gives the BLM a legal obligation to control weeds on public lands administered by the Taos Field Office.

Executive Order 13112, Invasive Species, directs federal agencies to prevent the introduction of invasive species and provide for their control, and to minimize the economic, ecological, and human health impacts that invasive species cause. Several other federal acts provide for management and control of invasive plants. Two weed control acts, the *Carlson-Foley Act of 1968* and the *Plant Protection Act of 2000* (Public Law 106-224), includes management of undesirable plants on federal lands; authorizes the BLM to manage noxious weeds; and to coordinate with other federal and state agencies in activities to eradicate, suppress, control, prevent, or retard the spread of any noxious weeds on federal lands. The

Federal Noxious Weed Act of 1974 established and funded an undesirable plant management program, implemented cooperative agreements with state agencies, and established integrated management systems to control undesirable plant species.

1.4 Identification of Issues

On November 9, 2009, the proposed project was discussed by Taos Field Office resource specialists at a monthly NEPA project coordination meeting. Issues discussed included wildlife, consultation requirements on threatened and endangered species, and needs related to archaeological clearance. Follow up staff meetings and consultations were held with field office resource specialists to further discuss the scope of this analysis. Section 5.2 goes into more detail on the public involvement that took place prior to initiating planning phase of this project.

The proposed project was posted in the Taos Field Office on-line NEPA log on December 1, 2009 inviting the public to submit comment and express concerns related to the scope of this project.

Based on public scoping, as well as the internal scoping efforts, the following issues are considered relevant to the analysis of this management action:

1. How would the Proposed Action and alternatives effect the quality of air and the climate within the proposed planning area?
2. What impact would the Proposed Action and alternatives have on climate change?
3. How would Areas of Critical Environmental Concern (ACEC's) be impacted by the Proposed Action and alternatives within the planning area?
4. How would the Proposed Action and alternatives impact the quantity and quality of cultural resources in the proposed planning area?
5. What impact would the Proposed Action and alternatives have on the availability of browse and forage within grazing allotments in the proposed planning area?
6. How would the Proposed Action and alternatives impact the quality of riparian resources within the proposed planning area?
7. What would be the potential for soil erosion or stabilization in the proposed planning area due to the impact from the Proposed Action and alternatives?
8. What would be the potential impact to migratory birds including eggs, young and the nesting habitat of these species from the Proposed Action and alternatives?
9. What would be the impact to the nesting habitat and the availability of forage for Threatened and Endangered Species including Special Status Species due to the Proposed Action and alternatives within the planning area?
10. What would be the impact to the quantity and quality of native vegetation within the proposed planning area due to the Proposed Action and alternatives?
11. How would the view shed character of the planning area be impacted by the Proposed Action and the alternatives?
12. What would be the potential of improvement or degradation of water quality in the proposed planning area due to the Proposed Action and alternatives?
13. How would habitat for wildlife species be impacted in the planning area by the Proposed Action and alternatives?
14. How would the Proposed Action and alternatives impact human health, and how would the Proposed Action and alternatives affect the prevalence of hazardous materials?

Chapter 2: Description of Alternatives

2.1 Alternative A: Proposed Action (Preferred Alternative)

The Proposed Action is to apply a rapid response for control of small infestations of non-native invasive plants and noxious weeds, as defined by the New Mexico Department of Agriculture Noxious Weed list or the BLM National List of Invasive Weed Species of Concern, wherever found on BLM lands, and to prevent their spread on BLM lands within the Taos Field Office area.

The scope of this Proposed Action shall include all BLM permitted rights-of-ways, leases, and permits. Implementation of this alternative shall be executed by a coordinated effort of BLM employees or by contract crews or partners covered under assistance agreements who are trained in BLM protocol under the direct supervision of a resource specialist who is certified, licensed, and trained by the BLM and the State of New Mexico. An integrated management system would be implemented with the following control methods to be considered for the rapid response and treatment of these areas, including the use of herbicides, manual controls, prescribed fire, or mechanical controls. The Proposed Action would cover initial attack spot treatments of typically less than 25 acres of contiguous weed infestations, and no more than 2,000 acres of initial treatments would be conducted each year.

An integrated management system would be implemented with multiple control methods and are considered for use separately or in combination, allowing the BLM to select the desirable method, or combination of methods, that best resolve environmental concerns, effectiveness, and cost control.

A Determination of NEPA Adequacy (DNA) would be used by Taos Field Office Resource Specialists in deciding whether or not to carry out weed control projects under the authority of this plan. The DNA would be used in correlation with a Pesticide Use Proposal (PUP) for herbicide use projects or a Burn Plan for prescribed fire projects. A DNA would also be used in correlation with Manual 8560 – Management of Designated Wilderness Areas. Projects in Wilderness Study Areas must be evaluated using an EA with a 30-day public review and as outlined in Manual 8550-1 Interim Management Policy and Guidelines for Lands under Wilderness Review.

The following treatment considerations would be utilized by Resource Specialists in order to construct parameters for making treatment decisions. Some of these considerations were adopted from the Record of Decision for the PEIS and would be used to promote integrated pest management efforts in the Taos Field Office for rapid response to weed infestations:

- Management program/objective for the site.
- Historic and current conditions.
- Opportunities to prevent future problems.
- Opportunities to conserve native vegetation.
- Effectiveness and cost of treatment methods.
- Success of past restoration treatments or treatments conducted under similar conditions or recommendations by resource specialists.
- Characteristics of the target plant species, including size, distribution, density, life cycle, and life stage in which the plant is most susceptible to treatment.
- Non-target plant species that could be impacted by the treatment.
- Proximity to populated areas.
- Slope, accessibility, and soil characteristics of the treatment. e.g., any ground disturbing treatment – defined as treatments that physically moves soil such as digging or use of wheeled vehicles - will be limited to slopes of 20% or less on soils classified as having moderate to severe risk of

erosion. Non ground disturbing treatments on slopes greater than 20% will implement BMPs sufficient to prevent loss of soil from site perimeter.

- Weather conditions at the time of treatment, particularly wind speed and direction, precipitation prior to or likely to occur during or after treatment, and season.
- Proximity of the treatment area to sensitive areas, such as wetlands, streams, or habitat for plant or animal species of concern, including Federally listed species or designated critical habitat. Treatments will not occur on floodplains adjacent to perennial streams that have been classified as impaired without further analysis. Treatments will not occur in habitat or potential habitat for any Federally listed plant or animal species, or designated critical habitat, without additional environmental analysis and consultation with the U.S. Fish and Wildlife Service.
- Potential impacts to humans and fish and wildlife (e.g., treatments in fish and wildlife habitat that has been identified as impaired will only occur if the objectives for site improvement include restoration of native vegetation).
- Need for subsequent re-vegetation and/or restoration.
- In designated wilderness areas the minimum "tools, equipment, or structures may be used for management when they are the minimum necessary for protection of the wilderness resource or when necessary in emergency situations for the health and safety of the visitor. Management must use the minimum tool, equipment, or structure necessary to successfully, safely, and economically accomplish the objective. The chosen tool, equipment, or structure would be the one that least degrades wilderness values temporarily or permanently."
- Use of timing restrictions would minimize impacts to wildlife. These timing restrictions would exclude treating during critical wildlife breeding or staging periods, including those for big-game such as deer, elk, bighorn sheep and pronghorn. Seasonal restriction would be implemented to avoid migratory bird breeding season, which is typically April through September. And if work cannot be avoided during these timeframes, nest searches would be conducted in vegetation that may be disturbed during project implementation activities. Golden eagles might nest adjacent to the project area, which could become occupied as early as February. To avoid potential impacts to the Golden Eagle, monitoring would be implemented on any nest site(s) within one-half (1/2) mile of project activities for negative project-related effects (e.g., flushing from the nest or alarm calls). If disturbance is noted, project-related activities would cease until fledging of young has been completed. In addition, if a Bald or Golden Eagles are observed within one-quarter (1/4) mile of active work zones in the morning before activity starts, or arrives during breaks in activity, all activities would suspend until the bird leaves of its own volition. If a Bald or Golden Eagle arrives during work activities, or is observed more than one-quarter (1/4) mile from the active work site, activities would not be interrupted.

The plant species targeted for treatment are listed in the New Mexico Department of Agriculture Noxious Weed list (NMDA 2009). This list identifies three classes of species (A, B and C) as well as "watch list" species. Class A species are not currently found in New Mexico or have limited distribution. Class B species are limited to specific portions of the state. Class C species are wide spread through the state. The watch list species are of concern in the state and have the potential to become problematic.

The plant species targeted also include those on the BLM National List of Invasive Weed Species of Concern (http://www.blm.gov/co/st/en/BLM_Programs/botany/invasiweed.html). This list focuses on the exotic species that are considered highly invasive in natural systems. The BLM list includes many invasive annual grasses that are known to disrupt natural ecosystem function. As these weed lists are updated the target species addressed by this document will be updated.

Mechanical and Manual Treatment

Manual treatment methods would include pulling, cutting, digging, chipping, and chopping the target species. Hand tools used would include, shovels, picks, pulaskis, loppers, and axes. Chainsaws, weed eaters, and chippers may be used for treatments of woody weed species. Manual treatment would be considered when:

- The target species is responsive to manual methods.
- When the use of other control methods is precluded because of human health and safety, or the proximity of sensitive resources.
- Fuel loading is such that prescribed fire treatment would be either ineffective at meeting the goals of the treatment or the window is so narrow that the chances of successfully treating the area are negligible.

Mechanical treatments may include, but are not limited to, the use of mulching masticators, tree extractors, tractor plows, and mowers. Mechanical treatment would be considered when:

- The target species is responsive to mechanical treatments.
- The treatment would be cost effective.
- The proximity of sensitive resources, such as water sources, precludes the use of chemicals.
- The treatment can aid in creating biomass, or slash piles, for prescribed fire treatment.

The following measures would apply to all manual and mechanical treatments within the planning area:

a. Surface disturbing treatments would avoid sites containing cultural resources and active wildlife habitat zones. Coordination with resource specialists will be required prior to treatment to mitigate impacts to these sensitive areas.
b. Where appropriate, vegetative material would be piled for burning at a later date. If burning is not an option vegetative material would be disposed of properly in a landfill after being double bagged in black plastic trash bags.
c. Certain mechanical treatments would be precluded from areas with slopes over 20% or on incompatible soils as documented in site specific assessment/plan.
d. The Vegetation Treatment Methods Standard Operating Procedures and Guidelines found in Table 2-5 of the PER are incorporated by reference into this EA.

Prescribed Fire
Prescribed fire treatment would be considered when:

- Target species is responsive to fire use.
- Fuel loading in a prospective treatment area is such that fire would effectively eradicate or control the spread of target species.
- Existing herbaceous vegetation in a prospective treatment area is adequate to effectively carry and support ignition attempts.
- The risk of an escaped prescribed fire is minimal.
- Piles of weeds are dumped on BLM lands.

All prescribed fires would be conducted under a site specific Prescribed Fire Burn Plan as per the Interagency Prescribed Fire Planning and Implementation Procedures Guide (USDI and USDA 2008).

The following measures would apply to all prescribed burn treatments within the planning area:

a. Range improvement projects (pipelines, fences), oil and gas related infrastructure and other similar facilities, power lines, and communication lines would all be excluded and protected from prescribed fire.
b. Each project area would be evaluated for deferment of grazing that would be applied if necessary.
c. Areas treated with prescribed fire may need to be fenced off to exclude livestock grazing in order to promote growth of native vegetation through at least two consecutive growing seasons following treatment. The growing season usually begins in spring (March 1) and continues until first frost (October 31).
d. Burning operations would be conducted with techniques to avoid smoke from impacting traffic on U.S. Highways and NM state roads.
e. The Vegetation Treatment Methods Standard Operating Procedures and Guidelines found in Table 2-5 of the PER are incorporated by reference into this EA.

Herbicide Use Treatments

Rapid response-spot herbicide treatments use ground-based equipment, such as spray rigs mounted on motorized vehicles or backpack sprayers, allowing the herbicide to be applied directly to the individual noxious plant species. Adjacent native vegetation would not be treated with herbicide. The following measures would be applied to all herbicide applications on lands administered by the Taos Field Office:

a. Only BLM-approved herbicides and adjuvants would be applied, according to their label instructions. The instructions include effective application rates for specific noxious weed species, and non-treatment buffers around water bodies and water sources.
b. The Standard Operating Procedures (SOPs) found in Appendix B of the Record of Decision (ROD) for the PEIS are incorporated into this EA. In addition, treatment of weeds with herbicides will follow the appropriate SOPs as listed in Appendix C to this EA
c. Herbicide-free buffer zones for wetlands and riparian areas would be utilized for herbicides not labeled for aquatic use based on Risk Assessment guidance. See Table 2-5, Vegetation Treatment Methods Standard Operating Procedures and Guidelines (pp. 2-34 & 2-35) in the PER.
d. Open bodies of water (rivers, streams, ponds, stock watering facilities, water wells for example) would be buffered from treatment in accordance with herbicide label directions for the specific target species to minimize impacts. See Table 2-5, Vegetation Treatment Methods Standard Operating Procedures and Guidelines (pp. 2-34 & 2-35) in the PER.
e. The mitigation measures listed in the ROD for the PEIS will be used for the spot treatment of noxious weeds (see Appendix A of this EA).
f. Treatment areas would avoid special status plant species. Individual special status plant species would not be treated. The locations of these species would be identified through GIS.
g. The potential for ground water contamination will be evaluated by appropriate resource specialists using the methods and techniques of the PEIS.
h. Pre- and post-treatment monitoring would be conducted to evaluate effectiveness of treatments.

The list of 18 herbicide active ingredients approved by BLM to treat weeds can be accessed at http://www.blm.gov/wo/st/en/prog/more/veg_eis.html. A list of these herbicides, their characteristics, and the target vegetation species can be found in Appendix F. These active ingredients are registered for use within the stated application rate on rights-of-way and rangelands for control of noxious weeds in the state of New Mexico and are addressed in the ROD for the PEIS. The application rate would be as described on the label. The total amount of herbicide will not exceed allowable rates. Application is normally scheduled during the active growing season of the target species or when it is best to achieve control of the target species. Where herbicides are used, the BLM would not apply when winds exceed 10 miles per hour or when rain is forecasted for the local area within 48 hours of application. Herbicides would be applied no later than two months before the normal spring runoff and high water tables, or by

February 15th, and could recommence once streamflow is below normal bank full stage, typically after July 15th.

Design Features
Any project conducted under this Programmatic Treatment Plan for Rapid Response to Weeds would follow the policies, standards and practices listed in the Proposed Action. The BLM Taos Field Office will also adopt the Mitigation Measures outlined in the ROD for the PEIS and the Measures as outlined in Appendix A of this EA. In addition, the following design features would also apply:

1. BLM would ensure that the agreed upon level of cultural inventory is completed prior to implementation, and would protect sensitive areas using buffer zones, hand treatment of vegetation, removal of heavy fuels or other actions agreed to under the provisions of the Protocol Agreement between the New Mexico Bureau of Land Management and New Mexico State Historic Preservation Officer. These procedures would ensure compliance with the National Historic Preservation Act. The appropriate mitigation measures may be implemented after consultation with New Mexico State Historic Preservation Officer.
2. All BLM vehicles and vehicles of partners covered under assistance agreements to conduct weed treatments shall be washed after leaving each weed infestation to minimize the spread of weeds to other areas.
3. Prior to implementation, a qualified BLM Wildlife Biologist would ensure that there are no Federally listed plant or animal species, or designated critical habitat, within or adjacent to treatment areas. If it is determined the proposed treatment site is within or adjacent to existing or potentially listed species habitat, or designated critical habitat, further environmental analysis and consultation with the U.S. Fish and Wildlife Service would be initiated before authorization or implementation of any weed control methods, or, alternatively, the action would not occur.
4. No more than 2,000 acres of BLM lands would be treated in a fiscal year in order to help ensure potential impacts, including cumulative impacts, would be kept to a minimum.

Monitoring
Any project implemented under this Proposed Action would be monitored in order to ensure that vegetative management is an adaptive process that continually builds upon past successes and eliminate ineffective practices. All monitoring for projects would be done in accordance with Appendix D (Monitoring) of the ROD for the PEIS. Weed monitoring for non-herbicide treatments would be accomplished through site revisits performed during the growing season of the target species. For herbicide use treatments implementation monitoring would be initiated through Pesticide Use Proposals (PUPs) and through Pesticide Application Records. Monitoring would be used to answer the following questions:

- What changes in the distribution, amount, and proportion (total percent cover and relative percent cover) of invasive plant infestations have resulted due to treatments?
- Has infestation size been reduced at the project level or larger scale?
- Which treatment methods, separate or in combination, are most successful for a particular species?

In 2007, the BLM began field-testing a new data management system for documentation, mapping, treating, and monitoring of invasive species – the National Invasive Species Information Management System (NISIMS). When fully operational, the system will provide tools for this Programmatic Treatment Plan for data collection and the generation of BLM-wide analysis and statistics for invasive species infestations and treatments.

The deployment of a BLM-wide database would support the BLM strategies to deliver information directly to the program specialists/decision makers, establishing accountability, responsibility, and standardized, comprehensive management of BLM information.

2.2 Alternative B: No Action

Under Alternative B, the BLM would not implement any of the above management actions described in the Proposed Action as rapid response weed treatments under this programmatic plan within the Taos Field Office. However, current weed management strategies would continue, including monitoring for range and woodland health. Weed treatments would continue to be assessed individually for proposed projects within the Taos Field Office area. Weed treatments would continue for areas evaluated in separate EA's such as the Treatment of Saltcedar (*Tamarix spp.*) and other invasive nonnative vegetation for Orilla Verde Recreation Area Environmental Assessment (EA No. NM-220-05-054) and Treatment of Saltcedar (*Tamarix spp.*), Russian Olive (*Eleagnus angustifolia L.)*, Siberian Elm (*Ulmus pumila L.)*, and Other Invasive Nonnative Vegetation on the Santa Fe River (EA No. NM-220-06-032). In contrast to the Proposed Action, the timing, treatment types, and delivery of weed treatments under No Action would not be as rapid or effective, resulting in the continued spread of noxious weeds to thrive in ACECs and other areas.

2.3 Alternative C: No Herbicide Use

Under Alternative C, the Taos Field Office would not utilize herbicide for rapid response treatment for infestations of non-native invasive species and noxious weeds. The Taos Field office would only utilize manual, mechanical and prescribed fire treatments for rapid response to target species infestations, as described in the Proposed Action.

2.4 Alternatives Considered but not Analyzed in Detailed

Aerial application of herbicides was initially considered but not analyzed in detail because larger scale treatments are usually associated with aerial application, and the higher cost of aerial applications.

Biological treatments were also considered but not analyzed in detail because they are usually not considered a rapid response treatment method.

Chapter 3: Affected Environment

The Taos Field Office administrative area encompasses approximately 24,000 square miles of land with mixed ownership in Union, Mora, Colfax, San Miguel, Los Alamos, Harding, Taos, Rio Arriba, and Santa Fe Counties in northeastern New Mexico. The programmatic assessment would affect approximately 595,100 acres of BLM surface land and approximately 1,517,850 acres of BLM-administered subsurface minerals. The affected environment of the planning area is generally discussed in the 1988 Taos Resource Management Plan (RMP). Only resources that are actually impacted by the Proposed Action are addressed in this document.

The following table contains a partial listing of New Mexico designated noxious plants that are of concern and their current known general locations by counties (New Mexico Department of Agriculture 2009). This list is not all-inclusive due to incomplete weed inventories.

Table 1: State-listed noxious weeds in the planning area

Scientific Name (Symbol)	Noxious/Common Name	State Weed Status	Native/ Introduced	Known County Location
Acroptilon repens (ACRE3)	Russian knapweed	B	I	San Miguel, Santa Fe, Rio Arriba, Taos, Los Alamos
Aegilops cylindrica (AECY)	Jointed goatgrass	C	I	Taos, San Miguel, Santa Fe, Mora, Los Alamos, Rio Arriba
Ailanthus altissima (AIAL)	Tree of heaven	A	I	Taos, Rio Arriba, Santa Fe, Los Alamos, San Miguel,
Cardaria draba (CADR)	Hoary cress	A	I	Throughout Field Office area
Carduus nutans (CANU)	Musk thistle	B	I	Union, Colfax, Taos, Rio Arriba, Los Alamos, Santa Fe, San Miguel
Centaurea calcitrapa (CECA2)	Purple starthistle	A	I	Mora
Centaurea diffusa (CEDI3)	Diffuse knapweed	A	I	Colfax, Santa Fe, Rio Arriba, San Miguel
Centaurea maculosa (CEMA4)	Spotted knapweed	A	I	Colfax, Rio Arriba, Santa Fe, San Miguel
Centaurea solstitialis (CESO3)	Yellow starthistle	A	I	San Miguel
Cirsium arvense (CIAR4)	Canada thistle	A	I	Colfax, Taos, Rio Arriba, Los Alamos, Santa Fe
Cirsium vulgare (CIVU)	Bull thistle	B	I	Union, Colfax, Taos, Rio Arriba, Los Alamos, Santa Fe
Conium maculatum (COMA2)	Poison hemlock	A	I	Union, Colfax, Taos, Mora
Convolvulus arvensis (COAR4)	Field bindweed	C	I	Union, Colfax, Harding Taos, Rio Arriba, Los Alamos, Santa Fe, San Miguel
Dipsacus fullonum (DIFU2)	Teasel	B	I	Taos, Rio Arriba
Elaeagnus angustifolia (ELAN)	Russian olive	C	I	Union, Colfax, Taos, Rio Arriba, Los Alamos, Santa Fe, San Miguel, Mora
Elytrigia repens (ELRE4)	Quackgrass	A	I	Colfax, Taos, Rio Arriba, Los Alamos, Santa Fe
Euphorbia esula (EUES)	Leafy spurge	A	I	Colfax, Taos, Rio Arriba
Halogeton glomeratus (HAGL)	Halogeton	B	I	Rio Arriba
Hydrilla verticillata (HYVE)	Hydrilla	A	I	Santa Fe
Hyoscyamus niger (HYNI)	Black henbane	A	I	Taos, Rio Arriba
Isatis tinctoria (ISTI)	Dyer's woad	A	I	Santa Fe
Lepidium latifolium (LELA2)	Perennial pepperweed	A	I	Colfax, Taos, Rio Arriba, Harding, Los Alamos
Leucanthemum vulgare (LEVU)	Oxeye daisy	A	I	Taos, Rio Arriba, San Miguel
Linaria genistifolia ssp. *daimatica* (LIGED)	Dalmatian toadflax	A	I	Mora, Rio Arriba, Santa Fe
Linaria vulgaris (LIVU2)	Yellow toadflax	A	I	Colfax, Taos, Rio Arriba, San Miguel
Lythrum salicaria (LYSA2)	Purple loostrife	A	I	Rio Arriba

Myriophyllum aquaticum (MYAQ)	Parrotfeather	A	I	Colfax
Myiropphyllum spicatum (MYSP)	Eurasian watermilfoil	A	I	Santa Fe
Onopordum acanthium (ONAC)	Scotch thistle	A	I	Taos, Rio Arriba, Santa Fe, Union, San Miguel
Tamarix (TAMAR2)	Saltcedar	C	I	Throughout Field Office area
Ulmus pumila (ULPU)	Siberian elm	C	I	Throughout Field Office area

Class A Species
Prevent 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. The following species are included in the watch list.

Common Name	Scientific Name
Crimson fountaingrass	Pennisetum setaceum
Giant cane	Arundo donax
Meadow knapweed	Centaurea pratensis
Pampas grass	Cortaderia sellonana
Quackgrass	Elytrigia repens
Sahara mustard	Brassica tournefortii
Spiny cocklebur	Xanthium spinosum
Wall rocket	Diplotaxis tenuifolia

The following list contains the National BLM invasive species of concern (2008). Not all of these species are found within the Taos Field Office, however all species on this list shall be covered by the scale and scope of the proposed action.

Table 2: BLM National List of Invasive Weed Species of Concern (August 2008)

Scientific Name	Common Name	Family
Grasses		
Aegilops cylindrical	jointed goatgrass	Poaceae
Ammophila arenaria	European beachgrass	Poaceae
Arundo donax	giant reed	Poaceae
Bromus diandrus	ripgut brome	Poaceae

Bromus japonicas	Japanese brome	Poaceae
Bromus rubens	red brome	Poaceae
Bromus tectorum	downy brome	Poaceae
Cenchrus longispinus	longspine sandbur	Poaceae
Cortaderia jubata	Andean pampas grass	Poaceae
Cortaderia selloana	pampas grass	Poaceae
Cynodon dactylon	Bermudagrass	Poaceae
Ehrharta calycina	veldt grass	Poaceae
Elytrigia repens	Quackgrass	Poaceae
Eragrostis lehmanniana	Lehmann lovegrass	Poaceae
Nardus stricta	Matgrass	Poaceae
Panicum miliaceum	wild proso millet	Poaceae
Pennisetum setaceum	crimson fountain grass	Poaceae
Schismus arabicus	Schismus	Poaceae
Schismus barbatus	mediterranean grass	Poaceae
Sorghum halepense	Johnsongrass	Poaceae
Taeniatherum caput-medusae	medusa-head	Poaceae
Forbs		
Acroptilon repens	Russian knapweed	Asteraceae
Anthemis arvensis	scentless chamomile	Asteraceae
*Anthemis co*tula	mayweed chamomile	Asteraceae
Arctium minus	common burdock	Asteraceae
Bassia hyssopifolia	bassia Basellaceae	Asteraceae
Brassica nigra	black mustard	Brassicaceae
Brassica tournefortii	wild turnip	Brassicaceae
Caesalpinia gilliesii	Mexican bird-of-paradise	Fabaceae
*Cardaria chalepens*is	lens-podded whitetop	Brassicaceae
Cardaria draba	hoary cress	Brassicaceae
Cardaria pubescens	hairy whitetop	Brassicaceae
Carduus acanthoides	plumeless thistle	Asteraceae
Carduus nutans	musk thistle	Asteraceae
Carduus pycnocephalus	Italian thistle	Asteraceae
Carduus teniflorus	slender-flowered thistle	Asteraceae
Carpobrotus edulis	hottentot fig	Aizoaceae
Carpobrotus chilensis	sea iceplant	Aizoaceae
Carthamus lantus	distaff thistle	Asteraceae
Carum carvi	common caraway	Apiaceae
Centaurea calcitrapa	purple starthistle	Asteraceae
Centaurea cyanus	Cornflower	Asteraceae
Centaurea diffusa	diffuse knapweed	Asteraceae

Centaurea iberica	Iberian starthistle	Asteraceae
Centaurea jacea	brown knapweed	Asteraceae
Centaurea macrocephala	bighead knapweed	Asteraceae
Centaurea maculosa	spotted knapweed	Asteraceae
Centaurea melitenisis	malta starthistle	Asteraceae
Centaurea montana	mountain cornflower	Asteraceae
Centaurea nigra	black knapweed	Asteraceae
Centaurea nigrescens	Vochin knapweed	Asteraceae
Centaurea pratensis	meadow knapweed	Asteraceae
Centaurea squarrosa	squarrose knapweed	Asteraceae
Centaurea solstitialis	yellow starthistle	Asteraceae
Centaurea trichocephala	feather-headed knapweed	Asteraceae
Chondrilla juncea	rush skeletonweed	Asteraceae
Chrysanthemum leucanthemum	ox-eye daisy	Asteraceae
Cichorium intybus	Chicory	Asteraceae
Cirsium arvense	Canada thistle	Asteraceae
Cirsium vulgare	bull thistle	Asteraceae
Clematis orientalis	Chinese clematis	Ranunculaceae
Conium maculatum	poison hemlock	Apiaceae
Convolvulus arvensis	field bindweed	Convoluvaceae
Crepis setosa	bristly hawkweed	Asteraceae
Crupina vulgaris	common crupina	Asteraceae
Cynara cardunculus	artichoke thistle	Asteraceae
Cynoglossum officinale	Houndstongue	Boraginaceae
Digitalis purpurea	Foxglove	Scrophulariaceae
Dipsacus fullonum	common teasel	Dipsacaceae
Echium vulgare	Blueweed	Boraginaceae
Egeria densa	Brazillian waterweed	Hydrocharitaceae
Eichhornia crassipes	water hyacinth	Hydrocharitaceae
Erechtites glomerata	Australian fireweed	Asteraceae
Euphorbia cyparissias	cypress spurge	Euphorbiaceae
Euphorbia esula	leafy spurge	Euphorbiaceae
Euphorbia myrsinites	myrtle spurge	Euphorbiaceae
Foeniculum vulgare	Fennel	Apiaceae
Galega officinalis	goats rue	Fabaceae
Gypsophila paniculata	babys breath	Caryophyllaceae
Halogeton glomeratus	Halogeton	Chenopodiaceae
Hesperis matronalis	dames's rocket	Brassicaceae
Hieracium aurantiacum	orange hawkweed	Asteraceae
Hieracium pilosella	mouseear hawkweed	Asteraceae
Hieracium pretense	yellow hawkweed	Asteraceae

Hydrilla verticillata	Hydrilla	Hydrocharitaceae
Hyoscyamus niger	black henbane	Solanaceae
Hypericum perforatum	common St. Johnswort	Hypericaceae
Hyposhaeris radicata	common catsear	Asteraceae
Isatis tinctoria	dyer's woad	Brassicaceae
Knautia arvensis	blue buttons	Dipsacaceae
Lathyrus latifolius	everlasting peavine	Fabaceae
Lepidium latifolium	perennial pepperweed	Brassicaceae
Linaria genistifolia spp. dalmatica	dalmation toadflax	Scrophulariaceae
Linaria vulgaris	yellow toadflax	Scrophulariaceae
Lysimachia vulgaris	garden loosestrife	Primulaceae
Lythrum salicaria	purple loosestrife	Lythraceae
Lythrum virgatum	wand loosestrife	Lythraceae
Madia sativa	Chilean tarweed	Asteraceae
Myriophyllum spicatum	Eurasian watermilfloil	Haloragaceae
Onopordum acanthium	Scotch thistle	Asteraceae
Onopordum taricum	Scotch thistle	Asteraceae
Peganum harmala	African rue	Zygophyllaceae
Potentilla recta	sulphur cinquefoil	Rosaceae
Salvia aethiopsis	Mediterranean sage	Lamiaceae
Saponaria officinalis	bouncing bet	Caryophyllaceae
Senecio jacobaea	tansy ragwort	Asteraceae
Senecio mikanoides	German ivy	Asteraceae
Solanum dulcamara	bitter nightshade	Solanaceae
Sonchus arvensis	perennial sowthistle	Asteraceae
Sphaerophysa salsula	Swainsonpea	Fabaceae
Tanacetum vulgare	common tansy	Asteraceae
Zygophyllum fabago	Syrian bean caper	Zygophyllaceae
Shrubs and Trees		
Ailanthus altissima	tree-of-heaven	Simaroubaceae
Alhagi pseudalhagi	Camelthorn	Fabaceae
Cytisus junceum	Spanish broom	Fabaceae
Cytisus monspessulanas	French broom	Fabaceae
Cytisus scoparius	Scotch broom	Fabaceae
Cytisus striatus	Portugese broom	Fabaceae
Elaeagnus angustifolia	Russian olive	Elaeagnaceae
Ficus carica	edible fig	Moraceae
Lespedeza cuneata	Himalayan bush clover	Fabaceae
Retama monosperma	bridal veil broom	Fabaceae
Rubus discolor	Himalaya blackberry	Rosaceae

Schinus terebrinthifolius	Brazillian pepper	Anacardiaceae
Tamarix aphylla	Athel	Tamaricaceae
Tamarix chinensis	Tamarisk	Tamaricaceae
Tamarix gallica	French tamarisk	Tamaricaceae
Tamarix parviflora	small flower tamerisk	Tamaricaceae
Tamarix pentanda	Tamarisk	Tamaricaceae
Tamarix ramosissima	salt cedar	Tamaricaceae
Ulex europaeus	Gorse	Fabaceae
Ulmus pumila	Siberian elm	Ulmaceae

3.1 *Air Quality*

Degradation of air quality in portions of the planning area is the result of pollutants such as nitrogen dioxide, hydrocarbons, carbon monoxide, and particulate matter from motor vehicles, blowing dust, and dirt roads. Automobile exhaust from the more densely populated areas contributes to air pollution. This is especially evident during the winter when temperature inversions prevent the escape and dispersion of polluted air to higher altitudes. These inversions are usually of short duration because of storm fronts and unstable cold air masses moving through the area.

Summer inversions last longer. Convective columns can occur at any time of the years when solar radiation stabilizes the air close to the ground and produces air turbulence that can disperse trapped auto emissions.

Wind action on exposed or disturbed soils is a primary source of air pollution in this area. The soil particles create dust storms of various magnitudes, depending on wind velocity. Early spring winds cause blowing dust, which contributes to air pollution. Extensive preparation for spring planting is the source of much of the blowing dust.

There are no nonattainment areas for air quality in the planning area. This indicates that air quality in the planning area is generally good. Exceptions can occur, especially during wildfire events and high wind days when dust is mobilized. BLM actions that impact air quality include vegetation treatments that involve prescribed burning or disking, vehicle emissions, and any mining or mineral development on agency land including oil and gas development. Emission from treatments can include smoke and dust from exposed soil. Vehicle emission sources controlled by the BLM include construction vehicles, work trucks, and OHVs. Engines used in various phases of oil and gas development also produce emissions which can be mitigated through BMPs. While not managed by the BLM, class I areas within the planning area that may be affected by BLM activities are the Pecos Wilderness, Bandelier National Monument, and Wheeler Peak Wilderness. (USDI BLM 2010) Class 1 areas are those where any appreciable deterioration of air quality is considered significant.

3.2 *Climate Change*

In 2001, the Intergovernmental Panel on Climate Change (IPCC) predicted that by the year 2100, global average surface temperatures would increase 1.4 to 5.8°C (2.5 to 10.4°F) above 1990 levels. The National Academy of Sciences (2006) supports these predictions, but has acknowledged that there are uncertainties regarding how climate change may affect different regions. Computer model predictions indicate that increases in temperature will not be equally distributed, but are likely to be accentuated at higher latitudes. Warming during the winter months is expected to be greater than during the summer, and

increases in daily minimum temperatures is more likely than increases in daily maximum temperatures. It is not, however, possible at this time to predict with any certainty the causal connection of site specific emissions from the Proposed Action or other alternatives in this EA to impacts on the global/regional climate.

Mean annual temperatures have risen across New Mexico and the southwestern U.S. since the early 20th century. When compared to baseline information, periods between 1991 and 2005 show temperature increases in over 95% of the geographical area of New Mexico. Warming is greatest in the northwestern, central, and southwestern parts of the state. Recurrent research has indicated that predicting the future effects of climate change and subsequent challenges of managing resources in the Southwest is not feasible at this time (USFS, 2008). However, it has been noted that forests at higher elevations in New Mexico, for example, have been exposed to warmer and drier conditions over a ten year period. Should the trend continue, the habitats and identified drought sensitive species in these forested areas and higher elevations may also be affected by climate change (Enquist and Gori).

3.3 *Areas of Critical Environmental Concern*

The 1988 Taos Field Office Resource Management Plan designated areas of critical environmental concern (ACEC). See Table 3 for details of these ACECs, including their relevant and important values, for which the management of the designation is intended to protect.

Table 3: ACEC's within the Taos Field Office

ACEC Name	Public Land Acres	Relevant and Important Values
Black Mesa	5,460	Rare plant species, cultural resources
La Cienega	3,556	Cultural resources, riparian vegetation, wildlife habitat, and scenic values
Copper Hill	17,262	Watershed, scenic, riparian, wildlife, and cultural resource values and fish habitat
Lower Gorge	16,351	Recreation values, wildlife habitat, and riparian vegetation
Ojo Caliente	17,700	Cultural resource, wildlife, and riparian values
San Antonio Gorge	267	Wildlife habitat and natural and scenic values
Sombrillo	8,865	Paleontological, cultural, and scenic values
Winter Range	6,688	Wildlife habitat

As indicated under section 1.3, the current land use plan, which established the ACECs indentified in Table 3, is anticipated to be replaced within the next year. Under its proposed replacement, the Draft Taos RMP—released to the public for review and comment on June 11, 2010—areas designated as ACEC would be expanded to include an additional 341,000 acres. The relevant and important values for which the expanded areas would be managed to protect include cultural, paleontological, scenic, wildlife, and other values identified in Table 3.

3.4 *Cultural Resources*

It is extremely likely that any tract of land that encompasses appreciable acreage within the Taos Field Office contains significant cultural resources. Since the spatial distribution of existing cultural surveys and site location data is uneven across the landscape within these management areas it is impossible to equivocally state that no significant cultural resources are present within the planning area. Prior consultation with cultural resources specialist during initial planning stages must therefore constitute an integral component in the proposed implementation of any resource management activities that might pose an adverse affect to known or unknown cultural resources.

3.5 *Livestock Management*

There are 318 livestock grazing allotments within the planning area with over 58,000 animal unit months (AUMs) allocated to these allotments. Of the 595,100 acres of public land within the field office, 88% of that land is within the grazing allotments.

3.6 *Riparian Vegetation*

Public land within the planning area contains approximately 22 recorded riparian areas, including the Rio Grande Corridor comprising of several thousand acres of wetland habitat. Wetlands and riparian areas provide important ecological functions, including flood water attenuation, sediment trapping, and nutrient transformation and retention (Westbrooks 1998). There are sinkholes, and playas found throughout the planning area. The size of these features range from a few acres to hundreds of acres. Sinkholes are perennial while playas are ephemeral water bodies. Additionally, there are more than 20 springs and seeps on public land, each about one acre in size. Each of these features contributes to the habitats associated with riparian and wetland areas.

Replacement of native vegetation by exotic plant species, many of which are highly flammable, can contribute to an increased incidence of fire in riparian areas. Many invasive species like Tamarisk are highly flammable. The spread of many of these exotics is due in part to the same changes in stream flow regimes that render the riparian areas more susceptible to fire.

3.7 *Soils*

The planning area contains three of six major soil regions found in New Mexico. The majority of BLM-administered land in the area is contained within the Western Soil Region that includes mesas, plateaus and lava flows interspersed with steep canyons with topographic and geomorphic complexity that has resulted in diverse soil types. The eastern half of the planning area is in the East Central Plains Soil Region, characterized by undulating to rolling uplands, and less variation in topography. The northern and central portion of the planning area is in the Mountain Soil Region containing mesas, foothills, and lava flows incised by deep canyons.

The public land within the planning area contains 76 soil map units as derived in the State Soil Geographic Database known as STATSGO (NRCS 1993). These units are equivalent to the General Soil Units found in NRCS Soil Surveys. Appendix D lists general soil map unit acreage by planning unit. Soils comprising less than 1 percent of BLM land in the planning unit area were excluded.

The BLM uses detailed soil surveys to assess soil capability for a given use during project level analysis. Soil surveys are mapped by the Natural Resource Conservation Service (NRCS, formerly Soil Conservation Service) and results are published in soil surveys by county area. Available soil surveys for the planning area are:

Soil Survey of Mora County Area, New Mexico, 1985
Soil Survey of Taos County and parts of Rio Arriba and Mora counties, New Mexico, 1982
Soil Survey of San Miguel County Area, New Mexico, 1981
Soil Survey of Union County, New Mexico, 1981
Soil Survey of Rio Arriba County Area, New Mexico, 2008
Soil Survey of Santa Fe Area, New Mexico, 1975
Soil Survey of Colfax County, New Mexico, 1981
Soil Survey of Harding County, New Mexico, 1973

Although most soils in the planning area are subject to increased wind or water erosion resulting from surface disturbances, some soils have higher susceptibility due to small soil particle size and/or slope. Soils in the Lower Gorge/Copper Hill and El Palacio areas are most at risk of loss because of slope and sparse vegetation cover. Heavy summer rains move erosive soils in these units, resulting in increased turbidity in adjacent perennial waters.

3.8 *Migratory Birds*

An estimated 103 species of migratory birds of special management concern (NMSO 2008) either nest or migrate through the planning area. In 2007, the New Mexico Partners in Flight, representing a number of federal and state agencies as well as the New Mexico Audubon Society, The Nature Conservancy, Hawks Aloft, Inc., and various university and independent researchers, developed a list of priority migratory bird habitats, including raptors and waterfowl, in New Mexico. Many of these species are migrate through or nest on BLM lands.

Observations in upland habitats have found high avian diversity, especially in woodland habitat types. Of the priority species encountered during point count surveys conducted in the Taos Plateau area, most occurred in pinyon-juniper woodland or ponderosa pine habitat. The BLM monitors mountain plovers, a ground-nesting grassland bird, in active grazing allotments in the Taos Plateau area. Populations appear to be stable or increasing (Hawks Aloft 2007).

In most riparian areas, bird communities are consistently high in species richness and abundance due to the dense structure and limited distribution of this habitat type (NMPIF 2007). However, some riparian zones demonstrate consistent low detection rates and species richness due to spatial extent of riparian habitat (Hawks Aloft 2006).

Approximately 100 bird species can be found in sagebrush habitats (Paige and Ritter 1999). Sagebrush habitat is extensive in the northwest portion of the planning area. Priority species using this habitat include sage sparrow, Brewer's sparrow and sage thrasher. Because of their dependence on sage, these species have a limited breeding distribution in New Mexico as a whole and the persistence of sage habitat is important for maintaining these populations in the state (Bureau of Land Management National Sage-Grouse Habitat Conservation Strategy, Sec.1.3.1 Guidance for Addressing Sagebrush Habitat Conservation in BLM Land Use Plans, U.S. Department of the Interior, November 2004).

Management actions to improve habitat for migratory birds in the planning area have primarily been a byproduct of riparian habitat improvement projects. Specifically, seasonal restrictions on removal of vegetation or ground disturbing activities during the migratory bird breeding season (April through September) are imposed where feasible, and if work cannot be avoided during those timeframes, nest searches are conducted in vegetation that may be disturbed during authorized public land activities.

3.9 Special Status Species

Special status species, as defined by BLM Manual 6840, are federally listed or proposed species by the U.S. Fish and Wildlife Service, and designated BLM Sensitive Species, which include both federal candidate species and delisted species within 5 years of delisting.

Currently within the planning area, which includes eight counties in northeastern New Mexico, nine plant or animal species, and one designated critical habitat, are federally listed or proposed species by the U.S. Fish and Wildlife Service (see Appendix D). This list is made up of one plant species, two different fish species, one mammal species and five different kinds of birds. Of these species, only two, the Southwestern willow flylcatcher and the mountain plover, have the potential occur on BLM lands, as referenced in Table 4 below.

BLM Sensitive Species in the state of New Mexico total 108 species (1999). However, within the Planning Area, currently 20 species may occur or have potential habitat on BLM lands, including seven bird species, three fishes, eight species of mammals, and two plant species. New Mexico BLM is in the process of updating the BLM Sensitive Species list and, once finalized, this updated list would be used to analyze impacts to those species if they could occur within proposed project sites.

Table 4 contains the current USFWS or BLM special status species plants or animals, including designated critical habitat that may have potential habitat on BLM land in the planning area. The Taos Field Office maintains maps that identify the locations of listed species or potential habitat. These maps are updated as new species are identified as threatened, endangered, proposed or candidate for listing under the Endangered Species Act.

Table 4: Special Status Species with Potential Habitat on BLM lands in TFO

Common Name	Scientific Name	Status
Southwestern willow flycatcher (with designated critical habitat)	*Empidonax traillii extimus*	USFWS Endangered
Mountain plover	*Charadrius montanus*	USFWS Proposed
Gunnison's prairie dog (montane subspecies)	*Cynomys gunnisoni montanus*	BLM Sensitive (USFWS Candidate)
Yellow-billed cuckoo	*Coccyzus americanus*	BLM Sensitive (USFWS Candidate)
Rio Grande cutthroat	*Oncorhynchus clarki virginalis*	BLM Sensitive (USFWS Candidate)
Northern goshawk	*Accipiter gentilis atricapillus*	BLM Sensitive
Western burrowing owl	*Athene cunicularia hypugea*	BLM Sensitive
Ferruginous hawk	*Buteo regalis*	BLM Sensitive
Bald eagle	*Haliaeetus laeucocephalus alascamus*	BLM Sensitive
Loggerhead shrike	*Lanius ludovicianus*	BLM Sensitive
White-faced ibis	*Plegadis chihi*	BLM Sensitive
Plains minnow	*Hybognathus placitus*	BLM Sensitive
Flathead chub	*Platygobio gracilis*	BLM Sensitive
Townsend's big-eared bat	*Corynorhinus townsendii*	BLM Sensitive
Small-footed myotis bat	*Myotis ciliolabrum*	BLM Sensitive
Long-eared myotis bat	*Myotis evotis*	BLM Sensitive

Fringed myotis bat	*Myotis thysanodes*	BLM Sensitive
Long-legged myotis bat	*Myotis volans*	BLM Sensitive
Yuma myotis bat	*Myotis yumanensis*	BLM Sensitive
Big free-tailed bat	*Nyctinomops macrotis*	BLM Sensitive
Ripley milk-vetch	*Astragalus ripleyi*	BLM Sensitive
Santa Fe cholla	*Opuntia viridiflora*	BLM Sensitive

Southwestern willow flycatcher (w/Critical Habitat)

The only critical habitat designation within the planning area is that for the Southwestern Willow Flycatcher. The Final Rule establishing Critical Habitat for the Southwestern willow flycatcher was published on October 19, 2005 (Federal Register Vol. 70 #201) for lands identified along the Rio Grande from Taos Junction Bridge to the border of the Pueblo of Ohkay Owingeh.

The Southwestern willow flycatcher is federally and state-listed as endangered and is the highest priority special status species for BLM-Taos due to the riparian habitat found along the major river systems. The Southwestern Willow Flycatcher Management Plan (1998) describes the background and history of the species and outlines various tasks to be accomplished to protect, improve or reestablish nesting/foraging habitat on BLM administered lands within the planning area.

Flycatcher habitat is defined as those areas that the species uses or could use for nesting and foraging during the breeding season (April 15th through September 15th). Approximately 5 miles of habitat is known to be occupied by migratory Southwestern willow flycatchers (Rio Grande and Santa Fe River), with approximately 7 miles being short-term potential habitat (Rio de Truchas), and 12 miles rated as long-term potential habitat (various stream reaches throughout the planning area).

The Southwestern willow flycatcher frequents the area during summer migration and ongoing protocol surveys occur annually to monitor and report status of the species to the USFWS. The designated critical habitat incorporates developed campgrounds; a portion of the most highly used whitewater rafting area in the state, a popular fly-fishing area and carries a “scenic” river designation under the Wild and Scenic Rivers Act. The vegetation in the area is a dense tamarisk/willow association. An active native plant restoration plan is already in place, in cooperation with the USFWS, to maximize willow and cottonwood while controlling the exotic vegetation without adversely affecting the Southwestern willow flycatcher.

Across the Southwest, the Southwestern willow flycatcher has declined in extent of range occupied and population size as a result of habitat loss, modification, and fragmentation. Riparian habitats by nature are dynamic, with their natural distribution in time and space governed mostly by flood events and streamflow patterns. Natural or historic flow patterns have been greatly modified and reduced in rivers and streams, including those in the planning area. Historic patterns of river hydrology and hydraulics have been altered and regulated. Water management and flood control facilities have reduced peak discharges during seasons of high flows and have increased the duration and occurrence of minimum flows. Some watersheds are degraded, many stream channels are highly degraded, floodplain and riparian communities are reduced in extent, and the species composition of riparian communities has been modified by exotic species and livestock grazing. These conditions have significantly diminished the potential for rivers and streams to develop suitable habitat for the Southwestern willow flycatcher.

The Rio Grande is important migratory stopover habitat for the Southwestern willow flycatcher as it moves from its winter grounds in Mexico and Central America to the northeast extent of its range in San Luis, Colorado. Nesting has been documented along the Rio Grande in the vicinity of Orilla Verde as

recent as 2009; however, there has been no documented nesting of the species in any other portion of the planning area.

A portion of the critical habitat designated along the Rio Grande for the Southwestern willow flycatcher is actively being managed to control saltcedar and other herbaceous weed species, while planting native vegetation to provide the structure and ecosystem functions needed by the flycatcher and a properly functioning riparian area. The balance of existing potential Southwestern willow flycatcher habitat in the planning area contains a higher percentage of exotic vegetation than what was found there in the past. While it may provide vertical structure and nesting capability for the Southwestern willow flycatcher, studies have shown that insect availability and type in exotic vegetation is not a significant factor affecting Southwestern willow flycatcher population viability (Owen, J.C. et al. 2005).

Management of riparian areas where Southwestern willow flycatcher and bald eagle habitat exist, combined with seasonal restrictions in key areas, reduce habitat damage, minimize disturbance and improve overall habitat conditions for these species, and should result in long-term population increases. The Taos Field Office Riparian and Aquatic Habitat Management Plan (2000) presents an adaptive management strategy for maintaining, restoring, improving, protecting and expanding riparian areas in the planning area, including actions for the restoration and protection of threatened and endangered species habitat.

Mountain plover

The mountain plover is a shortgrass prairie bird. There are reports of mountain plovers breeding in 18 of New Mexico's 33 counties in all quadrants of the state. However, in recent years reports from the southern half of the state have been scarce (Williams, 1997).

Mountain plovers arrive in early March and nesting may begin as early as April; however, small chicks have also been seen as late as July. A potentially sizeable mountain plover population exists in the Taos Plateau area. BLM population monitoring studies have determined general distribution patterns for mountain plovers, and a standardized method of estimating density and population size employed distance sampling reveals a density of 0.017 mountain plovers per ha (1.7 birds/km^2). Population size over the entire monitoring area (about 48,000 ha) estimates the maximum breeding population to be 816 individuals (Hawks Aloft 2010),

Gunnison's prairie dog (montane subspecies)

Gunnison's prairie dog (montane subspecies) is a Federal Candidate Species, and its habitat occurs in the north-central and northwest part of the planning area. In 2010, there were 39 active prairie dog colonies in the Taos Plateau area, a slight decrease from the 44 colonies reported active in 2006. Estimated cumulative spatial coverage in this area is approximately 1,201 acres for the 28 active colonies where perimeter was measured. This total spatial coverage was nearly identical to that measured in 2006; however, the number of colonies contributing to the cumulative total in 2006 was much higher (n=44), thus the mean acreage per colony increased from 27.5 acres in 2006 to 42.9 acres in 2010 (Hawks Aloft 2010).

There has been an upward trend in the population in the Taos Plateau, increasing from an average estimated cumulative spatial coverage of 363 acres in 2005 to 1,209 acres in 2006, including additional sightings in the Chama area (Hawks Aloft, 2006). The major threat to this subspecies is plague due to the isolated nature of the colonies and inability to repopulate after a colony is wiped out by the disease.

Yellow-billed cuckoo

The yellow-billed cuckoo is a federal Candidate Species and its habitat may be found along large rivers where a significant cottonwood over story exists. The species is known to use the Rio Grande from Velarde south to Elephant Butte; however, it is not known to nest on BLM lands in the planning area. Surveys would be conducted in potential habitat and, if the species is found, monitoring would continue to document nest success or failure.

Rio Grande cutthroat trout

An intermountain West trout species of the family Salmonidae, its historic range is believed to include reaches and coldwater tributaries on the Rio Grande, Pecos River, and Canadian River. This species is now mostly limited to the higher elevation tributaries of these rivers. This species can interbreed with rainbow trout (*Oncorhynchus mykiss*), a species stocked throughout Rio Grande cutthroat range, as they are closely related and spawn during spring. This fact combined with the introduction of competitive species such as brown trout (*Salmo trutta*) and alteration of habitat are believed to have resulted in a reduction of species distribution. Currently, BLM manages no lands with pure populations of Rio Grande cutthroat trout, but is signatory to a range-wide conservation strategy and is working with NMDGF to implement a restoration project on the Agua Caliente.

Northern goshawk

Northern goshawk is a BLM Sensitive species and there is only one known location in the planning area in the Taos Plateau area. Further surveys are needed to confirm the exact nest location and mitigation measures applied when land use activities are proposed in this area.

Western burrowing owl

Burrowing owl is a BLM Sensitive species and is known to nest in the Taos Plateau, West Santa Fe, and Chama areas. A minimum of 14 adults and 11 young owls were documented in 2006, a sizeable increase over a total of 5 observations from 2003-2005 (Hawks Aloft 2006). In 2010, there were eight adult owls at six locations in the Taos Plateau area, with documented breeding at two of these sites (Hawks Aloft 2010). Future monitoring will determine if the apparent increases continue and provide a better understanding of the prevailing factors influencing this population in this area. Populations have not been monitored intensely in the Chama or West Santa Fe areas, although sightings in 2003 in Chama and 2009 in West Santa Fe suggest they persist.

Ferruginous hawk

Ferruginous hawk is a BLM Sensitive species and there is only one known location for a nesting pair in the Taos Plateau area. Additional surveys of this area will continue and mitigation measures applied when land use activities are proposed.

Bald Eagle

The bald eagle was removed from Federal threatened status in 2005; however it remains listed as Endangered by the State of New Mexico. Bald eagles are known to migrate to the planning area during the winter, and can be observed along the Rio Grande and in the Taos Plateau and Chama areas, as well as Ojo Caliente, West Santa Fe, and other areas adjacent to major river systems. Populations are small but stable. There are no known roost trees; however, frequent observations of bald eagles along the Rio

Grande from Orilla Verde south to Velarde are common. Formal surveys are not conducted during the winter for this species, although reports are made.

Loggerhead Shrike

The loggerhead shrike is a BLM Sensitive species and has been documented on USGS Breeding Bird Survey routes in Sabinoso and La Cienega. Loggerhead shrikes are known to use mixed shrub, sagebrush and pinyon/juniper in the planning area, having been documented on lands in the West Santa Fe and Taos Plateau Planning Units. Populations seem to be stable, but no intensive surveys have been conducted for this species.

White-faced ibis

The white-faced ibis is a BLM Sensitive species and has not been observed on BLM lands, however, it is known to migrate along the Rio Grande corridor and land in agricultural fields in Taos County. No surveys have been conducted for this species.

Plains minnow

The plains minnow is listed as a BLM sensitive species and is a native fish species in the Canadian River drainage. The species has also been introduced to the Pecos River where it has displaced the Rio Grande silvery minnow (*Hybognathus amarus*), contributing to its Federal Endangered listing. The plains minnow forages for algae and other benthic food sources. This species occurs across large areas of the U.S. though the population of the Canadian River was identified as declining in 1994, probably resulting in the BLM's Sensitive Species designation. It is expected that the BLM will remove this species from the list as BLM manages very little area in the Canadian River watershed and has limited ability to impact recovery of this fish.

Flathead chub

A member of the family Cyprinidae, which covers minnows and carps and is generally small in size (110 mm total length), this species is native to the Rio Grande, Canadian River, Pecos River, and tributaries to these streams within the planning area. The BLM has documented this species in the Rio Grande near Ute Mountain and in the Santa Fe River in La Cieneguilla. This species may occur in greater abundance on the Rio Grande, but collection methods limit our ability to collect small fish on this river. Reasons for decline in numbers of this species are unclear, but may be the result of competition from introduced species or hydrologic changes in the Rio Grande. There is currently no interagency conservation plan for this species. The BLM will continue to consider flathead chub in analysis of fish communities and work with NMDGF to maintain populations and increase distribution where appropriate habitat occurs.

Bat species (various)

In the past two decades, considerable research emphasis has been placed on bat habitat relationships and population characteristics in the western states. BLM signed a Memorandum of Understanding with Bat Conservation International in 1993 which increased BLM efforts to consider bat habitat protection in its management activities, particularly those related to abandoned mine reclamation.

Important habitat for bats can include cliffs, trees, caves and abandoned mines. One species with potential to occur in the planning area, Townsend's big-eared bat, has received management attention in other areas because of its tendency to roost in abandoned mines. Piñon-juniper habitats can also serve as

important habitat for several species of bats (Chung-MacCoubrey 2003). Of the 27 species of bats in New Mexico (Balistreri 1995), the BLM planning area is known to contain habitat for 15 of those species, including those listed as BLM Sensitive Species in Table 4 above. Auditory inventories of bats in the Rio Grande Gorge have documented over 900 passes in one night over three survey dates.

Ripley's milkvetch

Ripley's milkvetch is a BLM Sensitive species. Due to the palatability of Ripley's milkvetch and documented small sites of the plant in the Taos Plateau area, it is possible there was more Ripley's milkvetch on rangelands in the past, however, without early documentation it is difficult to determine effects of grazing on this plant species. Currently there are no known populations of the species in the planning area.

Santa Fe cholla

Santa Fe cholla is a state endangered species and BLM Sensitive species. The species has been documented on public lands and will require special management actions, including minimizing ground disturbance, closing the area to motorized vehicles and retention of ownership, to protect this population in the future. Santa Fe cholla has only been observed in three sites in northern New Mexico, one of which was recently extirpated. The population on public lands in the planning area is small, previously unknown, so there are now three known populations of the species in the region once again.

3.10 *Vegetation*

The planning area has a wide range of vegetation zones and habitat types. Ranging from a mix of ponderosa pine (*Pinus ponderosa*), juniper (*Juniperus spp.*), pinyon pine (*Pinus edulis*), gambel oak (*Quercus gambelii*), and mountain mahogany (*Cercocarpus montanus*) in the woodland areas, to understory composed of various grasses, and forbs, including blue grama (*Bouteloua gracilis*), side-oats grama (*Bouteloua curtipindula*), buffalo grass *(Buchloe dactyloides)*, longleaf squirreltail (*Elymus longifolius*), lupine (*Lupinus spp.*), and broom snakeweed (*Gutierrezia sarothrae)* in the rangeland areas. Sagebrush communities, a highly regarded ecotype by BLM and the New Mexico Department of Game and Fish, is found throughout the north and western portions of the planning area. Riparian areas are typically dominated by cottonwood *(Populus deltoides)* and coyote willow (*Salix exigua*) Saltcedar *(Tamarix spp.)*, Siberian elm (*Ulmus pumila*) and Russian olive *(Eleagnus angustifolia)* are significant non-native invaders.

Vegetation descriptions for the Taos Field Office planning area are described by vegetation categories, which were developed by Southwest Re-Gap and are described in the Draft Taos Resource Management Plan and Draft Environmental Impact Statement (USDI BLM 2010). Although there are 56 vegetation categories identified for the Taos Field Office, 92 percent of the terrestrial vegetation land cover is comprised of only eight categories. These categories include: Southern Rocky Mountain Pinyon-Juniper Woodland (31 percent), Inter-Mountain Basins Semi-Desert Shrub Steppe (21 percent), Inter-Mountain Basins Big Sagebrush Shrubland (20 percent), Southern Rocky Mountain Juniper Woodland and Savanna (14 percent), Inter-mountain Basins Semi-desert Grassland (8 percent), Rocky Mountain Ponderosa Pine Woodland (3 percent), Inter-mountain Basins Montane Sagebrush Steppe (2 percent), and Western Great Plains Shortgrass Prairie (2 percent).

3.11 *Visual Resources*

A diverse variety of landscapes exist in the planning area. The Taos Plateau is the second largest volcanic field in the Rio Grande Rift. Landforms in the Taos Plateau area include isolated peaks, cinder cones, shield volcanoes, and sheet flows. The sheet flows are well-exposed in the Rio Grande gorge. The most prominent shield volcano is Ute Mountain, rising to 10,093 feet. Vegetation includes grasses and sage at the lower elevations rising to pinon-juniper upslope and fir and aspens on the highest peaks. Sweeping southwest, the steep Rio Chama canyon offers striking color contrast with fading orange cliff walls stained black patina rimmed with ponderosa pine and lined with vivid green riparian vegetation. Downstream near Ojo Caliente the converging floodplains of the Ojo Caliente, Rio Chama, and Ojo Oso are broad and flat defined by a meandering band of cottonwoods, willow, New Mexico olive and salt cedar. The texture of foothills, weathered cliffs, and arroyos are fine, sandy alluvium deposits in muted tans, buff, pale orange, and pink. The slopes of Mesa Prieta (Black Mesa) contain a coarseness of large, dark grey, and black volcanic boulders.

Continuing southeast is the Chimayo Valley which offers complexity and harmony from green valley bottoms, to light red cliffs, to blue mesas and mountains. Panoramic views of the valley from woodland foothills near Cerro Piñon are expansive and extend to the Sangre de Cristos on the east and Black Mesa on the west. It is a rural valley of many repeating small meandering cliffs and bluffs with light tan, pink and rust exposed alluvium slopes.

Moving south again near Santa Fe, Diablo Canyon with its dramatic vertical tan, rust, and dark brown patina cliffs leads to the Rio Grande. From the flat top of La Bajada Mesa, are views into the Galisteo Basin. The Cerrillos Hills appear as a repeating series of steep, oblong and symmetrical hills rising sharply and giving Santa Fe a prominent and well known landmark on the horizon.

Landscapes in the planning area were rated and described in detail as part of the Visual Resource Inventory, (VRI) conducted in 2006. For a comprehensive overview of the inventory, refer to the *Scenic Quality & Public Interest Summary 2006.*

Visual resource indicators are defined by the Visual Resource Inventory Handbook H-8410-1, 1986. These indicators are combined to determine VRI inventory class objectives; ranging from Class I to Class IV. Visual Resource Management (VRM) classes are determined through the land use planning process.

Class I - Aims to preserve the existing character of the landscape. Level of change should be very low and must not attract attention.

Class II - Aims to retain the existing character of the landscape. The level of change should be low. Management activities may be seen, but should not attract the attention of the casual observer.

Class III - Aims to partially retain the existing character of the landscape. The level of change should be moderate. Management activities may attract attention but should not dominate the view of the casual observer.

Class IV - Allows management activities requiring major modifications to the existing character of the landscape. The level of change may be high. Management activities may dominate the view. However, every attempt will be made to minimize the impact and aim to repeat the basic elements in the landscape.

All four classes are found in the planning area. See Table 5 below for the Visual Inventory and Currently Established Management Classes.

Table 5: VRM - Inventory and Currently Established Management

VRM Class	Acreage

I	49,190
II	167,520
III	272,990
IV	105,400

3.12 *Water Quality*

3.12.1 – Surface Water The planning area is divided up into three major surface water basins with ninety percent of the area lying in the Upper Rio Grande Basin. The remaining ten percent consists of small, scattered parcels and lies within the Pecos and Canadian River basins. Major tributaries of the Rio Grande River with a high percentage of public land include the Red River, Rio Pueblo de Taos, Embudo Creek, and the Rio Chama.

Water quantity is quite variable within the planning area. Although the planning area provides a large percentage of water for the State of New Mexico, it is highly dependent on precipitation, which varies from year to year. Reductions in precipitation can affect all water sources, including wells and springs, which are often recharged by surface sources. Recent drought periods from 2001 to 2003 resulted in an overall decline in depth to water in many wells in Taos County, reduced annual flow, peak flow and base flow in perennial streams, and resulted in dry range tanks.

Indicators for water quality depend on the use. BLM water uses include: noncommunity domestic, livestock domestic, high quality cold water fishery, marginal cold water fishery, and secondary human contact via recreation. Table 6 is a listing of impaired streams identified by the New Mexico Environment Department.

Table 6: NMED listed impaired streams within the Taos Field Office.

Reach ID and Name	Designated Use	Impairment Category*	Miles of BLM
NM-2116.A_030 - Canjilon Creek (Perennial reaches Abiquiu Res. to headwaters)	high quality coldwater aquatic life (fish culture)	5/5A	0.42
NM-2116.A_010 - Cañones Creek (Abiquiu Reservoir to headwaters)	high quality coldwater aquatic life (fish culture)	5/5A	0.46
NM-2214.A_090 - Cow Creek (Pecos River to Bull Creek)	high quality coldwater aquatic life (fish culture)	4A	0.24
NM-2111_40 - Embudo Creek (Canada de Ojo Sarco to Picuris Pueblo boundary)	marginal coldwater aquatic life	5/5C	3.05
NM-2111_41 - Embudo Creek (Rio Grande to Canada de Ojo Sarco)	marginal coldwater aquatic life	4A	2.06
NM-2118.A_10 - Galisteo Creek (intermittent reaches above Santo Domingo boundary)	high quality coldwater aquatic life	5/5B	0.36
NM-2213_00 - Pecos River (Tecolote Creek to Canon de Manzanita)	marginal coldwater aquatic life	5/5A	1.08
NM-2119_10 - Red River (Rio Grande to Placer Creek)	coldwater aquatic life	4A	3.49
NM-2120.A_900 - Rio de los Pinos (New Mexico reaches)	high quality coldwater aquatic life (fish culture)	4A	0.32
NM-2111_00 - Rio Grande (Cochiti Reservoir to San Ildefonso boundary)	marginal coldwater aquatic life	5/5A	1.05
NM-2111_10 - Rio Grande (non-pueblo Santa Clara to Embudo Creek)	marginal coldwater aquatic life	5/5C	2.74
NM-2119_05 - Rio Grande (Red River to Colorado border)	coldwater aquatic life	5/5C	27.31
NM-2120.A_600 - Rio Hondo (Rio Grande to USFS boundary)	high quality coldwater aquatic life (fish culture)	4A	0.44
NM-2116.A_060 - Rio Nutrias (Rio Chama to headwaters)	high quality coldwater aquatic life (fish culture)	5/5A	1.19
NM-2119_20 - Rio Pueblo de Taos (Rio Grande to Arroyo del Alamo)	coldwater aquatic life	4A	0.25

NM-2118.A_52 - Rio Quemado (Santa Cruz River to Rio Arriba County boundary)	high quality coldwater aquatic life	5/5C	2.34
NM-2111_50 - Santa Cruz River (Santa Clara Pueblo boundary to Santa Cruz Dam)	marginal coldwater aquatic life	5/5C	0.2
NM-9000.A_061 - Santa Fe River (Santa Fe WWTP to Nichols Reservoir)	aquatic life	5/5C	0.39
NM-2110_00 - Santa Fe River (Cochiti Reservoir to Santa Fe WWTP)	marginal coldwater aquatic life	5/4A	6.05

*Impairment categories are defined as follows:
1. Attaining the water quality standards for all designated and existing uses.
2. Attaining some of the designated or existing uses based on numeric and narrative parameters that were tested, and no reliable monitored data is available to determine if the remaining uses are attained or threatened.
3. No reliable monitored data and/or information to determine if any designated or existing use is attained.
4. Impaired for one or more designated uses, but does not require development of a TMDL because:
   a. TMDL has been completed
   b. Other pollution control requirements are reasonably expected to attain the water quality standard in the near future
   c. Impairment is not caused by a pollutant
5. Impaired for one or more designated or existing uses:
   a. A TMDL is underway or scheduled
   b. A review of the water quality standard would be conducted
   c. Additional data would be collected before a TMDL is scheduled

3.12.2 – Ground Water The development of ground water in the planning area is under the administration of the New Mexico Office of the State Engineer which defines ground water basins for water rights purposes. A general map of those basins can be obtained from the State Engineer. The Santa Fe Formation is the major aquifer in the region. Water in this basin can be encountered at depths of about 250 to 750 feet beneath the surface. Perched ground water tables yielding an intermittent water supply can also be found at shallow depths along arroyos.

3.13 *Wildlife*

Wildlife population sizes and species diversity within the planning area varies depending upon extent and type of habitat. Dry upland habitat may support low species diversity and scattered populations over extensive areas, while riparian habitat and lands adjacent to them contain more plant and animal species during certain seasons than much larger areas year-round.

The New Mexico Department of Game and Fish used the Southwest Regional Gap Analysis to delineate landscape scale key wildlife habitats in the Comprehensive Wildlife Conservation Strategy for New Mexico (NMDGF 2005). Nine key terrestrial habitats and three key aquatic habitats are located in the Planning Area. Tables 7 and 8 lists the kind and amount these key habitats for wildlife and are contained in each of the planning units (planning units, defined in the Draft Taos Resource Management Plan and Draft Environmental Impact Statement, coincide with public lands in the respective areas).

Table 7
Wildilfe Key Terrestrial Habitats

Planning Unit	Surface (Additional Subsurface) Acres						
	Inter-Mountain Basins Big Sagebrush Shrubland	Western Great Plains Shortgrass Prairie	Madrean Pine-Oak/Conifer-Oak Forest & Woodland	Riparian	Rocky Mountain Alpine-Montane Wet Meadow	Rocky Mountain Montane Mixed Conifer Forest and Woodland	Western Great Plains Sand Sagebrush Shrubland
Taos Plateau	93,113 (153,420)	N/A	0 (5)	583 (2,206)	27 (1,746)	1,945 (113,070)	N/A
Lower Gorge/Copper	3,929 (0)	N/A	1 (1)	792 (14)	N/A	111 (1)	N/A

Hill							
Chama	**12,819 (31,148)**	**N/A**	**0 (13)**	**177 (7,481)**	**32 (5,248)**	**708 (172,939)**	**N/A**
Ojo Caliente	**0 (7)**	**N/A**	**N/A**	**783 (2,460)**	**N/A**	**3 (7,295)**	**N/A**
El Palacio	**N/A**	**N/A**	**N/A**	**570 (1,682)**	**N/A**	**0 (19)**	**N/A**
West Santa Fe	**N/A**	**N/A**	**0 (25)**	**279 (1,777)**	**0 (5)**	**0 (70,928)**	**N/A**
Galisteo	**N/A**	**2,125 (69,959)**	**2 (136)**	**50 (1,939)**	**N/A**	**135 (365)**	**N/A**
East Side	**0 (55)**	**6,812 (330,637)**	**56 (264)**	**4,329 (13,973)**	**3 (569)**	**84 (132,501)**	**1 (17,713)**
TOTAL	**109,861 (184,575)**	**8,937 (400,596)**	**59 (444)**	**7,563 (31,532)**	**62 (7,568)**	**2,986 (497,118)**	**1 (17,713)**

Table 8
Wildlife Key Aquatic Habitats

Planning Unit	**Surface (Additional Subsurface) Miles**		
	Perennial 1st and 2nd Order Streams	**Perennial 3nd and 4th Order Streams**	**Perennial 5th Order Streams**
Taos Plateau	**1 (322)**	**4 (10)**	**51 (6)**
Lower Gorge/Copper Hill	**7 (0)**	**3 (4)**	**15 (0)**
Chama	**11 (440)**	**1 (52)**	**N/A**
Ojo Caliente	**1 (21)**	**6 (27)**	**0 (1)**
El Palacio	**6 (3)**	**0 (9)**	**0 (9)**
West Santa Fe	**6 (115)**	**0 (1)**	**1 (11)**
Galisteo	**1 (2)**	**N/A**	**N/A**
East Side	**4 (433)**	**5 (77)**	**N/A**
TOTAL	**37 (1,336)**	**19 (180)**	**67 (27)**

In general, priority wildlife habitats (large areas of BLM land important for big game, raptors, and special status species) are located in the Taos Plateau, Chama, Lower Gorge/Copper Hill, West Santa Fe, and Ojo Caliente areas.

Riparian areas, such as the Rio Grande and Rio Chama and other perennial streams represent corridors necessary for migration of amphibians, bats, migratory waterfowl and other wildlife species. Big game corridors exist along the New Mexico/Colorado state border from the San Juan mountain range to the Taos Plateau, and the volcanic cones of Pot Mountain, Wind Mountain, Montoso, Chiflo and Ute Mountain to the Sangre de Cristos. Critical winter and summer range for elk and mule deer is located throughout the planning area. For migratory birds, the Central Migratory Flyway is centered on the north/south ridges of the mountains of central New Mexico, including the Sangre de Cristo and San Juan Mountains, in the planning area. The Sandia Mountains have been noted for the large number of migrating raptors utilizing the prevailing winds and thermals generated by these ridges (NMAPPWG 2004). These migration patterns include BLM lands along the Rio Grande, Rio San Antonio, Rio Chama, Canadian River, Pecos River, Santa Fe River, and in the Galisteo Basin in the vicinity of the San Pedro Mountains.

Caves and abandoned mines provide a unique habitat type that is required by certain habitat specialists, such as many species of bats that are also listed as sensitive by the BLM. Caves can be found on scattered BLM lands near Taos in the canyon near Pilar, south to Velarde, in the Copper Hill and Rio Embudo areas, the vicinity of Ojo Sarco and Rio Chama, as well as other areas near Santa Fe and Cerrillos. Abandoned mines of various types occur in the planning area. The Taos Field Office does not maintain an inventory of abandoned mines on public land. However the New Mexico Energy, Minerals, and Natural Resources Department maintains a website with such data (http://www.emnrd.state.nm.us/MMD/GISMapandMineData.htm).

Important snag species include ponderosa pine, Douglas fir, piñon and juniper. Species that depend on snags include bats, woodpeckers, flickers, and most breeding birds and eagles as perch sites. Data from fuelwood monitoring studies include a high density of snags in the more southern treatment sites (31 Mile), including 84-47 snags per acre for piñon and 15-5 snags per acre for juniper, while the northern portion of the planning area in the Taos Plateau have far fewer snags, as documented by 9-3 snags per acres for pinon and 3-5 snags per acre for juniper.

Downed woody material provides habitat for avian as well as small mammal species and insects. Downed woody material provides a microhabitat for grasses and flowering plants to grow, which provides habitat for macroinvertebrates, which provide food for reptiles, birds, rodents and in some cases black bears. While woody material provides habitat for rodents and small mammals, those species represent a food source for coyotes, fox, and other predators such as owls or mountain lions. There is no current data for amount of downed woody material in woodlands on BLM lands; however, it is incorporated into prescriptions to provide for wildlife habitat.

Key management prescriptions for wildlife are summarized in the Taos Resource Management Plan (1988), Rio Grande Corridor Final Plan (2000), the Riparian/Aquatic Habitat Management Plan (2000), the Rio Chama Management Plan (1990), the La Cienega ACEC Management Plan (1995), the San Antonio/Pot Mountain Habitat Management Plan (1992) and the Ute Mountain Interim Management Plan (2003).

Primary big game species in the planning area are mule deer, elk, pronghorn, and as a result of recent reintroduction, Rocky Mountain bighorn sheep. The New Mexico Department of Game and Fish (NMDGF) is the agency with the authority and responsibility for managing big game population numbers. The BLM works in partnership with NMDGF to establish population goals in big game management units that include public land and to manage habitats to try to achieve those goals. Other big game species which occur in the planning area are black bear and mountain lion. Neither species occurs in large numbers nor has there been any specific habitat management directed toward them. Merriam's turkey, listed as a big game species by NMDGF, also occurs in the planning area.

The most common upland game bird found in the planning area is the scaled quail, however, they are not found in large numbers. Migratory bird species legally harvested include mourning dove, band-tailed pigeon, ducks, geese, coot, and other waterfowl as authorized under NMDGF rules and regulations. Commonly hunted nongame species include coyotes, skunks, rabbits and rock squirrels.

The Upper Rio Grande in the Taos Plateau area is particularly important nesting habitat for raptors, including golden eagle, red-tailed hawk, ferruginous hawk, prairie falcon, peregrine falcon, American kestrel, osprey, Northern harrier, Swainson's hawk, Cooper's hawk, and great horned owl. Other areas with high priority raptor habitat are Chama, Lower Gorge/Copper Hill, and West Santa Fe. In addition, in cooperation with the NMDGF, reintroduction of the river otter has resulted in a self-sustaining population of at least 30 individuals.

Prairie dog towns occur throughout the planning area and serve as important habitat for many wildlife species. Several species of birds, such as horned larks, ferruginous hawks, and golden eagles frequent prairie dog towns in search of food. Three species of wildlife of management concern are very closely associated with prairie dog towns: the mountain plover, burrowing owl, and black-footed ferret.

The most common medium sized mammal across the planning area is the coyote, which is abundant across all habitat types. Other small predators include the ringtail, grey fox and bobcat, but they do not occur in large numbers. Small mammal productivity varies considerably from site to site and year to year depending on habitat conditions. For the most part, small mammal productivity is considered low. Occasional "boom" years can be observed in such species as cottontail and prairie dog; however, in most species high production years are not obvious or easily observed.

3.14 *Human Health and Hazardous Materials*

The three major urban areas in the planning area, Santa Fe, Española, and Taos, are major contributors to the spread of weeds. This is due to the travel corridors going in and out of the areas and the recreational use and trash dumping associated with them. The continued growth of these areas and the exurban and rural residential development provide opportunities for weeds due to the corridors and ground disturbance required for construction activities. Although these activities occur primarily on private land, weeds do not recognize political and private boundaries. The dumping of trash on public land from individuals cleaning yards and fields provides avenues for expansion of weeds.

Chapter 4: Environmental Effects

4.1 Direct and Indirect Effects -- Assumptions for Analysis

This chapter describes the anticipated effects on the resource issues if the alternatives are implemented. The general effects of each alternative on resource categories are addressed. Direct effects are caused by an action and occur at the same time and place. Indirect effects are caused by an action and occur later in time or farther removed in distance.

For the purposes of the environmental effects analysis, the BLM can make assumptions about the size and scope of how the Proposed Action would be carried out. It is assumed that most projects would be carried out along roadways (see Appendix E) and in disturbed areas such as pipelines and powerlines. It can also be assumed that there would be no more than 2,000 acres treated in one year. Riparian areas would also have higher concentrations of projects conducted under the Proposed Action. It is assumed that multiple treatments would be needed for each project area over subsequent growing seasons in order to achieve the desired control of noxious and invasive species.

4.1.1 Alternative A: Proposed Action

As described in section 2.1, the Proposed Action would be conducted on BLM land administered by the Taos Field Office. Management actions include controlling the spread of non-native invasive plants and noxious weeds by using a rapid response-spot treatment control method.

4.1.1.1 *Air Quality*

Impacts on air quality would be temporary, localized, and quickly dispersed throughout the immediate area. These factors, combined with the mitigation measures (see Appendix A) would minimize the significance of potential impacts. Federal, State, and local air quality regulations would not be violated.

Manual control methods would have little impacts on air quality. Manual treatments using chainsaws would have minimal impacts to air quality and would include the release of pollutants such as CO, NO2, SO2, and VOC's (Volatile Organic Compounds) from the engines of chainsaws, weed eaters, and chippers (ENSR, 2005). These pollutants are associated with vehicle and equipment exhaust as well as fugitive dust. Fugitive dust is dust created by vehicle traffic on unpaved roads.

Treatment with prescribed fire would have an immediate, but short term impact on air quality in the planning area. A number of air pollutants are found in smoke emissions from prescribed fires. These include CO_2, CO, PM_{10}, $PM_{2.5}$, and VOCs. Carbon Dioxide and water vapor make up the majority of emissions (about 90%) from prescribed fire (Prescribed Fire and Fire Effects Working Team, 1985). Approximately 20 pounds of VOCs are produced for each ton of fuel consumed (Schaaf 1994).

The effects of herbicide use on air quality originate primarily from ground vehicle exhaust emissions and fugitive dust resulting from herbicide transport and application. Volatilization or evaporation of liquid herbicide to gas may temporarily result in herbicides in the air. The standard operating procedures (see Appendix C) for ground-based application of herbicides would limit the amount of drift into non-target areas and unintended locations. The standard operating procedures would also limit the amount of herbicide released into the air through volatilization.

4.1.1.2 *Climate Change*

The assessment of Green House Gas (GHG) emissions, their relationship to global climatic patterns, and the resulting impacts is an ongoing scientific process. It is currently not feasible to know with certainty the net impacts from the Proposed Action on climate—that is, while BLM actions may contribute to the climate change phenomenon, the specific effects of those actions on global climate are speculative given the current state of the science. The BLM does not have the ability to associate a BLM action's contribution to climate change with impacts in any particular area. The technology to be able to do so is not yet available. The inconsistency in results of scientific models used to predict climate change at the global scale coupled with the lack of scientific models designed to predict climate change on regional or local scales, limits the ability to quantify potential future impacts of decisions made at this level and determining the significance of any discrete amount of GHG emissions is beyond the limits of existing science. When further information on the impacts to climate change is known, such information would be incorporated into the BLM's planning and NEPA documents as appropriate.

There is an assumption, however, that certain related activities in the alternatives (e.g. mechanical, herbicidal, and fire treatments) would contribute to short-term emissions of GHGs for the duration of a given project. Examples of some of these short term activities or sources, which may contribute to GHS include energy use in the form of vehicles and other engines like chainsaws or weed eaters which would be used to carry out invasive species removal projects. GHG emissions from these sources include Carbon Dioxide from fossil fuel combustion.

4.1.1.3 *Areas of Critical Environmental Concern*

The presence of noxious or invasive species degrades many of the values ACECs are established to protect relevant and important values including wildlife habitat, cultural, paleontological, scenic, and riparian resources. Where wildlife habitat is a relevant and important value, eradicating or preventing the spread of these species would prevent further habitat degradation. Short-term impacts in treated areas

would include the removal of the target vegetation, altering the habitat in small areas. Treated areas would transition to native vegetation over time. Long-term impacts would be positive as this occurs.

Potential impacts to other resources are discussed under their respective sections below. Where paleontological resources are protected as a relevant and important value, any surface disturbing action would require a paleontological survey in advance of the project to ensure any such resources could be avoided or otherwise appropriately mitigated.

4.1.1.4 *Cultural Resources*

Ground disturbance associated with proposed treatment activities could impact the condition and integrity of cultural resources. The use of manual or mechanical treatments could disturb both surface and subsurface cultural resources. However, these impacts would be minimal and would have the least potential to impact known cultural resources.

Short-term effects may include an increase in erosion due to the initial loss of vegetation cover. Erosion is a major cause for the loss of archaeological resources. Long-term effects of the proposed project would likely have a positive effect on cultural resources due primarily to forest, grassland and watershed restoration which should reduce long term erosion.

The use of prescribed fire as a treatment method could result in the destruction of cultural features constructed of wood. As a general rule, fire does not affect buried cultural materials. Studies show that even a few inches of soil cover are sufficient to protect cultural materials (Oster n.d.). Intense, high temperature fires can alter archaeological features such as fire hearths and artifacts. However, these possible impacts to inventoried sites can be reduced or eliminated through protective measures taken during the burning operation, such as foaming or black-lining around existing sites. The use of fire in areas where cultural resources are known to exist can increase the visibility of cultural sites as a result of vegetation burn-off and consequently increases the potential for vandalism and theft.

The effects of herbicide use on cultural resources would depend on the method of herbicide application and the herbicide type used. Utilizing the standard operating procedures outlined in Appendix C would reduce the possibility of impact to cultural resources from herbicide treatments.

As discussed in section 2.1, archeological inventories would be performed before any treatment projects are conducted. The intensity of archaeological inventory would be determined for each proposed project based on the potential for earth disturbing activities, fuel types, projected site types, etc. Inventory methods would help mitigate potential impacts to cultural resources.

4.1.1.5 *Livestock Management*

The goals of rangeland management for livestock include suppressing plant species that are undesirable and/or toxic and improving forage production by controlling competing vegetation. Livestock could be affected directly by ingesting poisonous weeds and indirectly by changes in forage supply and herbicide exposure. All treatments that successfully reduce the cover of noxious weeds on rangelands would benefit livestock by increasing the number of acres suitable for grazing and the quality of forage. Noxious weed infestations can greatly reduce the land’s carrying capacity for domestic livestock, which tend to avoid most weeds (Olson 1999).

The use of manual or mechanical treatments would have minimal effects to livestock because these treatments would target the undesirable species. In many cases the target species are avoided by livestock. Cattle in particular, preferentially graze native plant species over weeds, which often have low palatability as a result of toxins, spines, and /or distasteful compounds (Young 1992).

Herbicide treatments are generally applied in a form or at such low rates that they do not affect livestock. Since livestock should be specifically removed from the project area during vegetation treatment, as directed on the herbicide label, treatments could be scheduled to occur when livestock were not present. Livestock managers must adhere to the re-entry interval as specified on the herbicide label.

Over the short term, the use of prescribed fire as a treatment method would likely reduce the cover of grass and forb species available to livestock. Livestock would also have to be relocated during the treatment. In some cases livestock would need to be kept off of treated areas for a short time after a prescribed fire in order to give forage ample time to recover. The length of time would vary based on site conditions, but would generally range from two to four growing seasons (Stinson 2001). However, due to the small scale and scope of the Proposed Action, excluding livestock may not be necessary at all. Consultation with BLM Rangeland specialists would be conducted on a case by case basis concerning livestock exclusion for all treatment areas. This post-treatment rest could be considered a negative impact for grazing permitee holders, as alternative grazing must be located for the livestock normally using the treated area.

4.1.1.6 *Riparian Vegetation*

Short-term direct impacts would be similar to those described in Section 4.1.1.9 (Vegetation) of this EA, meaning non-target species would not be adversely affected by manual, mechanical, prescribed fire or herbicide use treatments. Open water would not be adversely affected using ground-based equipment that is either vehicle mounted or hand sprayers, when applying the standard operating procedures (see Appendix C) described in the Proposed Action. Long-term and indirect impacts would be beneficial habitat within riparian/wetland areas due to the removal or control of noxious weeds, as determined by monitoring plans (See Appendix D of the ROD for the PEIS).

Due to the scope and scale of the Proposed Action, manual and mechanical treatments would be unlikely to have an adverse effect on riparian and aquatic areas. In most cases, unwanted vegetation near a riparian area could be removed without disturbing more desirable species. Fuel and lubricant spills that could result from using chainsaws and trimmers would be contained or cleaned up before contamination spread to surrounding areas. With mechanical treatments erosion can be a problem on slopes greater than 15%. Thus, mechanical methods would be avoided on steep slopes near riparian areas.

The effect of prescribed fire as a treatment method in riparian areas would be dependent on the natural fire regime of the area, the time of year that burning occurred, and the extent of the prescribed fire. In riparian areas where vegetation density is usually high, the potential for hotter, more extensive burns is elevated (Thompson and Shay, 1984). However, due to the small scope and scale of the Proposed Action and the likelihood that most prescribed burns in riparian areas would consist of pile burns instead of broadcast burns the effect to riparian systems would be minimal.

The use of herbicide treatments would have a limited compounded effect to riparian systems because of the small scale and scope of the Proposed Action. An increase in soil erosion and surface water runoff could result from vegetation reduction near riparian and wetland areas, which could lead to streambank erosion and sedimentation (Ott 2000). The amount and likelihood of streambank erosion and sedimentation would be directly proportional to the size of the treatment area. Some herbicides such as sulfomenturon methyl which absorbs into soil particles could be carried offsite by surface runoff. This

could increase the risk to native vegetation in riparian areas. Additional impacts could include unintentional applications of herbicides in riparian areas. Accidental spills of herbicides could be very damaging to native riparian vegetation and could degrade water quality in these areas.

4.1.1.7 *Soils*

Impacts to soils would occur where soil is exposed to wind and water forces. A combination of bare soil surface caused by vegetation removal or changes in community structure, erodible soils, and slope leads to greatest potential for soil damage. Highly erodible soils on steep slopes occur most frequently in the Lower Gorge/Copper Hill and El Palacio areas, but are also found occasionally in other areas within the Taos Field Office planning area.

Vegetation treatments may directly affect the physical characteristics of soil, alter the abundance and types of vegetation that may shield it from erosion, or alter the presence and abundance of microorganisms or larger organisms that contribute to overall soil quality. The removal or destruction of biological soil crusts could adversely affect soils by increasing susceptibility to erosion, encouraging weed establishment, and reducing nitrogen inputs and water infiltration (Belnap et al. 2001). However, there would be little soil disturbance associated with the Proposed Action because of the scale and scope of this action. It is expected that the increased basal ground cover of grasses and forbs would improve watershed conditions. Runoff and soil erosion would be slowed with greater on-site retention of precipitation. Non-point source pollution is expected to decrease in the short and long-term.

Manual treatments would have short term soil disturbing impacts limited to the area once occupied by the target species. Limiting the number of people and the amount of time spent in each site would help minimize trampling (Tu et al. 2001). Removing the target species would have substantial positive long term impacts to soils. The increased organic matter caused initially by leaves, stems and roots of the treated plants and secondarily by the increased production of grasses and forbs would improve the fertility of the soil.

Prescribed burning may increase the erosion potential until the perennial vegetation reestablishes. Extremely intense fires would cause a higher than desired mortality on all plant species, resulting in the exposure of excess amounts of bare ground over a longer period of time and, consequently, greater soil loss. However, extremely intense burning would be avoided by burning within favorable prescriptions. Because fibrous-rooted perennial grass species increase soil stability, soil erosion would be reduced below present levels when grasses become re-established. Burning increases nutrient cycling by releasing nutrients that had been tied up in litter and plant material back into the soil. Soil temperatures of burned areas are usually higher than those of adjoining unburned areas. This is part of the reason that burned areas typically green-up earlier than unburned adjoining areas.

Although herbicides would not alter a soil's physical properties, there may be indirect effects on microorganisms. Depending on the application rate and the soil environment, herbicides can either stimulate or inhibit soil organisms. When herbicide-treated vegetation decomposes, the resulting addition of organic matter to the soil can support increased populations of microorganisms. The competition for water and nutrients would be decreased as the treatment takes effect. Grasses and herbaceous plants may be affected by the treatment during the first year. An increase in ground cover (grasses and forbs) is expected by the second growing season. This ground cover would help minimize erosion and increase infiltration of the surface water. Some soil micro-organisms may be negatively impacted for the short term duration of the treatment. Microbial activity is expected to resume at present levels once dispersion of the herbicide is complete.

4.1.1.8 *Migratory Birds*

To avoid direct impacts to migratory birds, non-native vegetation removal activities would be scheduled to take place outside of the migratory bird breeding season (April 15 – September 15) when feasible, and if work cannot be avoided during those timeframes, nest searches by a qualified BLM wildlife biologist would be conducted in vegetation that may be disturbed during authorized activities. Therefore, the Proposed Action has the potential to have a negative effect upon individual birds and/or the nesting habitat of nesting birds, but not of their eggs or young; however, it is unlikely there would be a notable impact to the populations of species of conservation concern.

4.1.1.9 *Special Status Species*

Weed treatments would aid in the conservation of native biodiversity and would reduce the likelihood of placing any native species on a special status species list. For rangelands, actions that move towards attainment of Fundamentals of Rangeland Health Standards would restore, protect, and enhance resources needed to allow native species to flourish in their historical proportions.

Because the design features, as outlined in the Proposed Action, eliminate treatment of any potential or existing Federally listed species habitat, or Federally designated critical habitat, it is determined that there would be no Federally listed species or designated critical habitat likely to occur in any specific project area. Therefore, the Proposed Action will have no affect on federally listed threatened or endangered wildlife species.

Mountain plover is a ground-nesting bird that could be impacted by any off-road activity associated with the treatment methods during the breeding bird season. If avoidance of the species nesting habitat cannot be accomplished during the breeding season, nest searches by qualified BLM wildlife biologist would avoid any direct impacts to the species by delineating and avoiding active nest sites. Therefore, it is determined that the Proposed Action would not jeapordize the continued existence of the species.

There could be a positive result for BLM Special Status species by implementing a control program over non-native vegetation that would provide a more diverse habitat.

It is possible that migrating or wintering Bald Eagles could use project areas for foraging. No direct or indirect impacts to nesting or breeding habitat would be associated with the Proposed Action; however, foraging habitat may be impacted in the short-term. If present within the project area, Bald Eagles would most likely avoid an active work area, and foraging opportunities may be temporarily reduced. However, the re-establishment and protection of native vegetation is expected to increase both biological diversity and habitat structure within the area. Therefore, there could be short-term negative impacts and long-term positive impacts to the bald eagle associated with the Proposed Action if the species is present.

4.1.1.10 *Vegetation*

Noxious weed treatments would have both beneficial and adverse effects on terrestrial vegetation. Target species in treated areas would be directly affected. When using the rapid response-spot treatment technique described in the Proposed Action, non-target species may be directly affected depending on their proximity to target species. The degree to which vegetation would be affected would depend on the number of acres treated. The overall effect of treating weeds would be to achieve the desired succession stage, and to create a more stratified age structure of native vegetation for wildlife habitat improvement and livestock grazing.

Manual or mechanical treatment would have both short term and long term positive impacts on vegetation with the removal of target species. Growth of herbaceous plants often increases after mechanical treatments as a result of reduced competition with woody species for light, nutrients, and water (Cox et al. 1982).

Prescribed fire typically does not kill southwestern grass species. This is because fires are usually fast moving and do not burn into the root crown. This allows the grass plants to re-sprout. Grass species recovery is dependent upon post-treatment precipitation, plant vigor prior to burning, relative humidity at time of burning, and post-treatment grazing pressure. Depending upon the amount of post-treatment precipitation, grasses can recover as quickly as the first growing season. Without sufficient post-treatment moisture, recovery could take several years to reach pre-treatment levels and support less desirable species during the interim.

Annual plants are generally more sensitive than perennial plants to herbicide treatments because they have limited food storage mechanisms and annual plant populations are greatly reduced if plants are killed before producing seed. Perennials are most sensitive when exposed to herbicides during periods of active growth. Exposure to herbicides during active growth and before plants become reproductive also would have the greatest negative effect on populations of many annuals. The ability of annual or perennial plants to maintain viable seeds in the soil for several years reduces their susceptibility to herbicides.

Response of non-target species to broad-spectrum herbicides may be highly dependent on the method of application. The use of selective herbicides would minimize the effects of herbicides to non target species. Damage to non-target species is minimized with spot treatment on individual plants and if non-target species are tolerant of these herbicides applied at rate sufficient to reduce target species.

Plants may vary greatly in their sensitivity to different herbicides. Effectiveness of herbicides may vary with different climatic and soil conditions. Soil-applied herbicides are less effective on fine textured soil relative to coarse-textured soil, because herbicide molecules may be adsorbed to clay colloids. Response of non-target plant species to herbicides depends not only on their susceptibility to the herbicide directly, but also on their response to a decrease of target plant species in the community.

4.1.1.11 *Visual Resources*

The use of manual, mechanical, prescribed fire, or herbicide vegetation treatments on flat terrain, such as sagebrush communities, may have less contrast to the characteristic landscape than treatments on steeper terrain, such as pinon- juniper woodlands, which may be more visible from greater distances. The affects of mechanical treatments on visual resources may be temporary, and may only last until the reestablishment of native vegetation on the treatment site. Vegetative treatments of typically twenty-five acres or less is unlikely to cause dramatic visual contrasts. However, the impact depends on the landscape character of the specific area and the VRI or VRM objectives. This would be determined by completing a Visual Contrast Rating worksheet to determine if the project meets visual objectives and to incorporate appropriate mitigating measures in the project design such as repeating elements of form, line color, texture to minimize contrast, use of key observation points, use of topography to screen treatments, scalloping and feathering edges of treatments, and scattering rocks and debris as appropriate to camouflage contrast.

4.1.1.12 *Water Quality*

The BLM is required to meet all Federal water quality regulations administered by the New Mexico Environment Department (NMED). The NMED also has authority over other land owners within the state

except for Tribal Lands, which are administered either by the EPA or by Tribal environmental offices. Given NMED's current authority and monitoring program, the forecast would be for no net decline in water quality within the planning area due to the Proposed Action.

4.1.1.12.1 Surface Water

The effects of manual and mechanical treatments to surface water quality would be largely dependent on the proximity of the treatment site to a stream or water body, and the slope of the site. The effects from manual and mechanical treatments would be minimal on surface water quality due to the small scale and scope of the Proposed Action.

Prescribed fire use as a treatment method would have little effect to surface water quality due to the small scale and scope of the Proposed Action. Low severity burns are less likely to degrade surface water quality and quantity. However, the potential for an increase in erosion exists with the use of prescribed fire if follow-up treatments that would include reseeding are not carried out in a timely manner following the initial treatment.

Herbicides may enter surface water during treatment through accidental direct application or drift, or after treatment through surface or subsurface runoff. To pollute the water, herbicides must be present in the water at concentrations high enough to impair water quality at point of use.

Buffer zones reduce drift impacts on sensitive areas, while wind increases drift impacts. After treatment, herbicides may enter streams by subsurface flow or by movement in ephemeral channels. Key factors that would affect peak concentration include the presence of buffers, storm size, herbicide properties, soil properties, and downstream mixing and dilution.

Large storms rarely produce high concentration because herbicides are diluted by large water volumes, while small storms may not produce enough flow to move herbicides into streams. Intermediate storms often produce higher concentrations of pesticides in streams relative to the other two situations because the resulting stream flow is sufficient to mobilize the herbicides but not large enough to substantially dilute the material.

The amount of herbicide available for movement from the site of application with surface or infiltrating water would be determined, in part by the herbicides persistence. Herbicide persistence is usually expressed in terms of "half-life" which is the typical length of time needed for one-half of the total amount applied to break down to substances that are no longer of toxicological concern. While an herbicide's soil half-life in practice is influenced by local conditions such as soil type and climate, it is useful for describing the relative rates at which various herbicides are broken down in the soil.

Sunlight, temperature, soil and water pH, microbial activity and other edaphic characteristics may affect the breakdown of herbicides. Soil organic matter and soil properties such as moisture, temperature, aeration, and pH all affect microbial degradation. Microbial activity increases in soil that is warm and moist with a neutral pH. In addition to microbial action, chemical degradation of herbicides can occur by reaction with water, oxygen, or other chemicals in the soil. As soil pH becomes extremely acidic or alkaline, microbial activity usually decreases; however, these conditions may favor rapid chemical degradation.

4.1.1.12.2 Ground Water

Impacts to ground water by manual treatment would be negligible because of the vegetation recovery from both reseeding and the natural succession of native plants back into the treatment area. Follow-up

treatments and monitoring would be necessary to ensure that weed species would not reestablish within the project area.

Impacts to ground water as the result of prescribed burning would be negligible because of the vegetation recovery after application.

After treatment, herbicides may move through the soil and into underlying ground-water aquifers by leaching. Herbicide mobility and persistence greatly affect potential for leaching. To pollute ground water, they must then move laterally at concentrations high enough to impair water quality at a point of use. Herbicides move most easily through sand, which is the most porous soil and has the least adsorption potential. The potential for ground-water contamination increases as the depth to the water table and distance to the point of use decrease. Applied at typical rates, herbicides should never occur in ground-water supplies at concentrations exceeding a small fraction of EPA's most stringent drinking-water standards.

Mobility depends on solubility and adsorption; persistence depends on degradation mode and rate. The leaching index is a relative ranking of the 19 herbicides based upon their chemical properties only. The higher the value, the greater the potential that the herbicides would move through the soil profile with infiltrating water.

To address the potential for ground water contamination the Record of Decision for the 2007 Vegetation Treatment PEIS lists mitigation measures for water resources (see Appendix A). The mitigation measures direct BLM to identify potentially vulnerable areas by factoring depth to water, net recharge, aquifer media, soil media, topography, impact to unsaturated zone, and gross hydraulic conductivity.

4.1.1.13 *Wildlife*

Use of timing restrictions would minimize impacts to wildlife. These timing restrictions would exclude treating during critical wildlife breeding or staging periods, including those for big-game such as deer, elk, bighorn sheep, and pronghorn. However, due to the small scale of proposed rapid response treatments, there would be limited impact to the availability of browse and forage for wildlife species. The Proposed Action is likely to create habitat conditions that exhibit an increased production of native understory grasses and forbs and would produce smaller unbroken blocks of weed monocultures. Under the Proposed Action, the management area would be less susceptible to large stand replacement weed invasions, thus increasing the native cover and forage that many wildlife species require.

Manual and mechanical treatments are especially effective in sensitive areas, such as wetland and riparian habitat, or near habitats of plant and animal species of concern, where greater control over treatment effects is required or effects to non target species are a concern. Manual and mechanical treatments would be unlikely to have an adverse effect wildlife species that are mobile because these species are likely to leave the treatment area and because of the small scale and scope of the Proposed Action. Less mobile species may not be able to leave the treatment area which may result in disturbance and stress. These effects should be short term in nature.

Because of the relatively small scale and scope of the Proposed Action, there would be limited impact to wildlife species and habitat due to the use of prescribed fire as a treatment method. Habitats would quickly recover from fire treatments; the effects of habitat loss to species with non-secure populations could persist over the long term and make populations more susceptible to local extirpation.

The Proposed Action in general is not likely to have an adverse effect on wildlife species because of the small scale and scope. However, herbicides used properly or improperly can potentially harm wildlife

individuals, populations, or species (USDA Forest Service 2005). Harm at the population or species level is unlikely for non-special status species because of the size and distribution of treatment areas relative to the dispersal of wildlife populations and the foraging area and the behavior of individual animals. Implementing the standard operating procedures for applying herbicide (see Appendix C) should reduce the effect of treatments to wildlife species and habitat.

4.1.1.14 *Human Health and Hazardous Materials*

As previously indicated, this EA is tiered to the 2007 Vegetation Treatment PEIS. In the PEIS, Volume 2, Appendix B, Human Health Risk Assessment discloses the human health risk of using the herbicides described in the Proposed Action. Volume 2, Appendix C, Ecological Risk Assessment, discloses the risk to the environment, including wildlife, of using the herbicides described in the Proposed Action.

The Proposed Action reduces the risks caused by chemical drift by prescribing ground-based application. The no-treatment buffers around water bodies and water sources have proved effective in the past for treatments in other field offices and would be used for prospective treatments. The standard operating procedures for applying herbicide (see Appendix C) and the mitigation measures (see Appendix A) would reduce risks to human health to undetectable levels.

The Proposed Action would produce positive impacts by removing the hazards posed by noxious and invasive weeds from the environment.

4.1.2 Alternative B: No Action

Under the No Action alternative, noxious weeds and non-native plants would continue to flourish and spread. This would result in degraded wildlife habitat, reduced forage availability for livestock and wildlife, reduced biological diversity, and watersheds not capable of functioning at their full potential.

4.1.2.1 *Air Quality*

The No Action alternative could have some have short term localized benefits to air quality. Taking no action would reduce nitrogen dioxide, hydrocarbons, carbon monoxide, and particulate matter from motor vehicles caused by traveling to and from the site of the target species. Many roads within the planning area are dirt roads that when disturbed by vehicles can cause blowing dust which contributes to air pollution.

4.1.2.2 *Climate Change*

It is assumed that certain related activities under the No Action alternative (e.g. monitoring of weed infestations) would contribute to short-term emissions of GHGs for the duration of a given project. Examples of some of these short term activities or sources, which may contribute to GHS include energy use in the form of vehicles used to monitor and inventory the spread of weed infestations. GHG emissions from these sources include Carbon Dioxide from fossil fuel combustion.

4.1.2.3 *Areas of Critical Environmental Concern*

The No Action alternative would have a continued negative impact to the values that Areas of Critical Environmental Concern were established to protect. These were established to care for wildlife habitat and natural and scenic values among others. Taking no action would leave non-native invasive plants and noxious weeds to thrive in ACEC's until more time consuming actions can be planned and implemented.

4.1.2.4 *Cultural Resources*

The No Action alternative would have no short-term effects on noncombustible cultural resources. Combustible cultural resources could be at a greater risk under the No Action alternative due to the higher risk for wildfire associated with monocultures of non native invasive plants and noxious weeds. Long-term effects on cultural resources could include less opportunity for accurate surveys due to noxious weed invasions.

4.1.2.5 *Livestock Management*

The No Action alternative could allow plants and weeds that are potentially poisonous to livestock to continue to grow uncontrolled. Livestock could be affected directly by ingesting poisonous weeds and indirectly by changes in forage supply due to overgrown non-native invasive weeds or noxious plants outcompeting native vegetation.

4.1.2.6 *Riparian Vegetation*

Under the No Action alternative, there would be on the whole increased vitality and higher stand density of weeds. Long-term impacts could be a decline in native plant species, decreased biodiversity, and a reduction in the quality of the riparian ecosystems within the planning area.

4.1.2.7 *Soils*

Under the No Action alternative, the area would support less native ground-cover vegetation, and retain noxious weed characteristics which would support a large community replacement weed invasion. Many non-native invasive plants and noxious weeds if left untreated can change soil composition. Invasions of alien plants can indirectly affect native plants and change ecosystems by altering soil stability, promoting erosion, colonizing open substrates, affecting the accumulation of litter, salt, or other soil resources (Brooks et al., 2004).

4.1.2.8 *Migratory Birds*

The No Action alternative could increase food sources for migratory birds because species like Russian olive provides forage for migratory birds in the form of berries. The No Action alternative would also impact ground nesting, grassland, and scrublands migratory birds because of the change to native vegetation composition due to monocultures created under noxious and non-native species invasions.

4.1.2.9 *Special Status Species*

A No Action alternative could create long term changes to the food base for special status species. Non-native invasive plants and noxious weeds could out-compete native vegetation, thus creating monocultures of weed species. Because of this change to the native vegetation composition the macro-invertebrates and small mammals that utilize current native vegetation for habitat would be forced to find different native habitat or may decline due to lack of habitat. These macro-invertebrates and small mammals are the food base for many special status species.

Because treatment of any potential or existing Federally listed species habitat, or Federally designated critical habitat, is not being considered in this EA, it is determined that the No Action alternative will have no affect on Federally listed threatened or endangered wildlife species.

4.1.2.10 *Vegetation*

Under the No Action alternative, weeds present within the planning area would continue to exist and would likely expand their dominance. This would result in the vegetation moving more toward a monoculture of invasive and noxious species instead of natural vegetation and native biodiversity. Biodiversity would likely be in decline under this No Action alternative.

4.1.2.11 *Visual Resources*

There is some potential under the No Action alternative that visual resources may degrade if there were uncontrolled overgrowth of non native invasive species and noxious weeds. This would be more likely to affect specially designated areas such as designated Wilderness and Wilderness Study Areas which are managed for VRM Class I.

4.1.2.12 *Water Quality*

The No Action alternative would have impacts to ground water quality from changes in soil composition caused by saline deposited into the soil by species such as saltcedar. Surface and subsurface water levels would continue to be impacted by the increase of invasive species density along riparian corridors and the increased evapotranspiration that occurs as a result. Water use by exotic species would continue to be high (New Mexico Office of the State Engineer and the Interstate Stream Commission, Framework for Public Input to a State Water Plan, 2002).

4.1.2.13 *Wildlife*

The No Action alternative is likely to create habitat conditions that would exhibit a decreased production of native understory grasses and forbs and would produce larger unbroken blocks of weed monocultures limiting wildlife habitat quality. Under the No Action alternative, the management area would also be more susceptible to large stand replacement fires, which could remove the native cover and forage that many wildlife species require.

4.1.1.14 *Human Health and Hazardous Materials*

Under the No Action alternative, the proposed action for the rapid response to weed infestations would not be implemented. There would be no impact or risk to workers and/or members of the public in or near the project area due to treatment methods. However, there would be an impact to human health by not treating weed species because some of these species are known to pose a health hazard to humans.

4.2 Cumulative Effects Analysis

A cumulative impact, as defined in 40 CFR 1508.7, is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable actions regardless of what agency (Federal or non-Federal) or person undertakes such other action.

Reasonably foreseeable future projects in the Taos Field Office area conducted by private individuals or federal, state, or local agencies include fuelwood thinning, prescribed burning, sagebrush removal, domestic grazing, or surface disturbing activities (e.g. construction of a utilities corridor). BLM projects would primarily restore native vegetation and ecosystem functionality in the watershed, based on agency priorities and budgets.

Cumulative impacts from the Proposed Action would be minimal, while the cumulative impacts of no treatment would be much more drastic. Areas infested by noxious weeds on BLM land in the West have increased from 2.5 million acres in 1985 to 8.5 million acres in 1994. Using the estimated national average spread rate of noxious weed spread of 2,000 to 2,300 acres per day on BLM land (Dewey et. al. 1995). The aggressive nature of noxious weeds prevents other plants form surviving which creates pure stands of noxious weeds. Pure stands of noxious weeds are not useable as forage by wildlife or livestock.

Currently areas with noxious weed infestations within the planning area are generally located along roads and from there, spread into the adjacent rangelands. The most common vector for expansion of noxious weeds is vehicle traffic. That is, the tires, wheels, and the vehicle undercarriage pick up seeds from noxious weeds and transport those seeds to other areas. Activities authorized by the BLM, such as rights-of-way development, contain conditions of approval that require permit or grant holders to eradicate or control noxious weeds that occur as result of the permit or grant holder's actions.

Monitoring information within the planning area indicates that spread of noxious weeds by off-highway vehicles (OHVs) is a minor vector. The OHV areas would, however, continue to be monitored for the presence of noxious weeds and would be treated should infestations occur.

Monitoring information and anecdotal evidence indicates livestock and wildlife are minor vectors in the spread of noxious weeds. If livestock and wildlife were major vectors, an observer would note weed infestations distinctly separate from existing infestations along roadsides and separated by some distance. BLM staff and others have not seen that kind of movement. Instead, the most common vector for the spread of noxious weeds appears to be wind, vehicle traffic, and runoff from precipitation.

In addition to the Proposed Action for treating weeds, there are two other project areas in which vegetation manipulation uses or would use herbicides to enhance current rangeland conditions. These areas are located in the Taos Plateau and Cebolla/Abiqui areas. The Taos Plateau area covers parts of Cerro Montoso and Pot Mountain. These are mentioned here in the context of cumulative impacts of grassland restoration efforts on a large scale. The goal of these projects is not to eradicate weed species but rather to reduce and control some native species such as sagebrush in order to restore grasslands.

The Proposed Action is the treatment of weed species to reach the goals and objectives desired for plant community. Environmental considerations are presented to mitigate impacts and include standard operating procedures for noxious weed treatments, as well as specific design features that would be developed for individual treatments and environmental conditions.

4.2.1 Cumulative Effects

4.2.1.1 *Air Quality*

Treatments with prescribed fire would have an immediate, but short term impact on air quality in the immediate area due to smoke. Mechanical treatments would have an immediate short-term impact on air quality due to chainsaw particulates and exhaust. Other impacts to air quality might come from nearby pollutants such as oil and gas developments, road maintenance, and regular traffic.

4.2.2.2 *Climate Change*

The incremental contributions to global GHG gases as a result of the proposed alternatives cannot be translated into effects on climate change globally or in the area of this site-specific action. As stated in the direct/indirect effects section under climate change, the assessment of GHG emissions and the

resulting impacts on climate is an ongoing scientific process. It is currently not feasible to know with certainty the net impacts from the Proposed Action on global or regional climate—that is, while BLM actions may contribute to the climate change phenomenon, the specific effects of those actions on global climate are speculative given the current state of the science. Therefore, the BLM does not have the ability to associate an action's contribution in a localized area to impacts on global climate change.

4.2.2.3 *Areas of Critical Environmental Concern*

There would be no cumulative effects to Areas of Critical Environmental Concern due to the Proposed Action.

4.2.2.4 *Cultural Resources*

BLM staff archaeologists have been integrated into the assessment process to promote proactive, long-term management of cultural resources. Proposed activity areas, which have not been intensively inventoried, and at-risk resources would be delineated for minimizing activity impacts with their perimeters. No cumulative impacts to cultural resources within the planning area would occur under either alternative.

4.2.2.5 *Livestock Management*

Cumulative impacts from rangeland restoration treatments to enhance livestock forage, prescribed broadcast burns, and other vegetation restoration projects would result in surface and vegetation disturbance. These treatments in the short term would disturb and remove vegetation and could potentially impact livestock grazing forage within the planning area. In the long term, these management actions would assist with maintaining and improving the overall vegetation conditions for a variety of resource objectives including increases of forage of native grasses for livestock grazing.

4.2.2.6 *Riparian Vegetation*

Cumulative impacts to riparian ecosystems from the actual implementation of operations would be minimal. Treatments in the short-term would disturb and remove vegetation. In the long-term, these management actions would assist with improving and restoring the overall conditions of the riparian and aquatic ecosystems.

4.2.2.7 *Soils*

Cumulative effects of each alternative would be similar to its direct effects. Non-herbicide treatments may result in nutrient decrease, erosion, reduction in mycorrhizal hyphae, increased bare ground, and decreased litter layer, which transient effects are given revegetation with native or non-invasive species. Soil compaction, loss of microbiotic crusts, formation of hydrophobic surface layer on soil, and loss of volatized nitrogen, phosphorus and potassium may have longer term effects and need to be minimized or eliminated through site-specific Standard Operating Procedures. Some herbicides are metabolized by soil bacteria, while others are toxic to soil microorganisms or no information about effects to these organisms is available. Picloram, chlorsulfuron, and imazapic are relatively water soluble and could move off-site in water. These herbicides are moderately adsorbed to soil particles and could be moved off-site with wind or mass soil movement.

The potential adverse effects to soils from the Proposed Action are small in comparison to the potential effects of invasive plants themselves and other influences. In the long term, restoration of healthy native plant communities proposed in this EA would have beneficial impacts on soils.

4.2.2.8 *Migratory Birds*

While there could be short-term impacts to individual birds due to disturbance during implementation, there would be long-term benefits from an increase in diversity of vegetation. Cumulative actions could also result in a slight reduction in the quantities of forage from non-native vegetation.

4.2.2.9 *Special Status Species*

Cumulative impacts to special status species include actions from the Proposed Action to enhance wildlife habitat with positive benefits to special status species. These treatments in the short term could disturb and remove some vegetation. In the long term, these management actions would assist with improving biodiversity that could benefit special status species.

4.2.2.10 *Vegetation*

Over several years time, the cumulative effects of not treating invasive plants would be biologically significant and outweigh most concerns about effects on non-target plants and native plant communities. For example, salt cedar is a highly invasive plant that is already present within the planning area and spreading rapidly in riparian zones in stream and river corridors. Without additional treatment options (herbicide use), populations of invasive plants, including salt cedar, are expected to continue to expand in size, increase in number, and spread elsewhere, displacing native plants and plant communities, and, in the process, degrading native ecosystems. Overall, manual, mechanical, and herbicide treatments would have an insignificant biological effect as far as harming native plants and plant communities if the project is implemented with the appropriate mitigation measures. Treatments could be expected to benefit native plants and plant communities and special status plants by restoring native habitats and plant communities.

4.2.2.11 *Visual Resources*

The anticipated 2000 maximum acres of treatment annually is not expected to cumulatively affect the characteristic visual landscapes.

4.2.2.12 *Water Quality*

Even if the invasive weed treatments are occurring at the same time on both Federal and nonfederal lands, the potential for sediment-related cumulative effects is very low considering the negligible amount of sediment expected to reach perennial streams from either manual, mechanical, or herbicide treatments of invasive plants.

The potential for cumulative effects is negligible considering the insignificant amount of herbicide or sediment expected to reach surface water due to implementation of Standard Operating Procedures that would minimize the amount and type of herbicides that actually reach surface water, and the distance between potential treatment areas.

4.2.2.13 *Wildlife*

Cumulative impacts of the proposed management actions on wildlife populations include disturbance from machinery, administrative motor vehicle use, and prescribed fire. There would also be short-term impacts to individual species due to disturbance during the implementation phase of the project; however, there would be long-term benefits from an increase in diversity of vegetation composition and structure.

In general, the cumulative impacts of this forest restoration project on wildlife would be positive. This project would reduce fuel loadings and decrease threats of catastrophic wildfires that bring temporary loss of wildlife habitat until, or if, recovery is accomplished. The Proposed Action in combination with other Federal actions would lead to more diverse woodland ecosystems that are healthy and sustainable.

4.2.2.14 *Human Health and Hazardous Materials*

Most of the herbicides used by the BLM do not pose a risk to human receptors when applied at the typical application rate (see Volume 1 Chapter 4 of the 2007 PEIS for a discussion on the cumulative impacts of treatments. By strictly complying with application instructions for each product, not cumulative impact is expected. This is further assured by the limited maximum potential application of herbicides per year across the planning area.

Chapter 5: Consultation and Coordination

5.1 Summary of Consultation and Coordination

The following people or agencies have been contacted regarding the Proposed Action to solicit input. Any comments and suggestions expressed during this scoping effort have been incorporated into this Environmental Assessment.

Federal and State Agencies
New Mexico Department of Game and Fish
New Mexico Department of Agriculture
New Mexico Environmental Department
U.S. Fish and Wildlife Service
Natural Resources Conservation Service
USDA Carson National Forest
USDA Resource Conservation and Development Program

Organizations/Interested parties
New Mexico Wilderness Alliance
Santa Fe County Manager
Taos Pueblo War Chief
San Miguel County Manager
Rio Arriba County
New Mexico State Library
Mora County Manager
Los Alamos County Administrator
Harding County Manager
Earth Justice Legal Defense Fund
Tierra y Montes Soil and Water Conservation District
Western Mora Soil and Water Conservation District
Mora Wagon Mound Soil and Water Conservation District
Mesa Soil and Water Conservation District
Eight Northern Pueblos Council
Edgewood Soil and Water Conservation District
Northeastern Soil and Water Conservation District
Canadian River Soil and Water Conservation District

Santa Fe Pojoaque Soil and Water Conservation District
Colfax Soil and Water Conservation District
Taos Soil and Water Conservation District
East Rio Arriba Soil and Water Conservation District
Upper Chama Soil and Water Conservation District
Colfax County Extension Office
Harding County Extension Office
Los Alamos County Extension Office
Mora County Extension Office
Rio Arriba County Extension Office
San Miguel County Extension Office
Santa Fe County Extension Office
Taos County Extension Office
Union County Extension Office
Amigos Bravos
Ute Creek Soil and Water Conservation District
Public Lands Council
Wild Earth Guardians
Union County Manager
Taos County Manager
Pueblo of Ohkay Owingeh
Southern Ute Tribe
The Nature Conservancy
Pueblo of Santa Clara
Hawks Aloft
The National Audubon Society
Taos Noxious Weeds Committee
ALP Cultural Resources
Pueblo of Tesuque
Pueblo of Nambe
Pueblo of Picuris
Northern New Mexico Stockman Association
Jacarilla Apache Tribe
Pueblo of Taos
Upper Rio Grande Watershed Group
Pueblo of San Ildefonso
People for the USA
New Mexico Wilderness Alliance
The Navajo Nation
Taos County Extension Agent
New Mexico Association of Conservation Districts

Individuals
Private land owners.
Range/grazing allotment permitees.

5.2 Summary of Public Participation

On July 2, 2009, the BLM Taos Field Office sent a scoping letter out to members of the public and organizations that have been identified as interested parties through the Taos Field Office Weeds Management Program. This scoping letter was intended to inform the interested parties that the BLM was in the process of developing a plan to address the spread of invasive species and noxious plants on public lands administered by the Taos Field Office. This initial letter was distributed to 118 interested organizations and local government entities as well as 20 individuals or private land owners. The initial comment period identified in this public scoping letter was open until July 24, 2009.

On July 8, 2009, a news release was posted on the New Mexico BLM news release website which was entitled "Public Invited to Comment on Plan of Development for Noxious Plants" In this release members of the public were encouraged to provide the Taos Field Office with any information concerning relevant issues or other pertinent information by July 31, 2009.

On July 16, 2009, the same news release that was posted on the BLM website was published in the Taos News. Members of the public were likewise encouraged to provide the Taos Field Office with information and relevant issues by July 31, 2009.

On December 8, 2009, an additional public scoping letter was mailed out to interested parties. This scoping letter was intended to inform the public of the BLM's plan to complete an environmental assessment which would be used as a rapid response treatment tool to aid in the removal and control of weed species. This second letter was sent to 233 holders of grazing allotment permits throughout the Taos Field Office. The comment period identified in this public scoping letter was open for comments until January 15, 2010.

5.2.1 Public Comments Analysis

To be completed following public comment on this document.

5.3 List of Preparers

NAME	TITLE	REVIEWED/TASK
Rudolph Pacheco	FMO, Farmington District	Assisted with Editing EA
Raul E. Hurtado	Lead Biological Technician (Fire)	Prepared/reviewed Document
Greg Gustina	Fisheries Hydrologist	Watershed
Valerie Williams	Wildlife Biologist	Wildlife/Migratory Birds/SSS/Riparian
Merrill Dicks	Archaeologist (Fire)	Archaeology
Jacob Young	Rangeland Management	Reviewed Document
Tami Torres	Outdoor Recreation Planner	Visual Resource Management
Patricio Martinez	Geographic Information Specialist	Maps, Arc GIS, Data
Kyle Sahd	Fire Management Specialist	Reviewed Document
Brad Higdon	Planning & Environmental Coordinator	Reviewed Document/Content
Peter Hoagland	Biological Technician (Fire)	Lead Preparer, miscellaneous

Chapter 6: References

Belnap, J. R. Rosentreter, S. Leonard, J.H. Kaltenecker, J. Williams, and D. Eldridge. 2001. Biological Soil Crusts: Ecology and Management. USDI BLM National Science and Technology Center. Report Technical Reference 1730-2. Denver, CO.

Brooks, Matthew L., Carla M. D'Antonio, David M. Richardson, James B Grace, Jon E. Keeley, Joseph M. Ditomasoo, Richard J. Hobbs, Mike Pellant, and David Pyke. Effects of Invasive Alien Plants on Fire Regimes, 2004 BioScience Vol. 54 No. 7:677.

Brooks, M. and M. Lusk. 2008. Fire Management and Invasive Plants: a Handbook. USFWS, Arlington VA.

Campbell, C.J. and W.A. Dick-Peddie. 1964. Comparison of phreatophyte communities on the Rio Grande in New Mexico. Ecology 45:492-502.

Cox, J.R., F.A. Ibarra, and M.H. Martin. 1990. Fire Effects on Grasses in Semiarid Deserts. Pages 43-49 in Symposium on Effects of Fire in Management of Southwestern Natural Resources (J.S. Krammes, technical coordinator). General Technical Report RM-191. USDA Forest Service, Rocky Mountain Forest and Range Experiment Station. Fort Collins, CO.

Cronk, Q., and J. Fuller. 1995. Plant Invaders: The Threat to Natural Ecosystems. Chapman & Hall. New York.

Dewey, Steven A., Michael J.Jenkins, and Robert C. Tonioli. 1995. Wildfire Suppression: A Paradigm for Noxious Weeds Management. Weed Technology, Weed Science Society of America.

ENSR, 2005. Air Quality Modeling for BLM Vegetation Treatments Programmatc EIS. Prepared for the USDI BLM Nevada State Office, Reno, Nevada. Westford, MA.

Enquist, Carolyn and Gori, Dave. Implications of Recent Climate Change on Conservation Priorities in New Mexico. April 2008.

Goddard Institute for Space Studies. 2007. Annual Mean Temperature Change for Three Latitude Bands. Datasets and Images. GISS Surface Temperature Analysis, Analysis Graphs and Plots. New York, New York. (http://data.giss.nasa.gov/gistemp/graphs/Fig.B.lrg.gif.)

Hawks Aloft, Inc. 2007. 2007 Mountain plover monitoring in Taos County, New Mexico. Hawks Aloft, Inc. Albuquerque, NM.

Intergovernmental Panel on Climate Change (IPCC). Climate Change 2007, Synthesis Report. A Report of the Intergovernmental Panel on Climate Change.

Intergovernmental Panel on Climate Change (IPCC). 2007. Climate Change 2007: The Physical Basis (Summary for Policymakers). Cambridge University Press. Cambridge, England and New York, New York. (http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-spm.pdf)

Invasive Plants Atlas of the United States, http://www.invasiveplantatlas.org/index.html Website developed by The University of Georgia - Center for Invasive Species and Ecosystem Health and the National Park Service in cooperation with the Invasive Plant Atlas of New England, Invasive Plant Control, Inc., USDA Forest Service, USDA NRCS PLANTS Database, Lady Bird Johnson Wildflower Center, National Association of Exotic Pest Plant Councils and PCA's Alien Plant Working Group.

National Academy of Sciences (NAS). 1968. Principles of Plant and Animal Pest Control, Volume 2: Weed Control. Washington D.C.

New Mexico Department of Agriculture 2009. New Mexico Noxious Weeds List. Accessed 2/1/10 http://nmdaweb.nmsu.edu.

New Mexico State Engineer and Interstate Stream Commission 2002. Framework for public input to State Water Plan.

New Mexico Partners in Flight (NMPIF) 2007. New Mexico bird Conservation plan, Version 2.1. C. Albuquerque, NM.

Olson, B.E. 1999. Grazing and Weeds. Pages 85-97 in Biology and Management of Noxious Rangeland Weeds (R.L. Sheley and J.K. Petroff, eds.). Oregon State University Press. Corvallis, OR.

Oster, E. No Date. The Effects of Fire on Subsurface Archeological Materials. In Wildland Fire in Ecosystems: Effects of Fire on Cultural Resources and Archeology (K.C. Ryan and A.T. Jones, eds.). Rainbow Series, USDA Forest Service Rocky Mountain Research Station. Fort Collins, CO.

Ott, R. 2000. Factors Affecting Stream Bank and River Bank Stability, with an Emphasis on Vegetation Influences. Prepared for the Region III Forest Practices Riparian Management Committee. Tanana Chiefs Confrence, Inc. Forestry Program. Fairbanks, AK.

Paige, C.; Ritter, S.A. 1999. Birds in a sagebrush sea, Managing sagebrush habitats for bird communities. Partners in Flight Western Working Group, Boise, ID.

Prescribed Fire and Fire Effects Working Team, 1985. Prescribed Fire Smoke Management Guide. National Wildfire Coordinating Group. Boise, ID.

Renz, Mark and Frank Sholedice, 2006, Troublesome Weeds of New Mexico, New Mexico State University Cooperative Extension Service.

Schaaf, M.D. 1994. Wildfire and Air Quality. Pages 82-88 in Proceedings of the Conference on Forest Health and Fire Danger in Western Forests. Harmen Press. Spokane, WA.

Stinson, K. 2001. Prefire and Postfire Grazing Management. Pages 178-190 in National Wildfire Coordinating Group. Fire Effects Guide. Fire Use Working Team, National Interagency Fire Center. Boise, ID.

Thompson, D.J., and J.M. Shay, 1984. The Effects of Fire on *Phragmites australis* in the Delta Marsh, Manitoba. Canadian Journal of Botany 63: 1864-1869.

Tu, M., C. Hurd, and J.M. Randall. 2001. Weed Control Methods Handbook: Tools and Techniques for Use in Natural Areas. Wildland Invasive Species Program. The Nature Conservancy.

USDA Forest Service, 2005. Preventing and Managing Invasive Plants, Final Environmental Impact Statement. U.S. Department of Agriculture Forest Service Pacific Northwest Region. http://www.fs.fed.us/r6/invasiveplant-eis/.

USDA Forest Service 2008. The Southwest Region and Climate Change.

USDA Natural Resources Conservation Service, 2010. Ecological Site Description System for Rangeland and Forestland. Accessed 6/3/10. http://esis.sc.egov.usda.gov.

USDI BLM, 2003. Bureau of Land Management, Taos Field Office. Monitoring Protocol for Hazardous Fuels Reduction Prescribed Fire, and Forest/Range Restoration Activities.

USDI BLM, 2004. Bureau of Land Management national sage-grouse habitat conservation strategy, Sec. 1.3.1 Guidance for addressing sagebrush habitat conservation in BLM land use plans. USDI, Washington D.C.

USDI BLM, 2007. Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement.

USDI BLM, 2008. New Mexico BLM migratory bird list, as developed on June 23, 2008, from the NM/OK BLM Migratory Bird Workshop, June 10; Santa Fe, NM.

USDI BLM, 2010. Bureau of Land Management, Taos Field Office. Draft Environmental Impact Statement. Resource Management Plan.

USDI and USDA 2008. Interagency Prescribed Fire Planning and Implementation Procedures Guide.

USDI USFWS, 2010. Endangered Species List by County for New Mexico. Accessed 3/23/10 http://www.fws.gov/southwest/es/EndangeredSpecies/lists/ListSpecies.cfm

Westbrooks, R.G. 1998. Invasive Plants: Changing the Landscape of America. Federal Interagency Committee for the Management of Noxious and Exotic Weeds. Washington D.C.

Young, J.A., 1992. Ecology and Management of Medusahead. Great Basin Naturalist 52:245- 252.

APPENDIX A

Mitigation Measures

Adopted from the ROD for the PEIS (Table 2)

Resource	Mitigation Measures
Air Quality	None proposed
Soil Resources	•Consult Soil Survey for specific mitigation. •On slopes greater than 15%, implement erosion protection to reduce soil loss.
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 downgradient 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 (ERAs) prepared for the PEIS for more specific information on appropriate buffer distances under different soil, moisture, vegetation, and application scenarios. • 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. • At the local level, consider effects to special status fish and other aquatic organisms when designing treatment programs.
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. • 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 apply bromacil or diuron in rangelands, and use appropriate buffer zones to limit contamination of off-site rangeland vegetation.
Paleontological and	• Do not exceed the typical application rate when applying 2,4-D,

Cultural Resources	bromacil, diquat, diuron, fluridone, hexazinone, tebuthiuron, and triclopyr in known traditional use areas. • Limit diquat applications to areas away from high residential and traditional use areas to reduce risks to Native Americans and Alaska Natives.
Visual Resources	None 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 Resources, Wildlife Resources, and Human Health and Safety).
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. • 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.

APPENDIX B

U.S. Fish and Wildlife Service Listed, Proposed and Candidate Species (with Designated Critical Habitat) by NM Counties within BLM Taos Field Office (www.fws.gov/southwest/es/newmexico)

Colfax County			
Common Name	Scientific Name	Species Group	Listing Status
Arkansas River shiner	*Notropis girardi*	Fishes	Threatened
Mountain plover	*Charadrius montanus*	Birds	Proposed
Black-footed ferret	*Mustela nigripes*	Mammals	Endangered
Mexican spotted owl w/Critical Habitat	*Strix occidentalis lucida*	Birds	Threatened
New Mexican meadow jumping mouse	*Zapus hudsonius luteus*	Mammals	Candidate
Piping plover	*Charadrius melodus*	Birds	Threatened
Rio Grande cutthroat trout	*Oncorhynchus clarki virginalis*	Fishes	Candidate
Southwestern willow flycatcher	*Empidonax traillii extimus*	Birds	Endangered
Harding County			
Common Name	Scientific Name	Species Group	Listing Status
Arkansas River shiner	*Notropis girardi*	Fishes	Threatened
Mountain plover	*Charadrius montanus*	Birds	Proposed
Black-footed ferret	*Mustela nigripes*	Mammals	Endangered
Lesser prairie-chicken	*Tympanuchus pallidicinctus*	Birds	Candidate
Los Alamos County			
Common Name	Scientific Name	Species Group	Listing Status
Mountain plover	*s Charadrius montanus*	Birds	Proposed
Black-footed ferret	*Mustela nigripes*	Mammals	Endangered
Mexican spotted owl w/Critical Habitat	*Strix occidentalis lucida*	Birds	Threatened

Southwestern willow flycatcher	*Empidonax traillii extimus*	Birds	Endangered
Yellow-billed cuckoo	*Coccyzus americanus*	Birds	Candidate
New Mexican meadow jumping mouse	*Zapus hudsonius luteus*	Mammals	Candidate
Mora County			
Common Name	Scientific Name	Species Group	Listing Status
Arkansas River shiner	*Notropis girardi*	Fishes	Threatened
Mountain plover	*Charadrius montanus*	Birds	Proposed
Black-footed ferret	*Mustela nigripes*	Mammals	Endangered
Mexican spotted owl w/Critical Habitat	*Strix occidentalis lucida*	Birds	Threatened
New Mexican meadow jumping mouse	*Zapus hudsonius luteus*	Mammals	Candidate
Rio Grande cutthroat trout	*Oncorhynchus clarki virginalis*	Fishes	Candidate
Southwestern willow flycatcher w/Critical Habitat	*Empidonax traillii extimus*	Birds	Endangered
Yellow-billed cuckoo	*Coccyzus americanus*	Birds	Candidate
Rio Arriba County			
Common Name	Scientific Name	Species Group	Listing Status
New Mexican meadow jumping mouse	*Zapus hudsonius luteus*	Mammals	Candidate
Black-footed ferret	*Mustela nigripes*	Mammals	Endangered
Least tern (interior population)	*Sterna antillarum*	Birds	Endangered
Mexican spotted owl w/Critical Habitat	*Strix occidentalis lucida*	Birds	Threatened
Rio Grande cutthroat trout	*Oncorhynchus clarki virginalis*	Fishes	Candidate
Rio Grande silvery minnow	*Hybognathus amarus*	Fishes	Endangered
Southwestern willow flycatcher w/Critical Habitat	*Empidonax traillii extimus*	Birds	Endangered
Yellow-billed cuckoo	*Coccyzus americanus*	Birds	Candidate
Mountain plover	*Charadrius montanus*	Birds	Proposed
Gunnison's prairie dog (montane population)	*Cynomys gunnisoni montanus*	Mammals	Candidate
San Miguel County			
Common Name	Scientific Name	Species	Listing Status

		Group	
Arkansas River shiner	*Notropis girardi*	Fishes	Threatened
Mountain plover	*Charadrius montanus*	Birds	Proposed
Black-footed ferret	*Mustela nigripes*	Mammals	Endangered
Holy Ghost ipomopsis	*Ipomopsis sancti-spiritus*	Plants	Endangered
Mexican spotted owl w/Critical Habitat	*Strix occidentalis lucida*	Birds	Threatened
Rio Grande cutthroat trout	*Oncorhynchus clarki virginalis*	Fishes	Candidate
Southwestern willow flycatcher	*Empidonax traillii extimus*	Birds	Endangered
Yellow-billed cuckoo	*Coccyzus americanus*	Birds	Candidate
New Mexican meadow jumping mouse	*Zapus hudsonius luteus*	Mammals	Candidate
Santa Fe County			
Common Name	Scientific Name	Species Group	Listing Status
New Mexican meadow jumping mouse	*Zapus hudsonius luteus*	Mammals	Candidate
Black-footed ferret	*Mustela nigripes*	Mammals	Endangered
Mexican spotted owl w/Critical Habitat	*Strix occidentalis lucida*	Birds	Threatened
Rio Grande cutthroat trout	*Oncorhynchus clarki virginalis*	Fishes	Candidate
Rio Grande silvery minnow	*Hybognathus amarus*	Fishes	Endangered
Southwestern willow flycatcher	*Empidonax traillii extimus*	Birds	Endangered
Yellow-billed cuckoo	*Coccyzus americanus*	Birds	Candidate
Mountain plover	*Charadrius montanus*	Birds	Proposed
Taos County			
Common Name	Scientific Name	Species Group	Listing Status
New Mexican meadow jumping mouse	*Zapus hudsonius luteus*	Mammals	Candidate
Black-footed ferret	*Mustela nigripes*	Mammals	Endangered
Mexican spotted owl w/Critical Habitat	*Strix occidentalis lucida*	Birds	Threatened
Rio Grande cutthroat trout	*Oncorhynchus clarki virginalis*	Fishes	Candidate
Southwestern willow flycatcher w/Critical Habitat	*Empidonax traillii extimus*	Birds	Endangered
Yellow-billed cuckoo	*Coccyzus americanus*	Birds	Candidate
Mountain plover	*Charadrius montanus*	Birds	Proposed
Gunnison's prairie dog	*Cynomys gunnisoni*	Mammals	Candidate

(montane population)	*montanus*		
Union County			
Common Name	Scientific Name	Species Group	Listing Status
Arkansas River shiner	*Notropis girardi*	Fishes	Threatened
Mountain plover	*Charadrius montanus*	Birds	Proposed
Black-footed ferret	*Mustela nigripes*	Mammals	Endangered
Lesser prairie-chicken	*Tympanuchus pallidicinctus*	Birds	Candidate

APPENDIX C

Standard Operating Procedures for Applying Herbicides on BLM Lands

Adopted from Biological Opinion for the 2007 Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement

Standard Operating Procedures for Applying Herbicides	
Resource Element	Standard Operating Procedure
Guidance Documents	BLM Handbook H-9011-1 (Chemical Pest Control); and manuals 1112 (Safety), 9011 (Chemical Pest Control), 9012 (Expenditure of Rangeland Insect Pest Control Funds), 9015 (Integrated Weed Management), and 9220 (Integrated Pest Management)
General	• Prepare operational and spill contingency plan in advance of treatment. • Conduct a pretreatment survey before applying herbicides. • Select herbicide that is least damaging to the environment while providing the desired results. • Select herbicide products carefully to minimize additional impacts from degradates, adjuvants, inert ingredients, and tank mixtures. • Apply the least amount of herbicide needed to achieve the desired result. • Follow herbicide product label for use and storage. • Have licensed applicators apply herbicides. • Use only USEPA-approved herbicides and follow product label directions and “advisory” statements. • Review, understand, and conform to the “Environmental Hazards” section on the herbicide product label. This section warns of known pesticide risks to the environment and provides practical ways to avoid harm to organisms or to the environment. • Consider surrounding land use before assigning aerial spraying as a treatment method and avoid aerial spraying near agricultural or densely populated areas. • Minimize the size of application area, when feasible. • Comply with herbicide-free buffer zones to ensure that drift will not affect crops or nearby residents/landowners. • Post treated areas and specify reentry or rest times, if appropriate. • Notify adjacent landowners prior to treatment. • Keep a copy of Material Safety Data Sheets (MSDSs) at work sites. MSDSs are available for review at ttp://www.cdms.net/. • Keep records of each application, including the active ingredient,

	formulation, application rate, date, time, and location. • Avoid accidental direct spray and spill conditions to minimize risks to resources. • Consider surrounding land uses before aerial spraying. • Avoid aerial spraying during periods of adverse weather conditions (snow or rain imminent, fog, or air turbulence). • Make helicopter applications at a target airspeed of 40 to 50 miles per hour (mph), and at about 30 to 45 feet above ground. • 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. • Use drift control agents and low volatile formulations. • Conduct pre-treatment surveys for sensitive habitat and special status species within or adjacent to proposed treatment areas. • Consider site characteristics, environmental conditions, and application equipment in order to minimize damage to non-target vegetation. • Use drift reduction agents, as appropriate, to reduce the drift hazard to non-target species. • Turn off applied treatments at the completion of spray runs and during turns to start another spray run. • Refer to the herbicide product label when planning revegetation to ensure that subsequent vegetation would not be injured following application of the herbicide. • Clean OHVs to remove seeds.
Air Quality See Manual 7000 (Soil, Water, and Air Management)	• Consider the effects of wind, humidity, temperature inversions, and heavy rainfall on herbicide effectiveness and risks. • 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. • Use drift reduction agents, as appropriate, to reduce the drift hazard. • Select proper application equipment (e.g., spray equipment that produces 200- to 800-micron diameter droplets [spray droplets of 100 microns and less are most prone to drift]). • Select proper application methods (e.g., set maximum spray heights, use appropriate buffer distances between spray sites and non-target resources).
Soil See Manual 7000 (Soil, Water, and Air Management	• Minimize treatments in areas where herbicide runoff is likely, such as steep slopes when heavy rainfall is expected. • Minimize use of herbicides that have high soil mobility, particularly in areas where soil properties increase the potential for mobility. • 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 See Manual 7000 (Soil, Water, and Air Management)	• Consider climate, soil type, slope, and vegetation type when developing herbicide treatment programs. • Select herbicide products to minimize impacts to water. This is especially important for application scenarios that involve risk

	from active ingredients in a particular herbicide, as predicted by risk assessments. • Use local historical weather data to choose the month of treatment. Considering the phenology of the target species, schedule treatments based on the condition of the water body and existing water quality conditions. • Plan to treat between weather fronts (calms) and at appropriate time of day to avoid high winds that increase water movements, and to avoid potential storm water runoff and water turbidity. • 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. Minimize treating areas with high risk for groundwater contamination. • Conduct mixing and loading operations in an area where an accidental spill would not contaminate an aquatic body. • Do not rinse spray tanks in or near water bodies. Do not broadcast pellets where there is danger of contaminating water supplies. • Maintain buffers between treatment areas and water bodies. Buffer widths should be developed based on herbicide- and site-specific criteria to minimize impacts to water bodies. • Minimize the potential effects to surface water quality and quantity by stabilizing terrestrial areas as quickly as possible following treatment
Wetlands and Riparian Areas	• Use a selective herbicide and a wick or backpack sprayer. • Use appropriate herbicide-free buffer zones for herbicides not labeled for aquatic use based on risk assessment guidance, with minimum widths of 25 feet for vehicle, and 10 feet for hand spray applications
Vegetation See Handbook H-4410-1 (National Range Handbook), and manuals 5000 (Forest Management) and 9015 (Integrated Weed Management)	• Refer to the herbicide label when planning revegetation to ensure that subsequent vegetation would not be injured following application of the herbicide. • Use native or sterile species for revegetation and restoration projects to compete with invasive species until desired vegetation establishes. • Use weed-free feed for horses and pack animals. Use weed-free straw and mulch for revegetation and other activities. • 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	• Complete vegetation treatments seasonally before pollinator foraging plants bloom. • Time vegetation treatments to take place when foraging pollinators are least active both seasonally and daily. • Design vegetation treatment projects so that nectar and pollen sources for important pollinators and resources are treated in

	patches rather than in one single treatment. • Minimize herbicide application rates. Use typical rather than maximum rates where there are important pollinator resources. • Maintain herbicide free buffer zones around patches of important pollinator nectar and pollen sources. • Maintain herbicide free buffer zones around patches of important pollinator nesting habitat and hibernacula. • 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 See manuals 6500 (Wildlife and Fisheries Management) and 6780 (Habitat Management Plans)	• Use appropriate buffer zones based on label and risk assessment guidance. • Minimize treatments near fish-bearing water bodies during periods when fish are in life stages most sensitive to the herbicide(s) used, and use spot rather than broadcast or aerial treatments. • Use appropriate application equipment/method near water bodies if the potential for off-site drift exists. • For treatment of aquatic vegetation, 1) treat only that portion of the aquatic system necessary to achieve acceptable vegetation management, 2) use the appropriate application method to minimize the potential for injury to desirable vegetation and aquatic organisms, and 3) follow water use restrictions presented on the herbicide label.
Wildlife See manuals 6500 (Wildlife and Fisheries Management) and 6780 (Habitat Management Plans)	• Use herbicides of low toxicity to wildlife, where feasible. • 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. • 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 See Manual 6840 (Special Status Species)	• Survey for special status species before treating an area. Consider effects to special status species when designing herbicide treatment programs. • Use a selective herbicide and a wick or backpack sprayer to minimize risks to special status plants. • Avoid treating vegetation during time-sensitive periods (e.g., nesting and migration, sensitive life stages) for special status species in area to be treated.
Livestock See Handbook H-4120-1 (Grazing Management)	• 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. • As directed by the herbicide product label, remove livestock from treatment sites prior to herbicide application, where applicable. • Use herbicides of low toxicity to livestock, where feasible. • Take into account the different types of application equipment and methods, where possible, to reduce the probability of

	contamination of non-target food and water sources. • Avoid use of diquat in riparian pasture while pasture is being used by livestock. • Notify permittees of the herbicide treatment project to improve coordination and avoid potential conflicts and safety concerns during implementation of the treatment. • Notify permittees of livestock grazing, feeding, or slaughter restrictions, if necessary. • Provide alternative forage sites for livestock, if possible.
Cultural Resources and Paleontological Resources See handbooks H-8120-1 (Guidelines for Conducting Tribal Consultation) and H-8270-1 (General Procedural Guidance for Paleontological Resource Management), and manuals 8100 (The Foundations for anaging Cultural Resources), 8120 (Tribal Consultation Under Cultural Resource Authorities), and 8270 (Paleontological Resource Management) See also: 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	• 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. • Follow BLM Handbook H-8270-1 (General Procedural Guidance for Paleontological Resource Management) to determine known Condition I 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. • Consult with tribes to locate any areas of vegetation that are of significance to the tribe and that might be affected by herbicide treatments. • Work with tribes to minimize impacts to these resources. • Follow guidance under Human Health and Safety in the EIS in areas that may be visited by Native peoples after treatments.
Visual Resources See handbooks H-8410-1 (Visual Resource Inventory) and H-8431-1 (Visual Resource Contrast Rating), and manual 8400 (Visual Resource Management)	• Minimize the use of broadcast foliar applications in sensitive watersheds to avoid creating large areas of browned vegetation. • Consider the surrounding land use before assigning aerial spraying as an application method. • 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.

	• 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). • 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. • 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 (VRM) objectives.
Wilderness and Other Special Areas See handbooks H-8550-1 (Management of Wilderness Study Areas (WSAs)), and H- 8560-1 (Management of Designated Wilderness Study Areas), and Manual 8351 (Wild and Scenic Rivers)	• Encourage backcountry pack and saddle stock users to feed their livestock only weed-free feed for several days before entering a wilderness area. • Encourage stock users to tie and/or hold stock in such a way as to minimize soil disturbance and loss of native vegetation. • Revegetate disturbed sites with native species if there is no reasonable expectation of natural regeneration. • Provide educational materials at trailheads and other wilderness entry points to educate the public on the need to prevent the spread of weeds. • 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. • 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. • Give preference to herbicides that have the least impact on non-target species and the wilderness environment. • Implement herbicide treatments during periods of low human use, where feasible. • Address wilderness and special areas in management plans. • Maintain adequate buffers for Wild and Scenic Rivers (¼ mile on either side of river, ½ mile in Alaska).
Recreation See Handbook H-1601-1 (Land Use Planning Handbook, Appendix C)	• Schedule treatments to avoid peak recreational use times, while taking into account the optimum management period for the targeted species. • Notify the public of treatment methods, hazards, times, and nearby alternative recreation areas. • Adhere to entry restrictions identified on the herbicide product label for public and worker access. • Post signs noting exclusion areas and the duration of exclusion, if necessary. • Use herbicides during periods of low human use, where feasible.
Social and Economic Values	• Post treated areas and specify reentry or rest times, if appropriate. • Notify grazing permittees of livestock feeding restrictions in

	treated areas, if necessary, as per herbicide product label instructions. • Notify the public of the project to improve coordination and avoid potential conflicts and safety concerns during implementation of the treatment. • Control public access until potential treatment hazards no longer exist, per herbicide product label instructions. • Observe restricted entry intervals specified by the herbicide product label. • Notify local emergency personnel of proposed treatments. • 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. • Consult with Native American tribes and Alaska Native groups to locate any areas of vegetation that are of significance to the tribes and Native groups and that might be affected by herbicide treatments. • 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	• Coordinate vegetation management activities where joint or multiple use of a ROW exists. • Notify other public land users within or adjacent to the ROW proposed for treatment. • Use only herbicides that are approved for use in ROW areas.
Human Health and Safety	• 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. • Use protective equipment as directed by the herbicide product label. • Post treated areas with appropriate signs at common public access areas. • Observe restricted entry intervals specified by the herbicide product label. • Provide public notification in newspapers or other media where the potential exists for public exposure. • Have a copy of MSDSs at work site. • Notify local emergency personnel of proposed treatments. • Contain and clean up spills and request help as needed. • Secure containers during transport. • Follow label directions for use and storage. • Dispose of unwanted herbicides promptly and correctly.

APPENDIX D

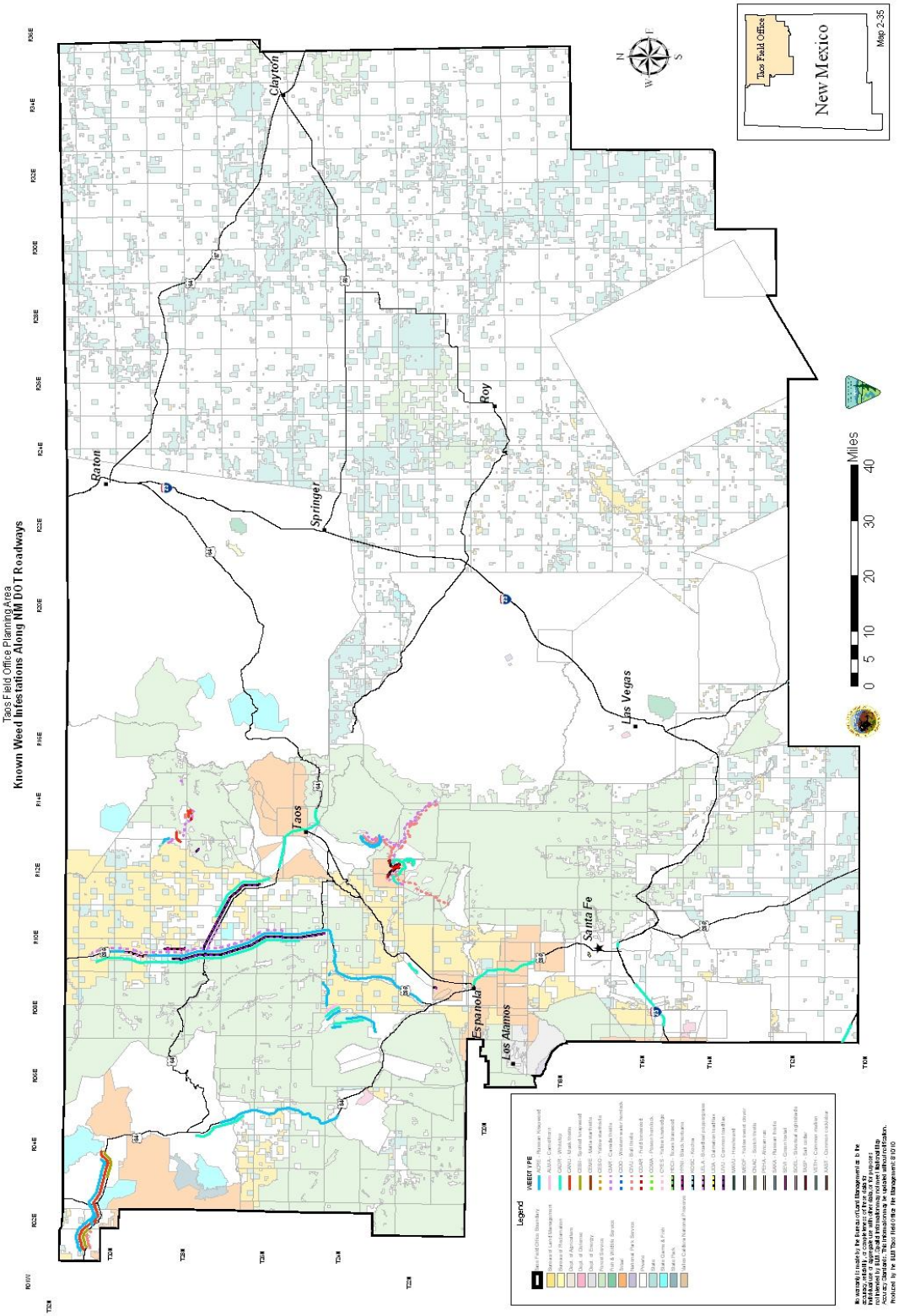
General Soil Map Units by Planning Unit

Map Unit Name	Acres
Taos Plateau	
Travelers-garita-luhon	139,259.98
Fernando-silva-tenorio	43,562.53
Raton-rock outcrop-orejas	32,232.09
Servilleta-prieta-petaca	13,858.75
Graypoint-platoro-dunul	7,156.84
Typic haplustalfs-eutric glossoboralfs-rock outcrop	3,821.26
Royosa-sedillo-orejas	3,045.66
Chama	
Berryman-menefee-calendar	22,021.04
Typic haplustalfs-eutric glossoboralfs-rock outcrop	5,132.83
Elpedro-peney-ransect	4,595.54
Goldvale-valto-hesperus	2,937.96
Typic eutroboralfs	1,652.43
Typic ustochrepts-typic haplustalfs-rock outcrop	1,366.85
Typic haplustalfs	1,109.25
Ruko-morapos-goldvale	747.19
El Palacio	
Florita-rock outcrop-pinavetes	33,298.72
Sedillo-montecito-badland	2,2013.32
Pojoaque-el rancho-fruitland	10,310.08
Pojoaque-fruitland-badland	5,441.85
Lithic ustorthents-typic dystrochrepts-rock outcrop	3,329.3
El rancho-fruitland-bluewing family	2,204.32
Rock outcrop-devisadero-sedillo	828.71
East Side	
Rock outcrop-tuloso-sombordoro	29,082.97
Sombordoro-tuloso-rock outcrop	5,621.48
Partri-carnero-tricon	4,917.48
Vibo-ribera-rock outcrop	2,274.52
Typic haplustalfs-eutric glossoboralfs-rock outcrop	1,787.71
Apache-rock outcrop-ayon	1,519.13
Redona-quay-conchas	1,451.09
Conchas-latom-badland	1,274.62
Swastika-colmor-mion	1,081.55
Capulin-charette-ayon	960.62
Galisteo Basin	
Rock outcrop-pena-chimayo	3,187.85
Panky-pojoaque-fivemile	2,411.33
Sombordoro-tuloso-rock outcrop	1,469.69

Map Unit Name	Acres
Rednun-pena-fivemile	1,401.29
Harvey-dean-tapia	1,379.67
Typic haplustalfs	887.79
Las lucas-persayo-rock outcrop	702.33
Vibo-ribera-rock outcrop	489.72
Travessilla-rock outcrop-rednun	446.14
Witt-harvey-clovis	423.94
Travessilla-ortiz-bernal	390.04
Typic ustochrepts-lithic ustochrepts	319.27
Fivemile-riverwash-galisteo	256.21
Laporte-silver-witt	236.57
Lower Gorge/Copper Hill	
Rock outcrop-devisadero-sedillo	26,326.39
Fernando-silva-tenorio	4,629.83
Royosa-sedillo-orejas	3,263.58
Maes-etoe-derecho	2,617.54
Sedillo-montecito-badland	1,989.98
Florita-rock outcrop-pinavetes	498.04
Ojo Caliente	
Florita-rock outcrop-pinavetes	44,590.88
Royosa-sedillo-orejas	10,015.6
Typic ustochrepts-typic haplustalfs-rock outcrop	9,998.53
Rock outcrop-hackroy-totavi	6,950.09
Fruitland-abiquiu-pinavetes	3,505.63
Typic haplustalfs-typic ustochrepts-typic dystrochrept)	888.43
West Santa Fe	
Pojoaque-fruitland-badland	19,979.37
Apache-clovis-calabasas	12,095.54
Panky-pojoaque-fivemile	2,154.3
Typic ustochrepts-typic haplustalfs-rock outcrop	769.17
Typic haplustalfs	1,068.91

APPENDIX E

Project Map



APPENDIX F

Herbicides Proposed for Use of Taos Field Office Lands -- Characteristics and Target Vegetation

Herbicide	Herbicide Characteristics and Target Vegetation
2, 4-D	Selective; foliar absorbed; postemergent; annual/perennial broadleaf weeds. Key species treated include burningbush, mustard species, and Russian thistle.
Bromacil	Non-selective; inhibits photosynthesis; controls wide range of weeds and brush. Key species treated include annual grasses and broadleaf weeds, burningbush, and Russian thistle.
Chlorsulfuron	Selective; inhibits enzyme activity; broadleaf weeds and grasses. Key species treated include biennial thistles and annual and perennial mustards.
Clopyralid	Selective; mimics plant hormones; annual and perennial broadleaf weeds. Key species treated include knapweeds, mesquite, and starthistle and other thistles.
Dicamba	Growth regulator; annual and perennial broadleaf weeds, brush, and trees. Key species treated include knapweeds, burningbush, and Russian and other thistles.
Diuron	Preemergent control; annual and perennial broadleaf weeds and grasses. Key species treated include annual grasses and broadleaf weeds, burningbush, and Russian thistle.
Glyphosate	Non-selective; annual and perennial grasses and broadleaf weeds, sedges, shrubs, and trees. Key species treated include annual, biennial, and perennial grasses and broadleaf weeds and woody shrubs.
Hexazinone	Foliar or soil applied; inhibits photosynthesis; annual and perennial grasses and broadleaf weeds, brush, and trees. Key species treated include mesquite and scrub oak.
Imazapyr	Non-selective; preemergent and postemergent uses; absorbed through foliage and roots; annual and perennial broadleaf weeds, brush, and trees. Key species treated include saltcedar.
Metsulfuron methyl	Selective; postemergent; inhibits cell division in roots and shoots; annual and perennial broadleaf weeds, brush, and trees. Key species treated include annual and perennial mustards and biennial thistles.
Picloram	Selective; foliar and root absorption; mimics plant hormones; certain annual and perennial broadleaf weeds, vines, and shrubs. Key species treated include knapweeds, leafy spurge, and starthistle.
Sulfometuron methyl	Broad-spectrum pre and postemergent control; inhibits cell division; grasses and broadleaf weeds. Key species treated include downy brome, annual and perennial mustards, and medusahead

Tebuthiuron	Relatively non-selective soil activated herbicide; pre and postemergent control of annual and perennial grasses, broadleaf weeds, and shrubs. Key species treated include creosotebush, oak, Russian olive, and sagebrush (thinning).
Triclopyr	Growth regulator; broadleaf weeds and woody plants. Key species treated include mesquite and saltcedar.
Diflufenzopyr + Dicamba	Postemergent; inhibits auxin transport; broadleaf weeds. Key species treated include knapweeds, burningbush, and Russian thistle and other thistles.
Diquat	Non-selective and foliar applied. Key species treated include giant salvinia,water-thyme, and watermilfoils.
Fluridone	Aquatic herbicide to control submersed aquatic plants. Key species treated include water-thyme and watermilfoils.
Imazapic	Selective postemergent herbicide; inhibits broadleaf weeds and some grasses. Key species treated include downy brome, leafy spurge, medusahead, and mustards.

APPENDIX G

Protective Measures

Adopted from Biological Opinion for the 2007 Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement

BLM proposes to implement the following measures to minimize adverse effects to listed species and their habitat as a result of vegetation treatments.

Measures for site access and Fueling/Equipment Maintenance for treatments occurring in watersheds with listed species and/or designated critical habitat:

- Where feasible, access work site only on existing roads, and limit all travel on roads when damage to road surface will result or is occurring.
- Where listed species occur, consider ground-disturbing activities on a case by case basis, and implement SOP's to ensure minimal erosion or impact to the aquatic habitat.
- Within riparian areas, use vehicle equipment only on established roads.
- Outsie riparian areas, driving off established roads is allowed only on slopes of 20% or less.
- Except in emergencies, land helicopters outside of riparian areas.
- Within 150 feet of wetlands or riparian areas, do not fuel/refuel equipment, store fuel, or perform equipment maintenance (locate all fueling and fuel storage areas, as well as service landings outside of protected riparian areas).
- Do not conduct biomass removal (harvest) activities that will alter the timing, magnitude, duration, and spatial distribution of peak, high, and low flows outside the range of natural variability.

Measures related to revegetation treatments

- Outside riparian areas, avoid hydro-mulching within buffer zones established at the field level. This precaution will limit adding sediments and nutrients which increase water turbidity.

Measures related to herbicide treatments

- Maintain equipment used for transportation, storage, or application of chemicals in a leak proof condition.
- Do not store or mix herbicides, or conduct post application cleaning within riparian areas.
- Ensure that trained personnel monitor weather conditions at spray times during application.
- Strictly enforce all herbicide labels.
- Do not broadcast spray within 100 feet of open water when wind velocity exceeds 5 mph.
- Do not broadcast spray when wind velocity exceeds 10 mph.

- Do not spray if precipitation is occurring or is imminent (within 24 hours).
- Do not spray if air turbulence is sufficient to affect the normal spray pattern.
- Do not broadcast spray herbicides in riparian areas that provide habitat for listed species.
- Do not use diquat, fluridone, terrestrial formulations of glyphosate, or triclopyr BEE, to treat aquatic vegetation in habitats where listed species occur or may potentially occur.
- Avoid using glyphosate formulations that include R-11, and either avoid using and formulations with POEA, or seek to use the formulation with lowest amount of POEA available, to reduce risks to aquatic organisms.
- Follow all instructions and SOPs to avoid spill and direct spray scenarios into aquatic habitats. Special care should be followed when transporting and applying 2,4-D, bromacil, clopyralid, diuron, glyphosate, hexazinone, imazapyr, metsulfuron methyl, picloram, tebuthiuron, and triclopyr.
- Do not broadcast spray diuron, glyphosate, picloram, triclopyr BEE in upland habitats adjacent to aquatic habitats that support (or may potentially support) listed species under condition that would likely result in off-site drift.
- In watersheds that support listed species or their habitat, do not apply bromicil, diuron, tebuthiuron, or triclopyr BEE in upland habitats within ½ mile upslope of aquatic habitats that support aquatic listed species under conditions that would result in surface runoff.
- Avoid accidental direct spray and spill conditions to reduce the largest potential impacts. Use the typical application rate, rather than the maximum application rate, to reduce rick for most herbicides, where practical.
- Reduce the size of the application area, when possible.

Wetland and riparian areas

- Minimize the use of terrestrial herbicides (especially bromacil, diuron, and sulfometuron methyl) in watersheds with downgradient ponds and streams if potential impacts to aquatic plants exist.

Fish and other aquatic organisms

- Regulate the use of diquat in water bodies that have native fish and aquatic resources.
- Regulate the use of terrestrial herbicides in watersheds, which have characteristics suitable for potential surface runoff, with fish-bearing streams during periods when fish are in life stages most sensitive to herbicide(s) use.
- Establish appropriate herbicide-specific buffer zones to waterbodies, habitats, or fish or other aquatic species of interest.

Measures related to prescribed fire within riparian areas, in watersheds with listed species or their habitats:

- Conduct prescribed burning only when long-term maintenance of the riparian area is the primary objective, and where low intensity fires can be maintained.
- Do not construct black lines, except by non-mechanized methods.
- Utilize/create only the following firelines: natural barriers; hand built lines parallel to the stream channel and outside of buffer zones; or hand built lines perpendicular to the stream channel with waterbarsand the same distancerequirement.
- Do not ignite fires using aerial methods.

- In forested riparian areas, keep fires to low severity levels to ensure that excessive vegetation removal does not occur.
- Do not camp, unless allowed by ESA section 7 consultation.
- Have a fisheries biologist determine whether pumping activity can occur in streams with listed species.
- During water drafting/pumping, maintain a continuous surface flow of the stream that does not alter original wetted stream width.
- Do not alter dams or channels in order to pump in streams occupied by listed species.
- Do not allow helicopter dipping from waters occupied by endangered and threatened species, except in lakes outside of the spawning period.
- Consult with a local fisheries biologist prior to helicopter dipping in order to avoid entrainment and harassment of listed species.

Measures related to Mechanical Treatments
These measures apply only to treatments occurring in watersheds that support listed species or their habitats.

Outside riparian areas in watersheds with listed species or their habitats:

- Conduct soil-disturbing treatments only on slopes of 20% or less, where feasible.
- Do not conduct log hauling activities on native surface roads prone to erosion where feasible.

Within riparian areas in watersheds with listed species or their habitat:

- Do not use vehicles or heavy equipment, except when crossing at established crossings.
- Do not remove large woody debris or snags during mechanical treatment activities.
- Do not conduct ground disturbing activities (e.g., disking, drilling, chaining, and plowing).
- Ensure that all mowing follows guidance to avoid negative effects to streambanks and riparian vegetation and major effects to streamside shade.
- Do not use equipment in perennial channels or in intermittent channels with water, except at crossings that already exist.
- Leave suitable quantities of excess vegetation and slash on site.
- Do not apply fertilizers or seed mixtures that contain chemicals by aerial methods.
- Do not apply fertilizer within 25 feet of streams and supersubstrated soils; apply fertilizer following labeling instructions.
- Do not apply fertilizer in desert habitats.
- Do not completely remove trees and shrubs.