Noxious Weed Treatment
DOI-BLM-NM-P010-2009-038-EA

FINDING OF NO SIGNIFICANT IMPACT: Based on the analysis of potential environmental impacts contained in the attached environmental assessment, I have determined the proposed action is not expected to have significant impacts on the environment because of the mitigation measures that would be applied in the treatments to control the spread of noxious weeds. Therefore, the preparation of an Environmental Impact Statement (EIS) is not required.

Rationale for Recommendations: The proposed action would not result in any undue or unnecessary environmental degradation. No action would in all likelihood result in environmental degradation by allowing noxious weeds to spread unchecked. The proposed action would meet the objectives of the Roswell Resource Management Plan.

/s/J H Parman 4/20/09

J H Parman Date
Acting Assistant Field Office Manager, Resources

Proposed Decision: It is my decision to approve the Noxious Weed Treatment project as described in the Proposed Action in the attached environmental assessment (DOI-BLM-NM-P010-2009-038-EA). The mitigation measures identified in the attached EA along with specific project design features relative to noxious weed treatments on public lands have been formulated into stipulations. This decision incorporates, by reference, those stipulations identified in the attached Environmental Assessment.

Rationale for Decision: Approval of the Proposed Action is the most economical and environmentally acceptable method of treating noxious weeds in field office area. Consequently, watershed functions, soil stabilization, wildlife habitat and livestock management will be safeguarded against the spread of these species. This action will authorize treatment by the use of herbicides in the field office area.

The Proposed Action is in conformance with the Roswell Resource Management Plan and the Fire and Fuels Management Plan Amendment for Public Lands in New Mexico and Texas. The treatments will be conducted when the windows are appropriate to safely meet treatment objectives.

If you wish to protest this proposed decision, you are allowed 15 days from receipt of this notice within which to file a protest with the Field Manager, Bureau of Land Management, 2909 West 2nd, Roswell, NM 88201. This protest should specify, clearly and concisely, why you think the proposed action is in error.

In the absence of a protest within the time allowed, the above decision shall constitute my final decision. Should this notice become the final decision, you are allowed an additional 15 days within which to file an appeal for the purpose of a hearing before the Interior Board of Land Appeals, and to petition for stay of the decision pending final determination on the appeal (43 CFR 4.21 and 4.410). If a petition for stay is not requested and granted, the decision will be put into effect following the 15-day appeal period. The appeal and petition for stay should be filed with the Field Manager at the above address. The appeal should specify, clearly and concisely, why you think the decision is in error. The petition for stay should specify how you will be harmed if the stay is not granted.

Bureau of Land Management, Roswell Field Office
Environmental Assessment Checklist, DOI-BLM-NM-P010-2009-038-EA

Resources	Not Present on Site	No Impacts	May Be Impacts	Mitigation Included	BLM Reviewer	Date
Air Quality			X	X		
Soil			X	X		
Watershed Hydrology			X	X		
Floodplains			X	X	/s/ Michael McGee	2/23/09
Water Quality - Surface			X	X	SWA Spec/Hydro.	
Water Quality - Ground			X	X	/s/ John S. Simitz Geologist/Hydrologist	2/4/09
Cultural Resources		X			/s/Rebecca L. Hill	25Feb2009
Native American Religious Concerns	X					
Paleontology	X				Archaeologist	
Areas of Critical Environmental Concern		X			/s/J H Parman Plan & Env. Coord.	2/3/09
Farmlands, Prime or Unique		X				2/11/09
Rights-of-Way		X			Realty /s/Sanderford	
Invasive, Non-native Species			**X**	**X**	/s/ Kyle Arnold	2/17/2009
Vegetation			**X**	**X**		
Livestock Grazing			**X**	**X**	Range Mgmt. Spec.	
Wastes, Hazardous or Solid					HMS/ EPS	N/A
Threatened or Endangered Species			X	X		
Special Status Species			X	X		
Wildlife			X	X	/s/ D Baggao	2/3/09
Wetlands/Riparian Zones			X	X	Biologist	
Wild and Scenic Rivers	X					
Wilderness	X					
Recreation		X				2/3/09
Visual Resources			X		/s/Bill Murry	
Cave/Karst			X		Outdoor Rec. Plnr.	
Environmental Justice		X			/s/Brian Novosak	2/3/09
Public Health and Safety			X		Env .Prot. Spec.	
Solid Mineral Resources					Geo/SPS	N/A
Fluid Mineral Resources		X			/s/ John S. Simitz Pet Engr/Geo	2/4/09

ENVIRONMENTAL ASSESSMENT

Noxious Weed Treatment

Roswell Field Office

DOI-BLM-NM-P010-2009-038-EA

April 2009

U.S. Department of the Interior
Bureau of Land Management
Roswell Field Office
Roswell, New Mexico

I. BACKGROUND

A. Introduction

Within portions of the Roswell Field Office, invasive and non-native weeds have become established. These plants are often described as noxious weeds. Their presence on the landscape has a negative effect on watersheds, forage for both 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 the ecosystem to sustain a healthy biodiversity and ability to provide for quality habitat.

A noxious weed is defined as a plant that causes disease or has other adverse effects on the human environment and is, therefore, detrimental to the agriculture and commerce of the United States and public health. Generally, noxious weeds possess one or more of the characteristics of being aggressive and difficult to manage, parasitic, a carrier or host of harmful insects or disease, and being either native, new to, or not common in, the United States. In most cases, however noxious weeds are normative species. Noxious weeds are designated and regulated by various state and Federal laws.

B. Purpose And Need For The Proposed Action

The purpose of the Weed Treatment project is to meet the goals and objectives of the desired plant community (DPC) as described in the 1997 Roswell Resource Management Plan by eliminating those plants that are classified as noxious, invasive, and/or non-native. The desired plant community would provide for the stabilization of both the biotic and hydrologic components of the watershed, and restore and support habitat requirements for flora and fauna within the area.

This environmental assessment would analyze impacts associated with various methods and techniques available for meeting the intended objectives of this action within the Field Office (see map), identify mitigation measures to minimize or eliminate impacts to affected resources and evaluate cumulative impacts in relation to threshold levels identified for the watershed as a whole.

C. Conformance With Land Use Planning

The proposed action conforms to the Roswell Approved Resource Management Plan (RMP) and Record of Decision (BLM 1997); the 2007 Vegetation Treatments Using Herbicides on BLM Lands in Seventeen Western States Final Programmatic EIS (2007 Veg Treatment PEIS); 1994 Environmental Impact Statement for Rangeland Reform; the Federal Land Policy and Management Act of 1976 (FLPMA) (43 U.S.C. 1700 et seq.); the Taylor Grazing Act of 1934 (TGA) (43 U.S.C. 315 et seq.); the Public Rangelands 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.

D. Relationships to Statutes, Regulations, or Other Plans

The Bureau of Land Management, Roswell Field Office, has entered into Memoranda of Understanding (MOUs) with the following agencies and groups:

The USDA-Forest Service, USDA-Natural Resources Conservation Service, USDI-Bureau of Reclamation, USDI-National Park Service, Lincoln County, Eddy County Commission, Chaves County, the New Mexico Highway & Transportation Department (District 2), New Mexico Department of Game & Fish, New Mexico Department of Energy, Minerals, and Natural Resources, and the New Mexico State Land Office, the Cooperative Extension Service of New Mexico State University, the Hagerman-Dexter Soil and Water Conservation District, and the Chaves County Soil and Water Conservation District.

The MOUs include agreements to assist with the Voluntary Noxious Plant Control Program in an effort to foster Coordination, Cooperation and Implementation on Goals and Objectives, Education and Training, Action Plans and Implementation, Monitoring, Program Assessments, and Applying Eradication and/or Control Treatments. Under these MOUs, the BLM has agreed to cooperate by providing funding for and implementing of noxious weed control. The other cooperators will also provide equipment, funding and labor.

II. PROPOSED ACTION AND ALTERNATIVES

A. Proposed Action

The proposed action is to control or eradicate the infestation of noxious weeds wherever found and prevent their spread to adjoining rangelands. These plant species would be treated with a BLM-approved herbicide using ground-based equipment, spray rigs mounted on motorized vehicles or backpack sprayers.

The following measures would be applied to all herbicide applications within the field office:

1. Undisturbed islands of vegetation would be left, where appropriate, to minimize negative impacts to wildlife. Additional islands of untreated vegetation would be left as needed to create or maintain the mosaic pattern that provides suitable habitat for such species.
2. Floodplains as well as wetlands and riparian zones would be treated and would be buffered according to Table 2-5, Vegetation Treatment Methods Standard Operating Procedures and Guidelines of the 2007 Veg. Treatment PEIS, pp. 2-34 & 2-35.
3. Chemicals would be applied in accordance with the prescriptions described in Appendix 9, Treating Vegetation with Herbicides, of the 1997 Roswell RMP.
4. The potential for ground water contamination will be evaluated using the methods and techniques of the 2007 Vegetation Treatment PEIS.
5. Post-treatment monitoring would be conducted to evaluate the effectiveness of treatments.

The plant species targeted for treatment and the chemical to be used are listed in the following table:

Table 1 Target Species and Approved Herbicides

Common Name	Scientific Name
African Rue	*Peganum harmala*
Black henbane	*Hyoscyamus niger*
Camelthorn	*Alhagi psuedalhagi*
Bull thistle	*Cirsium vulgare*

Canadian thistle	*Cirsium arvense*
Musk thistle	*Carduus nutans*
Scotch thistle	*Onopordum acanthium*
Malta starthistle	*Centaurea melitensis*
Purple starthistle	*Centaurea calcitrapa*
Yellow starthistle	*Centaurea solstitialis*
Russian knapweed	*Acroptilon repens*
Spotted knapweed	*Centaurea biebersteinii*
Diffuse knapweed	*Centaurea diffusa*
Leafy spurge	*Euphorbia esula*
Poison hemlock	*Conium maculatum*
Goldenrod	*Solidago Canadensis L.*
Teasel	*Dipsacus fullonium*
Dalmation toadflax	*Linaria dalmatica*
Yellow toadflax	*Linaria vulgaris*
Russian olive	*Elaeagnus angustifolia L.*
Salt cedar	*Tamarix* spp.
Dyer's woad	*Isatis tinctoria*
Euarasian watermilfoil	*Myriophyllum spicatum*
Parrotfeather	*Myriophyllum aquticum*
Giant salvinia	*Salvinia moesta*
Hoary cress	*Cardaria spp.*
Hydrilla	*Hyrilla verticllata*
Oxeye daisy	*Leucanthemum vulgare*
Purple loosestrife	*Lythrum salicaria*
Ravenna grass	*Saccharum ravennae*
Chicory	*Cichorium intybus*
Halogeton	*Halogeton glomeratus*
Perennial pepperweed	*Lepidium latifolium*
Tree of heaven	*Ailanthus altissima*
Cheatgrass	*Bromus tectorum*
Jointed goatgrass	*Aegilops cylindrica*
Siberian elm	*Ulmus pumila*

The list of chemical compounds (herbicides) approved by BLM to treat these species can be accessed at http://www.blm.gov/wo/st/en/prog/more/weeds.html. These compounds are registered for use within the stated application rate on rights-of-way and rangelands for control of broadleaf weeds in the state of New Mexico and are addressed in the 2007 Vegetation Treatments Using Herbicides on BLM Lands in Seventeen Western States Final Programmatic EIS. The application rate would be as described on the label. The total amount of herbicide will not exceed allowable rates. Application is normally scheduled for fall, prior to bird migration, or spring, prior to bird nesting. The plants need to be actively growing to move the active ingredient into the root zone of the target plant species.

If additional species of noxious weeds are found within the Roswell District, they would be added to the list and treated in a similar manner. Site-specific mitigation and design features would be incorporated in the Administrative Decision document.

B. No Action Alternative

The No Action alternative would not allow the treatment for control of noxious weeds.

III. AFFECTED ENVIRONMENT AND ENVIRONMENTAL IMPACTS

A. General Setting

The Roswell Field Office manages 1.49 million acres of public land in Quay, Curry, Roosevelt, De Baca, Guadalupe, Lincoln, and Chaves Counties in southeast New Mexico. The affected environment of the field office is generally discussed in the 1994 Roswell Draft Resource Management Plan (RMP). Refer to this plan and the following for a complete description (Chapter 2). Only those resources actually impacted by the proposed action would be addressed in this document.

B. Affected Resources

Prime or Unique Farmlands, Native American Religious Concerns, Hazardous or Solid Wastes, Wild and Scenic Rivers, and Wilderness are not present within the treatment area and would not be affected. (See Table 2-5, Vegetation Treatment Methods Standard Operating Procedures and Guidelines of the 2007 Vegetation Treatments on BLMS Lands in Western U.S. Final Programmatic EIS for a description of buffers around rivers, floodplains and riparian areas.)

No impacts have been identified that exceed those addressed in the 2007 Vegetation Treatments Using Herbicides on BLM Lands in Seventeen Western States Final Programmatic EIS (2007 Veg. Treatment EIS). The following are impacts of importance based upon site specific analysis of the proposal.

Air Quality

Affected Environment

The Roswell Field Office is classified as a Class II air quality area. A Class II area allows a moderate amount of degradation of air quality. Within the boundary of the field office, the Salt Creek Wilderness and the White Mountain Wilderness, which together contain 58,494 acres of land, are classified as Class I air quality areas. Class I areas have air quality that is pristine.

Degradation of air quality in portions of the field office is the result of pollutants such as nitrogen dioxide, hydrocarbons, carbon monoxide, and particulate matter from motor vehicles, blowing dust, dirt roads and combustion at major industrial sites. Automobile exhaust from the more densely populated area of Roswell 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.

Oil and gas extraction and storage activities also influence air quality in the resource area. Underground formations in southeastern New Mexico contain naturally occurring hydrogen sulfide (H2S) gas. Each oil or gas well varies in the amount of gases produced, but some

concentrations of up to 100,000 parts per million can occur. Those wells or sites producing H2S are marked with signs and wind socks to warn of high levels of gases. High levels sometimes occur when weather inversions occur over the resource area.

Environmental Impacts
The greatest impacts on air quality would be moderate noise and the potential for minimal chemical drift from aerial application of the herbicide. Impacts would be temporary, small in scale, and quickly dispersed throughout the area. These factors, combined with standard management practices (stipulations), minimize the significance of potential impacts. Federal, State, and local air quality regulations would not be violated. Standard management practices for aerial application of herbicides would limit the amount of drift into non-target areas.

Soil

Affected Environment
Alluvial soil varies in depth from shallow in the western portion of the resource area to deep along the Pecos River. Shallow alluvial soil, found on rolling hills, and is susceptible to water erosion, particularly in draws and drainages.

Soil in the eastern portion of the resource area is primarily derived from limestone, gypsum and windblown sediments. This soil ranges from being nearly level to gently sloping, and is shallow to deep. Areas of steep, rocky soil occur along the breaks and ridges of the Pecos River and Mescalero Ridge.

Soil beyond the floodplain of the Pecos River, but still within the river's influence, is on level to moderately sloping topography and has varied textures. High concentrations of calcium and gypsum carbonates (caliche) occur in this substratum. Soil within the Pecos River floodplain consists of alluvial deposits with textures varying from clay to sand, and slopes that are nearly level.

Environmental Impacts
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.

There would be no soil disturbance associated with the proposed 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. Vegetation treatments will reduce runoff, erosion, sedimentation, and improve water infiltration and retention in soil and increase herbaceous plant growth and understory vegetation and reduce sediment yield to rivers and streams.

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. Soil microorganisms can metabolize herbicides and often are reported to be responsible for herbicide decomposition (Norris and Moore, 1981). However, certain herbicides may inhibit microorganism growth or may produce more toxic effects and increase mortality rates.

The positive effects of the proposed action on soil would be substantial. The increased organic matter caused initially by acacia *(Acacia* spp.) and creosote *(Larrea tridentata)* leaves, stems and roots and secondarily by the increased production of grasses and forbs would improve the fertility of the soil.

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 chemical is complete.

Vegetation

Vegetation descriptions for this management area are described by the seven Community Types, which were developed and described in the Roswell Resource Management Plan, October, 10, 1997. Further information on those communities can be found in the Draft RMP, Appendix 11.

The Grassland Community consists of the following grasses: Bluestem species *(Andropogon* spp.), sideoats grama *(Bouteloua curtipendula),* black grama *(Bouteloua eriopoda),* blue grama *(Bouteloua gracilis),* hairy grama *(Bouteloua hirsuta),* galleta *(Pleuraphis jamesii)* and tobosa *(Pleuraphis mutica),* sand dropseed *(Sporobolus cryptandrus* and vine mesquite *(Panicum obtusum).* The shrub component would include such species as skunkbush sumac *(Rhus aromática),* yucca *(Yucca* spp.), cactus *(Opuntia* spp.), winterfat *(Ceratoides lanata),* four-wing saltbush *(Atriplex canescens)*, mormon tea *(Ephedra* spp.) and dalea *(Dalea* spp.). Forbs would include buckwheat *(Eriogonum* spp.), croton *(Croton* spp.), globemallow *(Sphaeralcea* spp.), and threadleaf groundsel *(Senecio douglassii).*

The Mixed Desert Shrub Community consists of such grasses as black grama, blue grama, sideoats grama, sand dropseed and bush muhly *(Muhlenberia porteri).* Four-wing saltbush, yucca, littleleaf sumac *(Rhus microphylla),* globemallow and buckwheat are also listed.

Piñon/Juniper Plant Community consists of Piñon *(Pinus edulis),* juniper *(Juniperus* spp.), oak *(Quercus* spp.) and skunkbush sumac are among the shrub species listed as part of the potential plant community in the Piñon/Juniper Community. The grass species include little bluestem *(Schizachyrium scoparium),* blue grama, black grama, sideoats grama and metcalf muhly *(Muhlenbergia metcalfii).* Forbs include yarrow *(Achillea* spp.), buckwheat, globemallow, and Indian paintbrush *(Castilleja* spp.).

Other shrubs which are potentially found on the range sites include catclaw mimosa (*Mimosa biuncifera*), apache plume (*Fallugia paradoxa*), cholla, sotol (*Dasylirion leiophyllum*), winterfat, wolfberry (*Lycium berlandieri*), threadleaf groundsel, sacahuista (*Nolina microcarpa*), lechuguilla (*Agave lechuguilla*), algerita (*Berberis trifoliolata*), mountain mahogany (*Cercocarpus montanus*), dalea species, sumac species (*Rhus spp*.), juniper, oak species, Bigelow sagebrush (*Artemisia bigelovii*), four-wing saltbush, yerba-de pasmo (*Baccharis pteronioides*), ephedra species, range ratany (*Krameria glandulosa*),and javelinabush (*Condalia ericoides*); all contributing a total of approximately 2 to 10% of the vegetative production.

Environmental Impacts

Noxious weed treatments would have both beneficial and adverse effects on terrestrial vegetation. Target and non-target vegetation in treated areas would be directly affected. 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 successional stage, and to create a more stratified age structure for wildlife habitat improvement,

Annual plants are generally more sensitive than perennial plants to chemical 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.

Plants that have the ability to re-sprout after aerial shoot damage are generally least sensitive to herbicides. These plants are damaged most when exposed to herbicides when translocation to meristematic areas and to roots (Sosebee 1983). This generally occurs only when soil temperatures are adequate for root activity and soil water is available. These plants are generally less susceptible to foliar-applied herbicides with limited exposure periods, such as 2, 4-D.

Differences in active growth periods and phenology of non-target and target species that correspond to differences in sensitivity to herbicides can be used to minimize damage to non-target species.

Response of non-target species to broad-spectrum herbicides, such as glyphosate, may be highly dependent on the rate of application. Damage to non-target species is minimized if they are tolerant of these herbicides applied at rate sufficient to reduce target species.

Plants may vary greatly in their sensitivity to different herbicides (Sosebee 1983). 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.

Floodplains

Affected Environment

For administrative purposes, the 100-year floodplain serves as the basis for floodplain management on public lands. It is based on Flood Insurance Rate Maps prepared by the Federal Emergency Management Agency (1983) which describes a Zone A as the “Area of the 100-year flood”. Current development on the floodplain consists of two-track roads and several miles of boundary fence in the area.

Environmental Impacts

Nonpoint source pollution is expected to decrease in the short and long-term. Vegetation treatments will reduce runoff, erosion, sedimentation, and improve water infiltration and retention in soil and increase herbaceous plant growth and understory vegetation and reduce sediment yield to rivers and streams within the 100 year floodplain.

Water Quality - Herbicides applied to the land may enter surface or ground water. Herbicide use also may produce minor increases in stream nutrients, stormflows, and sediment yields.

Affected Environment - Surface Water

The majority of BLM surface ownership lies with the Pecos River Basin. A portion of western Lincoln County drains into the Tularosa Basin. Major tributaries of the Pecos River with a high percentage of public land include the Rio Hondo (the Rio Bonito and Salado Creek watersheds), the Rio Felix, Salt Creek, Arroyo del Macho (including Cowboy Draw), and Long Arroyo.

Environmental Impacts - Surface Water

Entry of herbicides into surface water is discussed in Appendix C, Ecological Risk Assessment of the 2007 Vegetation Treatments PEIS. 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. Mitigation requires buffer of 25 feet around livestock watering locations and ranch houses. 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 of the resulting streamflow 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”. This 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 a 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.

Table 4-7 of the 2007 Vegetation Treatments Draft PEIS (Volume 1, page 4-13) gives field half-lives for the 18 herbicides proposed for use in the PEIS.

In addition to degradation, these herbicides may be unavailable for movement with surface or infiltration water due to volatilization and plant uptake. Volatilization is the loss of herbicide vapor to the atmosphere from plant and soil surfaces. The rate of volatilization is determined by the herbicide’s vapor pressure and how strongly it is adsorbed.

Soil adsorption is also important in determining mobility in surface or infiltrating water. Adsorption of a herbicide varies with the properties of a chemical, as well as soil texture (relative proportions of sand, silt, and clay), moisture level, and amount of organic matter. Soil high in organic matter of clay tend to be the most adsorptive, and sandy soils low in organic matter least adsorptive. Therefore, the higher the organic matter content of the soil, the more adsorptive the soil and the less likely the herbicide is to move from the point of application.

The degree of herbicide adsorption is often represented by the ratio of the amount of herbicide in the soil water to the amount adsorbed. This ratio is called the adsorption coefficient or Kd. The degree of adsorption depends on both the herbicide and the soil properties. The Kd for a herbicide is soil specific and would vary with soil texture and organic matter content.

Another herbicide adsorption coefficient, which is less soil specific is called the Koc. The Koc is the Kd divided by the percent of organic carbon in the soil, a major component of soil organic matter. The higher the value for Kd or Koc, the greater the adsorption. Water solubility and Koc values for herbicides proposed for use in the 2007 Vegetation Treatments PEIS are given in Table 4-9 (page 4-28).

Non-point source pollution is expected to decrease in the short and long-term. Vegetation treatments will reduce runoff, erosion, sedimentation, and improve water infiltration and retention in soil and increase herbaceous plant growth and understory vegetation and reduce sediment yield to rivers and streams.

Affected Environment - Ground Water

The New Mexico State Engineer has declared eight underground water basin within the field office: Upper Pecos, Fort Sumner, Tucumcari, Curry County, Portales, Roswell Artesian, Hondo, and Tularosa. Agriculture is the primary use of ground water within the field office with additional demands by municipalities, industry, livestock and wildlife.

Ground water is located in two primary aquifers separated by a confining layer. The shallow aquifer is made up of unconsolidated alluvium (Quatenary and Tertiary Age), and the deeper aquifer consists of consolidated limestone and sandstone (Permian Age). Depth to ground water typically ranges from less than 10 feet to 100 feet in the unconsolidated alluvium, and 300 to 1,000 feet or more in the consolidated limestone and sandstone.

Environmental Impacts - Ground Water

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. Herbicide properties which determine the likelihood of movement with infiltrating water and leaching index based upon the work of Goss (1988) are given in Table 4-9 of the 2007 Vegetation Treatments PEIS (page 4-28). 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.

In response to the concern for ground water contamination, the 2007 Vegetation Treatments PEIS lists standard operating procedures (SOP) for water resources in Table 2-8 (page 2-31). The SOP is repeated on page 4-25. The SOP directs 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.

Riparian/Wetland Areas and Floodplains

Affected Environment
Public land within the field office contains approximately 32 miles of streams comprising 2,250 of riparian/wetland habitat. The 100-year floodplains are associated with the Pecos River and its major tributaries. Sinkholes, playas and alkali lakes dot the field office. The size of these features range from a few acres to hundreds of acres. Sinkholes are perennial while playas and alkali lakes 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 areas, wetlands or floodplains.

Environmental Impacts
Short-term direct impacts would be similar to those described in the Vegetation Section of this EA, meaning non-target species would be affected by chemical treatment. Open water would not be affected using ground-based equipment (either vehicle mounted or hand sprayers) and the standard operating procedures described in the proposed action.

Long-term and indirect impacts would be beneficial habitat within riparian/wetland areas and floodplains due to the removal or control of noxious weeds.

Wildlife

Affected Environment
The resource area is comprised of several distinct community types based primarily on vegetation, soil and landform. The Sacramento and Capitan Mountains to the west, Chihuahuan Desert to the south, and High Plains to the north and east greatly influence floral and faunal diversity. Federal, state and private land in the resource area provides habitat for approximately 500 species of wildlife. Public land provides important habitat for big game mammals and upland game birds, furbearers and non-game mammals, game and nongame fish, raptors or birds of prey, various songbirds, reptiles and amphibians and a variety of flora.

Environmental Impacts
Wildlife species depend directly on vegetation for habitat, so any change in the vegetation of a particular plant community is likely to affect the wildlife species associated with that community. Any change in community vegetation structure or composition is likely to be favorable to certain animal species and unfavorable to others (Maser and Thomas 1983).

The key to understanding the effects of vegetation manipulation on wildlife involves an understanding of the vegetation structure, production, flowering and fruiting of the community; these characteristics relate to seasonal cover and food requirements for particular animal species and predators dependent on them. These characteristics also respond to a particular vegetation manipulation.

Plant communities on many western rangelands are no longer pristine and therefore do not support pristine populations of wildlife species. Many rangeland plant communities have alien

herbaceous weeds or a high ratio of woody to herbaceous perennial vegetation than under pristine conditions. These vegetation conditions may harm species, such as pronghorn *(Antilocapra americana),* which require mixed-plant communities, rather than those dominated by a few woody or herbaceous species (Yoakum 1975).

The presence of noxious or invasive weeds degrades habitat quality since many of these plants are, at the least, unpalatable to wildlife species, and in some case poisonous to wildlife species. The proposed action would remove these species from the vegetation. Short-term (less than two years) impacts may be negative since some of the herbicides would affect non-target plant species. Long-term (greater than 2 years) impacts would be positive since the target species would no longer be part of the vegetation.

Threatened and Endangered Species Including Special Status Species

Affected Environment

Several state and federal candidate species and other sensitive species may occur within the project area on a seasonal basis. Refer to the Biological Opinion (AP11-38) in the 1997 Roswell RMP for a detailed description of the range, habitats and potential threats. Also refer to Appendix 10, Biological Assessment, of the 2007 Proposed Special Status Species RMP Amendment/final Environmental Impact Statement. For a list of special status species, see the 1997 Roswell RMP and the 2008 Special Status Species RMP Amendment.

Environmental Impacts

Under Section 7 of the Endangered Species Act of 1973 (as amended), the BLM is required to consult with the U.S. Fish and Wildlife Service on any proposed action which may affect Federal listed threatened or endangered species or species proposed for listing. RFO reviewed and determined the proposed action is in compliance with listed species management guidelines outlined in Biological Assessments Cons. #2-22-96-F-102, Cons. #22420-2006-I-0144, and Cons. #22420-2007-TA-0033. No further consultation with the Service is required.

Sites containing plant species within the field office listed as endangered or endangered by the U.S. Fish and Wildlife Service would be buffered out of treatment areas, or an alternate treatment method employed to still control noxious weeds while preserving species and habitat. Those species are listed in Table 2.

Table 2 Listed Plant Species

Common Name	Scientific Name	Status
Kuenzler's hedgehog cactus	*Echinocereus fendleri*	Endangered
Sneed pincushion cactus	*Coryphantha sneedii var. sneedii*	Endangered
Pecos sunflower	*Helianthus paradoxus*	Threatened
Gypsum buckwheat	*Eriogonum gypsophilium*	Threatened
Lee pincushion cactus	*Coryphantha sneedii var. leei*	Threatened

Areas of Critical Environmental Concern

Affected Environment

Both the 1997 Roswell RMPA and the 2008 Special Status Species RMPA established areas of critical environmental concern (ACEC). See the following table for details of these ACECs

Table 3 Areas of Critical Environmental Concern

ACEC Name	Public Land Acres	Management Objective

Fort Stanton	24,000	Provide quality recreation opportunities
Overflow Wetlands	3,000	Protect the biological and scenic values of the area – T&E species habitat
North Pecos River	3,400	Protect the biological and scenic values of the area – T&E species habitat
Mescalero Sands	7.900	Preserve a portion of the shinnery oak/sand dune plant community
Roswell Cave Complex	11,900	Protect the natural and scenic values of caves while providing limited scientific and educational use
Lesser Prairie Chicken *(Tympanuchus pallidicinctus)* Habitat Preservation	37,000	Protect and enhance habitat for the lesser prairie-chicken and sand dune lizard *(Sceloporous arenicola).*

Environmental Impacts
The presence of noxious or invasive species degrades many of the values these ACECs were established to protect. Eradicating or preventing the spread of these species would prevent further habitat degradation. Short-term impacts in treated areas are would include the removal of 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.

Livestock Management

Affected Environment
There are 279 livestock grazing allotments within the field office with over 300,000 animal unit months (AUMs) of permitted use. Of the 1.49 million acres of public land within the field office, less than one percent is unsuitable for livestock grazing.

Environmental Impacts
The goals of rangeland treatment methods 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.

Chemical treatments are generally applied in a form or at such low rates that they do not affect livestock. Treatment would be applied when livestock are not in the project area.

Visual Resources Management

Affected Environment
The public land in the field office is considered to contain both Class III and IV Visual Resource Management Areas (VRM). In a Class III VRM, contrasts to the basic elements caused by a management activity may be evident and begin to attract attention in the landscape. The changes should remain subordinate to the existing landscape. In a Class IV VRM, contrasts may attract attention and be a dominant feature in the landscape in terms of scale, however, the changes should repeat the basic elements of the landscape.

Environmental Impacts
There would be no direct or indirect impacts to visual resources by the proposed action.

Recreation and Off-Highway Vehicles

Affected Environment
Recreational pursuits are considered to be either facility-based or dispersed and the Roswell Field Office offers opportunities in both categories. Established recreation facilities are the Valley of Fires Recreation Area; the Fort Stanton Cave Campground and the Horse Trails Parking Lot in the Fort Stanton Area of Critical Environmental Concern (ACEC); Haystack Mountain OHV Area; and the Mescalero Sands North Dune OHV Area.

The Mescalero Sands North Dune OHV Area (approximately 560 acres) is the only location within the field office which is designated as open to OHV use. Seventeen areas, totaling approximately 39,000 acres are designated as closed to OHV use. See the 1997 Roswell RMP for a list of these areas. OHV use in the remainder of the field office is designated as limited to existing roads and trails.

Environmental Impacts
There would be no direct or indirect impacts to recreation by the proposed action.

Cave and Karst

Affected Environment
The field office has cave/karst potential. See the 1997 Roswell RMP for a description of this potential and maps of High, Medium and Low.

Environmental Impacts
There would be no direct or indirect impacts to cave and karst resources by the proposed action.

No Action Alternative

Affected Environment
The affected environment is the same as previous discussed in this document.

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

IV. CUMULATIVE IMPACTS

A cumulative impact is defined as “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time” (40 CFR 1508.7).

The specific resources being impacted are limited to those that are most important in terms of impacts resulting from remedial actions needing to be implemented to improve current environmental conditions. The proposed action is the treatment of noxious weeds and non-native invasive plant species to reach the goals and objectives desired plant community. Environmental considerations are presented to mitigate impacts and include standard operating procedures for weed treatments, as well as specific design features that would be developed on

a case-by-case basis for individual treatments and environmental conditions and resource concerns warrant.

Past weed treatments within the field office have occurred. BLM records show 8,024 acres chemical treatment projects and 1,641 acres manual treatment projects for a total of 9,665 acres in the past five years. Collectively, these treatments account for less than one percent of federal land within the field office.

Other major resource uses that have been occurring within the Roswell Field Office and expected to continue, include oil and gas development and rights-of-way construction. These legitimate activities under BLM's multiple use mandate are nevertheless cumulative impacts to grassland ecosystems as well. Since there are no leases or wells within the project area and the project area lies within a zone of low potential for hydrocarbons, BLM does not anticipate impacts from oil and gas development in the foreseeable future.

V. MITIGATION MEASURES

Mitigation Measures
Any project involving herbicides would follow the policies, standards and practices listed in Appendix 9, Treating Vegetation with Herbicides, of the 1997 Roswell RMP. In addition to the mitigation measures listed in the Proposed Action, the following measures would also apply:

1. Livestock numbers would not increase as a result of any of the treatments covered in this analysis. The livestock operator must demonstrate to BLM staff that any net increase in animal unit months (AUM's) is the direct result of the livestock operator's ability to manage livestock in balance with watershed capacity to provide forage, maintain livestock distribution and proper grazing use to restore rangeland health prior to any increases in authorized increases in animal numbers.

2. 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.

3. Monitoring studies would be conducted to determine those areas containing noxious weed infestations. Post-treatment monitoring would be conducted to evaluate the effectiveness of treatments,

Residual Impacts: Implementation of the proposed action or of the alternatives would all have the same potential for unavoidable adverse environmental impacts. They are as follows:

- Short-term reduction in air quality from dust and engine emissions resulting from the equipment being used in the application of herbicides

- Short-term change in chemical composition of the uppermost soil layers due to the change in organic matter.

-Short-term decrease in habitat for wildlife species.

VI. BLM TEAM MEMBERS

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VII. LITERATURE CITED

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