EA Number: **NM-060-2004-0060**
Preparer: Dan Baggao

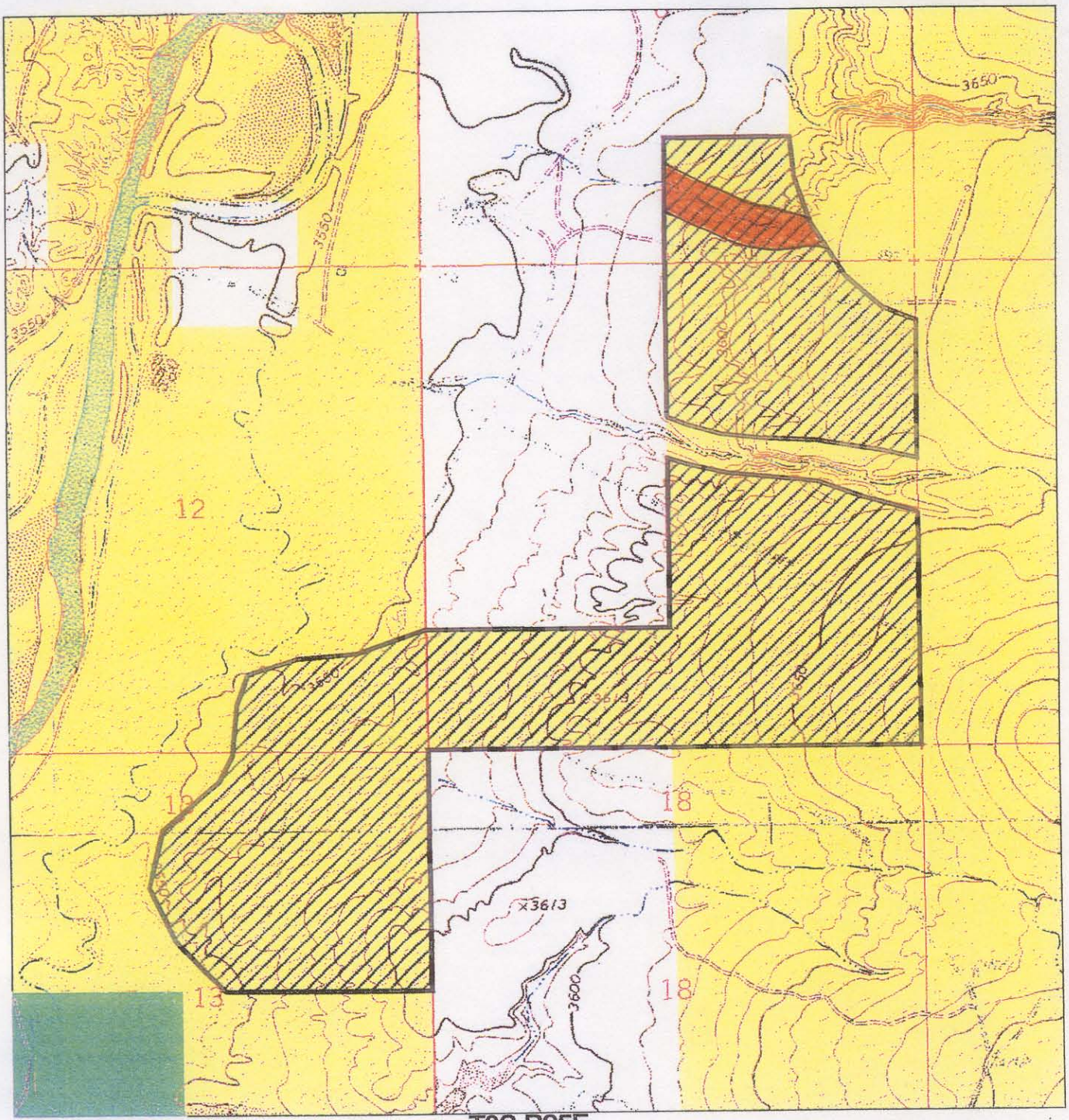
Action Type: Vegetation Treatment
Project Name: MD Mesquite Control

Resource / Activity	Not Present	Not Affected	**May Be Affected	Reviewer	Date
Air Quality*			√	/s/ Michael McGee	11/28/05
Floodplains*		√		Hydrologist	
Soils/Watershed			√		
Water Quality- Drinking/Ground*			√	/s/ Michael McGee Hydrologist/Geologist	11/28/05
Vegetation			x	/s/ John Spain Rangeland Management Spec	9/22/05
Livestock Grazing			x		
Invasive, Nonnative Species*			x	/s/ hcjmiller Range Mgmt Spec/Nox. Weed Spec	9/20/2005
Wastes, Hazardous or Solids*	X			/s/J H Parman Hazardous Waste Spec.	9/20/05
Prime/Unique Farmlands*	X			Irene M. Gonzales Realty Specialist	6-23-05
Lands/Realty/ROW		X			
Fluid Minerals		X		Armando A. Lopez Pet Eng/Geologist/Sur. Prot. Spec.	07/06/05
Mining Claims		√		/s/ Jerry Dutchover Geologist	06/28/05
Mineral Materials		√			
Threatened or Endangered Species*	X			/s/ D Baggao Wildlife Biologist	9/4/05
Wetlands/Riparian Zones*	X				
Wildlife Habitat			X		
Native American Religious Concerns*		X		Pat Flanary Archaeologist	7/12/05
Cultural Resources*		X			
Areas of Critical Environmental Concern*	X			/s/ J H Parman Planning & Env. Coordinator	7/6/05
Low Income & Minority Population Concerns		X			
Wild/Scenic Rivers*	x			Bill Murry Outdoor Recreation Planner/NRS	8/16/05
Wilderness*	x				
Cave/Karst Resources			x		
Outdoor Recreation		x			
Visual Resources			x		
Access/Transportation		**X**		*RICHARD G. HILL* Environ.. Prot. Spec.	8/3/05

* "Critical Element" - must be addressed in all NEPA documents.

MD Mesquite

New Mexico



T8S.R25E

1:19131

LOCATION MAP

Treatment Not Allowed Area

No warranty is made by the Bureau of Land Management as to the accuracy, reliability or completeness of these data for individual use or aggregate use with other data, or for purposes not intended by BLM.

Spatial information may not meet National Map Accuracy Standards. This information may be updated without notification.

Statewide Land Status Legend

Bureau of Land Management	Tribal Lands
Bureau of Reclamation	National Park Service
Dept. of Agriculture	Private
Dept. of Defense	State
Dept. of Energy	State Game & Fish
Forest Service	State Park
Fish & Wildlife Service	

Produced by the Bureau of Land Management
Roswell Field Office GIS Specialist.

Map printed on February 4, 2004

Figure 1

** "Affected Element" - must be addressed in the attached Environmental Assessment.

Environmental Analysis

MD Land and Cattle Mesquite Control Project

NM-060-2004-0060

Location:

Township 8 South, Range 25 East
Section 12 SE1/4, Section 13 NE1/4

Township 8 South, Range 26 East
Section 6 SW1/4SE1/4, Section 7 E1/2, S1/2SW1/4

New Mexico Principal Meridian

Allotment 65024
MD Land and Cattle

Chaves County, New Mexico

September 3, 2005
Revised from Original dated January 21, 2004

Bureau of Land Management
Roswell Field Office
Roswell, New Mexico

I. INTRODUCTION

A. General Information

The MD Land and Cattle Ranch Allotment #65024 is located entirely in Chaves County, New Mexico, about 14 miles northeast of Roswell via Highway 70 and Aztec County Road (see map). The allotment is approximately 5,225 acres in size of which 3,610 acres are federal land, 570 acres are State land, and 1,045 acres are private land (120 acres are uncontrolled by the permittee, i.e., not owned or leased by the permittee, but not fenced apart from the allotment).

The public range is well-blocked within the allotment, having the largest blocks in South and River Pastures. The Pecos River flows north-to-south through a broad alluvial valley along the western portion of the allotment. River Pasture contains one continuous reach of public land along the Pecos River. The area east of the river is a broad floodplain grading to low terraces (the breaks) that are dissected by numerous small draws. Eight Mile Draw is the major drainage located in the northern portion of the allotment and is a location for unnamed springs on State land. Elevations range from 3,540 feet along the Pecos River to 3,780 feet on the uplands to the east.

Allotment 65024 is considered a riparian allotment because of its 1.4 miles of riparian habitat along the Pecos River, all of which are on public land. Riparian-wetland areas are directly influenced by permanent free water, whether at the surface or in the subsurface. Compared to adjacent upland sites, the riparian area has a greater amount and diversity of vegetation. The diversity of plant species and availability of water makes riparian areas prime wildlife habitat.

Public land on the allotment provides benefits for other users as well as the permittee. These uses include recreation (e.g., hunting, fishing and wildlife viewing), and development of the Abo Gas Field. A very large above-ground petroleum products pipeline right-of-way (El Paso Natural Gas) traverses the southwest portion of the allotment. New oil and gas wells are being proposed for development on existing leases.

Prior to 1984, the allotment lacked interior fences needed for livestock rotation or deferment of grazing. In addition, there was lack of water distribution, and livestock were not evenly distributed over the ranch. The ranch was also heavily infested with mesquite. A Cooperative Management Plan was developed in 1985 to address these rangeland management concerns. Several range improvements have been constructed on public lands by the BLM since 1987, including the establishment of River, South, and Eight Mile Pastures through fence construction. Current range improvement projects for the management of livestock include earthen tanks, wells, several drinking troughs with associated pipelines, pasture and boundary fences, and corrals.

No historical spring are located on the allotment based on USGS topographic maps, although Eight Mile Draw has spring discharge at several points within the draw bottom. Sources are not located within the allotment boundary, but only a few hundred

yards above the boundary fence. Use of this water source by livestock in Eight Mile Pasture is not crucial because other developed waters exist in the pasture.

River Pasture is a very productive bottomland pasture and is grazed about six months out of the year. Cattle are moved into River Pasture after branding in June, and kept there until November. When in River Pasture, livestock use the upland sites, but naturally congregate in the bottomlands because of the availability of forage, water, and shade. Livestock depend heavily on the Pecos River as a water source, which is considered a base water for the allotment.

Water gaps and drops that span the Pecos River prevent cattle from moving off the allotment by trailing along, or within, the river channel. However, cattle may move on or off the allotment during periods when gaps are down due to flooding events. The water gaps are easily maintained due to the iron standpipe and cable construction at the allotment boundary.

Concurrent projects include the development of a riparian pasture by constructing a new fence generally running north-south through River Pasture (EA No. NM-060-2004-0059). The division of River Pasture into uplands and bottomlands would facilitate floodplain rangeland management and riparian area management. About 532 acres of salt cedar along the Pecos River has been targeted for since 2001. Initial control has been conducted along the El Paso Natural Gas Pipeline right-of-way due to safety concerns for the pipeline.

B. Purpose and Need For the Proposed Action

The purpose of this environmental assessment is to analyze the impacts of reducing mesquite in areas where mesquite is determined to be prohibitive to functioning native ecosystems by the application of an approved herbicide and maintenance of the project by spot treatment with an approved herbicide and application of prescribed fire.

Mesquite is a native plant to southern New Mexico, but is considered to be invasive. Once this invasive is established in areas, it increases in density and tends to out-compete other native vegetation for soil moisture, nutrients, and sunlight. Land with high density of mesquite exhibits accelerated soil erosion rates, poor water infiltration into soil, and lower amounts of forage available for wildlife and permitted livestock. These impacts can influence both biological organisms and physical properties of the site (Olson 1999). In sites which are dominated by mesquite, some soil will dune up around mesquite plants and leave larger patches of bareground with interspaces barren and unprotected from wind and water erosion.

The BLM Roswell Field Office desires it's rangelands to have reasonable densities of mesquite which will allow other native vegetation such as warm season perennial grasses and favorable brush such as four-wing saltbush *(Atriplex canescens)* to recover.

In 1991, the Bureau of Land Management released the Record of Decision for the Vegetation Treatment on BLM Lands in Thirteen Western States Environmental Impact Statement. The EIS analyzed the impacts of integrated vegetation management. The methods included in integrated vegetation management are manual, mechanical, biological, prescribed burning and chemical.

In 1997, BLM released the Record of Decision for the Roswell Resource Management Plan (RMP). The RMP established six Desired Plant Communities within the planning area. Two of these plant communities are found within the proposed treatment area, the grassland community and the mixed desert shrub community. The Roswell RMP set a threshold of 50 mesquite plants per acre to consider vegetative treatment.

In January 2001, the Secretary of Interior signed the Record of Decision for the Bureau of Land Management's New Mexico Standards for Public Land Health and Guidelines for Livestock Grazing. This decision established the processes for assessments and determinations necessary for implementation. Public Land (Rangeland) Health Assessments were conducted in 2003 and 2004 to supplement the long-term monitoring data by rating twenty-two indicators for rangeland health to address this issue.

Indicators for rangeland health on the MD Land and Cattle Ranch indicate that the invasive plants indicator has rated Moderate to Extreme identifying mesquite as the major shrub encroaching and common throughout the River Pasture site with densities with the potential to dominate. Copies of these assessments can be accessed at www.nm.blm.gov/rfo/index.htm.

Recent monitoring data also indicates that mesquite production has more than tripled from1994 to 2001, now estimated at 336 lbs/ac or kg/ha. The percent composition now is 61% of the total for the site. For an SD-3 sandy ecological site (Southern Desertic Basins, Plains & Mountains), the annual production for shrubs is 6% of the total annual yield for normal years, with mesquite as a very minor component. Mesquite has since become the major shrub on site exceeding the threshold as established in the Roswell RMP and the ESD (Ecological Site Description) and vegetative treatment may be considered.

Vegetative monitoring data in these areas indicates that mesquite densities have exceeded the threshold as established in the Roswell RMP, and vegetation treatment may be considered. Mesquite has encroached to the point that it covers wide areas and is in direct competition will all other plants for the available soil moisture. This competition restricts the abundance of more desirable forage grasses and forbs, causing limitations on livestock, wildlife and soil stability.

The need for the proposed action is to improve upland range and watershed conditions in River Pasture by reducing the amount of mesquite in the grassland community type. Mesquite has increased to the extent that other desirable shrubs, grasses and forbs are no longer available or have become sparse. River Pasture has much more mesquite

plants than the threshold number required for designation of treatment. Ground cover is reduced, exposing more of the soil to erosion and reducing the productivity of the range site.

The improvement of rangeland conditions in the east portion of River Pasture in concert with other planned activities such as the aforementioned riparian pasture fence and salt cedar control along the Pecos River would serve in the modification of the existing Cooperative Management Plan. A rest-rotation system would be implemented based on the new pasture configurations and improved rangeland conditions. The additional pasture and vegetation manipulation projects would allow for livestock management flexibility so that any one pasture could receive adequate rest to maintain vegetation resources.

C. Conformance with Land Use Plans: The proposed action conforms to the Roswell Resource Area Resource Management Plan and Record of Decision (1997) and the New Mexico Standards for Public Land Health and Guidelines for Livestock Grazing Management and Record of Decision (2001), which amended the Roswell RMP; and the Vegetation Treatment on BLM Lands in Thirteen Western States, Final EIS (USDI BLM, May 1991).

D. Relationship to Statues, Regulations, or Other Plans: The proposed action and alternatives are consistent with the following -

The Taylor Grazing Act of 1934, as amended (43 U.S.C. 315 (a)-(r)).

The Carson-Foley Act of 1968 (Pub. L. 90-583)

The National Environmental Policy Act of 1969, as amended (Pub. L., 91-190, 42 U.S.C. 4321-4347) Sec. 101.

The Federal Noxious Weeds Act of 1974 (7 U.S.C. 2801-2813) as amended by Section 15, Management of Undesirable Plants on Federal Lands, 1990.

The Federal Land Policy and Management Act of 1976, as amended (Pub. L. 94-579, 43 U.S.C. 1702 et seq), Sections 302 (a) & (b), Section 502 (a) & (c).

The Public Rangelands Improvement Act of 1978, as amended (Pub. L. 95-5 14, 43 U.S.C. 1901 et seq).

II. PROPOSED ACTION AND ALTERNATIVES

A. Proposed Action

The proposed action is to chemically treat approximately 550 acres of public land and private land in River Pasture of allotment #65024 infested with mesquite to enhance

watershed and native vegetation conditions within proposed treatment areas by reducing population densities of mesquite by herbicide application. The objective is to reduce mesquite in areas where mesquite is determined to be prohibitive to functioning native ecosystems by the application of an approved herbicide. Maintenance of the project would be accomplished by spot treatment with an approved herbicide and application of prescribed fire.

The areas identified for treatment by this environmental assessment are located within Chaves County, New Mexico, approximately 15 miles northeast of Roswell. Please refer to the attached map for specific locations.

These areas were selected for treatment due to several factors:

- The sites' ability to recover with native vegetation.
- Soils are present which tend to exhibit good results with herbicide treatment.
- Seed source present and available for desirable vegetation.
- Cooperation with the grazing allotment operators for adequate grazing deferment.
- Low risk of herbicide damage to non-target vegetation.
- The area is favorable for aerial application of the herbicide.

The goal is to lower existing mesquite ground cover to less than 10%, by the third year after treatment. Removing mesquite and allowing more desirable vegetative species to flourish will benefit the watershed by stabilizing soil and wildlife from additional forb, grass and favorable brush production.

Description of Treatment

The herbicides proposed for use are Reclaim™ (*clopyralid)*, and Remedy™ (*triclopyr)* to be applied aerially from a fixed wing aircraft. The proposed rate of application will be ¼ pound of active ingredient (ai) per acre of each chemical: ¼ lb ai/acre triclopyr and ¼ lb ai/acre clopyralid. The product label for Remedy recommends a tank mix with Reclaim to be applied at ½ to 1 pint of Remedy with ⅔ to 1 ⅓ pint per acre of Reclaim. This recommendation is the equivalent of ⅛ to ¼ lb ai/acre of triclopyr and ¼ lb to ½ lb ai/acre of clopyralid.

Clopyralid is a systemic, postemergent herbicide that is effective against many species of Compositae, Fabacease, Solanaceae, and Apiaceae. It has auxin-like activity, inducing severe epinasty (downward bending of the plants parts, caused by excessive growth of the upper side) and hypertropy (a nontumorous increase in the size of the plants parts due to the enlargement without increase in number of constituent cells) of the crown and leaves. It is classified as slightly to very slightly toxic to mammals. It is a severe eye irritant, however. Oncogenicity and mutagenicity studies suggest that clopyralid is noncarcinogenic and nonmutagenic. Clopyralid has a low order of toxicity for fish and aquatic invertebrates and is nontoxic to bees. Microbial decomposition appears to occur. Photolysis is not important in decomposition. It does not appear to be

strongly sorbed on soil and may be subject to leaching. Solubility is high. Persistence is low with the half life being in the range of 12 to 70 days, averaging 30 days for clopyralid amine salt.

Triclopyr is an auxin-type selective herbicide effective against woody plants and broadleaf weeds. The herbicide is particularly effective against root sprouting species, including ash and oaks and is used fro brush and weed control on rangelands, industrial sites, permanent grass pasture and broadleaf and aquatic weed control in rice. However, most grass species are tolerant to triclopyr. Based on acute oral exposures in rats, technical triclopyr is classified as slightly toxic. Laboratory data indicated that triclopyr is noncarcinogenic and nonmutagenic. Microbial breakdown appears to be important. Loss from photolysis is important. Adsorption is not strong and mobility is moderate to high. Solubility is 430 ppm in water. Soil half-life persistence of triclopyr ester is 30 to 90 days, averaging 46 days.

Specific information about these herbicides may be found on the internet address http://www.dowagro.com/theranch/products.htm.

These herbicides are registered for use within the stated application rate on rangelands for control of mesquite on BLM land in the state of New Mexico, as addressed in the 1991 Final EIS Vegetative Treatment on BLM Land. The total amount of herbicide will not exceed allowable rates as found within the herbicide labels.

Application of the herbicide would be performed when the correct phenological stage of mesquite growth occurs; aerial applications of liquid formulations are generally conducted between the latter part of May until mid-June.

The proposed treatments are designed to reduce straight edge lines where possible, and contain areas or islands of untreated mesquite left for the preservation of habitat important to the maintenance of existing and future populations of game and non-game animals. These proposed treatments will serve to create a regional mosaic within the landscape.

Appendix 9 of the Roswell RMP, p. AP9-13, outlines the policies, standards and practices to be used on public land in the Roswell Field Office when treating vegetation with herbicides. These requirements are derived from BLM policy, the Final EIS on Vegetation Treatment on BLM Land in Thirteen Western States, decisions made in Roswell Resource Area Land use plans, and mitigations developed through other environmental assessments.

The applicable federal regulations concerning the storage and disposal of herbicides and herbicide containers would be followed. These are described in the Environmental Protection Agency "Regulations for Acceptance and Procedures for Disposal and Storage," Federal Register May 1, 1974, pages 15236 through 15241. This notation can be found on the label of each herbicide.

Design Features of Treatment

Considerations for wildlife habitat, possible Threatened or endangered species, watershed conditions and livestock operations are factored into the project design. This includes leave out areas such as the major drainages, timing of treatment and grazing management actions after treatment.

The groundwater would be protected by project design and proper herbicide application. The BLM hydrologist would perform an analysis of risks to groundwater. If this analysis indicates elevated risk levels, this risk will be mitigated by specifying leave out areas from treatment and buffer zones. Buffer zones reduce drift impacts on sensitive areas, while wind increases drift impacts. Mitigation requires buffer of 100 feet (aerial).

The Environmental Protection Agency (EPA) in response to the concern for ground water contamination developed a rating system to delineate groundwater contamination vulnerability. This system, known as DRASTIC analysis (Aller et al. 1985), has been used nationwide and uses factors of depth to water, net recharge, aquifer media, soil media, topography, impact to unsaturated zone, and gross hydraulic conductivity to identify potential vulnerability areas. Figure 2-8 of the FEIS (page 2-32) shows those vulnerability areas for the FEIS area. Most of the areas in Figure 2-8 are in the low and moderate vulnerability category. The actual risk of ground water contamination appears to be low according to the attached Drastic report.

All livestock would be removed from the target pasture prior to herbicide application. The area would be deferred from grazing for a minimum of two consecutive growing seasons following herbicide treatment, or until agreement between the BLM and permittee, and depending on the vegetative response in the treated area. The growing season usually begins at the onset of the summer rains (July 4), and continues until the first frost (October 31). Ideally, a 3-inch average new growth of grasses such as bush muhly *(Muhlenbergia porteri)*, tobosa *(Pleuraphis mutica),* and alkali sacaton *(Sporobolus airoides)*, along with germination of new plants will indicate when grazing should resume. This determination will be made with the consultation of the grazing permittee and the resources staff of the BLM. The deferment period may be extended for one entire year, or for more than two growing seasons, if drought conditions exist.

At a later date, as early as two or three years after herbicide application, the herbicide-treated area may be burned to remove standing dead vegetation. Mesquite mortality due to prescribed fire is highest when it is burned just after new leaf growth begins.

The burns would be conducted between February 1 and April 15. The purpose for this time frame include; (1) the availability of firing and holding resources, (2) relatively low fire activity period, and (3) seasonal weather conditions that would be favorable to achieve the desired objectives. The specifics of the prescribed fire would be outlined in the necessary Burn Plan.

Coordination with the permittee prior to burning would include provisions to remove livestock from the area. Grazing would again be deferred after the prescribed fire until the perennial grasses reach an average new growth of three inches or boot stage.

Powerlines, fences, and any oil and gas facilities which are present in the proposed areas would be properly protected from the fire by clearing a 15 foot minimum buffer zone around the improvements. The clearing of vegetation prior to the prescribed burn would be accomplished, if possible, by burning small cool fires around the structure or improvements to remove the fuel; this is known as blacklining. Some mechanical removal of the vegetation may have to be done by tools. If large equipment is necessary, an archaeological clearance would be obtained prior to blading of fire lines. Assuming the adjoining state and private land isn't treated in the near future, this treatment would serve to create a regional mosaic within the landscape.

Resumption of use would be determined following coordination between the BLM and the permittee. The area may be burned again at later dates to continue maintenance of the area. Prescribed fire has been demonstrated to have the best results if it is conducted periodically in three to five year intervals.

B. No Action Alternatives

This alternative would leave rangeland vegetation condition as it is now whereby the mesquite would be left ➢as is▶ and would continue the existing management. This is the least cost alternative, but no benefits would be realized. Mesquite densities would remain the same or increase and the health of the rangeland would be expected to deteriorate.

C. Alternatives Considered but Not Analyzed

1. The alternatives of No Action, No Use of Herbicides, and No Aerial Herbicide Application have been analyzed in the *Vegetation Treatment on BLM Lands* FEIS and considered in the Record of Decision. Further discussion in this EA is unnecessary since site-specific conclusions and impacts would be essentially the same as in the FEIS.

2. Mechanical Removal Only - The alternative of grubbing mesquite was considered but not further analyzed. The cost of mechanical control and archaeological clearance, and amount of surface disturbance over the 540 acres would be prohibitive. Until the area re-vegetates it would be highly susceptible to soil erosion. This alternative will

not be given further consideration in this report; fewer environmental impacts would result from the action as proposed.

3. Prescribed Fire Alone - This alternative would be less costly but have less favorable results for the proposed areas. The rationale to not analyze this alternative is due to the fact that not enough fine fuels are available to carry a fire.

4. Chemical Treatment Alone - The proposed treatment area would be treated with herbicide but would not be followed by prescribed burning. This alternative would result in only the impacts associated with herbicide use. The impacts associated with fire would not occur. However, fire is part of the natural ecosystem and its occurrence has been drastically reduced over the last 100 to 200 years. The result has lead to a slow increase in the amount and density of shrubby vegetation. Introducing fire back to the ecosystem under controlled prescribed conditions would stimulate the natural vegetation in the area. Using fire in combination with an initial herbicide application would serve to hasten the process of returning the area to a savannah grassland. Future use of prescribed fire in the area would help to maintain the grassland aspect, and will reduce the need for future herbicide applications.

5. Apply Herbicide at a Different Rate - This alternative would apply the herbicides at a higher or lower application rate. The proposed action application rate is recommended due to the effectiveness on the target vegetation and the safety to non-target vegetation. Other rates would not produce the desired results or potentially harm non-target vegetation.

III. AFFECTED ENVIRONMENT

A. Affected Resources

The following resources or values are not present or would not be affected by the authorization of livestock grazing on Allotment 65024: Areas of Critical Environmental Concern, Cultural Resources, Floodplains, Native American Religious Concerns, Prime or Unique Farmland, Minority/Low Income Populations, Hazardous or Solid Wastes, Water Quality, Wild and Scenic Rivers, and Wilderness. Affected resources and the impacts resulting from livestock grazing are described below.

1. Air Quality: The allotments are in a Class II area for the Prevention of Significant Deterioration of air quality as defined by the federal Clean Air Act. Class II areas allow a moderate amount of air quality degradation. The 9,621-acre Salt Creek Wilderness is a mandatory Class I area just south of Allotment 64056.

Air quality in the region is generally good, with winds averaging 10-16 miles per hour depending on the season. Peak velocities reach more than 50 miles per hour in the spring. These conditions rapidly disperse air pollutants in the region.

2. Soil: The *Soil Survey of Chaves County, New Mexico, Northern Part (USDA Soil Conservation Service 1983)* was used to describe and analyze impacts to soils on Allotment 65024. There are five soil map units represented on the allotment:

Ustifluvents, frequently flooded, nearly level (USA) is found along the Pecos River on the west boundary of the allotment.

Glendale-Harkey association (GHA) is found on bottomlands within the 100-year floodplain of the river, in Farm Pasture, and the west part of River Pasture.

Hollomex-Gypsum land-Alama, dry complex, moderately steep (HKD) is found on terrace fronts and dissected terraces just above the 100-year floodplain. It is in the west parts of Eightmile and South Pastures, and the east part of River Pasture.

Pajarito-Bluepoint complex, hummocky (PBB) is found on alluvial side slopes in the south part of Eightmile Pasture, the east part of River Pasture, and most of South Pasture.

Hollomex-Reeves-Milner, dry loams, gently undulating (HRM) is found on terraces above the floodplain, in the northeast part of Eightmile Pasture.

Most of the soil on the allotment is derived from calcareous alluvium, residuum, or eolian deposits. This loamy soil is deep and well drained. Runoff is medium and the water erosion hazard is moderate. The wind erosion hazard is high.

3. Vegetation: Allotment 65024 is comprised of several vegetation community types arranged in a mosaic over the allotment: (1) Grassland; (2) Mixed Desert Shrub; (3) Drainages, Draws and Canyons (DDC); and (4) Riparian/Wetland. The allotment is characterized as a riparian allotment because of its proximity to the Pecos River. Riparian vegetation, primarily found within the floodplain of the river, is discussed in the Riparian/Wetland section of this environmental assessment.

Grasslands are intermixed with all community types. Sand dropseed, three-awn, black grama, bush muhly and fluffgrass are common in the sandy uplands. Alkali sacaton is the dominant species in the bottomlands where it is interspersed with saltcedar. Tobosa is found in both sandy uplands and bottomlands. Grassland sites also have a mesquite or broom snakeweed shrub component. Blue grama is primarily found on loamy soils and black grama on more gravelly soils. Gyp grama is common on the gypsiferous soil types found along Eightmile Draw.

Grassland communities on the uplands and shallow breaks above the bottomland support a large percentage of shrub species. Mesquite, broom snakeweed, fourwing saltbush, and yucca are common shrub species. The primary grasses are sand dropseed and bush muhly. Before chemical treatment, South Pasture was primarily mesquite hummocks with little grass present. Post-treatment surveys indicate an increase in bush

muhly, sand dropseed, vine mesquite and black grama. Fourwing saltbush also increased in the pasture following treatment.

The Mixed Desert Shrub community is found primarily on the rough breaks with gypsiferous soils above the bottomlands. This community type also supports a larger percentage of shrub species than the other types, including pockets of creosote and javelina bush. Gyp grama and tobosa are interspered with the shrubs.

The DDC Community is comprised of the major drainages crossing the allotment, including Eightmile Draw which is the largest drainage. Vegetation lining the banks of this well-defined draw includes saltcedar, alkali sacaton, inland saltgrass, desert willow, goldenrod, and sedges.

Ecological sites found within the treatment area are Southern Desert-3 Sandy, Bottomland and Salty Bottomland as described by the National Resource Conservation Service. The range site descriptions for this area may be found on the internet at www.nm.nrcs.usda.gov/technical/fotg/section-2/esd/sd2.html.

Non-Native and Invasive Species:

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 public health, agriculture and commerce of the United States. Generally, noxious weeds are aggressive, difficult to manage, parasitic, carriers or hosts of harmful insects or disease, and are either native, new to, or not common in the United States. In most cases however, noxious weeds are non-native species.

The list currently includes the following weeds: 1) African rue *(Peganum harmala)*, 2) black henbane *(Hyoscyamus niger)*, 3) bull thistle *(Cirsium vulgare),* 4) camelthorn *(Alhagi pseudalhagi),* 5) Canada thistle *(Cirsium arvense),* 6) dalmatian toadflax *(Linaria genistifolia ssp. Dalmatica)*, 7) goldenrod, *(Solidago Canadensis)* 8) leafy spurge *(Euphorbia esula),* 9) Malta starthistle *(Centaurea melitensis),* 10) musk thistle *(Carduus nutans),* 11) poison hemlock *(Conium maculatum),* 12) purple starthistle *(Centaurea calcitrapa),* 13) Russian knapweed *(Centaurea repens),* 14) Scotch thistle *(Onopordum acanthium),* 15) spotted knapweed *(Centaurea maculosa),* 16) teasel *(Dipsacus fullonum)*, 17) yellow starthistle *(Centaurea solstitialis),* 18) yellow toadflax *(Linaria vulgaris),* 19) Russian olive *(Elaeagnus angustifolia),* 20) Saltcedar *(Tamarix* spp.*),* 21) Siberian elm *(Ulmus pumila).*

Of the noxious weeds listed, the ones with known populations in the Roswell Field Office are African rue, non-native thistles *(Cirsium* spp.) such as bull thistle and Canada thistle, leafy spurge, goldenrod, Malta starthistle, Russian knapweed, Siberian elm, poison hemlock, teasel, Russian olive, saltcedar, musk and Scotch thistle. Also "problem weeds" of local concern are cocklebur *(Xanthium* spp.*)*, buffalobur *(Curcurbita foetidissima)* and spiny cocklebur *(Xanthium spinosum)*. "Problem weeds"

are those weeds which may be native to the area but whose populations are out of balance with other local flora. Saltcedar is commonly found in the draw bottoms and drainages near the treatment area. However the adjacent drainages and draw bottoms will be excluded from treatment.

Infestations of noxious weeds can have a disastrous impact on biodiversity and natural ecosystems. Noxious weeds affect native plant species by out-competing native vegetation for light, water and soil nutrients. Noxious weeds cause losses to native rangelands. These losses are attributed to: (1) decreased quality of agricultural products due to high levels of competition from noxious weeds; (2) decreased quantity of agricultural products due to noxious weed infestations; (3) costs to control and/or prevent the noxious weeds, (4) reduced property values due to noxious weed infestations.

Noxious weeds affect both crops and native plant species in the same way, by out-competing for light, water and soil nutrients. Losses are attributed to decreased quality and quantity of agricultural products due to high levels of competition from noxious weeds and infestations. Noxious weeds can negatively affect livestock productivity by making forage unpalatable to livestock thus decreasing livestock productivity and potentially increasing producer▶ s feed costs.

There are no known populations of noxious weeds on the allotment with the exception of saltcedar and Russian olive growing in some areas along the Pecos River on public and private lands. A large scale saltcedar treatment was conducted by the State of New Mexico in 2001 along most of the length of the Pecos River. The target areas were primarily private lands. Some saltcedar and Russian olive were missed or left untreated. Both species continue to re-invade the Pecos River riparian area.

4. Water Quality Drinking/Ground: Surface Water - The allotment straddles approximately 1.4 miles of the Pecos River. Eightmile and Railroad Draws drain to the river from the east. This portion of the river is in the reach from Salt Creek to Sumner Dam, which is identified as Segment 2207 by the New Mexico Water Quality Commission (WQCC). Under the authority of the federal Clean Water Act, the WQCC (1995) designated uses for streams in New Mexico. Designated uses for Segment 2207 include fish culture, irrigation, a limited warmwater fishery, livestock watering, wildlife habitat, and secondary contact (e.g., wading). The WQCC (1995) also established water quality standards to protect the designated uses, and directs periodic water quality assessments to ensure that standards are met. According to the New Mexico Environment Department (NMED), Segment 2207 is currently meeting the standards for all its designated uses (Hogge 1998, NMED 1998a).

Ground Water - The allotment lies at the northern end of the Roswell Basin monitoring area (New Mexico State Engineer 1995, Wilkins and Garcia 1995). The groundwater table is shallow and ranges from 10 to 30 feet deep in the shallow aquifer (New Mexico Office of the State Engineer Data). Yields of 100 gallons per minute or more are

possible from the alluvium (Geohydrology Associates, Inc. 1978). Ground-water quality is generally acceptable for stock use, though data are limited. Agriculture is the primary use of groundwater in the area, with additional demands by landowners and municipalities.

5. Wildlife: The allotment provides a variety of habitat types for terrestrial and aquatic wildlife species. The diversity and abundance of wildlife species in the area is due to the presence of open water, the numerous drainages interconnecting upland habitats to the Pecos floodplain, a mixture of grassland habitat and mixed desert shrub vegetation, and riparian vegetation found within the floodplain of the river.

Numerous avian species use the Pecos River during spring and fall migration, including nongame migratory birds. The Bitter Lake National Wildlife Refuge (BLNWR) is several miles downstream from the allotment, and serves as a major focal point for migratory birds (e.g., ducks, geese, sandhill cranes, waterbirds). Common bird species are mourning dove, mockingbird, white-crowned sparrow, black-throated sparrow, blue grosbeak, northern oriole, western meadowlark, Crissal thrasher, western kingbird, northern flicker, common nighthawk, loggerhead shrike, and roadrunner. Raptors include northern harrier, Swainson▶ s hawk, American kestrel, and occasionally golden eagle and ferruginous hawk.

The Pecos River once supported a wide variety of native fish species adapted to the flow regime that existed prior to dam construction, agriculture development, and the introduction of non-native fish species. The greatest impact to fish habitat is the manipulation of water supply to meet irrigation needs. Representative fish species include the red shiner, sand shiner, Arkansas River shiner, Pecos bluntnose shiner, plains minnow, silvery minnow, plains killifish, mosquitofish, speckled chub, river carpsucker and channel catfish.

Common mammal species using the area include mule deer, pronghorn antelope, coyote, gray fox, bobcat, striped skunk, porcupine, racoon, badger, jackrabbit, cottontail, white-footed mouse, deer mouse, grasshopper mouse, kangaroo rat, spotted ground squirrel, and woodrat.

A variety of herptiles also occur in the area such as yellow mud turtle, box turtle, eastern fence lizard, side-blotched lizard, horned lizard, whiptail, hognose snake, coachwhip, gopher snake, rattlesnake, and spadefoot toad.

6. Threatened or Endangered Species: The Pecos bluntnose shiner, Pecos gambusia, interior least tern and the Pecos sunflower are federally listed species that occur or have the potential to occur on the allotment. The status and presence of these species in the RFO area are discussed in the following section.

Pecos Bluntnose Shiner *(Notropis simus pecosensis)* - Federal Threatened

Historically, the Pecos bluntnose shiner inhabited the river from Santa Rosa to near Carlsbad, New Mexico. Currently, the subspecies is restricted to the river from the Fort Sumner area southward locally to the vicinity of Artesia, and seasonally in Brantley Reservoir (NMDGF 1988; USFWS 1992). Routine fish community monitoring conducted by the USFWS in the river between Sumner Dam and Brantley Reservoir show the fish remains generally abundant, especially in light of cooperative efforts between the Bureau of Reclamation and the USFWS to more closely mimic natural flows in the Pecos River.

There are two designated critical habitat areas on the Pecos River within the RFO area. The first is a 64-mile reach beginning about ten miles south of Fort Sumner (Township 1 North), downstream to a point about twelve miles south of the DeBaca/Chaves County line (Township 5 South). The second reach is from Highway 31 east of Hagerman (Township 14 South), south to Highway 82 east of Artesia (Township 17 South). The allotment does not fall within these reaches.

Livestock grazing does not appear to be a threat to the bluntnose shiner based on a review of the literature. Nor was grazing identified in the Pecos Bluntnose Shiner Recovery Plan as having the potential to adversely affect water quality, and thus the bluntnose shiner (USFWS 1992).

Pecos Gambusia *(Gambusia nobilis)* - Federal Endangered

The Pecos gambusia is endemic to the Pecos River Basin in southeastern New Mexico and western Texas. Historically, the species occurred as far north as the Pecos River near Fort Sumner, and south to Fort Stockton, Texas.

Recent records indicate, however, that its native range is restricted to sinkholes and springs and their outflows on the west side of the Pecos River in Chaves County. In spite of population declines, the species remains locally common in a few areas of suitable habitat. Populations on the BLNWR and the Salt Creek Wilderness Area constitute the key habitat of the species in the RFO area. On the refuge, the gambusia is primarily restricted to springs and sinkholes in the Lake St. Francis Research Natural Area.

Endangerment factors include the loss or alteration of habitat (e.g., periodic dewatering) and introduction of exotic fish species (e.g., mosquitofish). Potential impacts to habitat may also occur from surface disturbing activities at sinkholes or springs and their outflows.

Interior Least Tern *(Sterna antillarum athalassos)* - Federal Endangered

The interior least tern nests on shorelines and sandbars of streams, rivers, lakes, and man-made water impoundments. Records of breeding terns in New Mexico are

centered around BLNWR where the species has bred regularly since it was first recorded in 1949. BLNWR is considered "essential" tern breeding habitat in the state. Besides BLNWR, the only known nesting habitat in the RFO area is an alkali flat due north of the refuge on public lands. These are small populations with only a few nesting terns.

Sporadic observations of least terns have been recorded elsewhere in the Pecos River valley. The tern may occur on public lands in Chaves County along the river because suitable nesting habitat is found on sites that are sandy and relatively free of vegetation (i.e., alkali flats). Approximately 44 potential nesting sites are found throughout the RFO area. Other potential habitat sites are saline, alkaline, or gypsiferous playas that occasionally hold water. However, ephemeral playas do not support fish, the main staple for terns.

Specific surveys for nesting least terns have been conducted in potential habitat along the Pecos River and playas by the New Mexico Natural Heritage Program under a Challenge Cost Share project. No other nesting terns have been found to date.

Pecos (Puzzle) Sunflower *(Helianthus paradoxus)* - Federal Threatened

The Pecos sunflower is found along alkaline seeps and cienegas of semi-desert grasslands and short-grass plains (4,000-7,500 ft.). Plant populations are found both in water and where the water table is near the ground surface.

In the RFO area, the sunflower is found in only a few areas outside of the BLNWR. In 1994, a new population was found growing on the margins of Lea Lake and its outflow at Bottomless Lakes State Park. Lloyd's Draw, east of the Pecos River, has the only known Pecos sunflower population on BLM land, which only became evident following a prescribed fire. Potential habitat also occurs on BLM land within the Overflow Wetlands Wildlife Habitat Area.

Potential habitat for the sunflower occurs on the allotment as low lying areas where the water table is near the ground surface. The low lying areas are not necessarily along the existing river channel, but in old channel courses and oxbows. These areas are now invaded by saltcedar growing in dense stands, which may prevent the viability of the Pecos sunflower. Other potential sites include a few springs on the east side of the river. No Pecos sunflower populations have been found on the allotment to date. Endangerment factors include dewatering of riparian or wetland areas where the sunflower is found, surface disturbing activities, and excessive livestock grazing.

7. Livestock: The allotment is grazed yearlong by cattle. The current permit authorizes100 AUs. Grazing is by a cow/calf operation. Currently, the allotment is grazed yearlong with a rest-rotation system recently initiated by the allottee.

Ecological condition is considered to be a mid seral rating for the area proposed for treatment so that treating mesquite where it has become very dense would improve the ecological rating of the pasture .

8. Cave/Karst: Allotment 65024 is in a designated area of high potential for the occurrence of caves and karst. Although a complete inventory of significant cave and karst features has not been completed for BLM lands, significant cave and karst features are not known to exist on Allotment 65024. No significant features have been documented for Allotment 65024.

9. Visual Resources Management: The entire allotment is in a Class III area for visual resources management. In a Class III area, contrasts to the basic elements caused by a management activity may be evident and begin to attract attention in the landscape. The changes, however, should remain subordinate to the existing landscape.

IV. ENVIRONMENTAL IMPACTS

1. Air: The most significant impacts on air quality would be moderate noise. The use of aircraft to apply the herbicide could temporarily cause noise levels to reach 90 dB. Impacts would be temporary, small in scale, and quickly dispersed.

   Air quality will suffer short term decreases on burn days and for a few days following burning. No long-term impacts due to smoke accumulation are anticipated. The smoke dispersal area is unpopulated rangeland and smoke will disperse rapidly with the wind. Federal, State and local air quality regulations would not be violated.

2 Soils: Vegetation treatments may affect the characteristics of the soil by altering the abundance and types of vegetation that may shield soils from erosion, or alter the presence and abundance of soil microorganisms or larger organisms that contribute to overall soil quality.

   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.

   Although herbicides would not alter a soil's physical properties, there may be indirect effects on soil 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 soils 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). The chemical nature of the herbicide proposed is such that no residue will be left in the soil after approximately three years.

The increased organic material, caused initially by mesquite leaves, stems and roots and, secondarily by the increased production of grasses and forbs, improve the fertility of the soils. The increases in standing production and litter causes a gradual leveling of the undulating lands forms in the treated areas and the increase in organic material will also help prevent the erosion hazard of soil blowing.

Removal of solid stands of vegetation by chemical treatment may result in short-term, insignificant increases in surface erosion that would diminish as vegetation reoccupies the treated sites.
Short term negative impacts to the soil are anticipated from the mechanical clearing of firelines prior to the prescribed burn. The soils should stabilize after vegetation once again regenerates in the bladed areas. Short term negative impacts from burning the vegetation cover will occur until re-growth stabilizes the soils. Long term positive impacts are expected to benefit the soil from an increased herbaceous vegetation cover. Increased cover is expected to also increase water infiltration rates and moisture holding ability.

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 not expected to increase in the short or long term.

3. Vegetation: Vegetation treatments would have beneficial and adverse effects on terrestrial vegetation within the areas. Target (mesquite) and non-target vegetation gowing within the mesquite hummocks would be directly affected. The overall effect of treating vegetation would be to achieve the desired successional stage, and improve forage and browse sources for wildlife and livestock and to promote soil stabilization.

   Effects of the proposal would be to decrease the density and composition of mesquite while increasing the density and composition of desirable grasses and forbs. Forage production, ground cover and wildlife habitat would be improved. Although the treatment targets mesquite, some injury or loss of non-targeted species may occur. Those species include other desirable forbs and shrubs. The proposed treatments have been designed to reduce damage to non-target vegetation by designing leave out areas and buffering along drainages.

   Annual plants are generally more sensitive than perennial plants to chemical treatments because they have limited food storage organs 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. Control of some woody plants on some sites may open the community to dominance by annuals (Evans and Young 1985). Summer and Fall annuals will usually germinate after the proposed treatment timing and should be minimally affected.

Susceptibility of perennial plants to herbicides depends largely on their ability to re-sprout after aerial shoots are damaged (Table 3-3 of the FEIS, page 3-23). 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 occurs. (Sosebee, 1983). This generally occurs only when soil temperatures are adequate for root activity and soil water is available. These plants are generally more susceptible to soil-active herbicides that persist in the soil long enough to be taken up when optimum translocation conditions occur. Perennial grasses are not affected by the proposed herbicide as it is broadleaf specific. BLM experience with these herbicides have shown that favorable brush such as four-wing saltbush will be slightly affected the first 30 to 60 days after treatment, but will then flourish and produce new growth.

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. This is the case with the design of this project. Damage to preferable brush such as four-wing salt bush is minimized when using the design as outlined under the proposed action.

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

The degree of plant uptake is partially determined by the herbicide's water solubility. The more water soluble an herbicide is, the greater the possibility for plant uptake. In addition, for those herbicides applied to foliage, interception of the spray by foliage will reduce the amount of herbicide reaching the soil surface where it is available for movement with surface or infiltration of water. Foliar residues are usually more susceptible to photodegradation and volatilization. By contrast, those herbicides applied directly to the soil surface have a greater possibility of movement with surface or infiltrating water.

An even application of the chemical herbicides Reclaim and Remedy at the proposed 0.25 pounds of active ingredient each per acre will reduce the present composition of mesquite to an estimated 10% by the second year after application.

There is an estimated 64% average root kill on mesquite using this combination and amount of active ingredient per acre of herbicide. This reduction of mesquite reduces or eliminates the competition for soil water, which is critical in loamy or sandy loam soils where the moisture holding capacity is good but the soil itself is relatively shallow. The lack of competition will readily allow grass and forbs to flourish, producing higher amounts of livestock and wildlife forage.

The change in the composition of the vegetative community will have the affect of changing the entire treated area from a desert shrubland habitat to a grassland habitat in a very short period of time (approximately 2-3 years.). A change from shrubland to a grassland will change the animal community to one that is representative of grassland habitats.

By reducing the mesquite component, herbaceous species would gain in densities after adequate precipitation occurs. Herbaceous species tend to have abundant seed which germinate and mature more rapidly than woody species or succulents.

All vegetation would be temporarily negatively impacted after burning. The herbaceous species would respond within one growing season with adequate precipitation to level which may exceed pre-burning levels. The mesquite would be lowered for an extended period of time. However, not all of the targeted species would be burned completely or at all. This should lead to a natural mosaic in the area of shrubs, grasses and forbs.

There would be no impact to riparian vegetation as treatments would be conducted above the active floodplain terrace.

Noxious and Invasive Weeds: Cattle stocked on the allotment, supplemental feeds, and a variety of equipment may unintentionally contribute to the establishment and spread of noxious weeds. Noxious weed seeds could be carried onto the allotment by livestock, feed and equipment. The main mechanism for seed dispersion is by equipment that were previously used in noxious weed-infested areas.

Infestation of noxious weeds can have a potentially disastrous impact on biodiversity and natural ecosystems. In order to combat the negative effects of noxious weeds on crop lands, grazing lands and waterways, herbicidal and other weed control strategies can be implemented at further costs to producers and government agencies. Increased cost to producers are eventually borne by consumers.

There is an opportunity for noxious weeds to become established within the proposed treatment areas. The potential for the dissemination of invasive and noxious weed seed on public lands would remain low on the allotment due to the limited use of the lands and increased public awareness of the noxious weed problem.

Past experience with the herbicide in these range sites have shown success with no new noxious weed infestations. Monitoring after the area has been treated will be conducted to ensure that weeds do not become established. Any populations of noxious weeds found on the allotment would be treated according to prescribed control methods for the particular species encountered.

4. Water Quality:

Surface Water - Known surface water such as springs and the Pecos River are excluded in the treatment area. Entry of herbicides into surface water is discussed in the risk assessment (Appendix E of the FEIS). Herbicides may enter surface water during treatment through accidental direct application or drift, or after treatment through surface or subsurface runoff.

Surface runoff can carry herbicides mixed in water or bound to eroding soil. The severity of herbicide runoff depends on several factors, many of which influence the rate of water infiltration into the soil. These include the grade or slope of an area, the texture and moisture content of the soil, the amount and timing of rainfall, and the presence of vegetation or plant residues. To pollute the water, they must be present in the water at concentrations high enough to impair water quality at point of use.

Large storms events 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. Therefore, 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.

Herbicide properties which determine the likelihood of movement with surface water are given in Table 3-6 of the FEIS (page 3-45 of the FEIS). For conditions resulting in moderate to high infiltration rates, the likelihood that the herbicide will remain close to the soil surface may determine availability for movement with surface runoff.

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

Prescribed Fire - After the proposed fire, short term negative impact would occur after a precipitation event that produces streamflow. Ash may be suspended in the flow and deposited in downstream locations. Some soil erosion could occur if the streamflow is high in intensity. After vegetation has re-established, water quality should stabilize or increase due to better protection of the soil by herbaceous vegetation cover.

Herbicide use also may produce minor increases in stream nutrients, stormflows, and sediment yields.

Ground Water – After treatment, herbicides may move through the soil and into underlying ground-water aquifers by leaching. To pollute ground water, they must then move laterally at concentrations high enough to impair water quality at a point of use. Key factors affecting peak concentration are herbicide properties, soil, depth to water table, and distance to the point of use. 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.

Herbicide mobility and persistence greatly affect potential for leaching. Mobility depends on solubility and adsorption; persistence depends on degradation mode and rate.

Herbicides move most easily through sand, which is the most porous soil and have 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.

Ground water contamination occurs when herbicides move with the infiltrating water through the soil profile to the water table. The closer the water table is to the surface, the more likely that it may become contaminated. In some situations, herbicides that are tightly bound to the soil may only move a few inches from the point of application regardless of the amount of infiltrating water, whereas in other situations herbicides have been shown to move greater distances.

Herbicides that are highly water soluble, relatively persistent, and not readily adsorbed by soil particles (low Kd or Kos) have the greatest potential for movement. In addition, relatively level sandy soil low in organic matter is the most vulnerable to groundwater contamination due to their lower adsorptive capacity and higher infiltration rates.

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 3-6 of the FEIS (page 3-45 of the FEIS). 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 will move through the soil profile with infiltrating water.

The attached Drastic Report has an index of 152 which indicates a high risk of ground water contamination. Primary factors affecting the model results are the shallow depth to groundwater, soil media, and the high permeability of the aquifer media and vadose zone. Though the index is high, this reflects only certain environmental factors. Additional factors also affect the lidelihood of groundwater contamination. The actual risk of groundwater contamination appears to be low for the following reasons.

Triclopyr and clopyralid tend to stay in the upper portion of the soil profile. The proposed treatment is the application of 0.25 lb/ac of clopyralid (Reclaim) and 0.25 lb/ac of Triclopyr (Remedy). Clopyralid has a maximum application rate of 0.5 lb/ac according to the FEIS for Vegetation treatment on BLM Lands (1991). It is highly soluble, susceptible to leaching, and does not decompose significantly due to photolysis. These properties alone indicate a relatively high risk of ground water contamination, but clopyralid also has low persistence (half life of 12 to 70 days), and is broken down to a degree by microbial decomposition. In a study reported in "Dissipation, Movement, and Environmental Impact of Herbicides on Texas Rangelands, A 25 – Year Summary" (Bovey 1993), more than 99 percent of clopyralid had dissipated after 90 days, and most was restricted to the upper 30 cm of soil. In a 'worst case" two – year study, where two applications of 0.5 lb/ac were applied and then disked into the soil to prevent photolysis, no clopyralid was detected in the soil in 1988, and less than 6 ppb of clopyralid and picloram were detected in 1989.

Triclopyr has a greater persistence than clopyralid (30 to 90 days half-life), but it has a maximum application rate of 1.5 lb/ac according to the FEIS. It has low solubility, is strongly adsorbed, and is subject to significant decomposition by photolysis and microbes. Bovey reported a study on a dry site in Oregon in which triclopyr persisted in small amounts after one year. Residues decreased rapidly during the first 79 days and then declined slowly thereafter. Residues were confined to the upper 30 cm of soil. Movement of triclopyr residues in soil and surface water from a treated site was considered insignificant. In a Florida study, trace levels of triclopyr residue were detected in ground water following the first runoff event following application. No dry site studies of ground water were cited. It is likely that in New Mexico there would be a greater chance of photolysis decomposition before the first rain after application, and less chance of recharge to ground water before most of the chemical has decomposed. However, New Mexico soils probably have a lower adsorptive capacity, and microbial decomposition is probably less significant.

The ground water is shallow, however, the amount of recharge to ground water is expected to be low, therefore the risk of either chemical reaching the aquifer is expected to be low (See Depth to Water – Potentiometric map Attachment 1).

The soil media consists of silt loam, loam, and fine sandy loam. The pollution potential is greater for fine sandy loams than it is for loam due to the higher percentage of fine sands. The fine sands occurring in the loamy soils increases the pollution potential,

however, the amount of recharge to groundwater is expected to be low, therefore the risk of either chemical reaching the aquifer is expected to low.

The treatment areas avoid major drainage bottoms and depressions that could serve as ground-water recharge areas. The treatment area avoids the 100-Year floodplain. The 100-Year floodplain, drainage bottoms and depressions are excluded from treatment (See Figure 1).

The treatment area is located in an area that is designated as a medium potential and high potential for cave and karst occurrences, according to the Cave or Karst Occurrence Area Map A3-1 from the Roswell Resource Area, Roswell Approved Resource Management Plan and Record of Decision, October 1997. The treatment area is underlain by sand and gravel, silt, gypsum, mudstone, and dolomite deposits which also outcrop in the area. The gypsum and mudstone deposits have a potential to be solution altered which indicates a potential for karst occurrences. Known cave or karst features in the area also indicate karst potential. The aquifer media and vadose zone consists of sand and gravel, silt, gypsum, mudstone, and dolomite. All known surface cave or karst features in the treatment area will be excluded from the pesticide treatment.

The risk of groundwater contamination can be reduced further if the area is treated well in advance of the next rain event. This will allow the majority of chemical decomposition to occur before the chemical has a chance to move with infiltrating rainfall or in overland flow. The first rain following treatment cannot be predicted, but generally at least 90 days prior to the usual late summer "wet" period would be best to minimize the risk of water contamination. Of course, deciding when to treat the area is also affected by when the plants are physiologically susceptible to the chemical.

Known groundwater well sites and other water source sites such as springs and the Pecos River are excluded in the treatment area. No wells or other water sources are included in the treatment area.

5. Wildlife: 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. Therefore, any change in vegetation community structure or composition affects resident wildlife populations. Effects on wildlife from vegetation management would be both positive and negative, depending on the species affected and the type of treatment used.

   Chemical treatments traditionally have been applied most frequently to decrease woody plant cover and increase the production of grasses. The control of woody plants, especially by selective herbicides, often results in the initial control of associated broadleaf forbs, both categories of plants contain species which may be

important food for many different wildlife species. However, there are large areas adjacent to the proposed project area that contain mesquite and other large woody plants.

Chemical treatments are designed to increase and decrease other vegetation components for the benefit or exclusion of different groups of wildlife species which are associated with different types of habitat. This usually has a temporary effect on all wildlife species. Enhancing the structural diversity of vegetation by controlling shrubs and increasing understory species in a mosaic pattern should increase bird diversity. Some negative impacts can be lessened if the period of treatment avoids the bird nesting season and other critical seasons when loss of cover would be critical to wildlife; for example, during critical reproductive periods (from April to June).

Impact to wildlife would naturally be short term following the prescribed burn. As with any fire, whether natural or man caused, some mortality of small animals, reptiles and birds would occur. In most cases, wildlife would be displaced in the short term by the fire and the loss of vegetation and then would return when vegetation begins to grow back. Some shift of wildlife may occur within the burned areas. Species favoring dense, heavy brush may vacate the area, while species favoring open or savannah type habitat may inhabit the area.

After treatment of mesquite, the increase of forb and grass species would most likely lead to an increase in use of the treated areas by wildlife species that prefer a grassland type, such as pronghorn antelope and mule deer which in turn could lead to an increase in the number of hunters using the area. The recreational value would correspond to the availability of animals for hunting or viewing.

6. Threatened and Endangered Species: There would be no effect to listed species as they do not occur within the proposed project area.

7. Livestock: The goals of rangeland treatment for livestock include suppressing plant species that are in this case restrictive due to thorns, and improving a more desirable mix of vegetation while increasing forage production by controlling competing vegetation. Chemical treatments are generally applied in a form or at such low rates that they do not affect livestock. Herbicide applications would be made when livestock are not in the pastures.

   Grazing would occur in the project areas following sufficient green-up and establishment of herbaceous vegetation. Livestock numbers will not be increased within the treatment areas on a long-term basis to preserve the effectiveness of the project. Continued pasture rotation of cattle and reduction of overall livestock numbers during drought would ensure longevity of the project.

8. Cave/Karst: The proposed action would not affect cave/karst resource.

9. Visual Resources: The proposed action would change the color and texture of the landscape by partially replacing the mesquite cover with grasses and forbs. The potential creation of straight lines and stark contrasts in texture and color would be mitigated, at least in part, by the burn pattern produced by the fire. A mosaic of vegetation with irregular edges will be produced providing variety in color, form and texture. In the long term (in excess of one year following each treatment) increased lush plant growth and diversity will tend to change the visual character of the area in a positive manner.

B. Impacts of the Alternatives

1. No Action - This alternative would not significantly change the present conditions. The area would primarily remain in a status quo condition with the area dominated by mesquite. Wildlife populations would remain unchanged under this alternative. No increase of forage or stabilization of the soils would occur.

2. Herbicide treatment, but excluding the use of prescribed fire, would result in only the impacts associated with herbicide use. The impacts associated with fire would not occur. However, fire is part of the natural ecosystem and its occurrence has been drastically reduced over the last 100 to 200 years. The result has led to a slow increase in the amount and density of shrubby vegetation. Introducing fire back to the ecosystem under controlled prescribed conditions would stimulate the natural vegetation in the area. Using fire in combination with an initial herbicide application would serve to hasten the process of returning the area to a savannah grassland. Future use of prescribed fire in the area would help to maintain the grassland aspect, and would reduce the need for future herbicide applications.

C. Mitigation Measures and Residual Impacts

Impacts to the following resources and values would not be mitigated under any alternative and are considered to be residual impacts:

- Short-term change in chemical composition of the uppermost soils layers due to the change in abundance of organic matter.
- Long-term change in vegetative composition within the treated area.
- The RFO Wildlife Biologist has determined that the amount of land left untreated in the vicinity of the project will adequately serve the needs of the short-term disruption in the wildlife use of the area.

To avoid impacts to the oil and gas industry and to allow for safety, all oil and gas operators and right-of-way holders will be contacted prior the start of any eradication regardless of method used.

No additional mitigating measures would be needed if the standard operating procedures and design features previously discussed are adhered to. No additional mitigating measures would be needed as long as the prescribed burns stay within the parameters set forth in the Proposed Action and Burn Plan.

D. Cumulative Impacts:

The results of the proposed action will not substantially change the plant and animal communities of the project area, however, decreasing livestock utilization levels in areas of habitual use, including existing water locations, by implementing a rest-rotation grazing system should aide in attaining increased plant vigor. The proposed action will result in beneficial effects to the soil and animal life. Beneficial effects to the soil resource would appear in reduced soil compaction in areas of little slope, and a more even distribution of grazing pressure throughout the allotment. The construction of the project as proposed would not affect the environment as a whole, but would be site-specific in its effect. Therefore, the cumulative impact will not be significant when compared to existing disturbances created by heavy utilization of forage near existing water locations and habitually used areas.

V. PERSONS OR AGENCIES CONSULTED

The following are people who have been consulted for their comments in regards to the proposed action in addition to the resource area specialists. The comments and suggestions expressed during the consultation have been incorporated into this EA.

Helen Miller, Rangeland Management Specialist
Roswell Field Office, BLM

Michael McGee, Hydrologist
Roswell Field Office, BLM

Clint Lynch, Permittee
Roswell, NM

FINDING OF NO SIGNIFICANT IMPACT

MD Mesquite Control Project
EA No. NM-060-2004-0060

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 and that preparation of an Environmental Impact Statement is not warranted.

Rationale for Recommendations: The decision to authorize the proposed action does not result in any undue or unnecessary environmental degradation. The action is consistent with planned actions presented in the Roswell Resource Management Plan and Record of Decision, October 1997.

T. R. Kreager
Assistant Field Manager, Resources

Date