UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
LAS CRUCES DISTRICT OFFICE
1800 MARQUESS
LAS CRUCES, NM 88005

ECE Landscape Restoration Project

ENVIRONMENTAL ASSESSMENT

NM EA NO. - NM-030-2008-048

Prepared By: Margie Guzman 9-15-2008
Date

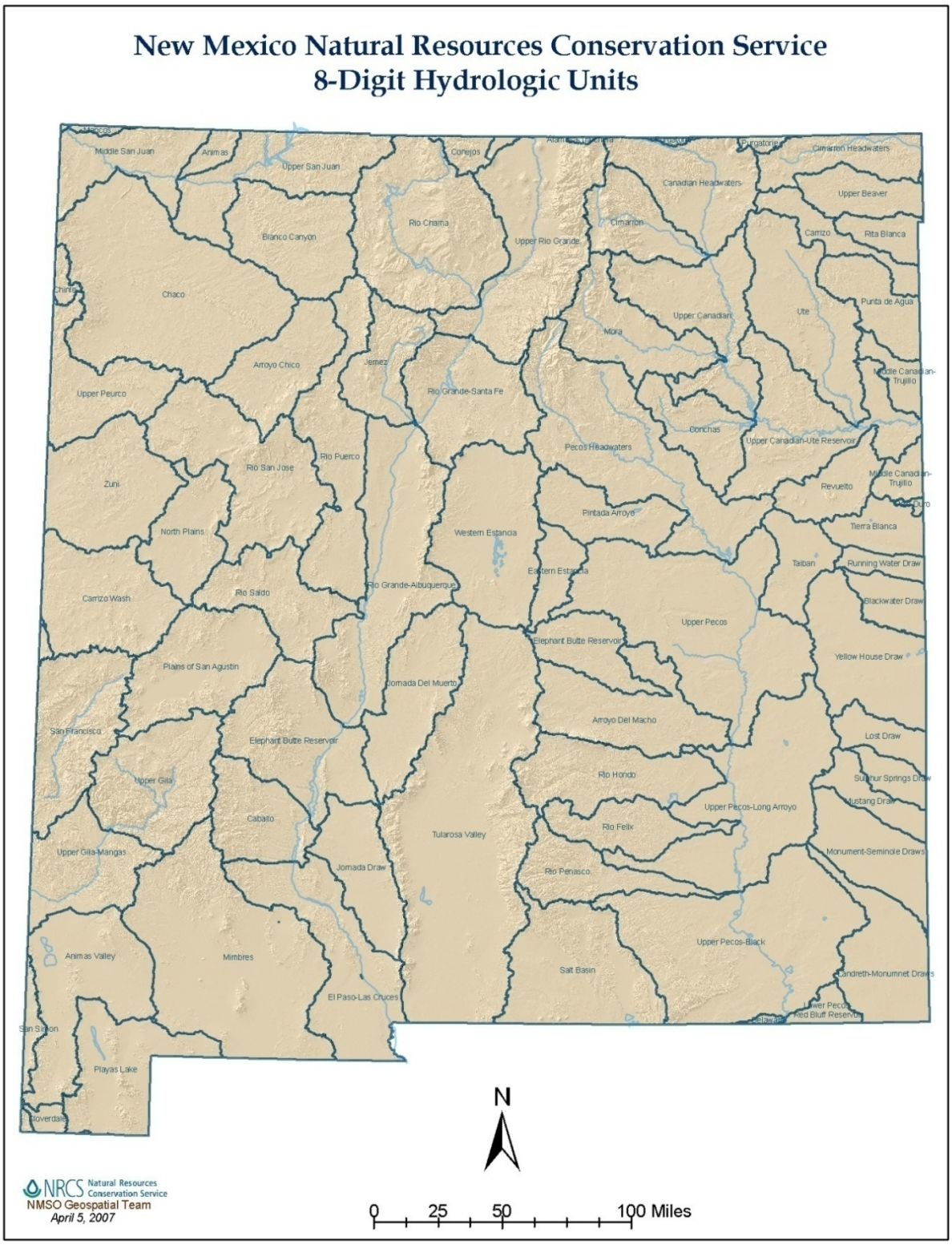
Reviewed By: 9/17/08
Date

INTRODUCTION:

This EA is being prepared to evaluate the predicted results of a proposed landscape restoration project. The project consists of three different vegetative treatment methods that include: chemical, prescribed fire, and mechanical treatments. The chemical treatments comprise four types of treatments that include: spraying a mixture of two liquid herbicides to reduce the density of mesquite (*Prosopis glandulosa*) on mixed shrub rolling grassland sites, the application of a pelleted herbicide on currently dominated creosotebush (*Larrea tridentata*), tarbush (*Flourensia cernua*), and juniper (*Juniperus spp.*) dominated areas, spraying a liquid herbicide to reduce Christmas cactus/Tasajillo (*Opuntia leptocaulis*) post treatment of creosote, and spraying a liquid herbicide on areas with saltcedar (*Tamarix spp.*). The prescribed fire treatments would mainly target piñon (*Pinus edulis*) and juniper and would be conducted within higher elevations where chemical treatments are not possible due to slope. Mechanical treatments could include, but may not be limited to, mastication, use of chainsaws or uprooting with a grubber/root-plow tractor attachment where cultural issues would not be a limiting factor. Mechanical treatments would be conducted in areas where neither prescribed fire nor chemical treatments are possible. The chemical treatments would be supplemented with prescribed fire and mechanical treatments, where an integration of methods is identified as appropriate. Treatments would be administered under separate or combined contracts.

The project area is within three eight digit watersheds that consist of (from north to south): **E**lephant Butte Reservoir No. 13020211, **C**aballo No. 13030101, and **E**l Paso-Las Cruces No. 13030102 (Map 1). Henceforth, the project area will be referred to as the **ECE Landscape Restoration Project**, named after the watersheds that the project will occur within. A map of the New Mexico Watersheds can be found on the web at http://www.nm.nrcs.usda.gov/technical/fotg/section-1/maps/new/8-digit-huc.jpg.

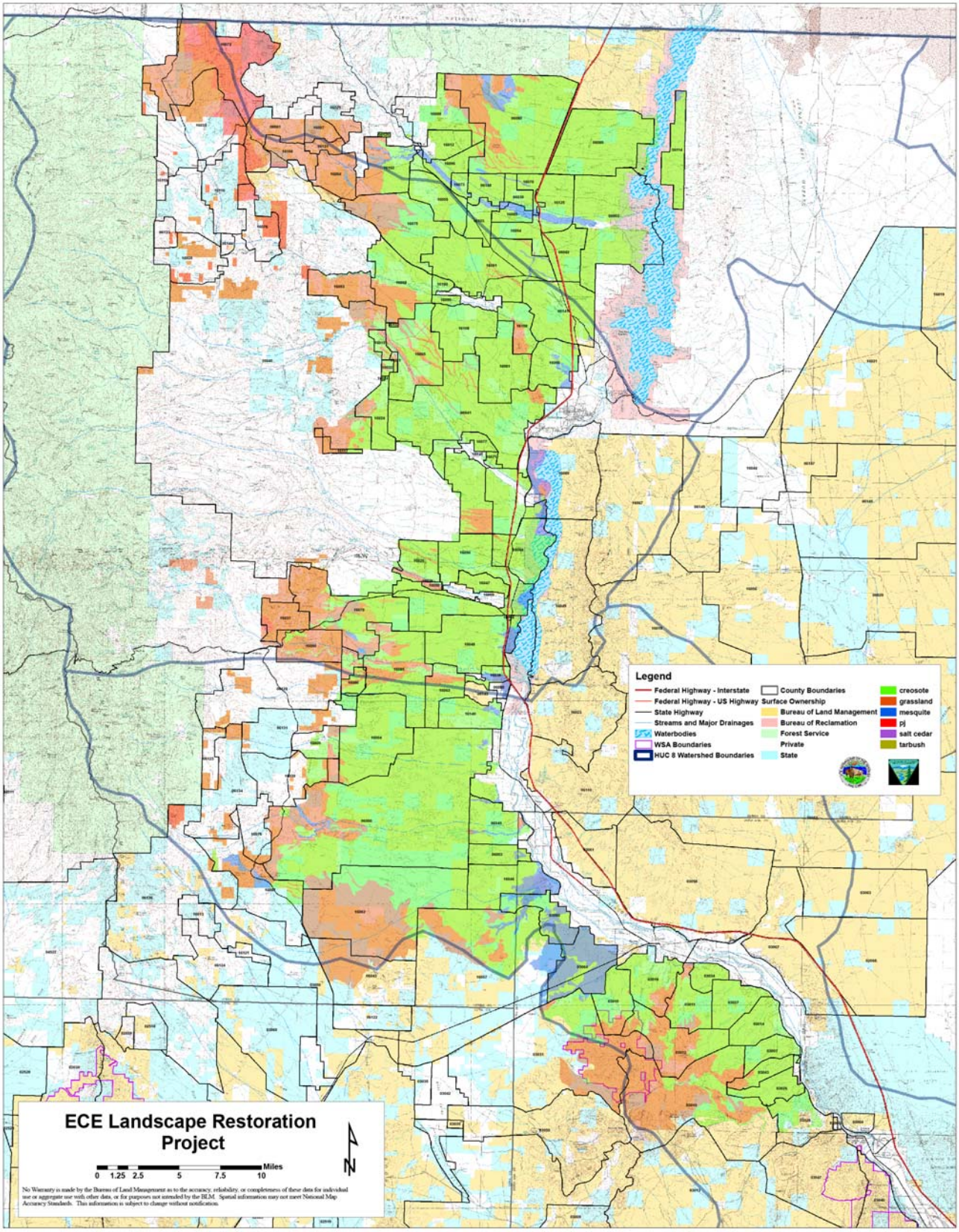
Map 1


New Mexico Natural Resources Conservation Service
8-Digit Hydrologic Units
Middle San Juan
Animas
Upper San Juan
Conejos
Cimarron Headwaters
Canadian Headwaters
Upper Beaver
Rio Chama
Cimarron
Carrizo
Rita Blanca
Blanco Canyon
Upper Rio Grande
Chaco
Punta de Agua
Upper Canadian
Ute
Mora
Arroyo Chico
Jemez
Middle Canadian-Trujillo
Upper Peurco
Rio Grande-Santa Fe
Conchas
Upper Canadian-Ute Reservoir
Pecos Headwaters
Rio Puerco
Rio San Jose
Zuni
Revuelto
Pintada Arroyo
Tierra Blanca
North Plains
Western Estancia
Taiban
Running Water Draw
Eastern Estancia
Rio Grande-Albuquerque
Carrizo Wash
Rio Salado
Blackwater Draw
Upper Pecos
Elephant Butte Reservoir
Yellow House Draw
Plains of San Agustin
Jornada Del Muerto
Arroyo Del Macho
San Francisco
Elephant Butte Reservoir
Lost Draw
Rio Hondo
Upper Gila
Sulphur Springs Draw
Upper Pecos-Long Arroyo
Caballo
Tularosa Valley
Rio Felix
Upper Gila-Mangas
Monument-Seminole Draws
Jornada Draw
Rio Penasco
Upper Pecos-Black
Animas Valley
Mimbres
Salt Basin
Landreth-Monumnet Draws
El Paso-Las Cruces
Lower Pecos
Red Bluff Reservoir
San Simon
Playas Lake
Hoverdale
N
0 25 50 100 Miles
NRCS Natural Resources Conservation Service
NMSO Geospatial Team
April 5, 2007

The potential treatable acres for the ECE Landscape Restoration Project (ECE) include approximately 432,466 acres of which approximately 293,174 acres are BLM land, 66,162 acres are State Land, 60,698 acres are private land, and 12,432 acres are other acres that include Bureau of Reclamation (BOR) and possibly International Boundary and Water Commission (IBWC) lands (Map 2). Approximately 46,500 acres have been chemically treated in the project area within the last 27 years. The continuation of these treatments would eventually lead to the restoration of the watersheds described above, that are within the Las Cruces District of the Bureau of Land Management and this portion of the Chihuahuan desert grasslands.

The ECE is located in south central New Mexico. The eastern boundary of the project area is the Rio Grande River and any BLM on the east side of the river that was not previously analyzed in the Environmental Assessment NM-030-2007-048, Jornada del Muerto Grassland Restoration Project, from the northern end of the Las Cruces District boundary south to Radium Springs, New Mexico. The western boundary is the Gila National Forest from the northern end of the Las Cruces District to the southeast corner of the forest, then, following the El Paso-Las Cruces Watershed boundary southeast to Radium Springs. The northern extent of the project area ends at the Socorro Field Office boundary.

Map 2.


Legend
Federal Highway - Interstate
Federal Highway - US Highway
State Highway
Streams and Major Drainages
Waterbodies
WSA Boundaries
HUC 8 Watershed Boundaries
County Boundaries
Surface Ownership
Bureau of Land Management
Bureau of Reclamation
Forest Service
Private
State
creosote
grassland
mesquite
pj
salt cedar
tarbush
ECE Landscape Restoration Project
0 1.25 2.5 5 7.5 10
Miles
N
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 the BLM. Spatial information may not meet National Map Accuracy Standards. This information is subject to change without notification.

PURPOSE AND NEED FOR THE PROPOSED ACTION:

Shrubs and low growing trees have always been present in New Mexico's grasslands, but historically were largely limited to drainages or to rocky shallow soil areas (Dick-Peddie 1993). Historic overgrazing and drought on New Mexico's grasslands have led to the invasion of woody shrubs. Large areas of desert grassland in New Mexico were lost to shrub invasion beginning in the mid-to-late 1800's.

Saltcedar is a native of Eurasia and Africa, was introduced into the United States as an ornamental shrub in the early 1800s, and has now spread throughout the inter-mountain region of the western United States (Carman and Brotherson 1982).

Once these species of shrubs become established in areas, they tend to increase in density and out-compete other native vegetation for soil moisture, nutrients, and sunlight. Lands with high densities of mesquite, tarbush, and creosotebush typically exhibit accelerated soil erosion rates, decreased water infiltration into the soil, and lower amounts of forage available for wildlife and permitted livestock.

The BLM Las Cruces District Office proposes to restore rangelands to a more natural plant community by decreasing to reasonable densities, mesquite, creosotebush, tarbush, Christmas cactus or tasajillo, piñon, and juniper which would allow other native vegetation such as perennial grasses, forbs, and favorable shrub species to exist and/or recover. Also, proposed is the treatment of saltcedar in and around riparian areas, wetlands, tributaries/drainages and water impoundments (dirt tanks, reservoirs) within the proposed area.

The objectives of the ECE are to reduce the density of mesquite, creosotebush, tarbush, Christmas cactus, saltcedar, and other undesirable shrub and tree species, such as piñon and juniper. The increased and improved vegetative cover would improve the watershed by reducing flash flooding and runoff and increasing moisture infiltration into the soils. Higher elevation habitat conditions would improve with the decrease of decadent and overgrown shrub species and opening up piñon/juniper invaded area.

The landscape provides existing and potential habitat for numerous grassland species which have declined over time concurrently with the decrease in area of historic desert grasslands. Some of these species include quail, pronghorn antelope, Aplomado falcon (Federally Proposed), and several Candidate and special status species including: mountain plover, Baird's sparrow, Texas horned lizard, Arizona black-tailed prairie dog, ferruginous hawk, grama grass cactus, along with numerous wildlife species occurring in the aea.

CONFORMANCE TO LAND USE PLANNING:

The proposed action conforms to the White Sands Resource Area/Resource Management Plan, and Record of Decision (1986) (pg 32, Decision 16: "The goal of herbicide treatments is to decrease target species, resulting in an increase in more desirable plant species"); the Mimbres Resource Area/Resource Management Plan and Record of Decision (1993) (pg 4-108: "Desired plant community would involve a significant amount of brush treatment by chemical herbicides.."), and the Vegetation Treatment on BLM Lands in Thirteen Western States, Final EIS (USDI BLM, May 1991), both of which were amended by the Standards and Guidelines EIS (2001).

RELATIONSHIPS TO STATUTES, REGULATIONS AND OTHER PLANS:

The proposed actions and alternatives are consistent with the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1700 et seq); the Taylor Grazing Act of 1934 (43 U.S.C. 315 et seq.); the Public Rangelands Improvement Act of 1978 (43 U.S.C. 1901 et seq.); the Carlson-Foley Act (1968); and the Federal Noxious Weed Act (1974), as amended by Section 15 - Management of Undesirable Plants on Federal Lands; and the Aplomado Falcon Recovery Plan (USDI, Fish and Wildlife Service, 1990). The proposal to implement a vegetation treatment on creosotebush and mesquite is consistent with and tiered to the New Mexico Record of Decision dated July, 1991, for the Vegetation Treatment on BLM Lands in Thirteen Western States, Final EIS (USDI BLM, May 1991) and the 2007 Final Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement *(PEIS)* (USDI BLM 2007). The project conforms to the 1994 Environmental Impact Statement for Rangeland Reform.

PROPOSED ACTION:

The proposed action is to treat 75% or approximately 324,350 of the potentially treatable acres identified in Table 1 to reduce population densities of creosotebush, Christmas cactus, tarbush, mesquite, saltcedar, piñon, juniper, and other shrub species. The remaining 25%, considered to be within their potential natural community (or reference state), are already meeting watershed objectives, have already been treated, or are not conducive to treatments. Reference states are the states containing the historic climax plant community, as described in ecological site descriptions. Reference states reflect reference conditions, for example those that occurred prior to the intensified settlement and land use of the late 1800s.

The remaining would be considered to be in non-reference condition or altered. Processes associated with non-reference states, meaning their forms or effects, are not characteristic of reference conditions. Their restoration options in the ecological site descriptions are for avoiding, controlling or decreasing departure and managing desired shifts in states, such as from shrub-invaded to grass-dominated (Yanoff et. al 2006).

There are approximately 432,466 acres within the proposed ECE area. The potential restoration acres to treat either by chemical, mechanical, or by prescribed burning, may be limited by the following criteria:

- Acreage estimates are for target vegetation regardless of slope. Certain types of treatments may be limited by slope.
- Acreage estimates are for target vegetation regardless of soil properties. Certain types of treatments may be limited by soil properties.
- Acreage estimates may decrease due to special status wildlife and plant considerations.
- Acreage estimates include those of already treated vegetation. Information about all existing treatments may not be available.

Ecological range sites having restoration potential include the gravelly, loamy, and shallow sandy sites in the lower elevation areas, in the limestone and igneous hill sites of the higher elevations for uplands; and river flood plains and tributaries for riparian areas. The table below (Table 1) shows approximate treatable vegetative acres for the ECE area.

Table 1: Potentially treatable vegetative acres

BLM					
	Mesquite	Creosote	Tarbush	Saltcedar	P/J
Total	11,422	269,360	589		11,803
Private					
	Mesquite	Creosote	Tarbush	Saltcedar	P/J
Total	6,976	47,732	223		5,767
State					
	Mesquite	Creosote	Tarbush	Saltcedar	P/J
Total	2,921	60,762	22		2,457
Other (BOR, & IBWC)					
	Mesquite	Creosote	Tarbush	Saltcedar	P/J
Total	3,024	8,149		1,252	7
Total					
	Mesquite	Creosote	Tarbush	Saltcedar	P/J
Total	24,343	386,003	834	1,252	20,034

*Potentially treatable acres for saltcedar are estimated low due to unknown populations not only on private land, but also on public lands, in and around riparian areas, tributaries, and water impoundments (dirt tanks, reservoirs) within the proposed area and other isolated areas along Elephant Butte, Caballo Lake and along the Rio Grande. Potentially treatable acres for Christmas cactus are not estimated because populations are mainly noticed or increase their production post treatment of creosote. P/J is piñon and juniper combined because they often inhabit areas together.

The table below (Table 2) shows ecological sites within the ECE area and potentially treatable and non-treatable ecological sites. Draw, bottomland and clayey sites would not be treated (except when saltcedar is present and treatable) to preserve any arroyo and grassland type vegetation that is important to wildlife species and for watershed health. Mesquite sand dune areas, which include the deep sand soils, would also not be treated since these habitat types are considered to be beyond restoration potential. Areas in the limestone and hills range sites may be identified as areas for potential P/J treatments with a combination of fire, chemical or mechanical depending on slope, other limiting factors and the overall objectives. Treatment of these areas would be planned on a case by case basis. More detailed descriptions may be obtained from NRCS Ecological Site Descriptions website; (http://www.nm.nrcs.usda.gov/technical/fotg/section-2/esd.html).

Table 2.

Ecological Sites For the ECE Landscape Restoration Project	
Ecological Sites	***Approximate Acres***
Bottom Land	9,677
Breaks	189,888
Clayey	22,665
Deep Sand	6,602
Draw	4,009
Gravelly Loam	53,746
Gravelly Sand	36,011
Gravelly	329,277
Hills	45,421
Igneous Hills & Mountains	32,351
Limestone Hills	3,696
Loamy	9,301
Malpais	1,354
Salt Flats	455
Sandy	903
Shallow Sandy	4,338
Unknown	384

Potentially Treatable Ecological Sites	
Ecological Type	**Vegetation**
gravelly and loamy, range sites	Creosotebush/tarbush Christmas cactus
sandy and shallow sandy range sites	Mesquite
limestone and igneous hills range site	Piñon/juniper
malpais range sites	Other mixed shrub
draw, bottomland, and clayey	Saltcedar/juniper

Potentially Non-Treatable Ecological Sites	
Ecological Type	**Vegetation**
deep sand sites (Sand Dunes)	Mesquite
draw, bottomland, and clayey range site (Arroyo)	Grassland vegetation
limestone and hills range site	Piñon/juniper /oak brush

It is expected that vegetation treatments would take place each year for the next several years based on funding. Treatment locations and acreage (estimated treatment of approximately 25,000 to 50, 000 acres per year) to be treated within any one year would be dependent upon availability of funds and the ability of the livestock operator to defer grazing to accomplish the treatment objectives. Treatment areas would be selected based on one or more of the following site characteristics:

- The site's ability to recover with native vegetation.
- Soil is present which tends to exhibit good results with herbicide treatment.
- A seed source is present and available for desirable vegetation.
- Cooperation with the grazing allotment operator for adequate grazing deferment.
- Cooperation with other land management agencies and private land owners to treat saltcedar on a case by case basis and/or as infestation areas are identified.
- The area is favorable for aerial/ground application of the herbicide, prescribed fire, and/or mechanical treatment.
- The treatment would have no negative impact on non-target plant or animal components of the community.

Once treatment selection has occurred, locations and grouping of actual treatments would be planned and implemented according to species, time of year, the permittees' grazing schedule, annual budget and potential effectiveness of treatments. Preferably, adjacent allotments with identified treatments would be treated at the same time, if criteria and characteristics are met, in order to increase the cost effectiveness of the contract.

Treatments of creosotebush that have been identified and selected to be treated in 2008 are:

Allotment Name & Number	**Project Name**	**Approx. Acres to be Treated**
Seco Creek, 16047	Savage GRT	950
44 Bar, 16098	Seferino Hill GRT	500
Canyon de la Plata, 16091	Plata GRT	2,050
Copper Flat, 16079	Copper Flats GRT	5,800
Flying X, 06080	Flying X Block 1	4,000
South Kelly Canyon, 16050	South Kelly GRT	530

The deferment period for these pelleted herbicide treatments (creosotebush) is two consecutive growing seasons that begin on the second growing season after the treatment. The growing season period is from June 1 through October 31 (5 months). In the event drought persists through the first two growing seasons of grazing deferment, the permittee may be required to take additional partial deferment of 3 months for years 4 and 5.

Any future projects would adhere to the following deferment:

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- At a minimum, the deferment period for a pelleted herbicide treatment (creosotebush, tarbush, piñon/juniper) is three consecutive growing seasons starting the treatment year. The growing season period is from June 1 through October 31 (5 months). In the event drought persists through the first three growing seasons of grazing deferment, the permittee may be required to take additional partial deferment of 3 months for years 4 and 5 based on monitoring information. In the event a permittee is

able to implement year round deferment, a minimum of two years would be required, with a potential of partial deferment (3 months) for year 3 and 4 if drought occurs.

There would be no increase in permitted livestock use levels due to increased forage production or habitat enhancement resulting from these proposed vegetation treatments. Adjustments to livestock permitted use levels are a function of the permit renewal process and assessment of the attainment or non-attainment of the public land health standards. Any proposed increase in permitted use must be consistent with the management guidance outlined in the White Sands or Mimbres Resource Management Plans, as amended or revised and comply with BLM grazing regulations.

Considerations for wildlife habitat, possible Threatened or Endangered species, Special Status Species (SSS), watershed conditions, and livestock operations are factored into the project design. This includes omitting areas such as the major drainages (except when treating saltcedar), surveying for T/E and SSS, timing of treatment, and grazing management actions post-treatment. Drainages and existing water improvements would be buffered, therefore not treated as per the Vegetation Treatment on BLM Lands in Thirteen Western States, Final EIS (USDI BLM, May 1991) and the 2007 Final Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement *(PEIS)* (USDI BLM 2007). The major drainages and tributaries within the proposed treatment area are either, perennial, intermittent, or ephemeral.

Prescribed fire treatments that are accessible to livestock would require a minimum of two growing seasons of deferment prior to treatment unless sufficient precipitation occurs that would allow for an earlier prescribed fire treatment with sufficient fuels to carry, unless the burn occurs in an area where there is no cattle grazing, at which point, no deferment would be necessary. Prescribed fire could be applied to treated areas as a secondary or follow up treatment to remove dead vegetation left standing as a result of the chemical application and any sprouting of the target species. Spring (April to late June) would be the preferred time of year for conducting the prescribed fire projects as this is when most natural-caused (i.e. lightning) fires occur; however, the prescribed fire projects may be implemented any time of the year the fuel and weather conditions are appropriate to safely meet the objectives for the proposed action. If prescribed burn is a follow up treatment, deferment from livestock grazing would be for at least an additional two consecutive growing season (June 1 to October 31). If substantial progress has not been made toward the objective after all the required deferments have been met, the treated pasture would be rested for two additional growing seasons. The use of prescribed fire would be considered when:

a. Fuel loading in a prospective treatment area is such that fire would effectively reduce the amount of shrubs. For mesquite, reduce to one-third or less of the total percent of shrub cover, reduce the amount of creosote to less than 10 percent of the vegetative canopy, and reduce piñon/juniper and woody vegetation to maintain a 40 percent or less canopy cover to enhance deer browse and forbs (Heffelfinger, et al. 2006).

b. Existing herbaceous vegetation in a prospective treatment area is adequate to effectively carry and support ignition attempts.

c. A reasonable treatment window would result from the prescribed fire parameters for effective treatment.

d. The risk of an escaped prescribed fire is minimal.

Mechanical treatments would be applied when areas to be treated would not support chemical use and/or prescribed burning due to topography or geographic location and the areas are small enough to make the treatment cost effective. Mechanical treatments would utilize hand-operated power tools and hand tools to cut and clear the treatment area of creosotebush, mesquite, piñon/juniper or other undesirable shrub species. Workers would cut plants at ground level and pull, grub or dig out root systems, and chemically treat in cases of salt cedar, to prevent sprouting and re-growth. Rest periods from livestock grazing would also apply to these types of treatments.

In all treatment methods, monitoring studies would determine if the objectives of the treatments have been met. If sufficient precipitation occurs, monitoring would determine if a lesser deferment period is warranted. There would be no increases to any permitted livestock numbers because of increased forage production and habitat enhancement.

Before implementing prescribed burning and/or mechanical treatments, the appropriate level of cultural resources inventory would be determined by following the procedures described in the "Protocol Agreement between the New Mexico Bureau of Land Management and New Mexico State Historic Preservation Officer" (June 2004) or successor documents (the Protocol Agreement).

Pre-Treatment

A protocol Aplomado falcon survey would be conducted several months prior to treatment of mesquite to ensure that no nest sites are within project site and falcons are not in the area. BLM would coordinate any detection with the U.S. Fish and Wildlife Service prior to beginning the treatment.

Shrub plants supporting raptor nests within mesquite treatment areas would be identified and would be excluded from treatment with a buffer zone of 100 meters.

ATV'swould be spray washed prior to entering the area to ensure that weed seeds are not carried to the treatment area by the ATVs. Off-road ATV travel would occur only on dry soil surfaces to minimize soil compaction.

Any prescribed burning would require the development of a burn plan. Leaseholders (i.e., mineral leases, communication site leases, utility leases, and any other ROW leases) near and around the proposed prescribed burn area would be notified of the time and duration of the burn.

Any surface disturbing treatments (i.e., mechanical treatments, prescribed burns requiring black lining) would require a cultural survey prior to project implementation.

During Treatment

At a minimum, the deferment period for a pelleted herbicide treatment (creosotebush, tarbush, piñon/juniper) is three consecutive growing seasons starting the treatment year. The growing season period is from June 1 through October 31 (5 months). In the event drought persists through the first three growing seasons of grazing deferment, the permittee may be required to take additional partial deferment of 3 months for years 4 and 5. In the event a permittee is able to implement year round deferment, a minimum of two years would be required, with a potential of partial deferment (3 months) for year 3 and 4 if drought occurred.

All range improvement water sources in the vicinity of the treatment area are buffered a minimum of 100 meters to ensure exclusion from chemical treatment, except when treating saltcedar. Range improvement projects (pipelines, fences), power lines, and communication lines would be excluded from fire when possible.

In order to avoid chemical "drift", application of herbicide spray on mesquite, Christmas cactus, and saltcedar would not occur when wind speed exceeds seven (7) mph or wind velocities are inconsistent. Application of the pelleted tebuthiuron to creosotebush would not occur when wind speeds exceed fifteen (15) mph.

Liquid herbicide treatment of mesquite, Christmas cactus, and saltcedar would be applied when the air temperatures are less than 90 degrees F to minimize volatilization.

ATV's used during the treatment to "flag" or monitor the project would be spray washed prior to entering the area to ensure that weed seeds are not carried to the treatment area. Off-road ATV travel would occur only on dry soil surfaces to minimize compaction.

Post Treatment Monitoring and Grazing Management

The deferment period for a liquid herbicide treatment (mesquite and Christmas cactus) would be June 1 through October 31 (5 months) and would begin on the first growing season after the treatment and would be for three consecutive growing seasons. Cattle would be removed from treatment pastures prior to application of chemical. For saltcedar treatments, areas would be examined on a case by case basis to determine the level of proper grazing use and possibly deferred grazing. The salt cedar grazing management determination would need to be made a part of the grazing management plan to maintain understory grasses if they are present and post treatment rehabilitation of riparian areas.

The location and type of prescribed fire treatment would determine the need for deferment of livestock. Prescribed fire treatments that are accessible to livestock would require a minimum of two growing seasons of deferment prior to treatment unless sufficient precipitation occurs that would allow for an earlier prescribed fire treatment with sufficient fuels to carry. Prescribed fire treatment areas would be deferred from livestock grazing for at least an additional two consecutive growing seasons (June 1 to October 31) following the burn or longer if sufficient precipitation does not occur.

Prescribed fire treatments that are not accessible to livestock, rarely utilized by livestock, deferment would not be required, such as, areas within higher elevation deer habitat.

In all deferment scenarios, monitoring would be established to determine if results have been achieved, based on site potential. If sufficient precipitation occurs, monitoring would determine if a lesser deferment period would be warranted or if insufficient precipitation occurs, or vice versa.

Forage increases as a result of grassland restoration treatments will be first reserved to meet the needs for watershed function. Forage in excess of those needs will be allocated to wildlife and livestock with wildlife receiving priority over livestock. A maximum of 40 percent use of key forage species would be allowed for those pastures receiving growing seasons rest. Depending on the site and specific treatment objectives, more stringent forage utilization constraints may be applied.

Monitoring studies would be initiated to evaluate the success (or adverse affects) of the treatments and determine if more or less deferment is required. The studies would determine percent kill of target species, effects of the treatments on non-target species, rate of recovery of herbaceous species, changes in soil stability, and overall habitat changes. USDA-ARS Jornada Experimental Range staff has developed the "BLM Shrub Control Monitoring Study and Spatially-Explicit Monitoring Protocol" outlining monitoring procedures for the treatments (Appendix 1).

Description of Proposed Action Treatments

Chemical Treatments:

The use of any herbicide on the list of BLM approved herbicides is acceptable for the control of vegetation on public land. The list of BLM approved herbicides is from the 2007 Final Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement *(PEIS)* (USDI BLM 2007).

Mesquite Treatment - The herbicides proposed for treatment of mesquite are Reclaim™ (*clopyralid)*, and Remedy™ (butoxyethel ester [BEE] of *triclopyr)* at a rate of ¼ pound active ingredient of each herbicide per acre. The herbicide would be added to a "tank mix" of water, an oil surfactant, and emulsifier, which is aerially applied at a rate of five gallons per acre from a fixed wing aircraft or helicopter.

Clopyralid is a systemic, postemergent herbicide that is effective against many species of Compositae, Fabacease (the bean family which includes mesquite), Solanaceae, and Apiaceae. It has auxin-like activity (auxin is a plant growth regulating hormone), inducing severe epinasty (downward bending of the plants parts, caused by excessive growth of the upper side) and hypertropy (a non-tumorous increase in the size of the plants parts due to the enlargement without increase in number of constituent cells) of the crown and leaves. Other effects of plant growth regulating herbicides include increases in tissue water content making plants brittle and easily broken; increase in cell division and respiration and decrease in photosynthesis; and loss of ability of roots to uptake soil nutrients and stem tissues to move food through the plant (Lingenfelter and Harwig 2002). Mortality of plants due to growth regulating herbicides is due to the combination of physiological effects. 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 adsorbed 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. Physiologic activity of the Triclopyr is similar to Clopyralid. The herbicide is particularly effective against root sprouting species, and is used for 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.

These herbicides are registered for use within the stated application rate on rangelands for control of mesquite in New Mexico, including BLM, state, and private lands, as addressed in the 1991 Final EIS Vegetative Treatment on BLM Land, and in the 2007 Final Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement (PEIS) (USDI BLM 2007). The total amount of herbicide would not exceed allowable rates as found within the herbicide labels. The proposed rate of application would 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 ¼ to ½ lb ai/acre of triclopyr and ¼ to ½ lb. ai/acre of clopyralid.

Application of the herbicide would be performed when the correct phenological stage of mesquite growth occurs. Aerial applications of liquid formulations on mesquite are generally conducted from mid-May until mid-June. 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 of the herbicides.

Application of the liquid herbicide would involve setting up a staging area, where the liquid would be loaded into the aircraft. The staging area would be located as near as possible to the application site and aircraft might use existing roads as landing strips. Roads would be blocked during take-offs and landings. The staging area would probably receive small amounts of the herbicide from the loading process; however, a single prolonged exposure is not likely to result in the chemical being absorbed through the skin in harmful amounts, according to the Material Safety Data Sheet (MSDS).

Creosote, Tarbush and Juniper Treatment - The herbicide selected for treatment of creosotebush, tarbush and juniper is Spike 20P (*tebuthiuron*) at a rate of ½ to 1¼ pound active ingredient per acre depending upon soil density and target species. Tarbush growing in tighter, denser soils would normally be treated with ¾ pound active ingredient or more, and up to 1 ¼ pound active ingredient if treating piñnon/juniper. This herbicide is registered for use at the proposed rate on New Mexico rangelands. Tebuthiuron, and the systematic name is N-(1, 1-dimethylethyl)-1, 3, 4-thiadiazol -2-y1)-N, N'-dimethylurea, is an odorless white crystalline powder. Tebuthiuron has been successfully formulated with kaolin clay sources for efficiency and storage stability and is applied as a small pellet directly onto the soil using a calibrated applicator mounted to a fixed wing aircraft. The clay pellet dissolves with precipitation and the herbicide percolates into the soil where it is taken into the plant by the roots and translocated to the leaves where it inhibits photosynthesis. The mechanism of photosynthetic blockage is through prevention of electron transfer during the formation of carbohydrates. Electrons are essentially borrowed from chlorophyll to provide energy to produce carbohydrates. The herbicide prevents replacement of chlorophyll electrons, causing destruction of the chlorophyll. Lack of chlorophyll essentially causes starvation of the plant over time (Lingenfelter and Hartwig 2002).

Application of the pellets would involve setting up a staging area, where the pellets would be loaded into the aircraft. The staging area would be located as near as possible to the application site and aircraft might use existing roads as landing strips. Roads would be blocked during take-offs and landings. The staging area would probably receive small amounts of the herbicide dust from the loading process; however, a single prolonged exposure is not likely to result in the chemical being absorbed in harmful amounts, according to the Material Safety Data Sheet (MSDS).

Metabolism, degradation, and leaching of tebuthiuron in soil were studied in the laboratory and field. The predominant mode of degradation in laboratory studies was N-demethylation to N-(5-(1, 1-dimethylethyl)-1, 3, 4-thiadiazol-2-yl)-N-methylurea. The half-life of tebuthiuron was 10 to 13 months in field studies conducted in moderate-to-high rainfall areas. In low rainfall areas, the rate of dissipation was much slower. In southwestern New Mexico, the half-life would be approximately 30 months +/- 10 months.

In laboratory studies, 14C tebuthiuron leached slowly through a muck soil, but leached more readily through a sand soil column. In field studies, 14C tebuthiuron leached slowly in medium textured soils with 2-3 percent organic matter. Tebuthiuron was found in runoff water in field studies on controlled watersheds when storms occurred immediately after application. For this reason, Spike 20P is applied in the fall when the possibilities of high intensity, short duration, storms are at a minimum.

Christmas cactus or Tasajillo - The herbicide selected for the treatment of Christmas cactus is Picloram. Picloram kills or damages annual and perennial broadleaf herbs and woody plants. It acts as an "auxin mimic" or synthetic growth hormone that causes uncontrolled and disorganized growth in susceptible plants. Picloram does not bind strongly with soil particles and is not degraded rapidly in the environment, allowing it to be highly mobile and persistent (half-life of picloram in soils can range from one month to several years). In soils, picloram is degraded primarily by microbial metabolism, but it can be degraded by sunlight when directly exposed in water or on the surface of plants or soil. Picloram can move off-site through surface or subsurface runoff and has been found in the groundwater of 11 states. Picloram may also "leak" out of the roots of treated plants, and be taken up by nearby, desirable species. Picloram is not highly toxic to birds, mammals, and aquatic species. Some formulations are highly toxic if inhaled, while other formulations can cause severe eye damage if splashed into the eyes. Because of the persistence of picloram in the environment, chronic exposure to wildlife is a concern, and studies have found weight loss and liver damage in mammals following long term exposure to high concentrations. Concentrations in runoff reported by researchers are often adequate to prevent the growth of non-target terrestrial and aquatic plants, and therefore, picloram should not be applied near waters used for irrigation.

The broadcast rate for range and pasture has been lowered from the current maximum of 2.0 lb. to 0.5 acid equivalent per acre (ae/A) for control of broadleaf weeds and woody plants. For control of noxious weeds, broadcast application of up to 1.0 lb. ae/A may be used annually. Spot treatments have been lowered to a maximum of 1.0 lb ae/A with no more than 50% of an acre being treated. Spot treatments and broadcast treatments can be applied during the same growing season only if the total amount applied does not exceed 1.0 lb. ae/A per annual growing season.

Picloram (Sold as Tordon 22K) is water-soluble, does not bind strongly to soil particles, and can be persistent and mobile in the environment. In plants, picloram is either metabolized (in non-susceptible species) or can remain intact for some time (in susceptible species). Unabsorbed picloram may photodegrade or be washed-off by rainfall. Absorbed picloram may be released into soil by passive transport in plant roots, and can then be taken up by nearby plants.

Saltcedar Treatment - Treatment of saltcedar would be accomplished with one of or a combination of three different methods, which are as follows:

1. Shearing, cutting and shredding – Cutting saltcedar trees as close to the ground as possible in a combination with immediately painting the resulting stumps with herbicides such as Triclopyr, sold

under the names of "Garlon 4, Remedy" or Imazapyr sold under the trade name "Arsenal" or "Habitat" is an effective way of killing saltcedar. This method of control is recommended for single plant treatment and/spot treatments due to the labor intensity, time requirements and costs. This practice is considered for spot treatment and to create buffers around and within existing cottonwood willow groves.

The herbicide application is required to completely kill the remaining root system to prevent resprouting from the remaining stumps and root systems of the saltcedar plants initially treated, as well as the established of pioneer plants as unoccupied habitat becomes available.

2. Hand spraying and ground spraying from a vehicle – hand application if the herbicide Arsenal or Habitat using hand sprayers and vehicles is an effective method of killing saltcedar also. This method will be done in areas where use of a helicopter is prohibited due to proximity to dwellings, presence of non-target species, or areas of very sparse saltcedar.

3. Aerial Spraying – Aerial application of the herbicide Arsenal or Habitat from either an airplane or helicopter is a very effective way to kill saltcedar. The airplane, which is more economical, can be used where there are large, homogeneous blocks of saltcedar. A helicopter is planned to be used where the treatment must be very accurate and controlled due to the presence of other species such as cottonwoods, inaccessible areas, or due to irregular patterns. Aerial application will be done only where treatment can be at least ¼ mile from any human dwelling. In most aerial treatments, Arsenal would be used with the exception of the presence of open water where Habitat would be used.

In order to protect remnant cottonwood, willow or other native trees from being affected by aerial treatment, a 100 foot buffer zone will be observed around these trees and only hand treatment will be done. Depending upon wind speed and direction, this buffer could be increased.

After application of herbicide, saltcedar will be left standing for at least two years in order to allow the herbicide to translocate into the plant's root system.

There would be some degree of retreatment needed to effectively control saltcedar at any treatment area. The method of treatment for re-sprouts and pioneer plants would be a foliar application of herbicide to small plants with primarily herbaceous growth present.

The proposed action is to treat the saltcedar in accordance with EPA approved label recommendations. The chemicals can be applied by many different methods and the selected technique depends on a number of variables. Some of these variables are:

1. The treatment objective (removal or reduction).
2. The accessibility, topography, and size of the treatment area.
3. The location of sensitive areas in the immediate vicinity (potential environmental impacts).
4. The anticipated costs and equipment limitations.
5. The location with regards to land ownership and cooperation.

Herbicide applications will be scheduled and designed to minimize potential impacts on non-target plants and animals, while remaining consistent with the objectives of the vegetation treatment program. The rates of application depend on the target species, presence and condition of non-target vegetation, depth to water table, presence of other water sources, and other label requirements.

Imazapyr (sold as Arsenal, Habitat) is a broad spectrum, nonselective herbicide used to control annual and perennial herbaceous plants, deciduous trees, vines, and brambles in non-cropland situations. Registered uses include rail road, utility and pipeline rights-of-way, petroleum tank forms, utility plant sites, fence rows and wetlands. Imazapyr is readily adsorbed by roots and foliage and inhibits plant growth by affecting the biosynthetic pathway of aliphatic amino acids.

Triclopyr (sold as Garlon, Remedy) is a broad spectrum systemic herbicide and is used for site preparation and occasionally in conifer release for woody plants and broadleaf weed control. Triclopyr is readily adsorbed through both leaves and roots of plants. It induces characteristic auxin-type responses in plants. Triclopyr is not considered a persistent compound in soils; it degrades rapidly, with an average half-life of 46 days. The major route of degredation in soil is via microbial decomposition. Degradation doesn't occur to any appreciable extent via chemical hydrolysis or other chemical routes in the soil.

Prescribed Burn Treatment:

All prescribed fires would be conducted under a site specific Prescribed Fire Burn Plan as per the interagency prescribed fire guide. The Prescribed Fire Burn Plan would specify the weather and fuel conditions, fire behavior, holding resources, and prep work (i.e. sites to be protected, line construction) needed to safely and efficiently meet the objectives for the project. The Prescribed Fire Burn Plan would identify any persons, agencies, and lease holders to be notified concerning the prescribed fire project. The Prescribed Fire Burn Plan would also identify any potential receptor sites and smoke management mitigation measures necessary to minimize impacts to the air shed and receptor sites. Prescribed fire control lines would utilize natural barriers (i.e. rock outcrops, bare ground), bladed roads and two-tracks when possible to avoid creating new surface disturbance. There would possibly be areas where control lines would have to be constructed via mechanical treatments and heavy equipment. New surface disturbances would require cultural clearances prior to burn project implementation.

Manual and Mechanical Treatments:

Hand-operated power tools and hand tools are used in manual vegetation treatment to cut, clear, or prune herbaceous and woody species. In manual treatments, workers would cut plants above ground level; pull, grub, or dig out plant root systems to prevent subsequent sprouting and re-growth; scalp at ground level or remove competing plants around desired vegetation; or place mulch around desired vegetation to limit the growth of competing vegetation. Hand tools such as the handsaw, axe, shovel, rake, machete, grubbing hoe, mattock (combination of axe and grubbing hoe), brush hook, and hand clippers are used in manual treatments. Axes, shovels, grubbing hoes, and mattocks can dig up and cut below the surface to remove the main root of plants such as prickly pear and mesquite that have roots that can quickly re-sprout in response to surface cutting or clearing. Workers also may use power tools such as chain saws and power brush saws. All materials removed would require hand piling and burning later. A unitary shredder or tree masticator would be used for vegetation such as saltcedar along the Rio Grande and its tributaries and in higher elevations for dense stands of

piñon/juniper. This mechanical tool would be used in conjunction with herbicide and prescribed fire post treatments.

Manual and Mechanical treatments would be conducted in conjunction with other treatments. Utilizing manual and mechanical treatments alone would not be cost effective to meet the objectives of restoring the ECE landscape. The entire area encompasses 432,466 acres and utilizing mechanical tools alone would not make any significant progress toward the restoration of the grasslands. Therefore, manual treatments as a primary control for creosote or mesquite would not be analyzed. Manual treatments would be utilized in steep areas where chemicals treatments are not possible and during prep work for construction of control lines for prescribed burns. These sites may comprise a range of vegetation communities or habitat types, and include areas where there may be wildlife concerns, yet it is deemed beneficial to remove trees, shrubs, or other fuel loading vegetation. Manual vegetation treatments cause less ground disturbance than mechanical treatments (i.e. tractors, dozers, etc.) and generally remove fewer amounts of vegetation than is associated with other treatment methods (prescribed fire or chemical treatments). New surface disturbances would require cultural clearances prior to mechanical treatment implementation.

Although the manual method of vegetation treatment is labor intensive and costly compared to prescribed burning or herbicide application, it can be extremely species selective and can be used in areas of sensitive habitats or areas that are inaccessible to ground vehicles.

Post Treatment Rehabilitation:

Dependent upon funding and priority, some areas may be identified for post treatment rehabilitation. Rehabilitation practices would include: erosion control structures, stream bank stabilization using pole plantings in riparian areas after saltcedar treatment where applicable, seeding after prescribed fire and areas of ground disturbance with native certified weed free seeds. The use of heavy machinery and hand power tools would be utilized to plant and seed. Auger attachments would be used on both tractors and hand drills. ATVs may also be utilized to broadcast seeds and haul tools and equipment into the work area. If a treated site is eligible for rehabilitation, a cultural clearance would be needed prior to any ground disturbance. On a case by case basis, some riparian areas may need to be excluded from livestock grazing either permanently or seasonally with the use of fencing, Any structural practices to improve rehabilitation could potentially require a separate EA. The degree of exclusion of a rehabilitated riparian area would depend upon site location, land ownership, degree of rehabilitation and its use.

ALTERNATIVES:

<u>Mechanical Treatment Alternative</u>

Wheeled or track crawler tractors (backhoes or dozers) would be used to “grub-out” or shred and clear the treatment area of creosotebush, mesquite, tarbush in the flat areas, piñon/juniper in the upper slopes of the deer habitat areas where slopes still allow the use of the machinery and saltcedar in areas where they are accessible. The shrubs would be severed at or below ground level in an attempt to deter re-growth, however it is expected that most of the shrubs would re-sprout after a few years. The effectiveness of this alternative would be short lived. Vegetative debris would be left in place to provide a protective covering for the soil surface or they would be used for “gully plugs” or sediment traps to reduce or minimize erosion potential. Extensive off-road

travel by equipment would be required throughout the proposed treatment area. Cultural clearances would need to be performed on the entire area.

No Action Alternative

This alternative would continue with the existing management and leave the sites as currently found. No treatment would be conducted to reduce the density of mesquite, creosotebush, tarbush, saltcedar and/or piñon/juniper in the proposed treatment areas. This is the least cost alternative, but no benefits would be realized. Mesquite and creosotebush densities would most likely increase in the flats, saltcedar would increase and continue to degrade riparian areas, wetlands and tributaries along with the continued encroachment of piñon/juniper off of the higher elevation slopes into the grasslands. Rangeland health would continue to deteriorate.

ALTERNATIVES CONSIDERED BUT NOT ANALYZED:

Biological Control Alternative

There currently is no known specific, effective method of biological control for targeted species with the exception of saltcedar. The saltcedar biological control is not approved for use in New Mexico and Arizona and based upon current research data would not be very effective in the proposed project area. Biological treatments therefore would not be analyzed.

Prescribed Fire Alone

Fires are more effective on non-sprouting shrubs such as sagebrush than on re-sprouting shrubs such as creosote and mesquite (Holechek, et al. 2001). Fire would not eliminate creosote or mesquite as they sprout following low to moderate severity fires. Prescriptions to generate fire intensity severe enough to kill root crowns of mesquite and creosote would likely pose an unacceptable risk of fire escaping the control boundaries. Therefore, prescribed fire treatments as a primary control for creosote or mesquite would not be analyzed. Fire would only be used as a primary tool for the control of piñon/juniper in the higher elevations and saltcedar in areas where feasible. After burning a chemical treatment will have to be implemented on saltcedar to control any resprouts. Fire is also analyzed as a supplemental follow up treatment to chemical mesquite and creosote treatments in the proposed action. Fire would be used as a primary tool for the control of piñon/juniper and overgrown deer forage in the upper elevations and is analyzed as a primary tool for these species as a part of the proposed action. It is also analyzed as a supplemental follow up treatment to chemical mesquite and creosote treatments in the proposed action.

Treatment with Other Chemical Alternative

There are other chemicals on BLM's list of approved herbicides that could be used to control creosote. A partial list of these chemicals include clopyralid, 2,4-D, dicamba, glyphosate, hexazinone, picloram, and triclopyr. BLM rejected their use due to impacts to non-target vegetation and/or effectiveness. Therefore, the use of these chemicals as a primary control for creosote would not be analyzed. Other approved chemicals could be used to treat mesquite, such as 2,4-D, dicamba, glyphosate, hexazinone, and picloram. However, the combination of Triclopyr and Clopyralid, applied at 0.25 lbs/ active ingredient per acre each, has been found to be the most effective with the least amount of adverse impacts to more desirable shrub species.

Apply Herbicide at a Different Rate Alternative

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 could potentially harm non-target vegetation and not be cost effective.

AFFECTED ENVIRONMENT AND ENVIRONMENTAL IMPACTS:

Affected Resources and Environmental Consequences by Alternative

General Setting:

Historical and present use of the subject land is predominately livestock grazing and recreational seasonal hunting. Land use authorizations such as rights-of-ways, leases, and permits would continue to be issued on a case by case basis. The area totals approximately 432,466 acres of which 293,174 are BLM land, 66,162 are State Land, 60,698 are private land, and 12,432 are classified as other (BOR/IBWC). Only those resources actually impacted by the proposed action are addressed in this document. Both the surface and mineral estates are in public ownership. The ECE landscape is made up of a variety of habitats ranging from piñon/juniper in the mountain areas to creosote dominated sites in the lower breaks with mixed shrub and tobosa draws interspersed in between. The areas targeted for creosote, Christmas cactus, tarbush, and mesquite treatment are in the transition zones along the upper valley benches and still have a grass cover component in the under-story. The areas targeted for piñon/juniper control are in the higher elevations. The proposed treatment areas occur on the more loamy and gravelly soils. Grasslands, major drainages, and high-density Rhus areas would be avoided, except when treating saltcedar.

Saltcedar infested areas are primarily located along river banks, riparian, wetlands, floodplains and tributaries to the Rio Grande. Other populations occur on private land surrounding dirt tanks, springs and secluded riparian areas. The highest densities of saltcedar are present on BOR and IBWC land along the Rio Grande, including Elephant Butte and Caballo Lakes.

The critical elements of Prime or Unique Farmlands, Native American Religious Concerns, Hazardous or Solid Wastes, and Wild and Scenic Rivers are not present within the treatment area and would not be affected. Low Income/Minority Populations are present but would not be impacted by proposed treatments.

Air Quality:

The air quality of the area of the proposed action is considered good and is designated a Class II air quality area. A Class II area allows for moderate amounts air quality degradation. The primary source of air pollution is pm10 (dust) generated off-site during high wind events, common during the spring months in southern New Mexico. In the event of a prescribed burn, a burn plan would be developed and address the impacts smoke would have on the air quality.

Environmental Consequences:

Proposed Action - There could be a short-term impact to air quality as the liquid herbicide mixture is aerially applied. The herbicide labels and above stipulations would be followed to minimize drift and volatilization. The impact would be temporary and insignificant. Federal, State and local air quality regulations would not be violated.

All prescribed fires would be conducted under a site specific Prescribed Fire Burn Plan as per BLM Manual 9214. The Prescribed Fire Burn Plan would specify the weather and fuel conditions, fire behavior, holding resources, and prep work (i.e. sites to be protected, line construction) needed to safely and efficiently meet the objectives for the project. The Prescribed Fire Burn Plan would identify any persons, agencies, and lease holders to be notified concerning the prescribed fire project. The Prescribed Fire Burn Plan would also identify any potential receptor sites and smoke management mitigation measures necessary to minimize impacts to the air shed and receptor sites. Prescribed fire control lines would utilize natural barriers (i.e. rock outcrops, bare ground), bladed roads and two-tracks when possible to avoid creating new surface disturbance. There would possibly be areas where control lines would have to be constructed via manual treatments and heavy equipment. New surface disturbances would require cultural clearances prior to burn project implementation.

Mechanical Treatment Alternative - The use of machinery to grub-out shrubs would generate dust during treatment as soils are disturbed and "loosened" throughout the treatment area. The removal of shrubs by this method would also remove some of the grasses and forbs, thus resulting in an increase in bare ground percentage (and bare patch size), potentially adding to the amount of wind generated dust until sufficient ground cover becomes reestablished.

No Action Alternative – Under the no action alternative, all resources would remain the same. The current situation would continue and no projects would be implemented to improve the conditions of the habitat. There would be no impacts to air quality under the No Action Alternative.

Soils:

The western portion of the area includes the foothills of the Black Range in Sierra County and the eastern slopes of the Uvas Mountains and Robledo Mountains in Dona Ana County. Soils on the hills and mountains are typically shallow, cobbly soils over igneous, basalt, and limestone bedrock. Gravelly loams and gravelly sandy loams are common on the piedmonts and fans which occur throughout a large portion of the eastern area. Soils typically become more sandy on the breaks into the Rio Grande valley to the east. Drainages form in higher elevations to the west and account for numerous west to east running ephemeral canyons, arroyos, and draws which dissect the project area and drain toward the Rio Grande. Soils in the drainages are typically fluvial riverwash materials with textures varying from cobbles, sand, and silt.

Detailed descriptions of the soils are found in the Soil Survey of Sierra County Area, New Mexico (NRCS, 1984) and Soil Survey of Dona Ana County Area, New Mexico (NRCS, 1980) or http://websoilsurvey.nrcs.gov/app/.

Environmental Consequences:

Proposed Action - Vegetation treatments may affect the characteristics of the soil by altering the abundance and types of vegetation that shield soil from erosion, or alter the presence and abundance of soil microorganisms or

larger organisms that contribute to overall soil quality. The increased organic matter caused initially by the mesquite or creosote leaves, stems, roots, and secondarily by the increased production of grasses and forbs would improve the fertility of the soils.

A decrease in shrub density by chemical treatment may result in short-term, insignificant increases in surface erosion that would diminish as understory herbaceous vegetation reoccupies the treated sites. In the long term, increased herbaceous ground cover would improve soil stability.

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 soil can support increased populations of microorganisms. Soil microorganisms can metabolize herbicides and often are reported to be responsible for herbicide decompositions (Norris and Moore, 1981).

Prescribed burning may increase the erosion potential until the perennial vegetation reestablishes. Extremely intense fires would cause a higher than desired mortality on all plant species, resulting in the exposure of excess amounts of bare ground over a longer period and, consequently, greater soil loss. However, extremely intense burning would be avoided by burning within favorable prescriptions. Because fibrous rooted perennial grass species increase soil stability, soil erosion would be reduced below present levels when grasses become re-established.

Burning increases nutrient cycling by releasing nutrients that had been tied up in litter and plant material back into the soil. The reason that burned areas typically green-up earlier than unburned adjoining areas is that soil temperatures of burned areas are usually higher than those of adjoining unburned areas.

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 microorganisms 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.

Manual treatments would have minor impacts on soils. Soils would be "loosened" in the areas where people would be walking and working during the manual removal of shrubs. All shrubs removed would be lopped and scattered, which would lessen the potential of soil loss due to erosion. As the native vegetation regenerates, the impacts would be lessened.

Soil disturbance associated with "flagging" the area prior to treatment would be minor. Some off-road ATV traffic may be required to flag the area, but off-road travel would only occur when the soil surface is dry.

<u>Mechanical Treatment Alternative</u> - The use of machinery to grub-out shrubs would generate dust during treatment as soils are disturbed and "loosened" throughout the treatment area. The removal of shrubs by this method would also remove some of the grasses and forbs, thus resulting in an increase in bare ground percentage (and bare patch size), significantly increasing the potential for erosion by wind and water until sufficient ground cover becomes reestablished. Mechanical treatment could damage resources. This would be cost prohibitive and invasive to the soil especially with the high number of acres proposed to be treated throughout the project area.

No Action Alternative – Under the no action alternative, all resources would remain the same. Once these species of shrubs become established in areas, they tend to increase in density and out-compete other native vegetation for soil moisture, nutrients, and sunlight. Lands with high densities of mesquite and creosotebush typically exhibit accelerated soil erosion rates, decreased water infiltration into soil, and lower amounts of forage available for wildlife and permitted livestock. Degradation of the landscape would continue to occur in the floodplains and riparian areas due to increased erosion and sedimentation. The current situation would continue and no projects would be implemented to improve soil conditions. No benefits would be achieved under the No Action Alternative.

Water Resources:

Surface Water:

A perennial stream, river or channel has continuous flow in parts of its bed all year round during years of normal rainfall. "Perennial" streams are contrasted with "intermittent" streams which normally cease flowing for weeks or months each year, and with "ephemeral" channels that flow only for hours or days following rainfall. During unusually dry years, a normal perennial stream may cease flowing, becoming intermittent for days, weeks, or months depending on severity of the drought.

There are perennial, intermittent and ephemeral surface waters within the proposed treatment area. Several ephemeral "tobosa" draws flow in a west-east direction throughout the treatment area during periods of high rainfall events which cause runoff. The draws would be excluded from treatment. Earthen impoundments (tanks) and wells are located in the proposed treatment area. The tanks and wells hold water during most of the year. A buffer area of a minimum of 100 meters would ensure the tanks and wells are excluded from treatment.

Ground Water:

Groundwater of the area occurs as a confined alluvial aquifer in the Rio Grande Watershed. Wells located in or near the proposed treatment areas are currently used to water livestock and wildlife. A buffer area of a minimum of 100 meters would be designated around the wells prior to application of herbicides.

Environmental Consequences:

Proposed Action - Herbicides may enter surface water impoundments during treatment through accidental direct application. A 100 meter buffer has been designated to avoid this possibility. Chemical "drift" might also occur during adverse weather. As per the above stipulations, application of liquid herbicide on mesquite would not occur when wind speed exceeds seven (7) mph or wind velocities are inconsistent. Application of the pelleted tebuthiuron to creosotebush would not occur when wind speeds exceed fifteen (15) mph.

After treatment, pelleted herbicide could be displaced through surface runoff, should a large rainfall event occur, however to mitigate a surface runoff, the pelleted herbicide would be applied in the fall/winter months to reduce the potential for displacement via intense rain events. To pollute the water, the herbicide must be present in the water at concentrations high enough to impair water quality at a point of use. The ephemeral drainages in the project area will be avoided and reported well depth information indicates groundwater levels

at 150 to 200 feet below ground surface. Therefore, the potential for herbicide percolating into groundwater aquifers is low.

Treatment of saltcedar with Habitat (aquatic label) would take place near or over surface water if needed to treat plants near the edge of water because it would not have any impacts to aquatic species . Treatment of saltcedar would increase both surface and ground water as trees die and free up their water usage.

Mechanical Treatment Alternative - The use of machinery to grub-out shrubs would generate dust during treatment as soils are disturbed and "loosened" throughout the treatment area. The removal of shrubs by this method would also remove some of the grasses and forbs, thus resulting in an increase in bare ground percentage (and bare patch size), potentially adding to the amount of erosion in the bare areas and would not be allowed to percolate into the soils which could lead to increased sedimentation and lower surface water quality into drainage areas. This would continue until sufficient ground cover becomes reestablished. Ground water resources would not be recharged as rapidly as when vegetation is present.

No Action Alternative – Under the no action alternative, all resources would remain the same. There could be a potential for vegetation conditions/ecological states to continue to deteriorate, thus decreasing herbaceous cover and increasing erosion potential which could increased surface runoff impacts to perennial streams.
The current situation would continue and no projects would be implemented to improve the conditions of the habitat. There would be no impacts to water resources under the No Action Alternative.

Vegetation:

Ecological sites within the entire project area are in the Southern Desertic Basins, Plains and Mountains-42 Major Land Resource Area. The ecological sites are in the SD-2 Sub Resource Areas. They are comprised of gravelly, gravelly loam, gravelly sand, loamy, limestone hills, sandy, and shallow sandy ecological sites. More detailed descriptions may be obtained from NRCS Ecological Site Descriptions website at http://www.nm.nrcs.usda.gov/technical/fotg/section-2/esd.html.

Vegetation of the Gravelly ecological site at potential is grassland, comprising up to 12% cover of grasses with dominants of black grama and bush muhly. Creosotebush is an integral, but not dominant, part of the community. Retrogression is indicated by increased bare ground and increased size of bare ground patches with change in grass species dominance. The shrub-dominated state is creosotebush with some grass cover of bush muhly and black grama. The shrubland state is generally devoid of grasses and exhibits soil erosion and truncation.

The Gravelly Loam site has a grassland aspect, characterized by short and mid-grasses and dominated by black grama. Yucca, sotol, and agave are highly noticeable components of the landscape. Forbs are least noticeable, except when such plants as desert baileya are in flower.

In the Gravelly Sand ecological site, it is associated with the gravelly ecological site and may grade into sandy or deep sand ecological sites. This site often occupies arroyos and is flanked by gravelly sites (e.g. Caliza gravelly sandy loam). In some cases, Bluepoint loamy sand soils (classified as deep sand sites) on dissected piedmont slopes may contain sufficient gravel so as to behave similarly to gravelly sands (e.g. in the Bluepoint-Caliza-Yturbide complex). The historic plant community type is generally assumed to exhibit dominance by dropseed grasses (mesa dropseed, and sand dropseed), and, secondarily black grama and bush muhly.

Creosotebush is a secondary dominant and annuals may be important components. Loss of these grasses due to overgrazing and/or drought, or due to climate change, may lead to a transition to dominance by creosotebush and mesquite. Persistent lack of grass permits wind erosion, leading to loss of soil fertility and eventual loss of the A horizon and exposure of the calcic horizon on some soils (transition to eroded shrubland state).

Vegetation in the Loamy site intergrades with Sandy, Clayey, and Gravelly or Gravelly loam sites and does not often form sharp boundaries with them. The presumed historic plant community type of this site is dominated by black grama and tobosa is a secondary dominant, followed by alkali sacaton. These areas tend to be on sandier soils, so the relative dominance of black grama and tobosa in the historic setting may depend on variations in surface or subsurface soil texture. Transitions within this ecological site appear to be governed by selective herbivory, erosion and soil truncation, although no systematic studies within this site exist. A loss of black grama, with subsequent dominance by burrograss, tobosa, or threeawns may occur in response to grazing. Both tarbush and honey mesquite readily invade this site, perhaps facilitated by bare areas where grass competition and/or fire are diminished. Creosotebush may also invade. Subsequent loss of remaining grass cover, erosion, and soil truncation eventually produces a shrubland state (often dominated by tarbush or creosotebush) with little grass cover. Christmas cactus may be present on either gravelly or gravelly loam sites and co-exists with creosotebush.

The Limestone Hills site frequently intergrades with gravelly and hills sites. This site tends to occur at or approaching transitions to higher-elevation land resource units (e.g. CP-4) so plant community composition may grade continuously across relatively short distances. The most common historic plant community type of the limestone hills site is dominated by black grama, bush muhly, and sideoats grama. Tobosa may be abundant on heavier soils or in areas receiving run-in water. Shrubs and succulents are common, especially on south-facing slopes. South-facing slopes often exhibit low grass cover, even when adjacent north-facing slope are grass-covered. Limestone hills sites often exhibit less shrub cover and more grass cover than adjacent hills sites, indicating the favorable properties of rocky, limestone-derived soils for grasses. The Limestone Hills site is resistant to grass loss compared with other sites in SD-2, perhaps due to the presence of a rough, stony surface that 1) retards sheet flow velocity and erosional soil loss and 2) protects the crowns of grasses from herbivory by livestock. Furthermore, fissures forming in limestone rocks may facilitate infiltration and rock cover retards evaporative water loss relative to other soils.

The Sandy site may exist as a finely-scaled mosaic with the Shallow Sandy site depending on local variation to the depth of caliche. This site may also intergrade with the Deep Sand and Gravelly Sand sites. Frequently, the mesquite shrubland state of this site, including the development of coppice dunes, has been associated with the Deep Sand ecological site. The Deep Sand site is a distinct ecological site harboring soils and vegetation that developed long before the coppice dunes. Black grama and other grasses, especially dropseeds, dominate the historic plant community of the Sandy site. Natural spatial variation in the vegetation of this ecological site may be governed by slight variations in soil texture. For example, dropseeds may dominate on loamy sands. Variation in the depth to a restrictive horizon, such as caliche, may also drive variation in grass cover. Black grama is a key plant of this site due to its dominance under pristine conditions, its high forage value, and its consequent sensitivity to grazing. Shifts away from black grama dominance are thought to be due to overgrazing and/or multi-year periods of summer or spring drought, or due to the introduction of honey mesquite seeds with or without grazing.

With continuous heavy grazing, the proportional representation of black grama declines because cattle prefer it to dropseeds, threeawns and snakeweed . Dropseeds are more palatable than threeawns, so dropseeds may also

decline relative to threeawns and snakeweed. Under climatic conditions that are not conducive to black grama reproduction, or due to the loss of components of the soil biota, demographic limitations may lead to persistent absence of black grama, even without shrub invasion. Shrub invasion is, however, very common. Loss of soil stability and/or a reduction in black grama cover may permit either the survival or establishment mesquite seedlings due to reduced competition or fire frequency. Subsequent grazing by livestock and native herbivores, competition from shrubs, erosion, and concentration of nutrients under adult shrubs eventually leads to persistent reductions of grass cover and mesquite-dominated coppice dunes with bare or snakeweed dominated inter-dunal areas.

Vegetation of the Shallow Sandy ecological site at potential is grassland dominated by black grama and dropseeds. Site retrogression toward shrub-invaded grasslands is indicated by change in species dominance toward three-awn species and increases of broom snakeweed and mesquite. The shrub-dominated state is characterized by increased bare ground with low composition of grasses, and dominance of mesquite and broom snakeweed. Coppice dunes may form, but size is limited by the presence of the shallow caliche layer. Soil nutrients would be localized in coppice dunes or beneath the canopy of shrubs, with decreased nutrient levels between shrubs or dunes. Currently this site appears to be variously in the black grama limited state to the shrub-invaded state.

Saltcedar occurs in moist rangeland and pastures, bottomlands, banks, and drainage washes of natural or artificial waterbodies, and in other areas where seedlings can be exposed to extended periods of saturated soil conditions for establishment. Saltcedar can grow on soils with up to 15,000 ppm soluble salt. Established plants have long roots that can tap deep water tables. Furthermore, saltcedar has the highest known evapotranspiration rate of any desert phreatophyte (Carman and Brotherson 1982), which may result in water depletion from the underlying soil.Among the serious direct impacts of this species are the displacement of native range plants by its aggressive growth, the possibly serious depletion of ground water due to its rapid evapotranspiration rate, increased deposition of sediments in tamarisk- infested streams, and the blockage of streams and artificial water channels by dense clumps of saltcedar growth, which can promote flooding during periods of heavy rain.

Environmental Consequences:

Proposed Action - Effects of herbicide treatments on public land are discussed in both the 1991 vegetation treatment EIS (USDI BLM 1991) and the 2007 Final Vegetation Treatments Using Herbicides on Bureau of Land Management Lands in 17 Western States Programmatic Environmental Impact Statement (PEIS) (USDI BLM 2007). Both EISs indicate that the herbicides proposed for use in the project area are relatively safe and effective for rangeland use, but can have affects off site and on non-target species.

In general, the proposal is expected to decrease the cover and density of mesquite and creosotebush while increasing the cover and density of desirable grasses and forbs. Herbaceous production, ground cover, and community structure would be shifted toward intermediate grass dominated states that vary in grass cover depending on the degree of retrogression present at treatment (or conversely the remaining cover of grasses available to re-establish in the site). In areas where sufficient grass cover is not present, there is potential for large increases of exotic (such as tumbleweed) and native annual forbs and grasses as well as potential for a relatively barren aspect. Treatment of these barren sites would be based on the potential for the site to recover given the amount of understory present. If the barren area is large enough where there is no potential for grass species occur, they would not be treated. Although the treatment targets mesquite and creosotebush, some

injury or loss of non-target forb and shrub species is likely to occur, the proposed treatments have been designed to reduce damage to non-target vegetation by using appropriate applications rates, adjusting timing of application, and designing leave out areas and buffering along drainages.

Mesquite Treatment Areas:
Use of the Remedy/Reclaim mix would occur during May when soil temperatures warm sufficiently to initiate maximum plant (mesquite) growth. The herbicide is absorbed directly through the leaf surface and becomes active in the plant. Uptake of the herbicide through the soil is minimal in high rainfall areas, but possible in arid areas such as the proposed area. The herbicide leaches readily into the soil column where it is readily broken down by microbial action in moist soils. The herbicides are more persistent in arid climates. Effects to plants offsite can occur through spray drift and through offsite runoff during storm events to distances of 200 to 900 meters, depending on the rate of application. The proposed action is a relatively low application rate, therefore effects of spray drift and runoff are likely to be reduced.

An even application of the chemical herbicides Reclaim and Remedy at the proposed 0.25 pounds of active ingredient each per acre would reduce the present composition of mesquite to an estimated 10% by the second year after application. There would be an estimated 64% average root kill on mesquite using this combination and amount of active ingredient per acre of herbicide (Combs/McDaniel 2006). Along with mortality of mesquite, it is expected that there would be high mortality of non-target shrubs and many broadleaf annual and perennial forbs in the treatment area.

In arid climates, the half-life of the herbicide is expected to be up to 90 days. This suggests that forbs and shrubs could begin to re-establish late in the growing season or the following year from the soil seed bank, depending on the amount and timing of precipitation received.

Because the herbicide is selective for broadleaf shrubs and forbs, grasses would benefit from the reduction of competition for nutrients and space, and should increase in cover and density significantly. Adequate grazing rest following the treatment should promote grass recovery.

Dead mesquite plants would not produce beans and therefore, livestock and wildlife would not consume them. Seeds within the beans would not be spread through defecation of livestock or wildlife.

Creosotebush and Tarbush Treatment Areas:
Tebuthiuron is generally considered a non-selective herbicide when used at application rates much greater than this proposal. Grasses as well as shrubs and forbs are affected by the herbicide. However, at an application rate of ½ to ¾ lb per acre, based on soil type, grasses are not affected by the herbicide and are benefited by reduced competition for nutrients and space. Other shrubs such as tarbush and mariola are susceptible to tebuthiuron at the proposed rates. However, mesquite is not susceptible to the ½ to ¾ lb per acre application rate.

Tebuthiuron is active and mobile in the soil and is translocated from the soil to leaf tissues where it becomes active. Because the herbicide is mobile on and in the soil, application occurs during October when there is relatively low probability of high rainfall events that would allow for increased movement across the soil surface and through the soil column. Generally, wind drift of tebuthiuron is low because it is applied in the form of a clay pellet.

Application of ½ to ¾ lb per acre is a relatively low application rate; however, it can be sufficient, in certain conditions, to cause mortality in forbs. Indications are that in general, forb communities appeared unaffected by tebuthiuron in treatments conducted by BLM over the past 17 years (Pers Comm, Vivie Melendez). However, in at least one recent situation in the Las Cruces District, apparent adverse affect to forbs were noted within 6 months of tebuthiuron treatment. However, long-term effects on this particular community are not known at this time. A study conducted on the vegetation and soils changes in areas treated for creosotebush reduction with tebuthiuron by the Las Cruces District over the past 17 years found approximately 85% mortality of creosotebush with a 95% reduction in canopy cover (Perkins et al. 2006). Little evidence of re-establishment of creosotebush was found, and is not expected to occur in the foreseeable future. Cover of short and mid grass species (such as burrograss, fluffgrass, tobosa, and bushmuhly) increased significantly after treatment with tebuthiuron. While there were regional differences in grass response, in general short grass cover was highest 4 to 8 years following treatment. Mid-grass cover was generally highest in areas treated 14 to 17 years previously. In addition, they found that soil nutrients, which had become localized under the canopies of creosotebush plants, began to disperse back into the interspaces between the dead shrubs. This suggests that further re-establishment of herbaceous vegetation between shrubs should continue to occur in the future. Post treatment of creosotebush, the Christmas cactus population, if present, may increase drastically if the growing conditions are correct.

In conjunction with the chemical treatments, prescribed burning can follow up after sufficient herbaceous cover has established to carry a fire, especially in areas that border the higher elevation deer habitats. This would help reduce the litter residue from the site and promote further the establishment of grass and forb cover. Mechanical treatments where needed would further compliment the chemical and prescribe treatments. The combination of all treatments would help restore the grasslands and the higher elevation deer habitats.

Christmas Cactus Treatment Areas:
Christmas cactus may be present in the understory of creosotebush and not very noticeable until the creosotebush has been treated. In some cases, after the treatment of creosotebush, Christmas cactus production will increase drastically, making the area impenetrable and undesirable to livestock and some species of wildlife. This increase in production is made possible only when the growing and soil conditions are just right. Overgrown populations of Christmas cactus would be treated with the herbicide Picloram. The broadcast rate for range and pasture has been lowered from current maximum of 2.0 lb. to 0.5 acid equivalent per acre (ae/A) for control of broadleaf weeds and woody plants. Spot treatments have been lowered to a maximum of 1.0 lb ae/A with no more than 50% of an acre being treated. Spot treatments and broadcast treatments can be applied during the same growing season only if the total amount applied does not exceed 1.0 lb. ae/A per annual growing season. Treatment of overgrown Christmas cactus would enable growth of perennial grasses and forbs for the benefit of livestock and wildlife. The selected treatment areas would be located far enough from any surface water so the likelihood of contamination would not occur. Non target plant species would be buffered out of the proposed treatments.

Saltcedar Treatment Areas:
Treatment of saltcedar as described in the proposed action would have no affect to other native plant species if all of the methods are utilized. Native vegetation would be buffered out and avoided with aerial application of Imazapyr. Treatment of areas currently dominated with saltcedar would allow native vegetation the ability to re-establish. The use of machinery to remove standing dead trees (root balls) may have some impact to native grasses, forbs, and shrubs if present. The major disturbance would be from tires or tracks of heavy equipment. Some degree of rehabilitation may need to occur post mechanical treatment to ensure saltcedar does not re-

establish, native plant re-establishment, and erosion prevention/control. Re-treatments with Imazapyr may need to take place post initial treatment to kill re-sprouts if mechanical removal of root balls does not occur. The treatment of salt cedar would allow for native vegetation to re-establish and allow for more water to be available for infiltration into the floodplain and riparian areas.

Pole plantings, reseeding, construction of erosion structures or livestock exclosures would increase the recovery time of the native species, thus speeding up the healing process for the watershed itself.

Mechanical Treatment Alternative - The use of machinery to grub-out shrubs would be very species selective and remove only the creosote, mesquite, and other undesirable shrubs. However, removal of shrubs by this method would also remove some of the grasses and forbs. This would result in an increase in bare ground percentage (and bare patch size), potentially adding to the amount of bare areas. This would continue until sufficient ground cover became reestablished. This method would be very costly and would require very many years to treat the entire area.

No Action Alternative – Under the no action alternative, all resources would remain the same. There could be a potential for vegetation conditions/ecological states to continue to deteriorate, thus decreasing herbaceous cover and increasing erosion potential which could increased surface runoff impacts to perennial streams. The current situation would continue and no projects would be implemented to improve the conditions of the resources. No benefits would be achieved under the No Action Alternative.

Non-Native and Invasive Plant 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 and to the agriculture and commerce of the United States. Generally, noxious weeds are aggressive, difficult to manage, parasitic, are 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.

There are currently 32 species listed as "noxious" by the State of New Mexico as shown on Table 3. The table also indicates presence within the proposed project area. 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 including decreased quality of agricultural products due to high levels of competition from noxious weeds; decreased quantity of agricultural products due to noxious weed infestations; decreased wildlife habitat quality and quantity; and costs to control and/or prevent the noxious weeds.

Table 3.

Common Name	Scientific Name	Origin	Traditional Habitat Terrestrial, Riparian, or Aquatic	NMDA Class
Alfombrilla	Drymaria arenarioides	Mexico	Terrestrial	A
Black Henbane	Hyoscyamus niger	Europe	Terrestrial	A
Camelthorn	Alhagi pseudalhagi	Asia	Terrestrial	A
Canada Thistle	Cirsium arvense	Eurasia	Terrestrial	A

Dalmatian Toadflax	Linaria genisitifolia ssp. dalmatica	Europe	Terrestrial	A
Diffuse Knapweed	Centaurea diffusa	Mediterranean	Terrestrial	A
Dyer's Woad	Isatis tinctoria	Europe	Terrestrial	A
Eurasian Watermilfoil	Myriophyllum spicatum	Eurasia	Aquatic	A
Hoary Cress	Cardaria draba	Europe	Terrestrial	A
Hydrilla	Hydrilla verticillata	SouthAfrica	Aquatic	A
Leafy Spurge	Euphorbia esula	Eurasia	Terrestrial	A
Onionweed	Asphodelus fistulosus	Mediterranean	Terrestrial	A
Perennial Pepperweed	Lepidium latifolium	SouthEurope	Riparian	A
Purple Loosestrife	Lythrum salicaria	Europe	Aquatic	A
Purple Starthistle	Centaurea calcitrapa	Europe	Terrestrial	A
Scotch Thistle	Onopordum acanthium	Europe	Terrestrial	A
Spotted Knapweed	Centaurea maculosa	Eurasia	Terrestrial	A
Yellow Starthistle	Centaurea solstitialis	Europe	Terrestrial	A
Yellow Toadflax	Linaria vulgaris	Eurasia	Terrestrial	A
African Rue	Peganum harmala	NorthAfrica	Terrestrial	B
Bull Thistle	Cirsium vulgare	Eurasia	Terrestrial	B
Halogeton	Halogeton glomeratus	Asia	Terrestrial	B
Malta Starthistle	Centaurea melitensis	Europe	Terrestrial	B
Musk Thistle	Carduus nutans	SouthEurope	Terrestrial	B
Poison Hemlock	Conium maculatum L.	Europe	Terrestrial	B
Russian Knapweed	Acroptilon repens	Eurasia	Terrestrial	B
Teasel	Dipsacus fullonum	Europe	Terrestrial	B
Russian Olive	Elaeagnus angustifolia L.	Europe	Terrestrial	C
Saltcedar	Tamarix sp.	Europe	Riparian	C
Siberian Elm	Ulmus pumila	Europe	Riparian	C
Jointed Goatgrass	Aegilops cylindrica	South Europe	Terrestrial	C
Field Bindweed	Convolvulus arvensis L.	Europe	Terrestrial	C

Further, noxious weeds can negatively affect livestock by making forage either unpalatable or toxic, thus decreasing livestock productivity and potentially increasing producers' feed and animal health care costs. They can also affect recreational uses such as hunting opportunities due to decreased wildlife numbers, and reduce realty values of both the directly influenced and adjacent properties.

Recent federal legislation has been enacted requiring state and county agencies to implement noxious weed control programs. Monies would be made available for these activities from the federal government, generated from the federal tax base. More information on New Mexico noxious weeds can be found on the web at http://plants.usda.gov/java/noxious?rptType=State&statefips=35.

Environmental Consequences:

Proposed Action - There would be little surface disturbance caused by the proposed action. Although an open niche would be created by the herbicide, mechanical, and burn treatments, it is unlikely that noxious weed species would move into rangelands. Past experience with the herbicide in these range sites have shown success with no new noxious weed infestations. ATVs used for survey/design and implementation of the the treatment areas would be thoroughly cleaned before use. Monitoring after the area has been treated would be conducted to ensure that weeds do not become established. If new noxious weed populations are discovered,

their treatment is covered for Sierra County by EA-NM-030-98-025 and EA-NM-030-2003-100 for Doña Ana County.

Mechanical Treatment Alternative - The use of machinery to grub-out shrubs would result in more soil disturbance throughout the treatment area. The increased soil disturbance would create increased opportunities and a higher likelihood of noxious weeds being introduced into the area. Vehicles would be cleaned before use to help prevent noxious weeds becoming established in the project area.

No Action Alternative – Under the no action alternative, all resources would remain the same. The current situation would continue or worsen and no projects would be implemented to improve the conditions of the resource. The potential for increased salt cedar and other invasive species could occur under the No Action Alternative.

Wildlife:

Standard wildlife habitat sites within the proposed treatment areas include Creosote Rolling Upland, Half Shrub Rolling Upland, Mixed Shrub Rolling Upland, Mesquite Rolling Upland, Mesquite Sand Dune, Creosote Breaks, and Pinon-Juniper/Grass Mountain. Areas comprised of Grass Rolling Upland, Draws, and Arroyo Standard Habitat Site (SHS), would be delineated out of the project design and would not be treated unless they are tributary arroyos where salt cedar occurs. Areas comprised of Mesquite Sand Dune SHS would be evaluated to determine the feasibility of treating the area prior to treating. Such areas would not be treated if it were determined that the proposed treatment area has a low potential to respond and meet vegetation and habitat improvement objectives. Vertebrate species lists for each SHS are available from the Integrated Habitat Inventory Classification System (IHICS) database on file in the Las Cruces District Office. The IHICS database is a companion product to the inventory mapping completed for the District Office in the late 1970's and provides a listing of species use and occurrence in various habitats.

Proposed Mesquite Rolling Upland treatment areas provide habitat for grassland wildlife species, with perhaps some inclusion of scrub species due to the increased density of mesquite within the grassland. Most conspicuous in the grassland area are the burrow mounds of the banner-tailed kangaroo rat – a keystone species of many grassland areas in the region. A small herd of 15-20 pronghorn antelope is resident in the area.

Proposed Creosotebush Rolling Upland areas consequently are dominated by species preferring shrub-dominated habitats. The interface or edge between the 2 habitats is a zone of high wildlife diversity as species from each habitat are in close proximity and may move small distances into their non-preferred habitats. Many species, particularly predators benefit by the diversity of the grassland – desert shrub edge. The creosote/grassland edge are generally not a distinct edge, but rather a gradation (a feathering effect) from grassland dominant or shrub invaded through shrub dominant with some grassland to shrubland. The other habitat sites are comprised of a mixture of both types of species found in the mesquite habitat sites and the creosote sites.

Proposed saltcedar treatment areas provide habitat for a number of bird and mammal species that live near perennial and/or intermitten water sources. Saltcedar has replaced native riparian species such as cottonwood and willow species, has replaced native desert willow arroyo habitats, and has invaded the floodplains and breaks near the Rio Grande.

***Environmental Consequences*:**

Proposed Action - 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).

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 favor certain wildlife species, such as the chukar partridge, which depends on the alien annual grass, cheatgrass for food (Weaver and Haskell 1967), or they disfavor other species, such as pronghorn, which require mixed-plant communities, rather than those dominated by a few woody or herbaceous species (Yoakum 1975). In general, the greater the diversity of the plant community, the greater the diversity of the associated animal community (Gysel and Lyon 1980). Therefore, any change in vegetation community structure or composition would affect resident wildlife populations by dispersing them to other non-treated areas, attracting species to the treated habitat, or having to adapt to the change in vegetation which may affect local population levels. Those species that are dependent upon the shrub component have increased overtime resulting in a loss of grasslands species and have more habitat than in the past. Effects on wildlife from vegetation management would be both positive and negative, depending on the species affected and the type of treatment used. The intent of the proposed action is to increase the availability of grassland habitat and therefore increase populations of grassland related wildlife species.

Chemical treatments, like mechanical methods, traditionally have been applied most frequently to decrease woody plants, and increase the production of grasses. The control of woody species, 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. Chemical treatments can be 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.

The proposed treatments would affect the spatial structure of the Creosote Rolling Upland and Grass Rolling Upland communities. The primary effect would be to reduce, but not eliminate the total aerial extent of Creosote Rolling Upland and replace it with Grass Rolling Upland, and to maintain shrub invaded grassland areas in a grassland state. The intent of the treatment is not to render the entire project area to a monoculture of grass, but to reduce the invaded shrubs by 70 to 75% and still have a shrub component within the grasslands. There would be areas at the edge of the grasslands and creosotebush shrubland left intact. In this manner, habitat edge diversity would be maintained and perhaps increased, while still increasing the aerial extent of Grass Rolling Upland.

Toxicity of the proposed herbicides is addressed in the two herbicide EISs (USDI BLM 1991, 2007). The herbicides were found to have negligible to low risk of toxic effects to wildlife species when applied according to label requirements and at the relatively low rates proposed and with suitable precautions and mitigation measures (such as buffering surface waters and other desirable features potentially harmed by the herbicides). All water sources in the vicinity of the treatment area are buffered from the treatment area by at least 100m as part of the proposed action.

For tebuthiuron, no risk or impact to fisheries would occur, because none are present in or near the proposal area. Aquatic invertebrates potentially occurring in dirt tanks and water storages and troughs for livestock,

would not be impacted because all water sources are avoided and not sprayed.. Accidental overspray of a water source would result in low chronic risk for invertebrate species. There would be little to no risk of effect to invertebrates due to herbicide drift or run off into a water source (USDI BLM 2007). There would be low to no risk of toxic effects to pollinating insects contacting treated vegetation and small and large mammals consuming treated vegetation following application. Otherwise, no impact is expected to wildlife due to the application of ½ lb. to 1¼ lb. active ingredient of tebuthiuron (USDI BLM 2007).

Application of Arsenal or Habitat (Imazapyr) is not expected to have toxic effects on aquatic species in tributaries, dirt tanks, reservoirs and the Rio Grande. Imazapyr is of low toxicity to fish and invertebrates. The LC50s for rainbow trout, bluegill sunfish, channel catfish, and the water flea (*Daphnia magna)* are all >100 mg/L (WSSA 1994). As of September 2003, imazapyr (tradename Habitat®) is registered for use in aquatic areas, including brackish and coastal waters, to control emerged, floating, and riparian/wetland species. A recent study from a tidal estuary in Washington showed that imazapyr, even when supplied at concentrations up to 1600 mg/L, did not affect the osmoregulatory capacity of Chinook salmon smolts (Patten 2003). Similarly, the Washington State Department of Agriculture reported that the 96-hour LC50 for rainbow trout fry to be 77,716 mg/L (ppm) -22,305 ppm of the active ingredient- which represents a greater concentration of imazapyr than found in commercially-sold containers (J. Vollmer, pers. comm.).

Imazapyr is of relatively low toxicity to birds and mammals. The LD50 for rats is > 5,000 mg/kg, and for bobwhite quail and mallard ducks is >2,150 mg/kg (WSSA 1994). American Cyanamid reports that studies with rats indicate that imazapyr was excreted rapidly in the urine and feces with no residues accumulating in the liver, kidney, muscle, fat, or blood (Miller et al. 1991). Imazapyr has not been found to cause mutations or birth defects in animals, and is classified by the U.S. EPA as a Group E compound, indicating that imazapyr shows no evidence of carcinogenicity.

Picloram is a selective herbicide designed to specifically target broadleaf plants. Picloram is "slightly to practically nontoxic" to birds and mammals. Since the project areas that this herbicide will be used are well away from surface and ground water, it is unlikely that wildlife will be affected by its application.

Application of Reclaim (Chlopyralid) is not expected to have toxic effects on aquatic species in nearby water facilities given the low application rate over rangelands. When used at typical application rates, small mammals have a low risk of toxic effects due to direct spray contact and a medium risk of toxic effects due to consumption of contaminated insects and vegetation. Large mammals would have a low risk of toxic effects due to consumption of contaminated grass (USDI BLM 2007). An application rate of 1 lb/ac was used as the typical application rate.

Application of Remedy (Butoxyethyl Ester of Triclopyr) would have low potential for toxic effects to aquatic invertebrates at a typical application rate (1 lb/ac). There could be a medium risk of toxic effects due to accidental over-flight of a surface water containing aquatic invertebrates. There would be a low risk of toxic effect to small mammals due to direct spray and consumption of contaminated insects; insect pollinators due to direct spray; large mammals due to consumption of contaminated grass; large birds due to consumption of contaminated grass; and small birds due to consumption of contaminated insects.

The proposed action is to use ¼ lb/ac active ingredient of each herbicide (Reclaim and Remedy). Because the application rate is less then what was analyzed in the EIS, it may be expected that potential for wildlife impacts would be the same or less. However, the most recent EIS (USDI BLM 2007) suggests that tank mixes of two or

more chemicals may have a modified toxic effect, ranging from less to increased effect. We have no information indicating the combined effects of the 2 herbicides proposed for use in this project.

More information on the herbicides above can be found at http://tncweeds.ucdavis.edu/handbook.html .

In addition to the herbicides themselves, 2 other chemicals would be added to the tank mix. These are Mist-Trol 336, which is used to minimize chemical spray drift by increasing droplet size, and Surf Plus 584, which is a modified soy oil used to increase the coverage and absorption of the herbicide on leaf surfaces (a surfactant).

Mist-Trol, which is a polyvinyl polymer, would be included as 0.03% of the spray solution. The material safety data sheet indicates that the chemical is an eye irritant, and a moderate skin irritant. It is not expected to be harmful due to inhalation or oral consumption (Townsend Chemical Div 1997). We believe it unlikely that Mist-Trol as 0.03% of the mix would create a noticeable impact on fish and wildlife due to the dilute nature of the application.

Surf-Plus is modified soybean oil. The manufacturer (Townsend Chemical Div 1998) indicates that the effects of over exposure to Surf-Plus may include eye irritation; skin irritation with prolonged contact; irritation to the respiratory tract if inhaled; and nausea, vomiting, diarrhea, and abdominal discomfort if ingested. When applied as a dilute spray, comprising approximately 16% Surf-Plus, over a large area, we believe it unlikely that there would be serious toxic effects. However, because the product is essentially an oil, there may be a small chance that contact with nesting bird eggs in sufficient quantities could cause egg failure. The degree of this impact is unknown, and depends on whether the eggs are exposed to the spray or covered by an incubating parent at the time of application. The density of grassland nesting birds in the area is expected to be low due to relatively "sparse" grass cover. The density of desert scrub birds is also expected to be low, due to "sparse" shrub cover. Impacts to nesting birds would also be lessened because of the mosaic nature of mesquite treatments. Smaller areas of mesquite would be treated, and adjacent mesquite dune areas would not be treated because they are not suitable for grassland conversion. The herbicide adjuvants would decompose and be inactive by the following spring. Any effects to birds would be for a single breeding season.

The application of prescribed fire would have immediate impacts in the form of displacement of many terrestrial species during the actual firing operations. If not conducted during a time period that considers migration, breeding and nesting, and fawning, prescribed fire could decrease the use of the area by wildlife. The impacts would still be short-term as there is similar adjacent habitat available. Wildlife would be temporarily displaced from the area during the burning and for a short time afterwards. Larger mammals such as coyotes and mule deer typically leave the treatment area before burning starts because of the increase in human presence on the burn days. Direct kills of smaller mammals because of the proposed action would be low, although some could suffocate as a result of the smoke and heat. It may be possible that small mammal populations could decrease temporarily because of the loss of cover in would make them more susceptible to predation. The small mammal populations should recover to or above pre-treatment levels as the vegetation recovers.

Birds would be less directly affected by the proposed action, as they are more mobile. A burn that results in a mosaic of burned and unburned areas would benefit the greatest number of bird species by providing increased plant diversity and edge effect. Prescribed fire can ultimately benefit most ground nesting birds by increasing cover for ground nests which reduces nest predation. The proposed action could improve forage habitat by removing litter, which improves forage areas, and by increasing the composition of forbs, which would increase the quantity and quality of the forage. A negative impact would occur if the timing of the proposed action

coincidences with nesting activities. There is the potential that nests would be destroyed during the proposed action; however, the adult birds should be able to escape and re-nest in unburned areas.

Mechanical Treatment Alternative - The use of machinery to grub-out shrubs would eliminate the potential of any impacts of chemical use on wildlife species. The time of use for machinery would have to be when the nesting period is over to avoid disturbance and potential direct impacts to wildlife species. The removal of shrubs by this method could also remove nest structures, cover, and forage provided by grasses and forbs. This method would be very costly and would require very many years to treat the entire area.

No Action Alternative – Under the no action alternative, all resources would remain the same. The current situation would continue and no projects would be implemented to improve the conditions of the resource. No benefits would be achieved under the No Action Alternative.

Special Status Species:

The Las Cruces District special status species list was reviewed for species potentially occurring in the project area. A total of 18 special status plant and animal species potentially occur. These species are listed in **Table 4**. Habitat is described in the Vegetation and Wildlife sections above.

Special Status animal species lists for Sierra and Dona County were compiled from (www.wildlife.state.nm.us/conservation/threatened_endangered_species/index.htm and www.fws.gov/ifw2es/NewMexico/SBC_view.cfm?spcnty=Sierra). Detailed descriptions for these special status wildlife species are available from the Bureau of Land Management, Las Cruces District Office and can be quarried from the websites listed above. Known geographic distribution and habitat requirements were considered for each species in comparison with habitat types in the project area. The results of this analysis are that of 47 species listed by the FWS as having special status[1] in Sierra County, 18 species (Table 4) are considered to have potential habitat within the project area.

TABLE 4: Special Status Wildlife Potentially Occurring or Having Habitat Present within the Project Area

Common Name	Scientific Name	Status	Comments
Texsas Horned Lizard	*Phrynosoma cornutum*	BLM Sensitive	Occurs in most lowland desert and sparse grassland habitats
Varied Bunting	*Passerina versicolor versicolor*	NM Threatened	Prefers dense stands of mesquite and associated growth in arid canyon bottoms

[1] Special Status Species are Federally Endangered, Threatened, Proposed, Candidate, Critical Habitat Designated, Species of Concern, New Mexico Endangered, New Mexico Threatened, and BLM Sensitive.

Bald Eagle	*Haliaeetus leucocephalus alascanus*	Federal Threatened NM Threatened	This species utilizes areas with large bodies of water. Nesting occurs in high cliffs, pinnacles, or trees usually 300 feet in height with water in near proximity (within 600 feet).
Aplomado Falcon	*Falco femoralis septentrionalis*	Non-Essential Experimental Population (Federal Proposed) NM Endangered	Closely tied to late seral yucca grasslands.
Peregrine Faclon	*Falco peregrinus anatum*	NM Threatened	Nests in cliff areas usually in areas of high, topographic diversity, near water.
Ferruginous Hawk	*Buteo regalis*	BLM Sensitive	Winters in most areas of the LCDO, but does not breed this far south. Related closely to prairie dog towns.
Common Ground Dove	*Columbina passerina pallescens*	NM Endangered	Typically found in agricultural and undeveloped areas. These include open stands of creosotebush and large succulents.
Burrowing Owl	*Athene cunicularia hypugaea*	BLM Sensitive Federal Species of Concern	Occurs in many habitats. Is a close associate, but not obligate, to prairie dogs.
Mountain Plover	*Charadrius montanus*	Federal Species of Concern	Tend to utilize short grass areas with scattered clumps of tall grasses, cow manure, rocks, and a variety of cacti and shrubs. They nest almost exclusively in short grass prairie often in association with prairie dogs.
Southwestern Willow Flycatcher	*Empidonax traillii wxtimus*	Federal Endangered	Breeds in relatively dense riparian tree and shrub communities associated with rivers, swamps, and other wetlands, including lakes (e.g., reservoirs).
Loggerhead Shrike	*Lanius ludovicianus excubitorides*	BLM Sensitive	Occurs in most upland habitats. Prefers areas with some scrub for nesting.
Baird's Sparrow	*Ammodramus bairdii*	BLM Sensitive Federal Species of Concern NM Threatened	Grassland specialist, winters in the area.
Gray Vireo	*Vireo vicinior*	NM Threatened	Most often found in arid piñon/juniper woodlands on foothills and mesas, these most often associated with oaks and usually in habitat with a well-developed grass component
Townsend's Pale Big-eared Bat	*Corynorhinus townsendii pallescens*	BLM Sensitive Federal Species of Concern	Occurs widely throughout the LCDO in all habitats.
Fringed Myotis Bat	*Myotis thysanodes thysanodes*	BLM Sensitive	Occurs in mid-elevation habitats included desert scrub, grasslands, and oak/pj. Occurs in most areas of the LCDO.

W. Small-footed Myotis Bat	*Myotis ciliolabrum melanorhinus*	BLM Sensitive	Occurs in most habitats of the LCDO, but elevation distribution centers in the Ponderosa zone.
Desert Bighorn Sheep	*Ovis canadensis mexicana (endangered pops)*	NM Endangered	The bighorn occurs in arid, rocky mountains, mainly in open habitats
Chiricahua leopard frog	*Rana chiricahuensis*	Federal Threatened	The Chiricahua leopard frog is an inhabitant of montane and river valley cienegas, springs, pools, cattle tanks, lakes, reservoirs, streams, and rivers.

Presence of special status plant species and their habitats in Sierra County was considered using LCDO species occurrence/habitat records and New Mexico Natural Heritage species records. Species descriptions and distributions were derived from LCDO office records and New Mexico Rare Plant Technical Council [NMRPTC. 1999. New Mexico Rare Plants. Albuquerque, NM: New Mexico Rare Plants Home Page. http://nmrareplants.unm.edu (Latest update: 18 January 2006)]. Based on evaluation of the above information, 20 species potentially occur in Sierra County, and of the 20 species listed, only six (Table 5) potentially occur or have habitat present in the project area being analyzed in this Environmental Assessment.

TABLE 5: Special Status Plants Potentially Occurring or Having Habitat Present within the Project Area

Species	Scientific Name	Status	Comments
Arizona Coral-root	*Hexalectris spicata var. arizonica*	BLM Sensitive	Fairly rare, saprophytic orchid species that grows in the duff of oak, pine, or juniper trees, on limestone in south central and southwest New Mexico. Occurrence on public land within the proposed action area is unknown, but potential.
New Mexico Rock Daisy	*Perityle staurophylla*	BLM Sensitive	Found in crevices of limestone cliffs and boulders. Usually on protected north and east exposures; (4,900-7,000 ft).
Plank's catchfly	*Silene plankii*	BLM Sensitive	In igneous cliffs and rocky outcrops; 1,500-2,800 m (5,000-9,200 ft). Restricted to mountains near the Rio Grande.
Duncan pincushion cactus	*Escobesseya duncanii*	BLM Sensitive	Found in cracks of limestone and limy shale in broken terrain in Chihuahuan desert scrub; 1,550 m (5,100 ft) in New Mexico.

Sandberg pincushion cactus	*Escobaria sandbergii*	BLM Sensitive	In rocky, igneous and limestone soils in Chihuahuan desert scrub and open oak and piñon/juniper woodland in mountainous terrain; 1,300-2,250 m (4,200-7,400 ft). In Doña Ana and Sierra counties on San Andres Mountains and Fra Cristobal Range.
Wright's marsh thistle	*Cirsium wrightii*	NM Endangered	Found in wet, alkaline soils in spring seeps and marshy edges of streams and ponds; 1,130-2,600 m (3,450-8,500 ft). An old specimen collected at Lake Valley in southern Sierra County is stored at the U.S. National Herbarium. Suitable spring seeps no longer occur there and this population is likely extirpated from county.

Environmental Consequences:

Proposed Action – The proposed action includes surveying individual proposal sites prior to treatment to determine if SSS plants may be present and design treatments to eliminate or avoid impacts to the extent direct, indirect and cumulative impacts are consistent with Bureau policy. Use of buffers, slope restrictions and application to avoid high/heavy rainfall events around SSS plants would minimize or eliminate the potential for negative impacts. For federally listed or proposed species, LCDO would consult or confer with the Fish and Wildlife Service as required under section 7 of the Endangered Species Act where a proposal may affect species. Proposed treatments would not proceed until completion of consultation or conference and implementation of any subsequent terms and conditions. For candidate and BLM sensitive species (includes FWS species of concern) LCDO would employ measures to ensure treatments would not contribute to the need for the species to be listed. For State listed plant species, LCDO would ensure that any treatment would further conservation of the species. By ensuring each project proposal is consistent with BLM policy; impacts from herbicide application would not jeopardize species or contribute to the need for listing, and would conserve SSS plants. The projects areas proposed for 2008 have been surveyed and no SSS plants occur.

Effects of the proposed treatments on special status species are the same as for wildlife and vegetation described above. There is low potential for toxic effects to terrestrial wildlife. There is greater potential for effects to aquatic associated wildlife such as the bat species and the chiricahua leopard frog, which may use the dirt tanks located in the treatment areas. However, the effects are expected to be minimal because dirt tanks are buffered and not treated, thus eliminating any potential impacts. There would be no effects to the chiricahua leopard frog because dirt tanks are buffered and not treated. No mortality is expected.

The bald eagle utilizes areas with large bodies of water. The potential for bald eagles to occur on the proposed action area locations exists, because of the proximity of Caballo and Elephant Butte Lakes, although they would occur as winter migrants only. Nesting occurs in high cliffs, pinnacles, or trees usually 300 feet in height with water in near proximity (within 600 feet). The proposed action areas that would be chemically treated are not in close proximity to large bodies of water, so there would be no impacts to the bald eagle from the chemical treatments. Prescribed burns would be conducted in the higher mountain areas, where the bald eagle may occur,

however, there are no nesting bald eagles in the area and mainly migrates through. The proposed action would not affect the bald eagle.

The proposed treatment area is west approximately 15 miles of an Aplomado release site in the Armendaris Ranch, where 11 Aplomado Falcons were released in 2006, and more released in 2007 and 2008, after they were designated as a non-essential experimental population. There is potential for the Aplomado Falcon to fly west to the treatment site location. The proposed treatment areas are currently rated as poor and not providing the habitat qualities required for Aplomado falcons. Therefore, effects of the herbicide treatments to the falcon would be limited to habitat modification. With the mesquite treatment, we expect a reduction in the density of mesquite, with a subsequent increase in herbaceous (grass and forb) cover. With the tebuthiuron treatment, we expect a reduction in creosotebush habitat, and maintenance or a slight increase in creosotebush/grassland edge due to the creosotebush control. Aplomados prefer to nest in grassland habitats, but often hunt on the grassland shrub edges where birds may be preyed upon as they venture from the shrub community into the open grassland. In addition, edges have a greater diversity of species and potentially more abundant prey populations. The overall objective of the project is to improve the quality of existing grasslands and restore previous grassland habitats now dominated by creosotebush to a grassland aspect. This would have a beneficial effect on Aplomado habitat.

Direct impacts to the falcon during nesting season due to aircraft operations would be avoided by conducting protocol Aplomado surveys prior to treatment to ensure that no falcons are in the area. BLM would coordinate any detection with the U.S. Fish and Wildlife Service prior to beginning the treatment. The creosotebush (tebuthiuron) control would be conducted during October or November and would have no affect on nesting activities. Overflights by the aircraft during tebuthiuron application could disturb any falcons potentially using the area for a few days, as long as it would take to aerially spray the proposed areas. This level of disturbance is not expected to result in mortality or otherwise cause take of the birds. The mesquite treatments would occur in May or June, and would have a greater chance of potential disturbance to the Aplomado. Clutches of two to four eggs are laid between January through July, with most clutches initiated in April and May. The survey protocol would be implemented to avoid impacts.

The potential for aplomados to be currently using the area, for either foraging or nesting, is low to non-existent due to the ecological condition of the proposed areas. They are in a shrub dominated state and currently not Aplomado falcon habitat.

On July 26, 2006, Aplomado Falcons were designated a nonessential experimental population under section 10(j) of the Endangered Species Act. Species with this designation are considered a “proposed” species for purposes of compliance with Section 7 of the Endangered Speices Act of 1973 (16 U.S.C. 1531 *et seq.*), as amended. Based on this analysis, the proposed action May Affect, but is Not Likely to Adversely Affect the Aplomado Falcon. Treatment of low potential habitat to improve grassland habitat values is expected to be a beneficial affect to the falcon. Consultation or conference with FWS under Section 7 of ESA is not required.

The southwestern willow flycatcher breeds in relatively dense riparian tree and shrub communities associated with rivers, swamps, and other wetlands, including lakes (e.g., reservoirs). Most of these habitats are classified as forested wetlands or scrub-shrub wetlands. Habitat requirements for wintering are not well known, but include brushy savanna edges, second growth, shrubby clearings and pastures, and woodlands near water. The southwestern willow flycatcher has experienced extensive loss and modification of breeding habitat, along with

the establishment of invasive non-native plants (salt cedar), has lead to the consequent reductions in population levels. No treatments would be conducted in flycatcher habitat, so there would be no impact to flycatcher.

Native vegetation would be buffered out and avoided with aerial application of Imazapyr. Treatment of areas currently dominated with saltcedar would allow native vegetation the ability to re-establish. The use of machinery to remove standing dead trees (root balls) may have some impact to native grasses, forbs, and shrubs if present. The major disturbance would be from tires or tracks of heavy equipment. Some degree of rehabilitation may need to occur post mechanical treatment to ensure saltcedar does not re-establish, native plant re-establishment, and erosion prevention/control. Re-treatments with Imazapyr may need to take place post initial treatment to kill re-sprouts if mechanical removal of root balls does not occur.

The proposed salt cedar treatments would have No Affect on the flycatcher because no treatments would be conducted within flycatcher habitat.

The Caballo Mountain range has habitat that is suitable for desert bighorn. Sheep have migrated from the introduced Armendaris Ranch herd, located on the east side of the Fra Cristobal Mountains. They have travelled south to the Caballo Mountains and to the smaller Red House mountains on the southern portions of the proposed action area. There is potential that sheep could move to the west side of the Caballo and Fra Cristobal Mountains and migrate to other ranges. Lion predation of bighorn ewes and lambs is thought to be a limiting factor in the recruitment of bighorn sheep herds. Susceptibility to predation is tied in a large part, to habitat suitability. Desert bighorn require open, grassy feeding areas with good visibility, close to cliff and bluff features. Woody species reduce visibility and increase the potential for predation. Chemical treatments would not affect the sheep, as they are located on higher elevations that are not suitable for aerial chemical treatments, but are suitable for prescribed burning. Fire is generally considered important in maintaining desert bighorn habitat. Periodic fire prevents shrubs and trees dominating climax grassland areas. Human activity associated with the proposed action would be of low magnitude and duration, because of the lack of access to the area, and is not expected to affect any desert bighorn sheep that have migrated to the area. Prior to any prescribed burn being proposed in the area, a burn plan would be written and mitigation measures, like conducting the burn outside the lamb period, would be implemented to avoid impacts to the sheep.

The Arizona Coral-root, New Mexico Rock Daisy, Planks Catchfly, Duncan Pin Cushion, and the Sandberg Pin Cushion would not be directly affected by the chemical treatments because of the location of their habitat. All are located along slopes and crevices of mountain ranges, in habitat types that would not be chemically treated. They would be more susceptible to prescribed burning; however they are located in steeper slopes within crevices that would not carry a fire, so impacts are not anticipated. These species would not be affected by the proposed action.

The Wright's marsh thistle is found in wet, alkaline soils in spring seeps and marshy edges of streams and ponds; 1,130-2,600 m (3,450-8,500 ft). An old specimen collected at Lake Valley in southern Sierra County is stored at the U.S. National Herbarium. Suitable spring seeps no longer occur there and this population is likely extirpated from county. The chemical treatments or prescribed burning would not affect the marsh thistle because it likely the species does not occur in the county anymore.

<u>Mechanical Treatment Alternative</u> - The use of machinery to grub-out shrubs would eliminate the potential of any impacts of chemical use on special status species. The time of use for machinery would have to be when the nesting or lambing period is over to avoid disturbance and potential direct impacts to wildlife species. The

removal of shrubs and some plant species by this method could also remove nest structures, cover, and forage provided by grasses and forbs. This method would be very costly and would require very many years to treat the entire area.

No Action Alternative – Under the no action alternative, all resources would remain the same. The current situation would continue and no projects would be implemented to improve the conditions of the resource. No benefits would be achieved under the No Action Alternative.

Visual Resources:

The proposed project area contains Class 2 - Retain the character of the landscape. The level of change to the character of the landscape should be low. Management activities may be seen, but should not attact the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.Visual Resource Management Area (VRM) Classes, it is classified as Class II, Class III and Class IV. Class II areas must retain the character of the landscape. The level of change to the character of the landscape should be low. Management activities may be seen, but should not attact the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape. Class III areas allow that 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 in the existing landscape. The treatment sites along the highway rights-of-way are categorized as Visual Class III. The description of the Class IV is to provide for management activities which require major modification of the existing landscape. The level of change to the characteristic landscape can be high. These management activities can dominate the landscape and be the major focus of viewer attention; however, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements. The areas would be visible to the public.

Environmental Consequences:

Proposed Action - There would be a change in the color and texture of the treatment areas. The change would move from a brush dominated area to an area with more perennial grasses. The casual observer may recognize this, but it would appear as natural.

Prescribed Burn – Burns would be carefully planned to avoid the potential need to bring heavy machinery into Class II areas. Directly following the burn, the blackened area would show obvious, temporary changes. Over time, the area would green up, and regrowth would occur. Burning would greatly decrease the amount of visible dead shrubs, and would hasten the decomposition of any standing, burned vegetation.

Mechanical Treatment Alternative - The use of machinery to grub-out shrubs would create a lot more disturbance to the soils and “loosened” throughout the treatment area. The removal of shrubs by this method would also remove some of the grasses and forbs, thus resulting in an increase in bare ground percentage (and bare patch size), adding to the amount of bare areas that would be visually unpleasant. This would continue until sufficient ground cover became reestablished.

No Action Alternative – Under the no action alternative, all resources would remain the same. The current situation would continue and no projects would be implemented to improve the conditions of the resource. There would be no impacts to visual resources under the No Action Alternative.

Recreation:

The proposed action area is in close proximity to Las Cruces and T or C, and, as a result, has the potential of being frequented by hunters, campers, hikers, photographers, bird watchers, and a variety of other recreationists. ATV recreationists do utilize the area even though the area is limited to vehicle travel on existing roads and trails.

Environmental Consequences:

Proposed Action - After treatment of creosotebush, mesquite, and overgrown deer habitat in the higher mountain areas, the increase of forb, browse, and grass species would most likely lead to an increase in use of the treated areas by wildlife species such as pronghorn, mule deer, quail, and dove. This 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. The primary recreational activity occurring in the project area is hunting and wildlife viewing. Mule deer and game birds such as quail and dove are taken during hunting seasons set by New Mexico Department of Game and Fish. A secondary activity occurring in the area is observing nature or watching wildlife. Hiking and driving (vehicle and ATV) for pleasure would not be affected by the proposed action. Recreation activities would not be adversely affected by the proposed action.

Mechanical Treatment Alternative - The use of machinery to grub-out shrubs would have the same out come as the proposed action, however, the full benefit would take longer and be more expensive. There would be a decrease in hunting potential when equipment is within the area as well as after heavy grubbing of plants occurs. This should be a temporary affect and would not be long lasting. There would be a potential of increased hunting activities due to the restored grasslands.

No Action Alternative – Under the no action alternative, all resources would remain the same. The current situation would continue and no projects would be implemented to improve the conditions of the resource. No benefits would be achieved under the No Action Alternative.

Wetlands/Riparian Zones:

Wetlands and riparian areas do exist within the proposed treatment area. There are numerous riparian areas along the many drainages and tributaries to the Rio Grande River and wetlands in the river floodplain. These areas are heavily infested and in some cases, dominated by saltcedar, Russian olive, and perennial pepperweed. However, these areas do contain native riparian plant species, including: cottonwoods, willows, sedges, rushes, walnut, and sycamores. The majority of these lands are controlled by other agencies such as the Bureau of Reclamation and the International Boundary and Water Commission, as well as private land owners.

Environmental Consequences:

Proposed Action - Riparian areas and wetlands would be targeted for mainly saltcedar treatment using the aquatic label Habitat herbicide. Native woody vegetation would not be treated. Preferably, treatment of satellite populations would start at the upper, higher elevations, of the tributaries and drainages and move towards the Rio Grande where the large populations occur. Post treatment rehabilitation of riparian areas would be determined on a case by case basis. Rehabilitation practices would include, but would not be limited to; pole plantings of willows and cottonwoods, seeding, and bank stabilization practices. Treatment of saltcedar and rehabilitation of riparian areas and wetlands would help transition areas to a healthier condition in order to achieve a proper functioning condition. Some degree of machinery use would aid in some rehabilitation practices, such as, using a tractor with an auger to drill holes for pole plantings within the floodplain. Small machinery, such as reciprocating drills, would be used to plant smaller willow cuttings and would not create the same disturbance as a tractor.

Mechanical Treatment Alternative - The use of machinery to grub-out, cut, or masticate saltcedar would have the same out come as the proposed action, however, the full benefit would take longer, be more ground disturbing, and more expensive.

No Action Alternative – Under the no action alternative, riparian areas and wetlands would remain the same. The current situation would continue and no saltcedar would be removed to improve the functioning condition of the resource. No benefits would be achieved under the No Action Alternative, only further degradation would occur. Native riparian plant species would continue to be out competed for water and nutrients by the saltcedar, to a state in transition that is not capable of returning to a climax condition.

Livestock Grazing:

Cattle would be removed from the pastures within the proposed treatments during the growing season (June 1 through October 31) for a minimum of three consecutive years (starting the treatment year) and up to five years, depending upon growing conditions and the flexibility in the permittees grazing schedule, in order for herbaceous plant species to re-establish within the treated area. There would be no increase to permitted livestock numbers as a result the improvement to grassland habitats.

Environmental Consequences:

Proposed Action - Livestock grazing would be affected by changes in forage supply. The vegetative treatments are intended to suppress shrub species that are unpalatable and allow a more desirable mix of vegetation to be produced. Livestock would be affected in a positive manner by changes in forage supply and quality.

Livestock would be removed from the pastures during treatments and allowed to graze the pasture in the non-growing season. Livestock numbers would not be increased within the treatment areas to preserve the effectiveness of the project. Changes in grazing management would be consistent with the guidelines for livestock grazing management and could include adjustments in permitted use levels, season of use, kind of livestock, allowable use levels, and /or stocking rates. Forage increases as a result of grassland restoration treatments would first be reserved to meet the needs for watershed function. Forage in excess of those needs would be allocated to wildlife and livestock, with wildlife receiving priority over livestock. A maximum of 40 percent use of key forage species would be allowed during those years of growing season deferment following

treatment. Untreated pastures could receive more use during the growing season due to the deferment of the treated pastures.

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 treated pasture. Based on the risk analysis in Appendix E-8 of the 1991 Vegetation Treatment FEIS, the estimated doses for livestock would be well below the EPA risk criterion of 1/5 LD50 for all of the program herbicides. Therefore, the risk of direct toxic effect to these animals is negligible, even assuming exposure immediately after treatment. Using herbicides is the most efficient and effective way to control some competing vegetation and noxious weeds. However, some aerially applied herbicides also may eliminate some shrubs and trees that livestock need for shelter. Following chemical application and prescribed burning, the treated areas would be rested from livestock grazing to allow the forage species time to produce leaves, stems and leaders which would build up root reserves. Vegetative impacts could occur as a result of livestock grazing during the growing season in alternative grazing areas for the deferment period.

Mechanical Treatment Alternative - The use of machinery to grub-out shrubs would eliminate the potential impacts from herbicides of the Proposed Action. Due to longer periods, which are required for mechanical treatments, alternate locations may be needed for the displaced livestock. Impacts to livestock grazing management (rest until the treated area recovers) would be the same as the Proposed Action.

No Action Alternative – Under the no action alternative, all resources would remain the same. The current situation would continue and no projects would be implemented to improve the conditions of the resource. No benefits would be achieved under the No Action Alternative.

Lands, Realty and Rights-of-Way:

Interstate 25 (I-25), several state highways, county roads, gas pipelines, and several power lines run through the proposed treatment area. These rights-of-ways would not be adversely affected by the proposed action. Each right of way leaseholder would be contacted prior to any treatments being implemented.

CUMULATIVE IMPACTS

A cumulative impact is defined in 40 CFR 1508.7 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."

The analysis of cumulative impacts focuses on the geographical area defined as the set of BLM-administered grazing allotments within the ECE Landscape Restoration Project area, as illustrated on the attached map. 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 invasive shrub and tree species (i.e. mesquite, creosotebush, Christmas cactus, tarbush,

piñon/juniper, saltcedar etc...) within the landscape area using a combination of methods to reach the goals and objectives for the restoration of the native grassland and riparian/wetland communities. Environmental considerations are presented to mitigate impacts and include standard operating procedures for vegetation treatments, as well as specific design features that would be developed on a case-by-case basis for individual treatments, environmental conditions and resource concerns. The health, viability and sustainability of resources within the project area have been impacted by land use activities that have occurred over the last 150 years.

The Bureau of Land Management is still addressing impacts from open-range livestock grazing from the last century. The impacts of past practices coupled with climatic conditions such as long-term drought periods has encouraged the encroachment of brush species such as creosote, mesquite, broom snakeweed, yucca and cactus species, saltcedar and other non-native plant species (noxious weeds) that increase when rangeland conditions deteriorate. The suppression of range fires has also contributed to the increase in brushy species and deterioration of rangeland health. On its own, these areas cannot revert back to the once pristine grassland prairie and riparian/wetland ecosystems of the past, and prior to man's activities, without resource management actions to help the watershed by improving soil and vegetation resources.

Other major resource uses that have been occurring within the project area, and expected to continue, include: mining, land exchanges, and urban sprawl which would result in potential displacement of wildlife onto adjacent public lands. The proposed vegetative treatments would serve to enhance grassland habitats to provide improved habitat quality for the displaced wildlife. These legitimate activities under BLM's multiple use mandate are nevertheless cumulative impacts to grassland ecosystems as well.

Livestock grazing is expected to continue in the project area but allocation of forage resources above current uses would not occur. As markets for beef production fluctuates, so does actual livestock use on federal land. As drought conditions and effects are seen on the landscape, this natural event also affects livestock grazing on public lands. Livestock numbers are expected to fluctuate following market conditions and rangeland health, with a decrease in stocking rate following a decline beef prices in the market and/or in rangeland vegetation production from lack of precipitation. In the long term, the treatment would occur in stages spanning several years to allow for project planning and optimum treatment prescriptions. This "staggering" of site-specific projects reduces the amount of direct impacts to resources and buffers the cumulative impacts of repeated actions over the landscape. Individual treatments could range from 500 acres up to 20,000 acres or more in size, with numerous projects cumulatively adding up to potentially 50,000 or more acres being treated per year. The possibly of a larger number of acres could be treated utilizing prescribed fire activities. The size and number of treatments would be, in part, determined by funding, deferment capabilities, weather, and the ability to efficiently implement control over the project area. The degree of cumulative impacts would increase as the size of the individual treatments increase.

All authorized activities that occur on federal land can also take place on private and state lands. It is expected that additional land treatments would occur on other private and state lands through either private funding or through programs administered by the National Resource Conservation Service (NRCS). The amount of specific treatments that may be proposed on other lands within the project area is not known. The very nature of the proposed action is to improve the watershed by limiting and reducing impacts. Direct and indirect impacts of the proposed action to resources are adequately addressed above.

Improving the grassland community within the project area has the effect of sustaining the viability and health of the watershed in the long term, and countering other ongoing and foreseeable impacts generated by activities such as rights-of-ways, which tend to fragment habitat.

Overall, the cumulative impacts associated with the proposed action are not expected to be an additive negative impact to the environment but rather a beneficial additive impact to various resources over the entire landscape, given the mitigation, standard operating procedures and case-by-case project design and implementation. As mentioned, the degree of cumulative impacts may vary based on the size and type of individual treatments. In general, long term watershed health would benefit the grassland and riparian/wetland ecosystems and wildlife species dependent on these habitat types. Customs and culture would be sustainable from enhanced rangeland conditions. Other land use impacts would be buffered, or balanced with landscape restoration efforts. Sustaining the projects would require monitoring efforts to detect the need for follow-up treatments, appropriate livestock utilization levels, modification of future projects to reach objectives, and other resource use restrictions as needed to ensure the longevity of the restoration efforts. Undesirable impacts to other resource values from implementation of the ECE Grassland Restoration Projects, with the controls, procedures, and stipulations as outlined in this document, would not be significant.

PERSONS/AGENCIES CONSULTED:

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Ryan Whiteaker, Fuels Management Specialist, BLM Las Cruces
Rich LaCasse, Rangeland Management Specialist, BLM Las Cruces
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Dave Legare, Cultural Resource Specialist, BLM Las Cruces
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Bruce Call, Soils/Water/Air Resource Specialist, BLM Las Cruces
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New Mexico Department of Game and Fish – Pat Mathis, Wildlife Biologist
SW Chapter of Quail Unlimited – John Moen, President
Bureau of Reclamation – Brent Tanzy,
International Boundary and Water Commission – Carlos Peña,

The proposed ECE Landscape Restoration Project was posted on the BLM Las Cruces District web site "Active Project Roster" on _____.

The concept of restoring large landscapes was included in presentations to representatives of the Peregrine Fund, SW Consolidated Sportsmen, Rocky Mountain Elk Foundation, Mule Deer Foundation, Wild Turkey Federation, Quail Unlimited, and the State of New Mexico Office of Natural Resources Trustee on.

The concept of restoring large landscapes was also discussed with representatives of the Peregrine Fund and the USGS Biological Research Division, New Mexico Cooperative Fish and Wildlife Research Unit. These

discussions were in conjunction with a presentation and update of BLM Las Cruces habitat assessments in the ECE Landscape Restoration Project area. These monitoring efforts were designed to validate the Aplomado Falcon Habitat Suitability Model developed by the Cooperative Fish and Wildlife Research Unit in 2002. Falcons were designated a non-essential experimental population on 7/26/06 under section 10(j) of the Endangered Species Act. Falcons were released onto adjacent private land habitats owned by the Armendaris Ranch in cooperation with the Peregrine Fund and the US Fish and Wildlife Service in August, 2006. The proposed grassland restoration project was discussed in the context of habitat restoration and the potential benefits to aplomado falcons.

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FINDING OF NO SIGNIFICANT IMPACT
(NM-030-2008-0048)

FINDING OF NO SIGNIFICANT IMPACT

Based on the analysis of the potential impacts of the proposed action as described in the EA and after careful consideration of public comment, I do not anticipate any significant impacts on the quality of the human environment. I base my finding of no significant impacts on the factors related to context and intensity of impacts as defined by the Council on Environmental Quality (CEQ) at 40 CFR parts 1500-1508. I conclude that an environmental impact statement is not required.

RATIONALE FOR DECISION

Approval of the proposed action is the most environmentally acceptable method of stimulating regeneration of desired plant communities and reducing invasive brush encroachment in the proposed project area. Watershed function, soil stabilization, wildlife habitat, and rangeland health will be improved.

The proposed action is in conformance with the White Sands Management Plan and the Mimbres Resource Management Plan and the Fire and Fuels Management Plan Amendment for Public Lands in New Mexico and Texas.

If you wish to protest this decision in accordance with 43 CFR 4160.2, you are allowed 15 days from receipt of this notice within which to file a protest with the Assistant District Manager for Renewable Resources, Bureau of Land Management, 1800 Marquess Street, Las Cruces, NM 88005. This protest should specify, clearly and concisely, why you think the proposed action is in error.

If a protest is filed within the time allowed, the protest statement of reasons and other pertinent information will be considered and a final decision will be issued with the right to appeal as per {43 CFR 4160.3 (b) and 4160.4}.

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 30 days within which to file an appeal for the purpose of a hearing before an Administrative Law Judge, and to petition for stay of the decision pending final determination on the appeal {43 CFR 4.21, 4.470 and 4160.3 (c)}. If a petition for stay is not requested and granted, the decision will be put into effect following the 30-day appeal period. The appeal and petition for stay should be filed with the District 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.

_____

Assistant District Manager for Renewable Resources Date