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ENVIRONMENTAL ASSESSMENT

WEST POTRILLO MOUNTAINS
GRASSLAND RESTORATION PROJECT

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1 INTRODUCTION

1.1 RESTORE NEW MEXICO

The West Potrillo Grassland Restoration Project is an undertaking by the Bureau of Land Management (BLM) Las Cruces District Office (LCDO) to implement the Restore New Mexico program in the West Potrillo Mountains in southern Doña Ana County, New Mexico. Restore New Mexico is an aggressive partnership between the BLM, landowners, other agencies, and conservation partners to restore grasslands, woodlands, and riparian areas to a healthy and productive condition. More information about this program can be found on the following website: http://www.blm.gov/nm/st/en/prog/restore_new_mexico.html.

The key goals of the program listed in BLM New Mexico's Restore Newsletter (BLM–NMSO 2007) are:

1) Restore habitat for fish, wildlife and endangered species.
2) Reverse expansion of invasive plant species.
3) Reverse habitat fragmentation from historic oil and gas development and ensure responsible energy development.
4) Improve water quality.
5) Reduce impacts from catastrophic wildfire.

This environmental assessment (EA) is being prepared to evaluate 3 proposed vegetation treatments within the West Potrillo grazing allotment located in southwest Doña Ana and east Luna counties located in southwest New Mexico (Figure 1). The treatments also enter very small parts of the adjacent (Afton, Mt. Riley, and Kilbourne Hole) grazing allotments.

1.2 PURPOSE AND NEED FOR THE PROPOSED ACTION

The purpose of the West Potrillos Grassland Restoration project is to return the vegetative communities plant composition, distribution, and abundance to within the natural range of variability for the ecological sites that occur within the project area as based on the reference condition.

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 by livestock of New Mexico's grasslands has led to invasion of woody shrubs causing a large increase in density and establishment into sites where they did not occur. Vast areas of the landscape function below their potential in terms of habitat provision and watershed stability because of past resource use and extraction. These sites have been altered to a degree that prevents recovery without human intervention.

Once native invasive shrubs reached a high enough density, they tend to increase in density and out-compete other herbaceous vegetation and grasses for soil moisture, nutrients, and sunlight. They are less susceptible to drought than herbaceous species. Lands with high densities of invasive brush typically exhibit accelerated soil erosion rates, decreased water infiltration and decreased biodiversity. New Mexico has experienced degraded water quality due to erosion and an interrupted hydrologic cycle as a result of these vegetative changes.

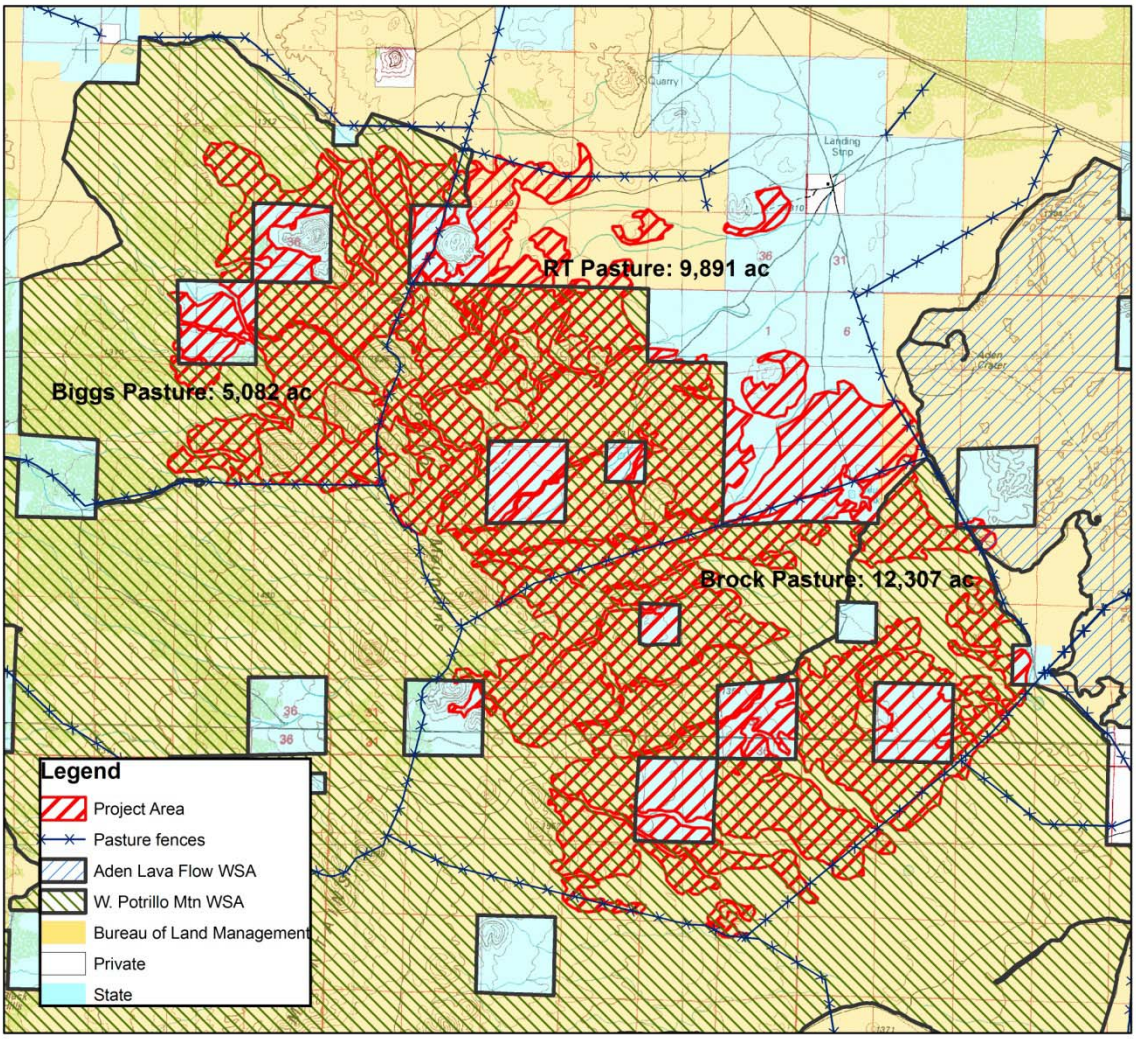

Figure 1 Proposed West Potrillo Mountains Grassland Restoration Treatment Area*

* No Warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data, or for purposes not intended by the BLM. Spatial information may not meet National Map Accuracy Standards. This information is subject to change without notification.

Creosote, mesquite, acacia, whitethorn, tarbush and juniper trees are now dominating landscapes that used to be grasslands to the point vast areas do not provide the same quality of wildlife habitat they did prior to European settlement. With the exception of riparian systems, much of the change is the result of an altered fire regime due to the reduction of grass composition by intensive grazing prior to the retention of public lands and passing of the Taylor Grazing Act of 1934, which is the primary carrier of fire in semi-arid systems. The vegetative community on these areas is far removed from the historic climax community and no longer supports the historic abundance and diversity of flora and fauna.

Chemical treatment of shrubs and subsequent careful livestock management are usually necessary to allow grass cover to begin to play a role in restoring natural ecological processes. Without chemical treatment creosote densities have stayed the same or become greater over the last 31 years in an area just to the south of the proposed treatment area on the adjacent Mt. Riley

grazing allotment. Chemical brush control treatments will serve to enhance desert grasslands in the project area and assist in the conversion of current shrub invaded grassland sites to a more historic ecological condition that will be able to support a more natural fire regime reversing the human caused conditions that make this regime unable to exist. Management actions are needed to restore, protect, and maintain the wilderness characteristics of the WSAs by restoring natural conditions that will allow for factors such as fire to play their natural role in the environment.

Most ecological sites have some restoration potential but ability to recover varies depending primarily on current condition, follow-up livestock management and post treatment precipitation. Of these, livestock management is the only post treatment variable under the BLM's control. This document defines the parameters under which proposed treatments on public and state land would be carried out and managed to ensure success in obtaining the overall goal of improving watershed and habitat conditions in the West Potrillo Mountains project area. Following treatment, management of public land will be an integral component of each phase of the project. Management must be adaptable to account for yearly precipitation fluctuations to reach a site's capability for vegetation recovery.

1.3 CONFORMANCE TO LAND USE PLANNING

This proposed action conforms to the Mimbres Resource Management Plan approved December, 1993 because it is specifically provided for in the following land use decisions:

MRMP 1993, Decision p. 2-31:

> *Grass bottomlands, mixed desert shrub (>10 percent slope), snakeweed, and mountain brush type will be treated using combinations of prescribed burning, prescribed natural fire, and prescribed grazing management. Creosote, mesquite and desert shrub (< 10 percent slope) will be treated almost entirely by the use of chemical herbicides.*

MRMP 1993, Wilderness p. 2-53

> *The objective of the wilderness program is to … manage [wilderness] areas in a manner that will preserve the natural values of those ecosystems.*

1.4 RELATIONSHIP 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.

The proposal 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 proposed action also conforms to the interim management policy (IMP) and guidelines for lands under wilderness review (Handbook 8550-1) dated July 5, 1995 which states (p. 10):

> *Actions that clearly benefit a [wilderness study area's (WSA)] wilderness values through activities that restore, protect, or maintain these values [roadlessness, naturalness, solitude, primitive, and unconfined recreation, size, and supplemental values] are allowable.*
>
> *If the proposed action would result in a positive or beneficial change in the state or condition of the wilderness value(s) as described, assessed, or calculated on the date of approval of the intensive [wilderness] inventory, then the wilderness value would be enhanced by the proposed action.*

2 PROPOSED ACTION AND ALTERNATIVES

2.1 PROPOSED ACTION

The proposed action is to apply the chemical herbicide Tebuthiuron (i.e. Spike 20P™) at a rate of ½ lb pound per acre active ingredient to 27,280 acres of creosote dominated range sites in the vicinity of the West Potrillo Mountains.

Tebuthiuron (i.e. Spike 20P™) would be applied as a small pellet directly onto the soil using a calibrated applicator mounted to 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. Application would be in the fall/early winter to take advantage of typically gentle rainfall in fall and winter. Tebuthiuron would be applied at a rate of 0.5 pound active ingredient (a.i.) to areas that are dominated by creosote bush and tarbush. Application of the pellets would involve setting up a staging area, where the pellets would be loaded into the aircraft. This staging area would most likely be at an airport. The nearest airport is the Las Cruces International Airport.

The proposed chemical treatment technique would be used to achieve changes in the vegetative species assemblages to be more consistent with the ecological reference state of each particular ecological site. Reference states reflect conditions that occurred prior to settlement and land use of the late 1800s.

A comparison of inventory data collected by LCDO in the late 1970's and early 1980's, on the ground observations by BLM resource specialists, and state and transition models available in the Natural Resource Conservation Service's (NRCS) ecological site descriptions (http://www.nm.nrcs.usda.gov/technical/fotg/section-2/ESD.html) indicate approximately 27,280 acres in the project area are shrub invaded and have potential for successful restoration (Table 1). The proposed treatment area is mostly public land with some State lands targeted for treatment.

Table 1 Potentially Treatable Acres in the West Potrillo Mountains

Landownership	BLM	State	Total
Acres	21,297	5,983	27,280

2.1.1 Treatment Parameters

The proposed treatment would be implemented in three phases. Each treatment phase would be located within a different pasture within the West Potrillo allotment to facilitate post treatment livestock management. The pasture to be treated in a particular year would be dependent upon availability of funding and the ability of the livestock operator to successfully manage livestock to accomplish treatment objectives. Table 2 lists the pastures associated with each project phase and the amount of treatable acreage proposed for treatment.

Table 2 Treatable Acres by Pasture

Pasture	Treatable Acres
Brock Pasture	12,307
RT Pasture	9,891
Biggs Pasture	5,082
Total Acres	27,280 acres

2.1.2 Standard Operating Procedures Included in the Proposed Action

1. Areas treated with tebuthiuron would be completely rested from livestock grazing for a minimum of 2 growing seasons (July 1 through October 31) the second and third summers following application. Rest would be incorporated for longer than 2 years if precipitation is inadequate to allow recovery during the first 3 growing seasons. Rest may extend outside the growing season as determined by monitoring to ensure that ground cover (plant basal, leaf litter, etc.) remains on site to protect soil.

2. A maximum of 40% utilization of the current year's growth of key forage species would be allowed in treated pastures during the deferment periods in the years following treatment. This would ensure herbaceous cover remains on site to provide seed source, protect against erosion and add to the litter layer, which is paramount to soil nutrient cycling and repartitioning of nutrients to interspaces between shrubs. Utilization will comply with the levels outlined in the RMP that exists at the time deferment is no longer required.
3. All herbicide treatments would be applied as per the chemical label, State law and BLM's Programmatic Environmental Impact Statement (PEIS) for Vegetation Treatments with Herbicides (USDI 2007a).

4. Monitoring studies would be established on each treatment to assess the degree to which the treatment meets the key goals and objectives for watershed and habitat improvement. Parameters measured to infer success would include, but not be limited to, basal cover and species composition. Studies would establish a baseline, but timing may vary depending on vegetation response to the chemical. Studies would be reread during the last year of scheduled growing season rest and at least 5 years thereafter. Where possible, each transect would be matched with a paired transect outside the treatment. Transects would be permanent and would include photo points. While transects may be read at any time, transects should be read at the about the same time, for example, if baseline is established in January, rereads should occur in January if at all possible. Study design would be consistent across the treatment area to allow a cumulative assessment of the restoration effort through time. Monitoring studies would be initiated to evaluate the success (or adverse affects) of the treatments and determine if more or less post treatment grazing deferment is required. The studies would be used to assure this treatment falls within the expected results as based on treatments in other shrub invaded Chihuahuan desert grasslands in the Las Cruces District. 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 would be monitored. The BLM and USDA-ARS Jornada Experimental Range have collaborated to develop a "BLM Shrub Control Monitoring Study and Spatially-Explicit Monitoring Protocol" which outlines monitoring procedures for the treatments (Appendix 2). These procedures include a focus on highly repeatable measurements of basal, canopy cover, and vertical structure alongside data suitable for assessing demographic trends in grasses and shrubs that may help explain changes in structural parameters. In addition, BLM is cooperating *with researchers from the USDA-ARS Jornada Experimental Range to* implement biodiversity studies to quantify responses by terrestrial plant and animal biodiversity to grassland restoration. If grassland restoration is implemented in the West Potrillos landscape area, it would be included as one of several study site locations selected to evaluate changes in biodiversity to landscape scale grassland restoration practices implemented by the BLM Las Cruces District within the Chihuahuan Desert. Biodiversity monitoring would be designed to measure short and long-term effects of herbicide treatments on distribution, abundance, and viability and diversity multiple taxa including plants, birds, and keystone rodents.

5. All sites would be monitored to ensure noxious species do not become established. Where identified, appropriate control measures would be implemented.

6. Permitted livestock use would not be increased due to increased forage production resulting from implementation of proposed chemical treatments. Improved herbaceous production would be reserved to meet the objectives for enhancement of watershed function and improved wildlife habitat.

7. No herbicide application within 100 meters of areas containing sensitive native trees or shrubs (such as little-leaf sumac, skunkbush sumac, desert willow, hackberry, soapberry, willow, oaks, cottonwood, etc.) or other important wildlife habitat susceptible to the herbicide to be used on the treatment.

8. No herbicide application within 100 meters of any stick nest if the substrate species is susceptible to the herbicide to be used in that treatment (For example, tebuthiuron application could occur within 100 m of a soaptree yucca with a stick nest because tebuthiuron does not kill soaptree yucca. Conversely, a little-leaf sumac with a stick nest would be buffered to ensure it would not be killed.)

9. All range improvement water sources troughs and/or dirt tanks in the vicinity of the treatment area would be buffered a minimum of 100 meters to ensure exclusion from chemical treatment.

10. In order to avoid chemical "drift", application of tebuthiuron pellets would not occur when wind speeds exceed fifteen (15) mph.

11. Application of tebuthiuron pellet herbicide would be conducted in the fall/early winter to coincide with typically gentle rainfall to minimize herbicide movement with runoff.

12. Off-road travel would not be authorized within the boundaries of the WSA. In areas where ATV's or other vehicles are used off road in planning, mapping, or carrying out the project, prior to entering the area they would be high-pressure spray washed to remove any soil or plant parts to ensure that weed seeds are not carried to the treatment area. Off-road travel would occur only on dry soil surfaces to minimize soil compaction and rutting, and would not occur in sensitive areas.

13. Where determined appropriate, prescribed fire would be utilized in future years as a tool to maintain treatments and continue to move sites toward improved ecological conditions, providing enhanced watershed function and wildlife habitat values.

2.2 NO ACTION ALTERNATIVE

Under the no action alternative, vegetation treatments in the West Potrillo Mountains area would not be implemented.

2.3 ALTERNATIVES CONSIDERED BUT NOT ANALYZED

2.3.1 Biological Control Alternative

There currently is no known specific, effective method of biological control for targeted species (i.e. creosote and tarbush). Biological treatments therefore will not be analyzed.

2.3.2 Treatment with Other Chemical Alternative

There are other chemicals that control invasive brush species. BLM rejected the use of these chemicals due to impacts to non-target vegetation and/or increased impacts to soil or water resources, or reduced cost effectiveness. Therefore, the use of these chemicals as a primary control for target species will not be analyzed.

2.3.3 Mechanical Treatment Only Alternative

Mechanical treatments for the control of creosote would be cost effective but would result in unacceptable resource damage. Surface disturbance and off-road travel are not permitted under WSA guidelines. Because most of the proposed vegetation treatment area is located within the West Potrillo or Aden Lava Flow WSAs, mechanical treatment will not be analyzed.

2.3.4 Prescribed Fire Only Alternative

Prescribed fire is the preferred treatment to reduce woody species, but as discussed above, its utility is largely limited in the treatment area by the lack of grass available to carry fire. Because the current ecological conditions within proposed treatment areas are not conducive to successful burning treatments, this alternative will not be analyzed.

3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

Historical and present use of the public land within the proposed treatment area includes livestock grazing, and many types of recreation including hiking, bird-watching, photography, and hunting. Activities associated with homeland security near the international border have increased dramatically in recent years and will continue.

The treatment area is located approximately 9 miles south of Interstate 10 and extends to just north of Mt. Riley and Cox Peak in the northern portion of the East Potrillo Mountains. The treatment is bounded by the Aden Lava Flow on the east and the West Potrillo Mountains and the Luna-Doña Ana County Line on the west. The majority of the proposed treatment area lies within the West Potrillo and Aden Lava Flow WSAs.

3.1 AIR QUALITY

3.1.1 Affected Environment

The air quality of the area of the proposed action is considered generally very good and is designated a Class II air quality area (MRMP p. 2-34). A Class II area allows for moderate amount of degradation of air quality. The primary source of air pollution in the West Potrillo region is pm10 (dust) generated off-site during high wind events, common during the spring months in southern New Mexico.

3.1.2 Environmental Consequences

3.1.2.1 Proposed Action

The staging area would probably receive small amounts of the herbicide dust from loading the pelleted herbicide; 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). The herbicide labels and Standard Operating Procedures would be followed to minimize drift. Federal, State and local air quality regulations would not be violated.
As vegetative communities responded to the treatment, over several years, increased vegetative ground cover would reduce the windborne erosion of soil to below pre-treatment levels.

3.1.2.2 No Action Alternative

There would be no increase in vegetative ground cover and no corresponding reduction in windborne soil erosion under the No Action alternative. Under the no action alternative, over time there is a possibility that there would be an increase in windborne soil.

3.2 SOILS

3.2.1 Affected Environment

The three major soil types in the treatment area are:

- gravelly, calcareous soils on piedmonts and fans around the base of the mountains,
- deep, finer textured soils in the alluvial valleys,
- playas

Detailed descriptions of the soils within the project area are found in the Soil Survey of Doña Ana County, New Mexico (SCS 1980).

3.2.2 Environmental Consequences

3.2.2.1 Proposed Action

Chemical vegetation treatment would not physically alter a soil's properties; however, such treatment could cause indirect effects by impacting soil microorganisms. Depending on the application rate and the soil environment, herbicides can either stimulate or inhibit soil organisms. Some soil microorganisms may be negatively impacted for the short-term duration of the treatment. Under the ½ lb per acre application rate, microbial activity would be expected to resume at present levels once dispersion of the chemical is complete.

After treatment, the soil would gain organic matter initially from the decomposition of plant leaves, stems, roots, and secondarily through increased production of grasses and forbs. The additional organic matter in the soil could support increased populations of microorganisms. Soil microorganisms can metabolize herbicides and often are reported to be responsible for herbicide decompositions (Norris and Moore, 1981). Additional organic matter would improve

the water holding capability and fertility of the soils, allowing for increased vegetative production.

The soil would also be affected by the post-treatment change in abundance and types of vegetation that shield soil from erosion. The decrease in canopy cover post-treatment would result in some short-term increase in surface erosion. That impact would diminish as herbaceous vegetation increases on the treated sites. In the long-term, increased herbaceous ground cover would improve soil stability, decrease erosion and increase water infiltration.

3.2.2.2 No Action Alternative

Implementation of the no action would allow for ongoing accelerated soil loss which would continue with wind and water events. With the soil loss, grasses and forbs would not be able to establish. The lack of grasses means the lack of fine fuels necessary to carry fire and suppress further shrub invasion. Additional soil loss could also lead to further channelization and head-cutting of arroyos and washes in the project area.

3.3 WATER RESOURCES

3.3.1 Affected Environment

The major drainages within the project area are ephemeral, running water only after high precipitation events. There are no perennial surface waters within the proposed treatment area. Large grassy bottomlands and draws that are found throughout the area can briefly carry substantial amounts of water during high rainfall events causing runoff. There are some playas within the West Potrillo Mountains area; however none exist in the proposed treatment area. Many earthen water impoundments (tanks) and wells are located within the area, constructed for livestock and also used by wildlife. Reported well depth information indicates groundwater levels are typically over 100 feet below ground surface.

The majority of the project area drains into closed basins.

3.3.2 Environmental Consequences

3.3.2.1 Proposed Action

Herbicides may enter surface water impoundments during treatment through accidental direct application. Chemical drift over water might also occur during adverse weather. Per the standard operating procedures (SOP), the possibility of chemical drift away from targeted locations during application would be significantly reduced. In addition, a buffer area of a minimum of 100 meters around open waters to ensure these areas (tanks and wells) are excluded from chemical treatment is required.

After treatment, pelleted herbicide could be displaced through surface runoff, should an intense rainfall event occur shortly after application, before the pellets have dissolved into the soil. Application according to the SOP would avoid the time of year when such storms are likely and

would avoid treatment within larger drainages, where chemical would be more likely to be transported by runoff.

Over the long-term, increased herbaceous ground cover would slow runoff and allow for greater infiltration of water into the ground.

3.3.2.2 No Action Alternative

Implementation of the no action alternative would not change current impacts to water resources. Watershed conditions would continue to degrade through increased erosion, decreased basal vegetative cover, and increased sheet run-off. This degraded cycle leads to an increase in evaporation of water, increasing the likelihood of desertification.

3.4 VEGETATION

3.4.1 Affected Environment

There is one major land resource area (MLRA) described within the project area as described by the NRCS: The Southern Desertic Basins, Plains and Mountains. Many different vegetative assemblages are present within this area, and they are classified as ecological sites. An ecological site is defined as a distinctive land type, with specific characteristics, that differs from other kinds of land in its ability to produce a distinctive kind and amount of vegetation. Detailed descriptions of each ecological site found within the proposed area may be obtained from the NRCS website. Approximately 6 different ecological sites are found within the proposed treatment area (Figure 2).

The majority of the acreage proposed for treatment would occur within the Malpais ecological site (Table 3).

Table 3 Treatment area by Ecological Site

Ecological Site	Acreage
Malpais	24,005
Gravelly	1,273
Shallow Sandy	846
Sandy	548
Loamy	495
Bottomlands	123
Total	**27,280**

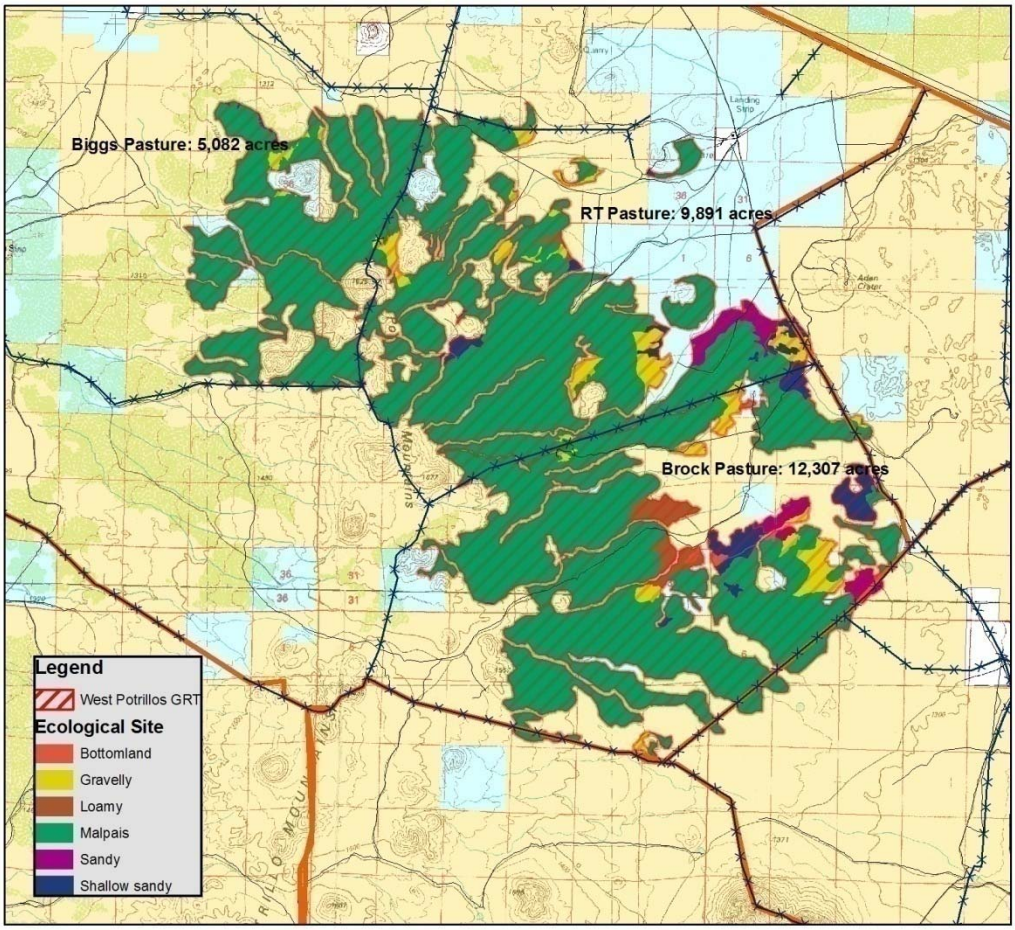

Figure 2 Ecological Sites mapped by NRCS*

***** 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.

Ecological Site Descriptions (ESDs) are NRCS reports that describe the soils, historic vegetation composition, states, transitions, suitable uses, etc. for each ecological site. Of the ecological sites listed in Table 3, the Malpais and the Gravelly ESD mention creosote as being a component of the historic vegetation. The ESDs for remaining ecological site do not consider creosote to be a part to the natural community.

According to the ESD, grasses are dominant in the natural community (reference state) of the Malpais ecological site, but composition and cover varies depending on soil texture, run-in conditions, and disturbance history. Various shrub species, including creosote, may be present in pockets and in fissures in the basalt. Within the treatment area these ecological sites are in the shrub dominated state where the communities are invaded and dominated by shrubs creosote bush (*Larrea tridentata)*, mesquite (*Prosopis glandulosa*) with a variable cover of fluffgrass, snakeweeds, other grasses, and annuals. The proposed treatment will decrease creosote cover values closer to those expected in the reference state.

As a site transitions from the reference (grassland) state to a shrub-dominated state, increases in bare ground and increased germination of shrub seedlings occurs. As this transition progresses, increases in bare ground, decadence of grasses, reduced litter cover, pedestalling of grasses, evidence or erosion around rocks, abundant water flow patterns, reduced soil depth may occur leading to the "bare ground" state.

For the Gravelly ecological site, the ESD describes the reference state as the cover of black grama and/or bush muhly and other grasses is more or less continuous and occurs in shrub interspaces. Shrub (creosote being the dominant shrub) density is variable, but typical intershrub distance should be several yards to 10s of yards. Within the treatment area, these sites are shrub dominated where cover of black grama and/or bush muhly is patchy. Bare expanses of several to 10s of meters are typical. Bush muhly and other grasses may be restricted to the bases of shrubs. Shrub density is moderate, typical intershrub distances are 2–3 meters or less. The proposed treatment will decrease creosote cover values closer to those expected in the reference state.

When transitioning from the reference (grassland) state to a shrub-dominated state, decreases in grass and litter cover, increases in bare patch size, increases in the frequency and size of rills, gullies, and litter movement occur. As this transition progresses, decreases, sometimes rapid, in grass and litter cover, increases in bare patch size, increases in the frequency and size of rills, gullies, and litter movement, accumulation of gravel and pebbles at the surface, and pedestalling may occur leading to a shrubland state. Persistent lack of grasses may lead to erosion and soil truncation, and grasses may take decades or more to recover. This leads to the site becoming a shrubland.

A discussion of the historical and current vegetation trends and fire history of the area is found in the Wildlife and Wildlife Habitat section.

3.4.2 Environmental Consequences

3.4.2.1 Proposed Action

The herbicide proposed for use in the proposed treatment area is relatively safe and effective for rangeland use, but can have affects off-site and on non-target species. The treatments would be designed to reduce damage to non-target vegetation and create a mosaic of treated and untreated creosote by using the lighter ½ lb per acre application rate (versus ¾ or 1 lb), adjusting timing of application, and designing leave-out areas and buffering along drainages. A ½ lb application rate is used to achieve a sufficient kill on the creosote without wiping out the entire population and removing cover for wildlife. The ½ lb rate would create the mosaic that is more natural and not lead to a monoculture of grass in an area that historically had sparse amounts of native shrubs.

In general, chemical treatment is expected to decrease the cover and density of creosote bush while increasing the cover and density of desirable grasses and forbs and some other shrub species. 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 and non-affected shrubs 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. However, all proposed treatment areas have been determined to have native seed sources available in sufficient quantities to allow establishment of the desired vegetative assemblages.

Forbs and grasses 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.

Tebuthiuron, used primarily for control of creosote, is applied as a clay pellet that dissolves with precipitation or moisture. Tebuthiuron is active and mobile in the soil and is translocated from the soil by roots through the plants to the leaves where it inhibits photosynthesis. Lack of chlorophyll essentially causes starvation of the plant over time.

Generally, wind drift of tebuthiuron is low when applied in the form of a clay pellet. The mobility of the herbicide is greatly influenced by the soil texture, for this reason the SOP provides for application during months 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.

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.

Metabolism, degradation, and leaching of tebuthiuron in soil were studied in the laboratory and field. 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.

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 at higher rates. However, at an application rate of ½ lb active ingredient per acre, grasses are not greatly affected by the herbicide and are benefited by reduced competition for nutrients and space. When used at application rates greater than ½ lb per active ingredient per acre rate, some mortality in forbs may occur. Shrubs such as tarbush and mariola are susceptible to tebuthiuron at the proposed rates, while mesquite is not susceptible to the ½ lb per acre application rate. Non-target, desirable shrub/tree species known to be susceptible to this chemical are ocotillo, desert willow, wolfberry, little-leaf sumac and juniper; however areas containing those shrubs are not proposed for treatment.

A study conducted on the vegetation and soils changes in areas treated with tebuthiuron by the Las Cruces District over a 17 year period found approximately 85% mortality of creosote bush with a 95% reduction in canopy cover (Perkins et al. 2006). Little evidence of re-establishment of creosote bush in the short-term was found. Cover of short and mid grass species (such as burro grass, fluff grass, 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, soil nutrients, which had become localized under the canopies of creosote bush plants, began to disperse back into the interspaces between the dead shrubs. This suggests that further re-establishment of herbaceous vegetation between shrubs is expected to continue to occur in the future.

Adequate deferment from livestock grazing following treatment is necessary to promote grass and herbaceous plant recovery and spread. Plants must have the opportunity to grow vigorously, create carbohydrate stores, and reproduce sufficiently to be able increase as expected. Without such deferment, the gains expected from treatment may not occur, and rangeland health may decrease to below pre-treatment levels. Deferment would be required as described in the proposed action.

Beneficial impacts would be indirect, a function of changes in watershed and fire regime subsequent to chemical treatment. With death of affected plants there would be a release and redistribution of nutrient and mineral resources to the interspaces between plants. Subsequently, as herbaceous species establish and litter cover increases, water runoff would slow and spread and infiltration would increase. Most herbaceous plant species would benefit and continue to increase over the long-term with planned post treatment management for watershed and habitat values. Implementation of herbicide treatments and post treatment management over the restoration area would result in grass and forb cover dense enough and continuous enough to allow an increase in fire potential, perhaps to the extent fire could begin to maintain a native vegetative community similar to the reference state.

3.4.2.2 No Action Alternative

Ecological Sites that are approaching the thresholds for economically viable and effective treatment may continue to degrade beyond those thresholds, from shrub dominated states into shrubland states, resulting in increased erosion and soil loss potential. Once these thresholds are crossed recovery to more desirable states become ecologically and economically infeasible.

3.5 Non-Native and Invasive Plant Species

3.5.1 Affected Environment

Legally, a noxious weed is any plant designated by a Federal, State or county government as injurious to public health, agriculture, recreation, wildlife or property. Generally, noxious weeds are aggressive, difficult to manage, and can be parasitic, carriers or hosts of harmful insects or disease. In most cases noxious weeds are non-native species, although they can be native, new to, or not common in, the United States. Recent federal legislation has been enacted requiring state and county agencies to implement noxious weed control programs. There are currently thirty eight species listed as “noxious” by the State of New Mexico. Sixteen of the thirty eight can be found in Doña Ana County.

Invasive plants include not only noxious weeds, but also other plants that are not native to this country and plant that have encroached into an area where human impacts have caused a change in the natural vegetative composition. The BLM considers plants invasive if they have been introduced into an environment where they did not evolve. As a result, they usually have no natural enemies to limit their reproduction and spread. Some invasive plants can produce significant changes to vegetation, composition, structure, or ecosystem function.

Keeping these species from being introduced into new areas is the most effective management strategy for reducing their spread. They can be accidentally established in new sites through

activities that bring seeds or plant parts, or bring soil that may contain such seeds or plant parts. The use of vehicles, machinery, tools, or the introduction of livestock or wildlife that have been in areas that contain noxious or invasive plants can promote the spread of these species.

The main noxious weed species that may be found in the project area is African rue. African rue is mostly limited to disturbed areas associated with livestock facilities such as corrals and high traffic areas around water troughs.

3.5.2 Environmental Consequences

3.5.2.1 Proposed Action

There would be no surface disturbance caused by the proposed chemical treatment. The SOP requiring follow-up monitoring and appropriate treatment (should noxious or invasive species be found within the treatment area) would address the possibility of invasive or noxious species being introduced to new locations within the proposed treatment area..

3.5.2.2 No Action Alternative

If the no action alternative is implemented, there is a possibility for noxious weed communities to increase and fill the niche that would otherwise be filled by native grasses. The most common noxious weed that may potentially occur in the project area would be African rue. This species commonly inhabits disturbed areas near high traffic livestock areas, roads, gravel pits, etc.

3.6 Livestock Grazing

3.6.1 Affected Environment

The project area is primarily located in one grazing allotment (West Potrillos - 03029). However, in order to create a more natural looking mosaic treatment design, the proposed treatment area would include small portions of the Afton (~90 acres), Kilbourne Hole (~365 acres) and Mt. Riley (~60 acres) allotments. Small fingers of the proposed treatment would cross the allotment boundary into adjoining allotments to avoid straight edge fence line contrasts (Figure 3).

The proposed action would occur primarily on the West Potrillo allotment. Grazing allotments vary tremendously in size, from just a few animals, to over 2,100 head. The West Potrillo allotment is currently authorized for year long livestock grazing with 935 cattle and made up of public, State, private and other lands owned or controlled by the permittee. There are 6 pastures in the allotment and the proposed treatment area encompasses portions of 3 pastures. This will allow for grazing rotation management to accommodate the required grazing deferment periods.

3.6.2 Environmental Consequences

3.6.2.1 Proposed Action

Chemical treatments are generally applied in a form, in a manner, or at such low rates that they do not affect livestock. 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.

Livestock grazing management would be impacted by the required grazing deferment of the treatment area during the subsequent growing seasons. During the years that deferment is required; permittees would need to keep all stock out of the treated pastures during the deferment period (2 growing seasons the second and third summers following application), but would be allowed to graze the area in the remainder of the year. A maximum of 40 percent use of current year's growth of key forage species would be allowed during those deferment years following treatment.

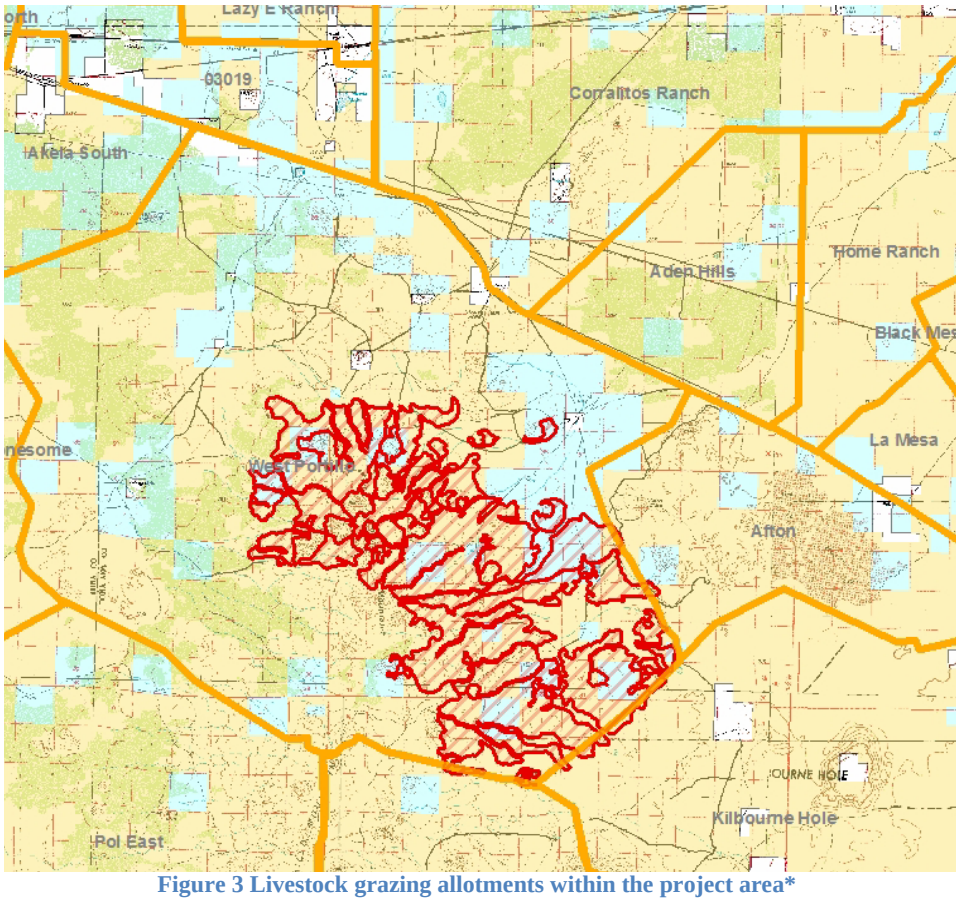

Figure 3 Livestock grazing allotments within the project area*

* No Warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data for individual use or aggregate use with other data, or for purposes not intended by the BLM. Spatial information may not meet National Map Accuracy Standards. This information is subject to change without notification.

Livestock grazing would be affected by changes in the forage supply and plant community. The vegetative treatments would suppress shrub species that are unpalatable or not normally grazed

by livestock and allow more herbaceous plants (grasses and forbs) to be produced. Aerially applied herbicides may eliminate some shrubs and trees that livestock use for shelter, although drainages that support taller plants are not proposed to be treated.

The proposed action would not allow for increases in current permitted livestock use due to increases in forage production resulting from treatments, to preserve the effect of the treatment for watershed function. However, other benefits would occur for livestock grazing. The improved rangeland health would positively impact livestock by producing a larger and more reliable amount of forage. It would allow for better livestock nutrition, increased calf crops, and higher weaning weights. It would decrease the need for destocking in years of lower forage production, although such destocking continues to be highly encouraged. The advantages gained from improved rangeland health and watershed stability would assist in the long-term stability of the ranching operation.

Changes in grazing authorization would be consistent with the grazing regulations, public land health standards, and the guidelines for livestock grazing management. This could include adjustments in permitted use levels, season of use, kind of livestock, allowable use levels, and /or stocking rates if public land health standards for multiple use objectives are not being met. Increases in forage as a result of grassland restoration treatments would be reserved to meet the needs for improved watershed function, wildlife habitat, and rangeland health.

3.6.2.2 No Action Alternative

Under the no action alternative, resources for livestock grazing and management would remain unchanged or would continue to degrade over time due to reduced ground cover, soil erosion, and diminished ecological function within areas proposed for treatment. Treatment specific pasture deferment would not be required, and rangeland health and forage production would not be improved.

3.7 Wildlife And Special Status Species

3.7.1 Affected Environment

3.7.1.1 Wildlife and Wildlife Habitat

The distribution and quality of wildlife habitats within the project area reflects impacts from many decades of livestock grazing and its associated activities such as water developments, roads, etc. As a result, the existing abundance and distribution of wildlife species reflects the capability of habitats in these allotments to support wildlife on a grazed landscape.
The BLM conducted an inventory of wildlife habitats using the Integrated Habitat Inventory and Classification System (IHICS) in 1981. Standard Habitat Sites (SHS) occurring in the project area as of 1981 include:

- Creosote Hills
- Creosote Rolling Upland
- Grass Flat
- Grass Rolling Upland

- Half-Shrub Rolling Upland
- Mesquite Sand Dunes

Figure 4 shows SHS's that occur within the proposed treatment area. Creosote rolling upland is by far the most extensive SHS. This SHS is a grazing disclimax (stable state) community that at one time was desert grassland. Creosote rolling upland and mesquite rolling upland are the least diverse SHS's in terms of vegetative species composition in the LCDO (Inventory Report, American Ag International, no date). The lack of diversity is especially apparent for grass species (4 perennial, 2 annual species). In contrast, the report lists 15 grass species for the grass rolling upland SHS across the District. The proposed vegetation treatments would be located primarily within creosote rolling upland and creosote hills SHS.

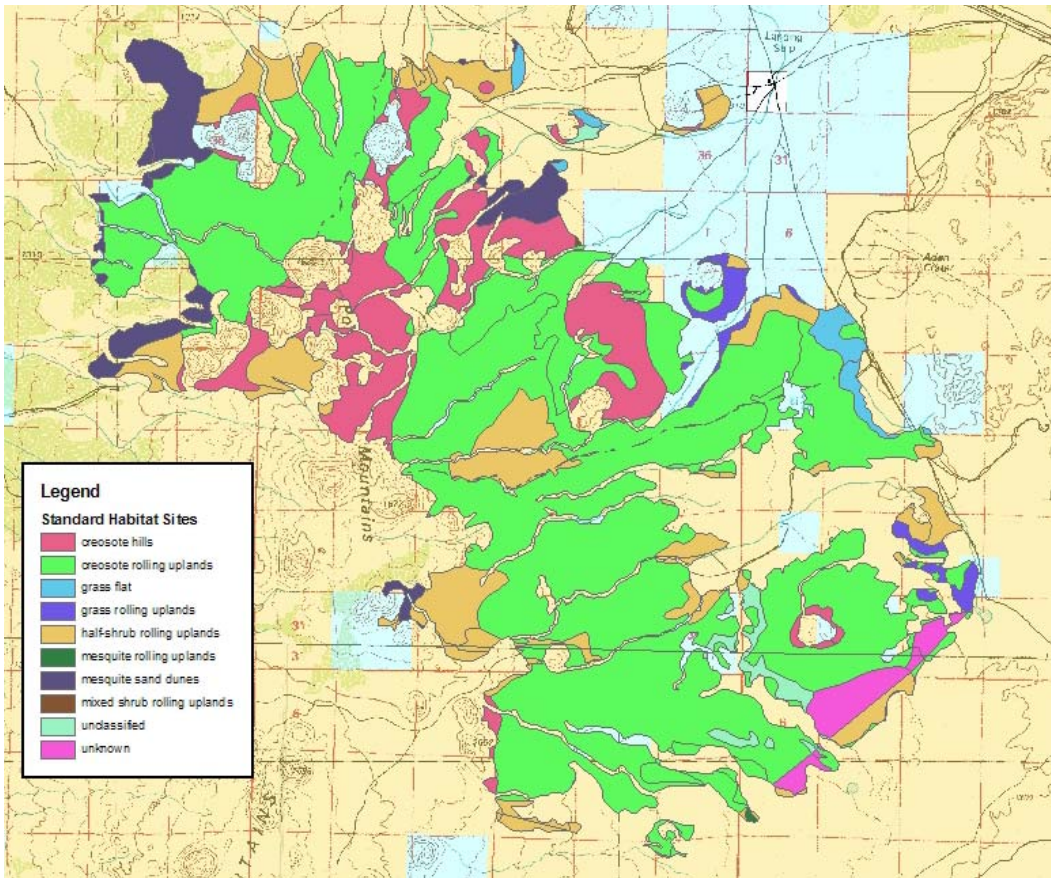

Figure 4 BLM LCDO Standard Habitat Sites*

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The key to restoring watersheds, a wildlife assemblage and the naturalness similar to that prior to European settlement is through provision of herbaceous cover to an extent fire could play its historic role in limiting woody species – especially in lower elevation habitats.

Typical amphibians that inhabit most if not all of the standard habitat sites within the project area include the New Mexico spadefoot, Great Plains toad, green toads and red-spotted toad. Reptiles include marbled whiptail lizards, collared lizards, round-tailed horned lizards, striped whipsnakes, and Western diamondback rattlesnakes. Mammals include mule deer, javelina, grey

fox, coyotes, black-tailed jackrabbits, desert cottontail rabbits, spotted ground squirrels, Merriam's and banner-tailed kangaroo rats, desert pocket mice, white throated woodrats, and cactus mice. Common birds include mourning doves, Swainson's hawks, Northern harriers, roadrunners, mockingbirds, horned larks, scaled quail, golden eagles, meadowlarks, black-throated sparrows, and Scott's orioles.

There are several dirt tanks in the restoration area. These tanks are in close proximity and within the watershed of the creosote treatment areas. All of these tanks are detention dams that may potentially hold water for several months at a time. Ephemeral surface waters in the region have increasingly been found to contain branchiopod invertebrates (most notably fairy shrimp) that are rare and sometimes never previously recorded for the state. Any or all of the dirt tanks could potentially harbor fairy shrimp.

3.7.1.2 Special Status Species (SSS)

3.7.1.2.1 Plants

Presence of special status plant species and their habitats in Doña Ana County was considered using LCDO species occurrence/habitat records and New Mexico Natural Heritage Program 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: 22 January 2009)].

Based on evaluation of the above information, potential habitat for sand prickly pear cactus (*Opuntia arenaria*) and night-blooming cereus (*Peniocereus greggii* variety *greggii)* could occur in the project area. However, there are no known locations of sand-prickly pear cactus or night-blooming cereus in the project area. Table 4 below identifies special status plant species considered.

Table 4 Special Status Plant Species

Species	Conservation Status
Night-blooming cereus	BLM sensitive species, USFWS Species of Concern, New Mexico Endangered
Sand prickly pear cactus	BLM sensitive species, State Endangered, USFWS Species of Concern

Night-blooming cereus (*Peniocereus greggii* variety *greggii*) This slender, twig-like cactus grows mostly in sandy to silty gravelly soils in gently broken to level terrain in desert grassland or Chihuahuan desert scrub. Typically found growing up through and supported by shrubs, especially *Larrea tridentata* and *Prosopis glandulosa*.

Sand prickly pear (*Opuntia arenaria*) This low-growing, mat-forming prickly pear grows in sandy areas, particularly semi-stabilized sand dunes among open Chihuahuan desert scrub, often with honey mesquite and creosote and a sparse cover of grasses; 1,160-1,300 m (3,800-4,300 ft).

3.7.1.2.2 Animals

The Special Status animal species lists for Doña Ana County was compiled from: Biota Information System of New Mexico (BISON-M). http://www.bison-m.org

Known geographic distribution and habitat requirements were considered for each species in comparison with habitat types within the area proposed for treatment. The results of this analysis are that habitat for 13 special status species could potentially occur in the project area (See table 5).

Table 5 Special Status Wildlife Species

Species	Status
Texas horned lizard	BLM Sensitive
Northern aplomado falcon	NM Endangered, USFWS Non-essential Experimental Population
American peregrine falcon	USFWS Species of Concern, NM threatened
Common ground dove	NM Endangered
Ferruginous Hawk	BLM Sensitive
Burrowing owl	USFWS Species of Concern, BLM Sensitive
Mountain Plover	USFWS Species of Concern, NM Sensitive
Loggerhead Shrike	BLM Sensitive, NM Sensitive
Gray vireo	NM Threatened
Townsend's big-eared bat	USFWS Species of Concern, BLM Sensitive, NM Sensitive
Fringed Myotis Bat	BLM Sensitive, NM Sensitive
Desert pocket gopher	USFWS Species of Concern
Moore's Fairy Shrimp	NM Sensitive

3.7.2 Environmental Consequences

3.7.2.1 Proposed Action

3.7.2.1.1 Special Status Species Plants

Tebuthiuron poses risks to SSS plants. Potential direct impacts to non-target plants would be through exposure to herbicide.

There would be potential for SSS plants to be killed or by exposure to tebuthiuron. However, there are no known occurrences of SSS plants in the project area. If there happens to be SSS plants in the project area, losses would be at an individual level rather than a population level.

3.7.2.1.2 Wildlife, Including Special Status Species

The potential direct impacts from herbicide application to terrestrial wildlife include short-term disturbance and displacement of individuals and the potential for effects from exposure to the chemicals. Human activity associated with the project would likely result in a short-term displacement of mobile animals.

Exposure to chemicals could be through ingestion or as a result of indirect. Direct chemical effects depend on the sensitivity of each species to the chemical used, differences in sensitivity among individuals (life stage), rate and degree of exposure and pathway of exposure. Indirect chemical impacts would vary with the degree to which a species or individual was positively or negatively affected by changes in habitat.

The Bureau completed a Programmatic Environmental Impact Statement (PEIS) to analyze the potential for impacts of herbicide use on BLM managed public lands (USDI BLM 2007a). The analysis included ecological risk assessments. The risk assessments analyzed endpoint effects of herbicides including mortality levels as well as affects on growth, reproduction and other ecologically important sub-lethal processes. A variety of exposure scenarios were considered in order to assess both acute and chronic effects (direct spray of individual or water body, indirect contact with foliar residue, ingestion of contaminated food items, off-site drift of spray, surface runoff, deposition of contaminated dust and accidental spills to water bodies). Information used in the analysis consists mostly of toxicity studies conducted in conjunction with the EPA pesticide registration process.

Areas of important habitat would be excluded from treatments and buffered to prevent loss of important habitat components. Examples would be stands of little-leaf sumac, hackberry, soapberry, desert willow, wolfberry, and other shrubs that may occur along arroyos or on small sites within a proposed treatment area that is otherwise dominated by creosote or mesquite. The level of detail could be as small as a single native tree surrounded by salt cedar trees at a spring. Herbicide would be applied so as not to contact or impact the desirable plant(s). Pelleted tebuthiuron application would result in no negative impacts from wind drift but surface runoff could cause mortality of non-target plants (USDI BLM 2007c p. 4-102).

The PEIS described the specific risks related to tebuthiuron. The following discussions and table 6 showing risk from herbicide exposure are conclusions in the PEIS.

The PEIS (p 4-84) concluded that “tebuthiuron may have a moderate residence time in water bodies (over 1 year in anaerobic conditions). Under an accidental spill scenario, tebuthiuron would pose a low risk to fish and aquatic invertebrates in ponds. Accidental direct spray of tebuthiuron over a pond would pose a low chronic risk to aquatic invertebrates, and accidental direct spray over a stream would pose a low to moderate chronic risk to aquatic invertebrates. Off-site drift and surface runoff of tebuthiuron does not pose a risk to fish or aquatic invertebrates. If tebuthiuron is applied at the typical application rate, under normal application scenarios, it is likely to have little or no impact on fish or aquatic invertebrates”. Tebuthiuron application to aquatic habitat is not a part of the proposed action. Timing of application, slope restrictions and buffers around aquatic habitat included in the proposed action largely negate the potential for impacts to aquatic or riparian species.

The proposed action to apply pelleted tebuthiuron at ½ lb per acre active ingredient is consistent with the typical application rate used in the PEIS risk assessment and is much below the maximum 4 lb per acre rate. The proposed action is for pelleted form application, which reduces

the potential for exposure and ingestion scenarios relative to liquid application. These factors combined with SOPs including timing for gentle rainfall, slope restriction, inclusion of buffers around important habitat largely reduce any potential for direct impact of the chemical to animals. Table 6 lists the risks of tebuthiuron on certain wildlife species.

The potential for indirect impacts to wildlife and SSS animals is through changes to habitat through time. With successful implementation of herbicide treatments and subsequent careful management, habitat would transition from shrub dominated with relatively large areas of bare soil to grass dominated with smaller bare soil interspaces, higher herbaceous canopy cover and more herbaceous species diversity. In general, grassland adapted species would benefit and low seral, disturbance favored species would be negatively affected.

Successful implementation of herbicide treatments would set the stage for follow-up treatments using fire and increasing the potential for wildfire, both of which would maintain desert grassland habitat while also resulting in diversity within the habitat. The degree of past disturbance and ongoing land uses on the landscape combined with multiple use mandates that will continue on public land into the future, virtually eliminate the potential for reestablishment of a natural historic fire regime in habitat on the large scale in the restoration area. For instance removal of 40% to 50% of current year's growth by livestock as suggested in the MRMP is also removal of more than ½ of the fuel available to carry fire in a grass system. This alone effectively results in grassland habitat being more comparable to deserts receiving less than 7 inches of rainfall, in terms of fire frequency, where rainfall rather than resource use limits the amount of fine fuel and fire does not largely influence the ecosystem (Wright and Bailey 1982). In the long term, habitat in the restoration area would likely be the result of continual artificial manipulation by prescribed fire on a repeated basis. The proposed action would set the stage for a long-term conversion and maintenance cycle requiring repeated treatment and conservative management to benefit Chihuahuan desert grassland wildlife species. Eventually much of the area mapped as creosote rolling upland, creosote hills SHS's would show an increase in density and diversity of herbaceous species.

Impacts to the remaining Special Status animal species listed in the Affected Environment are anticipated as follows:

Texas horned lizard: Application of chemical herbicides is anticipated to enhance Texas horned lizard habitat by creating more grass seed, which is the food of harvester ants, on which Texas horned lizards feed exclusively.

Northern aplomado falcon: These birds would be expected to avoid the disturbance created by aerial chemical application or mechanical equipment during treatments. This treatment is aimed at restoring grasslands which are a vital component to the aplomado falcon and their prey's (grassland birds) habitat. An increase in grassland habitat would clearly benefit the aplomado falcon.

American peregrine falcon: There is little likelihood of peregrine falcons using the area during treatments, but if any are, they would be anticipated to avoid the aircraft applying chemical herbicides or equipment conducting mechanical treatments. There may be temporary disturbance to individual birds, but no long-term impact to them. Grassland restoration should enhance grassland bird populations, which in the long term would benefit this falcon.

Common ground dove: Grassland restoration is anticipated to be beneficial for these doves, and increase seeds and nest sites available to birds including the common ground dove.

Ferruginous hawk: Grassland restoration should enhance rodent populations, improving winter habitat for these hawks.

Burrowing owl: Application of chemical herbicides and restoration of grasslands may enhance burrowing owl habitat by providing additional nest and roost sites and the prey base for these owls.

Mountain plover: Application of chemical herbicides and restoration of grasslands may enhance their habitat, which would benefit mountain plovers by providing additional nest and roost and foraging sites.

Loggerhead shrike: Loggerhead shrikes prefer open shrub and grasslands and are year-round residents of southern New Mexico. The quality of potential Loggerhead shrike habitat in the treatment area is expected to increase over time as vegetation continues to restore grassland habitat. Removal of large creosote bushes could remove possible perch and nest sites for shrikes, but stands of other shrub species would be avoided in order to provide habitat for wildlife species

Gray vireo: Treatment of dense creosote invaded habitat is anticipated to create more open savannah habitat which gray vireos prefer, so the proposed action is anticipated to have beneficial effects for this species.

Townsend's big-eared and fringed myotis bats: It is unknown exactly how grassland restoration may impact habitat for these bats. It would not have any effect on roosting habitat, but may alter the availability of insect resources. It is unknown whether any of these species would prefer grassland insects to shrubland insects, although it is anticipated that grassland restoration would increase insect numbers as a whole. Bats are anticipated to benefit from treatments because restoration of grasslands would enable bats to once again feed in these areas.

Desert pocket gopher: This gopher may occur in loamy soils within the proposed treatment area. It is unlikely that any populations would be affected in the long-term as the treatment will not impact subterranean inhabitants.

Moore's fairy shrimp: The proposed action is not anticipated to have any effect, beneficial or detrimental to fairy shrimp as may inhabit dirt tanks which would be excluded from treatment.

3.7.2.2 No Action Alternative

Under the no action alternative there would be no herbicide treatments to shrub invaded habitats on public land in the treatment area. Changes to habitat and impacts to wildlife and SSS on public land would be through structural type projects such as fences (analyzed on a case by case basis), grazing management and limited natural events such as lightning caused fire. Habitat conditions relative to site potential would remain static or would continue to degrade without the proposed treatments. Wildlife and plant species (including SSS) populations would possibly decline due to habitat loss.

Table 6 Risk categories for wildlife and SSS animals for tebuthiruon by application scenario (USDI BLM 2007a)

	Exposure Pathway							
	Accidental Spill to Pond		Surface Runoff		Indirect Contact with Foliage After Spray		Ingestion of Food Items Contaminated by Spray	
	SSS	non-SSS	SSS	non-SSS	SSS	non-SSS	SSS	non-SSS
Pond Fish	NE/M	NE/L	0/0	0/0				
Stream Fish			0/0	0/0				
Pond Aquatic Invertebrates	NE/L	NE/L	0/0	0/0				
Aquatic Invertebrates Stream			0/0	0/0				
Small Mammal 100% Absorption					0/0	0/0		
Pollinating Insect 100% Absorption					0/L	0/L		
Small Mammal 1st Order Dermal Absorption					0/0	0/0		
Small Mammal Herbivore - Acute							0/M	0/0
Small Mammal Herbivore - Chronic							0/L	0/L
Large Mammal Herbivore - Acute							0/L	0/L
Large Mammal Herbivore - Chronic							0/L	0/L
Small Avian Insectivore - Acute							0/0	0/L
Small Avian Insectivore - Chronic							0/0	0/0
Large Avian Herbivore - Acute							0/L	0/0
Large Avian Herbivore - Chronic							0/0	0/0
Large Mammal Carnivore - Acute							0/0	0/0
Large Mammal Carnivore - Chronic							0/0	0/0

[1]Risk categories: 0 = no risk [majority of risk quotients (RQ) < the most conservative level of concern (LOC); L = low risk (majority of RQ's 1 – 10x the LOC); M = moderate risk (majority of RQ's 10 – 100x the most conservative LOC); H = high risk (majority of RQ's > 100x most conservative LOC). See USDI BLM 2007 and 2005 for risk assessment methodology. [2]Typical Application Rate = .5 lb active ingredient per acre / Maximum Application Rate = 4 lb active ingredient per acre.

3.8 VISUAL RESOURCES

3.8.1 Affected Environment

The proposed West Potrillo project area contains two of the four Visual Resource Management Area (VRM) Classes (Figure 5). Approximately 20,033 acres are Class 2 and approximately 1,264 acres are Class 3. MRMP objectives for each class are as follows (BLM LCDO 1993):

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 attract 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 3 - Partially retain the character of the existing landscape. The level of change to the characteristic landscape can be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.

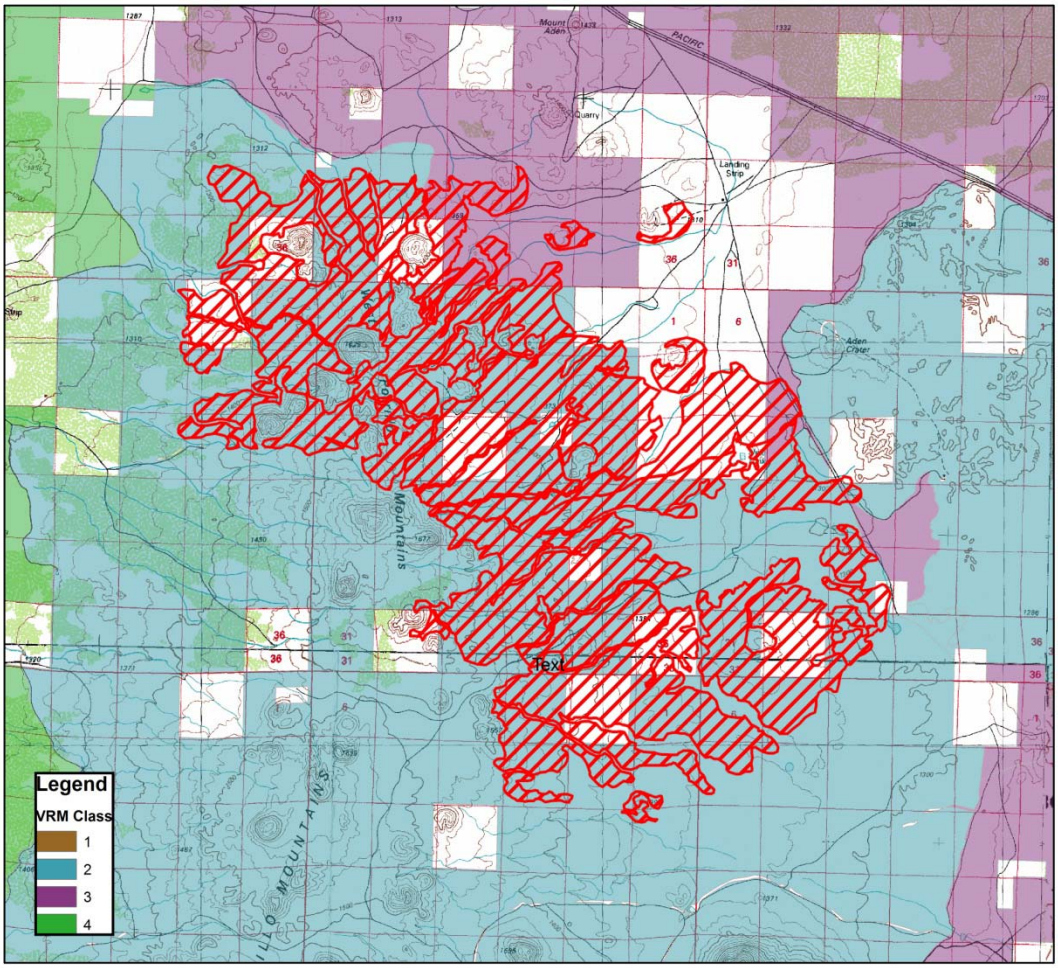

Figure 5 Visual Resource Management Classification

***** 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.

3.8.2 Environmental Consequences:

Proposed Action

The treatment polygons have been designed to leave an undefined, natural looking transition between vegetation treated with herbicide and vegetation left untreated. This will prevent a

sharp, linear contrast in vegetation type, in the VRM class 2. To bring about less obvious treatment boundaries, treatments might need to be carried across fence lines or out to natural geographic breaks.

Following chemical treatment, dead shrubs may remain upright for a number of years, depending on weather conditions and other environmental factors. The shrub skeletons would be visible for 5-7 years, while gradually breaking down.

Following treatment, there would be a change in the color and texture of the treated areas. The visual aspect would change from brush-dominated, to an area with more perennial grasses and forbs. The casual observer may recognize this, but the vegetative community would appear natural, and more closely aligned with the historic vegetation expected for the ecological site.

No Action Alternative
Under the no action alternative, visual resources would continue to be managed as Class 2 and Class 3.

3.9 Wilderness Study Areas

3.9.1 Affected Environment

According to the wilderness inventory, 53,179 acres in the West Potrillo/ Mt. Riley WSA and 1,821 acres in the Aden Lava Flow WSA are dominated creosote bush. As discussed in the vegetation section of this EA the treatment would take place in the Malpais and Gravelly ecological sites which should be dominated by grasses within the treatment area these ecological sites have been invaded by and are now dominated by shrubs.

The project area lies mostly within the West Potrillo Mountains WSA with parts entering the Aden Lava Flow WSA. The West Potrillo WSA contains 151,132 acres of BLM managed land. The Aden Lava Flow WSA contains 25,287 acres of BLM (Figure 6).

The most popular uses in this WSA are recreation activities that include upland game bird hunting (quail and dove) as well as bird watching. The WSA has a high concentration of raptors. Raptor populations that winter in the WSA are high due to the abundance of prey (black tail jack rabbits and desert cottontail rabbits).

The wilderness value most predominate in the West Potrillo WSA is its large size (148,540 acres) which provides ample opportunity for solitude and primitive, unconfined recreation.

3.9.2 Environmental Consequences

Proposed Action
As discussed in the Wildlife Section (3.7) the key to restoring watersheds, wildlife assemblage, and the wilderness values to conditions similar to those that existed prior to European settlement is through a process of removing the now dominant invasive shrub species, allowing the site to

return to a grass dominated system. The proposed treatment will decrease creosote cover values closer to those expected in the natural community (reference state).

The use of herbicide treatments to reduce the amount of creosote and increase the amount of grass cover and eventually return the area to a more natural fire regime would "clearly benefit the WSAs wilderness values through restoring and maintaining the naturalness that historically occurred." (USDI 1995) A return to a historical Chihuahuan Desert without the unnaturally dense creosote would lead to an increase in the prey base which will in turn lead to a further increase in the raptor populations for which bird watchers often utilize this WSA.

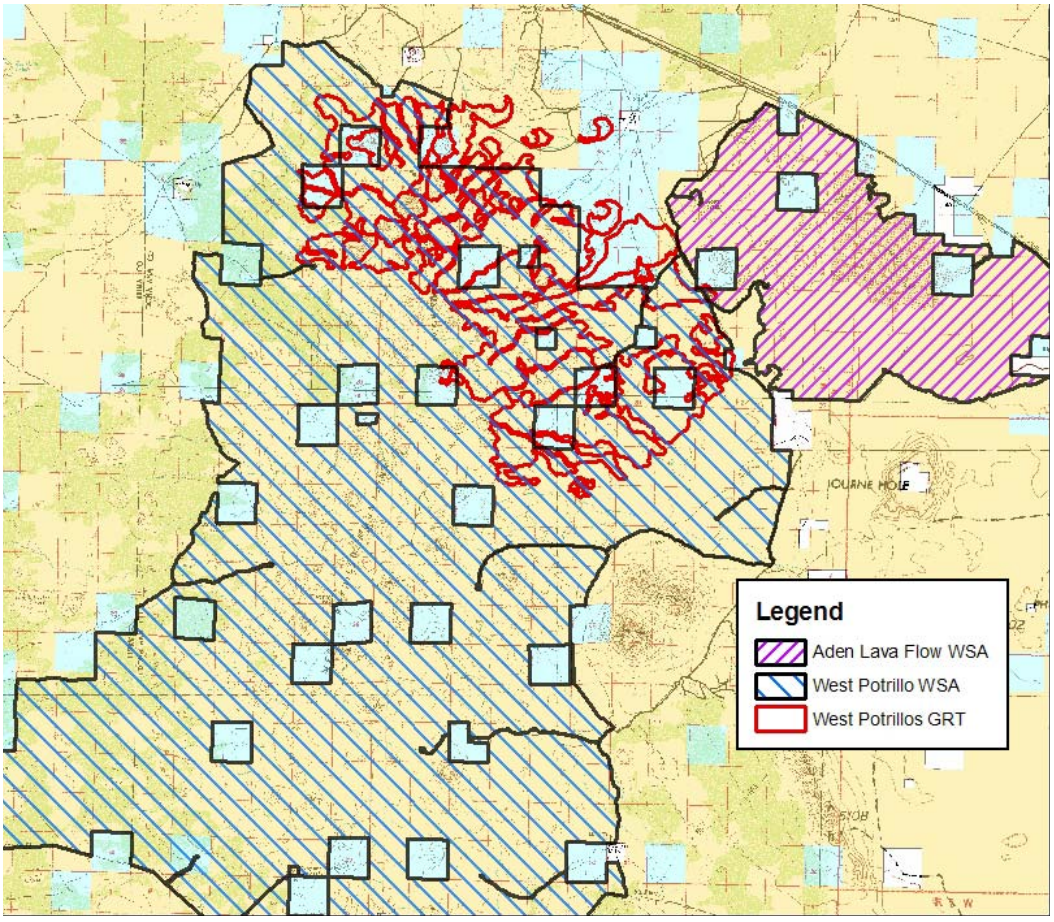

Figure 6 Special Management Areas

***** 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.

As outlined in the interim management policy (IMP) and guidelines for lands under wilderness review (Handbook 8550-1) dated July 5, 1995:

> "If the proposed action would result in a positive or beneficial change in the state or condition of the wilderness value(s) as described, assessed, or calculated on the date of approval of the intensive [wilderness] inventory, then the wilderness value would be enhanced by the proposed action."

Increasing grasses or other fine fuels in the understory and interspaces of existing vegetative communities would allow a return of the once naturally occurring fire regime in that would maintain the natural composition, distribution, and abundance of native plant communities within the project area

No Action Alternative
Under the no action alternative, the herbicide treatments would not occur. The creosote invaded state of the project area would continue to exist with creosote densities in some areas possibly increasing (See Appendix 1). Areas that are approaching the thresholds for economically viable and effective treatment may further degrade beyond those thresholds, from shrub dominated states into shrubland states. Under this alternative, the landscape would not have a chance to recover to a natural and historical state. Restoration, protection, and maintenance of wilderness characteristics, through improvement of vegetation conditions from current degraded states to potential natural community, would not occur.

3.10 Cultural Resources

3.10.1 Affected Environment

Cultural resources include archaeological, historic, and socio-cultural properties. Archaeological resources generally refer to prehistoric sites while historic resources refer to those for which some form of written record exists. Socio-cultural properties refer to concerns of Native Americans and other entities as they pertain to archaeological and/or historic sites significant to their heritage or other places of significance on the landscape.

There are several distinct periods or traditions that are discernible in the archaeological records for the project area. The earliest occupation occurred from about 9,500 BCE to approximately 6,000 BCE. This period is known as the Paleo-Indian period. The period is divided into three traditions; Clovis, Folsom, and Plano. Each tradition is associated with distinctive projectile points and lithic tool kits. Isolated projectile points from these traditions have been found within the study region. Paleo-Indian people are thought to have been mobile hunters and gatherers who focused on migratory big game some species of which are now extinct.

The second prehistoric period is referred to as the Archaic or Desert Archaic. The Archaic cultures are believed to have occupied the study area from around 6,000 BCE to about 100 ACE. Archaic cultures are believed to have been nonsedentary, pre-pottery hunters and gatherers with a growing emphasis on territoriality and home bases and plant gathering leading to plant cultivation. The origins of agricultural in the southwest begin during this period. Here again, the Archaic cultures are known for a suite of projectile points that define sites distinctive to this period as well as other lithic tools and organic remains in the form of basketry, sandals, and other textiles that have survived owing the dry conditions of this area.

The third of our periods or traditions has been identified as the Mogollon. The Mogollon culture group has been divided into the western Mogollon and eastern or Jornada Branch of the Mogollon. This period is also known as the Formative Period. This period begins at approximately 200 ACE and extends to approximately 1450 ACE. Within this time period,

several distinct changes begin to occur in the archaeological record. 1) Agriculture becomes the basic element of the economy although supplemented by hunting and gathering in varying degrees. 2) Pottery is introduced and soon divides into technological and distinctive artistic/stylistic traditions. 3) Pithouse hamlets aggregate into sedentary pithouse villages. 4) These communities in turn begin to construct above ground residences known as pueblos of either masonry or adobe. 5) Interregional contact and trade are more evident, at least in the archaeological record, than heretofore.

The Mogollon Period ends at 1450 to 1500 ACE. There appears to be complete break in occupation although this may be more apparent than real. This period is succeeded by the Protohistoric period or that period just before and phasing into the historic period. While variously dated, the Protohistoric occurs between 1540 ACE and 1680 ACE for this area. Several named protohistoric groups are recorded for this area and appear to have practiced hunting and gathering economy. During this period various peoples that would become the historic Apaches move into the project area from the west and northwest displacing and/or absorbing the peoples in their path. The Chiricahua Apache occupation of the project area continued into the historic period until about 1890. The Apache were mobile hunters and gatherers and, increasingly during the historic period, depended on raiding to supplement the economy.

A wide variety of historic sites are known to occur. The Spanish Colonial and the Mexican periods are not well represented owing to fierce Apache resistance to European encroachment although several military expeditions were mounted by the Spanish Colonial authorities to combat Apaches in several of the area mountain ranges. However, all broad historic trends are represented and are summarized as follows: explorers, trappers, and traders pioneered trails to be followed by 49ers heading west, military forts, mining camps and towns, the railroad and farming and ranching. All of these have left their imprint on the land in one form or another.

3.10.2 Environmental Consequences

3.10.2.1 Proposed Action

Aerial application of chemical herbicide will not have adverse effect upon cultural resources. The increase in ground cover and reduction of erosion following treatment would protect resources that might currently be subject to damage or displacement for lack of it.

3.10.2.2 No Action Alternative

Continued degradation of range site conditions could result in increased surface erosion adversely impacting cultural sites.

3.11 Cumulative Impacts

This analysis of cumulative impacts focuses on the geographical area defined as all potentially suitable treatable sites in the project area, as described in the proposed action.

Major resource uses that have been occurring, and are expected to continue to occur within the project area, include Border Patrol activities, military operations, ranching/livestock operations, recreational camping, hunting, photography and hiking. These are activities addressed in the MRMP and under BLM's multiple use mandate, but also nevertheless add to the cumulative impacts to the ecosystems.

The cumulative impacts associated with the proposed action are expected to have an overall beneficial impact to various resources over the entire landscape, given the project design and implementation. In general, the long-term changes to the vegetation and soil health would benefit watersheds, ecosystems and wildlife species dependent on them. Some land use impacts would be buffered, or balanced with grassland restoration efforts. Sustaining the benefits of the project would require monitoring efforts to detect appropriate livestock utilization levels, modification of future projects as needed to reach objectives, implementation of additional projects to maintain improved plant communities, and other resource use restrictions as needed to ensure the longevity of the restoration efforts.

To ensure the long term benefits of the proposed treatments and improvements in grazing management are achieved throughout the allotment, coordination would be made with the permittee to ensure that water facilities (i.e. pipelines, troughs, storage facilities) would be fully operational on a year-round basis. Also, the grazing use on the treatment area would not exceed 35% outside of the deferment period.

4 CONSULTATION AND COORDINATION

4.1 Public Notice

On June 11, 2009, the proposed West Potrillo Grassland Restoration Project was posted as DOI-BLM-NM-L000-2009-0140-EAon the BLM Las Cruces District web site Active Project Roster:

http://www.blm.gov/style/medialib/blm/nm/programs/planning/nepa_logs0/nepa_logs_2009.Par.68884.File.pdf/Las_Cruces_NEPA_Log_2009.pdf

As per 43 CFR 4160.2, the public will be afforded an opportunity to comment on the Environmental Assessment. Notice of the completed EA will be posted on the BLM external web site for review. Upon initial posting, the public will be given 30 consecutive days to comment.

4.2 Consultation And Coordination Contacts

Coordination with wildlife groups has taken place throughout the entire planning process. Members of New Mexico Wilderness Alliance (NMWA) participated in a field trip on July 31, 2008 along with a BLM interdisciplinary (ID) team to discuss the overall goals of the proposed treatment and to discuss any concerns they had with the design of the treatments.

Discussions have also taken place with the local chapter of Quail Unlimited and the Mesilla Valley Audubon Society. Both entities have been actively participating with BLM personnel to get their concerns addressed in this EA.

BLM has also been actively working with the permittee of the West Potrillos allotment to address any issues that may exist with the grazing management on this allotment and neighboring allotments.

This Environmental Assessment has been prepared in consultation with:

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APPENDIX 1: BLM Shrub Control Monitoring Study and Spatially-Explicit Monitoring Protocol.

This monitoring procedure is based on two issues. First, vegetation responses are patchy at scales of tens of square meters. The patchy responses of vegetation often contains valuable information about the nature and scale of impact (e.g., patch grazing, amount of chemical application, fire intensity), the nature and scale of soil constraints on vegetation dynamics, and the role of differences in initial species composition on vegetation responses. Second, ground-based monitoring is becoming increasingly coupled to digital data, including soil-landscape models and remote sensed data, in order to generalize interpretations to broad land areas (i.e., scale up results). Thus, we need to be able link vegetation measurements to digital data in an unambiguous way.

Sampling in relatively small plots (e.g., 400 m^2) is an effective way to deal with patchiness as well as linkages to digital data. When compared to long transect lines (e.g., 100 m), variable-size plot protocols are better able to accommodate stratification to patches, are more robustly linked to soil properties measured in single soil pits, and easier to link to digital raster data and hierarchical landscape metrics. Our specific procedure for the BLM study is described below.

Plot establishment

1. Locate paired 20m x 20m plots in Gravelly ecological sites. One plot will be within the 'control' (non-treated) zone and the other plot will be within the chemically treated area. Aim for four to eight pairs in low elevation Gravelly ecosites (3800ft – 4800ft) and four to eight pairs in high elevation Gravelly ecosites (4900ft – 5600ft).
2. Mark the four corners (NW, NE, SW, SE) of the plot with rebar. Collect a sub-meter accuracy GPS point at each corner of the plot.
3. Place pin flags at each corner of the plot.

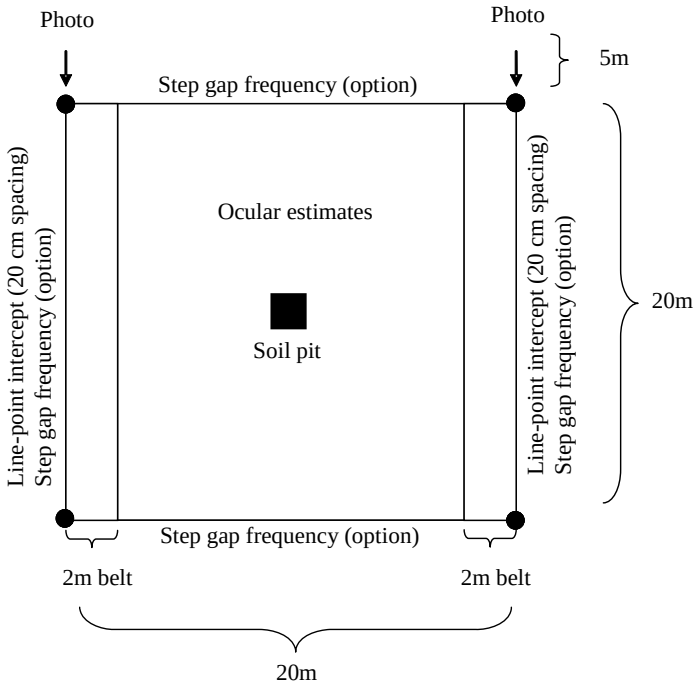

Photo-trend records (repeat annually)

1. Write on the whiteboard: Plot ID, Transect (West or East), Direction of Photo (South), and Data.
2. Use a digital camera.
3. One photo from 5m behind (north of) the northwest corner (rebar) looking south toward the southwest corner. Horizon should be <1/4 from the top of the photo, whiteboard should be against the northwest rebar.
4. One photo from 5m behind (north of) the northeast corner (rebar) looking south toward the southeast corner. Horizon should be <1/4 from the top of the photo, whiteboard should be against the northeast rebar.

Vegetation sampling

These procedures include a focus on 1) highly repeatable measurements of basal, canopy cover, and vertical structure alongside 2) data suitable for assessing demographic trends in grasses and shrubs that may help explain changes in structural parameters.

First Year, then repeated **every five years**

1. Domin-Krajina (DK) cover estimation by species with focus on perennials and invasive species. Annual forbs will be lumped into one group. Annual grasses will be lumped into one group. This procedure accounts for rare/patchy species.
2. Line-point intercept collected at 20cm intervals on two, 20m transects (northwest rebar to southwest rebar, and northeast rebar to southeast rebar). Only perennial plant species will be recorded.
3. Record two nominal indicators and pedoderm characteristics (resource retention measure, erosion pattern class, and surface soil properties).
4. Dominant perennial plant height.

First Year, then repeated **annually**

1. Two-meter wide belt transects along the same lines as line-point intercept. Record grass species (plants or clones/patches) and shrub species separately by stage/size class, and by decadence class. Include succulent species with shrubs. Indicate when a grass patch includes recruits.

Grass stage/size classes	**Shrub stage/size classes**
Seedling = Cotyledons present or only one stem	Seedling = Cotyledons present or only one stem
1-5 cm^2	<0.25m tall
5-20 cm^2	0.25 – 0.50m tall
20-50 cm^2	0.5 – 1.0m tall
50-100 cm^2	1.0 – 1.5m tall
>100 cm^2	>1.5m tall

Decadence Class	Definition
Non-decadent	Plant contains >50% live stems
Partially decadent	Plant contains 1-50% live stems
Decadent	No observable live stems

2. Collect three vegetation structure measurements on each transect at the 6m, 13m and 20 m marks. Stand 1m away from the transect, on the same side of the transect as the Robel pole (and the opposite side of the transect walked along for line-point intercept and belt transect), at the 1m, 8m and 15m marks. Record the percent that each band is covered (or obstructed) by vegetation.
3. Reproductive inventory: record species name of perennial grasses and shrubs with seedlings or recruits (grasses <5cm tall, shrubs <10cm wide). Assign each species to a log-scale frequency class within the 400 m^2 plot: (1) 1-10, (2) 10-100, (3) 100-1000, and (4) >1000.

Soil sampling (First year only)

1. Soil pedon sample will be located near the center of the plot in a bare plant interspace. The soil pedon will represent the 400 m^2 plot. The soil pit will be excavated using any combination of a soil auger, a Montana sharpshooter and a shovel to a 1) the top of an indurated petrocalcic horizon, 2) the top of bedrock, 3) to a C horizon, or 4) to a depth of 150 cm.
2. Split out horizons, sieve a sample (2 mm sieve) from each horizon, and record the following for each horizon:
   Top and bottom depth (in centimeters)
   Master horizon and suffix symbols
   Percent volume of rock fragments by size.
   Hand texture, including an estimate of percent clay
   Effervescence
   Color (completed in the office when time is limited)
   Structure, including size and grade
   Carbonate stage
   Presence of clay films
3. Collect a sample of each soil horizon and place in soil sample box or bag. Label each sample with the Township Range Section, Section Line ID, Date, and Depth (in cm). In addition, collect a sample from 0-1 cm.
4. Record an ocular estimate of the percent surface cover of rock fragments, by fragment size.
5. Record the pedon fragment volume class for rock fragments larger than gravel, by fragment size.
6. Evaluate the presence of a compaction layer, and the number and depth of roots within the soil pit.

Step gap frequency (optional every 5 years)

This measurement describes the frequency of gap size observations for points on the land surface (not a tally of individual gaps). This is an effective measurement for documenting the beginning stages of grassland degradation (but we will probably not use it for studies of grass recovery from shrubland, as cover and demography will effectively tell the story). All forbs and annual grasses are ignored. Perennial grasses need to be in a patch of several individuals >20 cm apart to be considered a patch. Gaps are measured along the line between plot corners, beginning and ending with a shrub or perennial grass patch that intersects the line.

1. Begin with heel at rebar, face the northeast flag.
2. Looking at flag, pace in a straight line along the edge of the plot, repeat for all four sides of plot.
3. At each pace, record the gap size in which your toe lands :(Plant patch, one single plant/clone or group of plants < 20 cm apart), (<50 cm), (50-100cm), (100-200cm), (200+cm). If your toe lands on a perennial grass patch, or on a "significant" portion of shrub, tally “Plant patch.” It is ok to record the same gap multiple times if you step into it multiple times (this is a frequency distribution of points, not gaps).
4. Add your tally marks for each class for every step and write the number in the total box.