Comments may be submitted to Cyndie Abeyta at:

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or

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Please submit comments by March 14, 2008

FINDING OF NO SIGNIFICANT IMPACT

Management of Exotics for the Recovery of Endangered Species
Rhodes Property Habitat Restoration Project

The U.S. Fish and Wildlife Service (Service) proposes to provide funding to restore native cottonwood-willow habitat for the endangered Southwestern willow flycatcher and establish a new population of the threatened Pecos sunflower on the project site. The proposed project is partially funded by the Service's Management of Exotics for Recovery of Endangered Species (MERES) Program of the Middle Rio Grande Bosque Initiative and the NRCS Wetland Habitat Incentives Program. The approximate cost of this portion of the project is $500,000. One design alternative, the Proposed Action, and the No Action alternative were considered to meet the overall purpose and need of the project.

The project site currently represents an excellent opportunity for restoration without undue impacts to habitat for the Southwestern willow flycatcher. It is a patchwork of living and dead non-native saltcedar, and other native vegetation communities, recovering from the 2006 Bosquecito wildfire and a previous aerial herbicide treatment. If the Proposed Action did not occur, the majority of the site would be rapidly re-colonized by saltcedar. This would result in loss of the gain from the previous saltcedar control treatment, and more importantly, continued degradation of the remnant native vegetation and the re-establishment of the elevated fire risk associated with dense saltcedar infestations.

The following elements have been analyzed and would not be significantly affected by the planned action: land use, soils, air quality, noise levels, visual resources, water resources, socioeconomics, biological resources, special status species, Indian Trust Assets, recreation, cultural and historic resources, environmental justice, transportation and access. The planned action would result in only minor and temporary adverse impacts on land use, air quality, noise levels, native vegetation, soils, wildlife, and transportation resources during implementation.

The Clean Water Act (CWA) provides for the protection of waters and wetlands of the United States from impacts associated with discharges of dredged or fill material in aquatic habitats, including wetlands as defined under Section 404(b)(1). Consultation with the U.S. Army Corps of Engineers determined that no Section 404 permit is required for this project.

The planned action has been fully coordinated with Federal, State, and local governments with jurisdiction over the ecological, cultural, and hydrologic resources of the project area.

Based upon these factors and others discussed in the attached final *Rhodes Property Habitat Restoration Project Environment Assessment* (Keystone Associates, September 2007) (EA), the planned action would not have a significant effect on the human environment. Therefore, an Environmental Impact Statement will not be prepared for this project.

Public Comment

The draft *Rhodes Property Habitat Restoration Project Environment Assessment* was made available for public review from February 24 to March 26, 2007. Save Our Bosque Task Force media releases announcing the availability of the draft EA was sent to the two newspapers in the Socorro County area. The draft EA was available at the Socorro Libraries, upon request via e-mail, and posted at www.sobtf.org. A public meeting was also held in Socorro, NM on March 26, 2007.

Written comments were received from the Bureau of Land Management and electronic comments were received from the Middle Rio Grande Conservancy on the draft EA during the public review period. All comments were addressed in the final EA, which lists and responds to all issues, concerns and questions. The comments did not identify any significant new environmental impacts which were not addressed in the draft EA.

This FONSI, with its attached final EA, will be available at www.sobtf.org and www.fws.gov/southwest/es/NewMexico. All commenters on the draft EA will receive notice of this decision and information as to where it can be accessed.

Determination

It is my determination, based on information contained in the final EA, the proposal for habitat restoration on the Rhodes property is not a major Federal action that would significantly affect the quality of the human environment within the meaning of section 102(2)(c) of the National Environmental Policy Act of 1969 (as amended). Accordingly, the preparation of an EIS is not warranted.

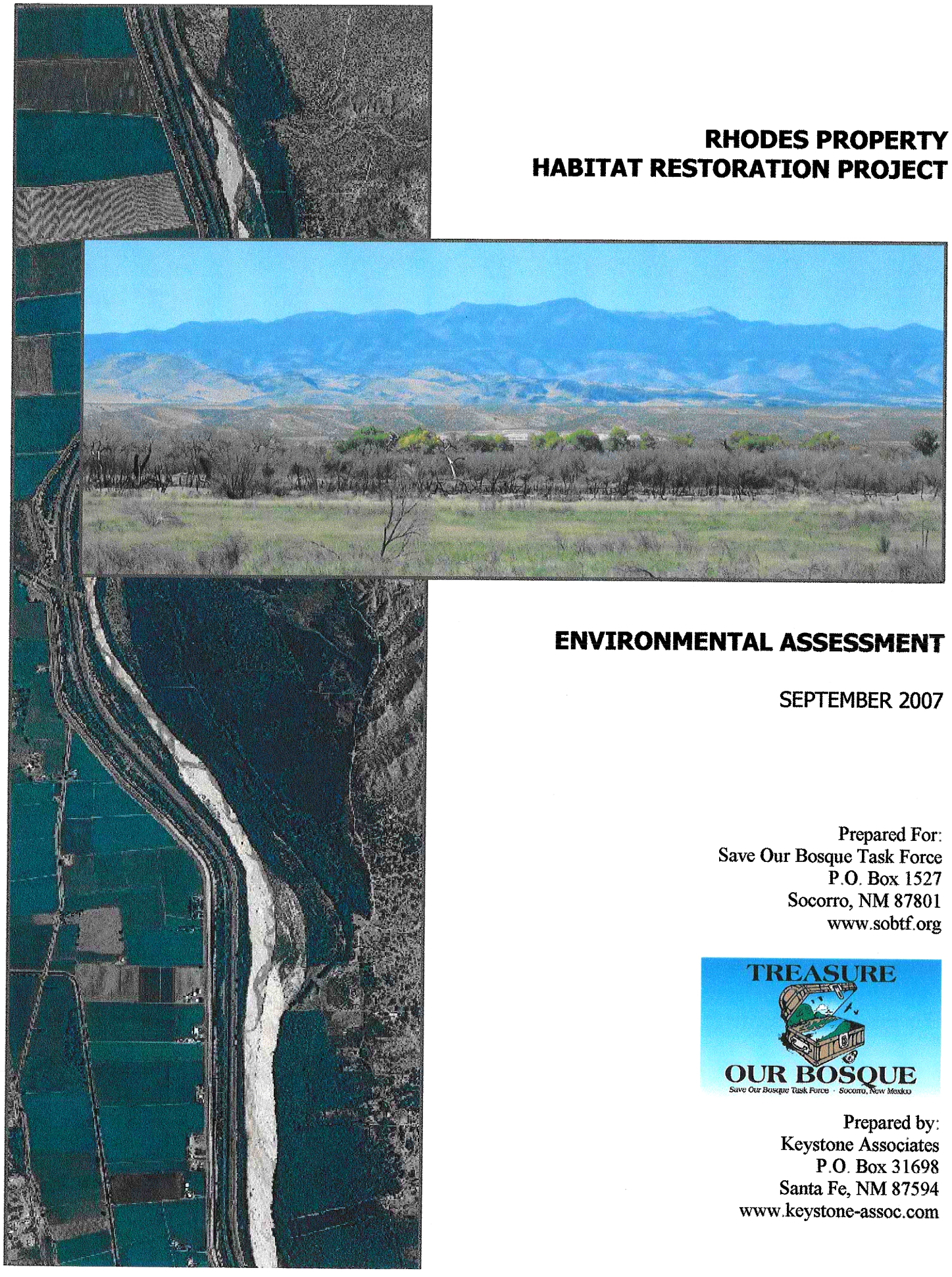
It is my decision to proceed with the preferred alternative for restoration of native cottonwood-willow habitat for the endangered Southwestern willow flycatcher and establishment of a new population of the threatened Pecos sunflower on the Rhodes property project site.

References

Keystone Associates, September 2007, Rhodes Property Habitat Restoration Project Environmental Assessment: prepared for the Save Our Bosque Task Force through a contract with the U.S. Fish and Wildlife Service (Grant Agreement 201816G938), 64 p.

Regional Director
Southwest Region
U.S. Fish and Wildlife Service

1/18/08
Date



RHODES PROPERTY
HABITAT RESTORATION PROJECT

ENVIRONMENTAL ASSESSMENT

SEPTEMBER 2007

Prepared For:
Save Our Bosque Task Force
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Socorro, NM 87801
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TREASURE OUR BOSQUE
Save Our Bosque Task Force · Socorro, New Mexico

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Prepared Under Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act, 40 CFR Parts 1500-1508 (as of July 1, 1986).

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ACRONYMS AND ABBREVIATIONS

BA – Biological Assessment
BLM – U.S. Bureau of Land Management
BMP – Best management practices
BOR – U.S. Bureau of Reclamation
°C – Degrees Celsius
Cfs – Cubic feet per second
Cm - centimeters
ESA – Endangered Species Act
ESRI – Environmental Systems Research Institute, Inc.
°F – Degrees Fahrenheit
ft - feet
GPS – Global Positioning System
GIS – Geographic Information System
Ha – hectares
Km – kilometers
M - meters
MERES – Management of Exotics for Recovery of Endangered Species – a program of the US Fish and Wildlife Service.
Mi – miles
Minnow – Rio Grande silvery minnow (*Hybognathus amarus)*
n – Sample size, i.e., if 100 persons participate in a medical experiment, n =100.
NPDES - National Pollutant Discharge Elimination System
PCEs – Primary constituent elements.
Ppm – Parts per million
FWS – U.S. Fish and Wildlife Service
NMDGF – New Mexico Department of Game and Fish
NRCS – U.S. Natural Resource Conservation Service
NWR – National Wildlife Refuge
SOBTF – Save Our Bosque Task Force
State – State of New Mexico Land Office
SWWF – Southwestern willow flycatcher
USGS – United States Geological Survey
UTM – Universal Transverse Mercator

1.0 INTRODUCTION

This Environmental Assessment (EA) describes proposed federal and nonfederal actions to be implemented by the U.S. Fish and Wildlife Service (FWS), Save Our Bosque Task Force (SOBTF), the U.S. Natural Resources Conservation Service (NRCS) and private property owners for the purpose of improving and restoring habitats. The majority of the project site is private property owned by the Rhodes family; small portions within the project area are owned by the BLM and State.

Funds from the U.S. Fish and Wildlife Service Management of Exotics for Recovery of Endangered Species (MERES) habitat restoration program, federal fiscal year 2006 would partially finance this project and constitute the federal nexus. FWS is the lead agency for this project; the NRCS is a cooperating agency. SOBTF would be responsible for administering the funds and for overall coordination of the project.

The proposed action would seek to improve and restore habitats through treating and removing exotic vegetation and restoring native vegetation; in particular, establishing a new population of the endangered Pecos sunflower (*Helianthus paradoxus*), and restoring Goodding willow (*Salix gooddingii*) vegetation of appropriate structure for nesting habitat for the Southwestern willow flycatcher (*Empidonax traillii extimus*). The project would also fence selected restored vegetation areas to exclude livestock, monitor the project outcomes, and based on that monitoring, continuing follow-up treatments of non-native vegetation as needed. This site-specific project is part of a larger regional bosque restoration initiative for which conceptual planning has already been completed (Tetra Tech, Inc., 2004a).

The project as described is a continuation of previous work on the same site, which included treatment of exotic vegetation, and is described in section 3.2 of this EA. The project design also has been influenced by the fact that much of the existing vegetation on the property was damaged or destroyed by the Bosquecito wildfire that occurred on the site in June 2006. As a result, the project offers an excellent opportunity to carry out restoration without undue impacts to existing vegetation and habitats.

Analysis of special status species is considered in a separate Biological Assessment.

1.1 Purpose and Need for Action

Need

The principal factor that has led to the current endangered status of the Southwestern willow flycatcher and the Pecos sunflower is a decrease in suitable habitat (U.S Fish and Wildlife, 1999b; U.S Fish and Wildlife, 2002; U.S Fish and Wildlife, 2005). In some cases, appropriate habitat areas have been converted to human use, and in other cases, they have been degraded by any or all of the following factors: fragmentation; invasion of nonnative vegetation; livestock impacts; lowering of water tables and subsequent changes in soil characteristics; other local and landscape scale factors. Remedying this lack of suitable habitat is the single most important factor in ensuring the long-term persistence of these species.

Unfortunately there are few sites at which new suitable and high-quality habitats for these species can be created. The same patterns of land and water rights ownership and use that created the lack of habitat, continue to work against restoration. Very few areas exist in which river flooding is possible, or in which sufficiently large patches of habitat exist to restore habitat appropriate for these endangered species. This project would directly address this lack of habitat and it is located on one of the few remaining and most ecologically valuable sites available for restoration.

Purpose

The purposes of this project are:

1. To help ensure the long-term persistence of the Southwestern willow flycatcher and Pecos sunflower by:
   a. Restoring willow and cottonwood-willow (*Populus deltoides* ssp.*wislizeni-Salix* spp.) habitat that would meet the specific habitat requirements of the Southwestern willow flycatcher and restore the conditions and processes that would support the long-term persistence of this habitat. This restoration of habitat would directly address the primary factor driving this species toward extinction.
   b. Establishing a new population of Pecos sunflower on the site as well as the conditions and processes that would support the long-term persistence of this population. This would broaden the distribution of the species and reduce its vulnerability to stochastic environmental events.
2. To restore the ecosystem composition, structure and function on the project site to the extent possible, within the constraints of current laws and infrastructure limitations.

Anticipated Environmental Benefits

The project is expected to result in the following benefits:

- Restoration of approximately 200 acres (81 ha) of native cottonwood-willow vegetation that would provide habitat for Southwestern willow flycatcher (SWWF) and other wildlife;
- Removal of exotic saltcedar that will:
  - reduce wildfire risk in the project vicinity thus protecting nearby vegetation and habitat, and reducing the risk of private property damage, and impacts associated with fire suppression;
  - facilitate overbank flooding onto the property, and consequent regeneration of native vegetation, thus improving habitat for many species and decreasing vegetation-related water consumption;
  - allow river banks to deform in a manner more consistent with historic processes.
- Establishment of a new population of Pecos sunflower that would provide help ensure overall species persistence;
- Restoration of the currently degraded saltgrass meadow/wetland area would contribute to regional habitat diversity and integrity, and provide additional habitat for wetland obligate or facultative species that reside in or migrate through the area.

1.2 Project Background

1.2.1 Location

The proposed project would be implemented on a site consisting of approximately 549 acres (222 ha) in Socorro County, New Mexico. The property is located within the active floodplain of the eastern side of the Rio Grande, and includes approximately 2 miles of river frontage. It is located immediately north of the village of Bosquecito on Bosquecito Road and approximately 8 miles north of the Bosque del Apache National Wildlife Refuge (Figure 1). There are a number of private inholdings, one State of New Mexico parcel, and one U.S. Government (BLM) parcel either within or at the boundary of the project area. No work will be done on these private or government parcels without the express consent of those individuals or entities. At the time of the writing of this final Environmental Assessment, an updated survey was not completed. No work will commence until that survey is complete.

1.2.2 Project Proponents

The proposed project would be carried out collaboratively by:

- U.S. Fish and Wildlife Service, which is providing project funding through the MERES Program;
- the Rhodes family which currently owns the majority of the project site;
- the BLM and State, which each own smaller portions of the site;
- NRCS, which expects to hold a conservation easement on the Rhodes portion of the site;

- and the SOBTF.

SOBTF is a nonprofit organization founded in 1993 with the mission to "work to preserve, protect, and enhance the Rio Grande and its adjoining riparian area (bosque, wetlands, grasslands) while respecting the customs and cultures of the residents of Socorro County to provide for public recreation, allow for historical resource use, and plan for public safety, all within the confines of current infrastructure and political limitations" (Save Our Bosque Task Force website. www.sobtf.org).

The SOBTF is composed of but not limited to the following agencies and organizations:
- New Mexico State Forestry
- Middle Rio Grande Conservancy District
- County of Socorro
- City of Socorro
- Natural Resources Conservation Service
- U.S. Bureau of Reclamation
- U.S. Bureau of Land Management
- U.S. Fish and Wildlife Service
- Sevilleta National Wildlife Refuge
- Bosque del Apache National Wildlife Refuge
- Socorro Soil and Water Conservation District
- Socorro Chamber of Commerce
- Private citizens and landowners

1.2.3 Regulatory Compliance

This Environmental Assessment (EA) was prepared by Keystone Associates Environmental Consultants on behalf of the project proponents and in compliance with all applicable Federal statutes, regulations, and Executive Orders, including the following:
- American Indian Religious Freedom Act of 1978 (42 U.S.C. 1996)
- Archaeological Resources Protection Act of 1979 (16 U.S.C. 470)
- Clean Air Act of 1972, as amended (42 U.S.C. 7401 *et seq.*)
- Clean Water Act of 1972, as amended (33 U.S.C. 1251 *et seq.*)
- Endangered Species Act of 1973, (ESA) as amended (16 U.S.C. 1531 *et seq.*)
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low Income Populations, 1994.
- Fish and Wildlife Coordination Act of 1958, as amended (16 U.S.C. 661 *et seq.*)
- Floodplain Management (Executive Order 11988)
- National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S.C. 4321 *et seq.*)
- Regulations for Implementing the Procedural Provisions of NEPA (40 CFR 1500 *et seq.*)
- National Historic Preservation Act of 1966, as amended (16 U.S.C. 470 *et seq.*)
- Native American Graves Protection and Repatriation Act of 1990 (25 U.S.C. 3001 *et seq.*)
- Protection and Enhancement of the Cultural Environment (Executive Order 11593)
- Protection of Wetlands (Executive Order 11990)
- National Pollutant Discharge Elimination System, as amended (33 U.S.C. 1251 *et seq.*)
- The approved Resource Management Plan (Socorro Resource Management Plan FEIS; BLM-NM-PT-89-021-4410) for the public lands administered by the Bureau of Land Management as required by 43 CFR 1610.5.

This EA does not rely on or tier from any previous NEPA analyses. It reflects compliance with all applicable State of New Mexico and local regulations, statutes, policies, and standards for conserving the environment and environmental resources such as water and air quality, endangered plants and animals, and cultural resources.

A separate Biological Assessment was prepared for this proposed action in compliance with the Endangered Species Act and is incorporated by reference.

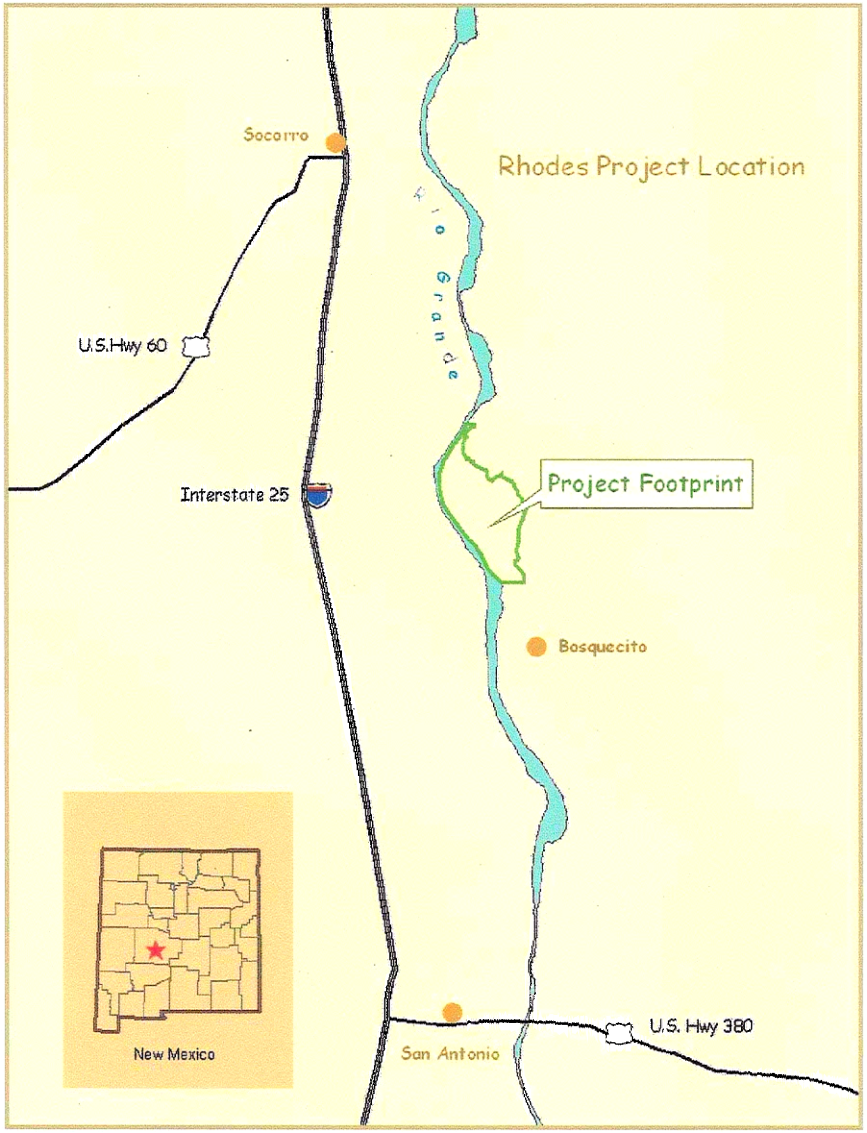

Figure 1. Overview location of project

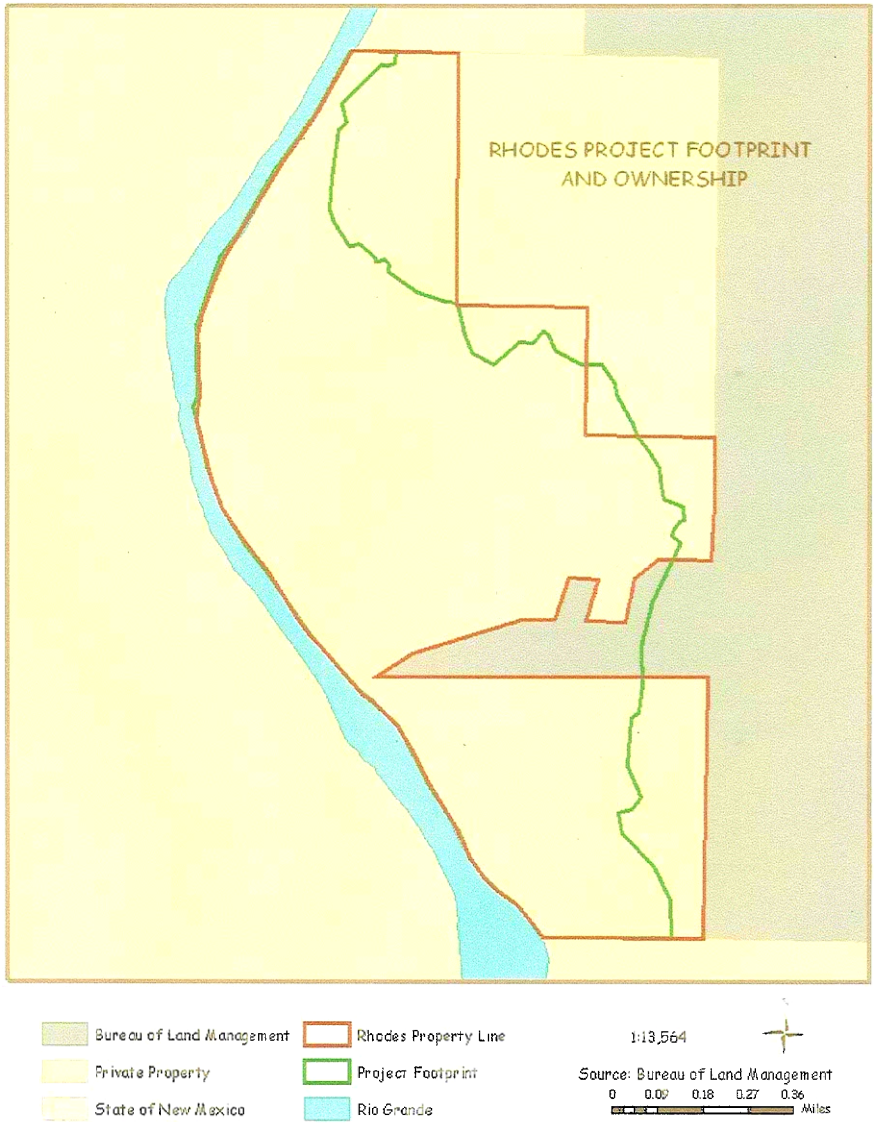

Figure 2. Land ownership within project footprint

2.0 PROPOSED ACTION AND ALTERNATIVE

There are two alternatives described and analyzed in this EA. Alternative 1 is the No Action Alternative, which is based on maintaining all current conditions and management actions in their current state. Alternative 2 is the proposed Action Alternative which would carry out restoration activities on the project site.

2.1 Alternative 1. No Action

The No Action Alternative would provide no Federal funding for restoration efforts at this location. Under this scenario, very limited anthropogenic actions would occur. Follow-up action to the 2003 aerial herbicide treatment would not occur. Nonnative vegetation control, fencing, restoration planting would not occur.

The current practices of livestock and honey production would likely continue, along with associated management tasks.

Current ecosystem disturbance patterns and trends in vegetation and fire regime would remain intact.

2.2 Alternative 2. Proposed Action

This proposed project would be part of a regional initiative to restore the form and function of the Middle Rio Grande bosque that has been undertaken by the SOBTF. In 2004, the SOBTF completed *The Conceptual Restoration Plan for the Active Floodplain of the Rio Grande, San Acacia to San Marcial, NM* (Tetra Tech, Inc., 2004a). That document describes the current status of the Middle Rio Grande and its associated floodplain and bosque, and a conceptual plan for restoring the area to the best possible ecosystem function, within the limits of current laws, infrastructure, and other constraints. For the site that is the subject of this current proposed project, the Conceptual Restoration Plan recommends: 1) removal and control of exotic vegetation over the entire site; 2) removal of exotic vegetation on a portion of the river bank to permit natural channel evolution; and 3) enhancement of the existing wetlands. These are the activities proposed in this current project.

The overarching goals of the project are to improve the ecosystem integrity within the project footprint by shifting conditions to more nearly match those that historically existed there and restore or partially restore the ecosystem processes that maintain those conditions. The project consists of four general phases, although activities in any one phase may overlap those of other phases:

1. Preproject implementation activities – mapping and information gathering;
2. Control of nonnative vegetation – this is a key phase in that it would lay the critical foundation for the restoration activities in phase 3. A menu of treatment options to control nonnative vegetation is detailed in section 2.2.4 to ensure the greatest possible success. "Menu" is an appropriate term here, since not all techniques would be applied uniformly over this large and variable project site. The menu approach is designed to allow for great flexibility in selecting techniques that are appropriate for differing vegetation communities, levels of infestation, soil conditions and other factors. Appendix D, *New Mexico Options for Non-native Phreatophyte Control,* is attached. This document provides detailed descriptions and photographs of the techniques that may be used in various combinations for vegetation control.

   Vegetation would be removed from the bankline on a portion of the site, which would facilitate overbank flooding and deformation of the bank, when conditions permit. Overbank flooding would be necessary for the regeneration of native vegetation, and especially for cottonwoods, on the site.
3. Restoration of native vegetation – Once nonnative vegetation is controlled, active restoration of willows and Pecos sunflower in the form of seeding establishment would occur. These plantings

would be protected from grazing and trampling effects by the installation of wildlife-friendly fencing. Passive restoration of cottonwoods and other native vegetation is expected to proceed from the restoration of overbank flooding, noted in Phase 2.

4. Monitoring and follow-up activities. Methods would be followed and evaluated for success, and based on these monitoring results, continuing follow-up treatments of non-native vegetation would be implemented as needed to maintain the value of the restored habitat areas.

This proposed project is a critical next phase of restoration activities that were initiated in 2003, as a separate project. The 2003 project consisted of aerial herbicide spray treatment of 197 acres (80 ha) within the project footprint. That treatment was the first step in controlling the large monotypic tracts of saltcedar present on the property, but required that the saltcedar with its herbicide treatment be left standing in place for a period of three years for greatest efficacy. This waiting period has now been completed; timely follow-up in the form of additional saltcedar control and revegetation is critical and forms the bulk of the project activities.

The techniques proposed consider and compliment the impacts of the June 2006 Bosquecito fire that occurred on the property. As a result of this fire, the project footprint offers a very attractive opportunity for restoration, as it largely avoids impacting intact critical habitat for the Southwestern willow flycatcher. Both the previous restoration activities and fire are discussed in section 3.2 and illustrated in Figures 4 and 5.

As of the date of this BA, the property owners are considering placing a conservation easement on the property under the NRCS wetland reserve program. The terms and conditions of the easement are not finalized. NRCS would assume responsibility for long-term control of nonnative vegetation on properties that it has under easement (personal communication between Marcus Miller and Keystone Associates, 11/28/2006).

The project activities are summarized below in Table 1 of section 2.2.3 and indicate the zones of the project footprint in which activities would be conducted and the specific restoration objective sought. Zones within the project are depicted in Figures 3 and 4. Detailed descriptions of the project activities are found in Table 2 in section 2.2.4. Sections 2.2.5 and 2.2.6 contain impact avoidance and minimization measures, and conservation measures, respectively. These measures are an integral part of the project design.

2.2.1 Project Timeline

The project covers a total of six federal fiscal years, beginning October 1, 2006 and ending September 20, 2012 and are dependent on available funding for completion.
Project year 1 = October 1, 2006 – September 30, 2007
Project year 2 = October 1, 2007 – September 30, 2008
Project year 3 = October 1, 2008 – September 30, 2009
Project year 4 = October 1, 2009 – September 30, 2010
Project year 5 = October 1, 2010 – September 30, 2011
Project year 6 = October 1, 2011 – September 30, 2012

2.2.2 Project Footprint, Activity Zones, and Restoration Objectives by Zone

For the purposes of this document, the "footprint" of the project is defined as the area in which *all* project activities would occur. The footprint is defined by, and therefore is located entirely within the active floodplain of the eastern side of the Rio Grande. The footprint includes approximately 2 miles of river frontage. For the maps in this document, the western boundary of the footprint is the eastern edge of active channel of the Rio Grande. The eastern boundary of the footprint was delineated from the historic

floodplain data from the University of New Mexico Resource Geographic Information System (http://:rgis.unm.edu) and borders state and federal lands. The north and south boundaries are defined by the north and south boundaries of the Rhodes private property. The footprint consists of 549 acres (222 hectares). Of this, 506 acres (205 hectares) are private property; 37 acres (15 hectares) are BLM land and 6 acres (2.4 hectares) are State land.

Although all project activities would occur within the footprint, they would not all occur uniformly over the entire area of the footprint. Some are limited to defined zones, while others would be applied in a patchy fashion across the entire footprint.

Footprint and zone boundaries were defined using the following:

- Photo interpretation of 2005 USGS digital orthophoto quarter quadrangles;
- Digital versions of the public land survey system and surface land ownership developed by the New Mexico office of the Bureau of Land Management;
- A 1979 survey of the Rhodes property.

Footprint and zone acreages were calculated with ERSI Inc., ArcGis 9.1 software. All acreages are approximate.

2.2.3 Restoration Objectives by Project Activity Zone

Table 2 describes the project footprint, the zones of activities within the project footprint, and the various restoration objectives that apply to each defined zone.

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Table 1. Restoration objectives by project zone.

Project Footprint	**Restoration Objectives for Entire Footprint**	
Project Footprint – Full spatial extent of all project activities. 548.5 acres (222 ha)	▪ ***Gain initial control and maintain control of nonnative vegetation (548.5 acres treated over life of project)*** ▪ ***Via control of nonnative vegetation, establish conditions that foster bank deformation and overbank flooding when flow conditions permit (entire bankline within project area over life of project)*** ▪ ***Re-establish native vegetation - saltgrass meadow, Pecos sunflower, Goodding willow, cottonwood/willow community or appropriate other native vegetation (548.5 acres treated over life of project)***	
Limited **Activity Zones within Project Footprint**	**Additional Restoration Objectives for Limited Activity Zones**	
Habitat Zone X 16 acres (6.5 ha)	▪ ***No net loss of SWWF habitat during project***	
	Area within the project footprint that currently contains useable, but ***essentially 100% nonnative***, habitat for the SWWF.	Treatments to gain control of nonnative vegetation would not occur in these areas until and unless replacement habitat is created elsewhere in the project footprint.
Habitat Zone Z 30.5 acres (12.3 ha)	Area within the Project Footprint that currently contains useable ***mixed native-nonnative*** habitat for the SWWF.	Treatments in this area would be limited to hand mechanical and hand application of herbicides to preserve this zone as intact habitat throughout the duration of the project.

Special **Activity Zones within Project Footprint**	**Additional Restoration Objectives for Special Activity Zones**	
Zone 1A 112 acres (45.3 ha)	▪ ***Establish a new viable population of Pecos sunflower over extent of current saltgrass meadow*** ▪ ***Expand saltgrass meadow***	
	Zone currently contains degraded saltgrass meadow.	Pecos sunflower would be planted over zone extent.
Zone 1B 26 acres (10.5 ha)	Zone currently contains mixed vegetation.	No planting or other manipulation. Pecos sunflower and/or saltgrass meadow is expected to naturally expand into this area as soil and moisture conditions permit.
Zones 2A, B, C (north to south) 80 acres (32.4 ha) total.	▪ ***Establish Southwestern willow flycatcher habitat***	
	Zones currently are essentially barren of vegetation after Bosquecito wildfire.	Zone 2A – First of three Goodding willow restoration zones for flycatcher habitat. Plantings winter-spring 2007-8. Zone 2B – Second of three willow restoration zones. Plantings winter-spring 2008-9 Zone 2C – Third of three willow restoration zones. Plantings winter-spring 2009-10.

* All zone boundaries and calculated acreages are approximate

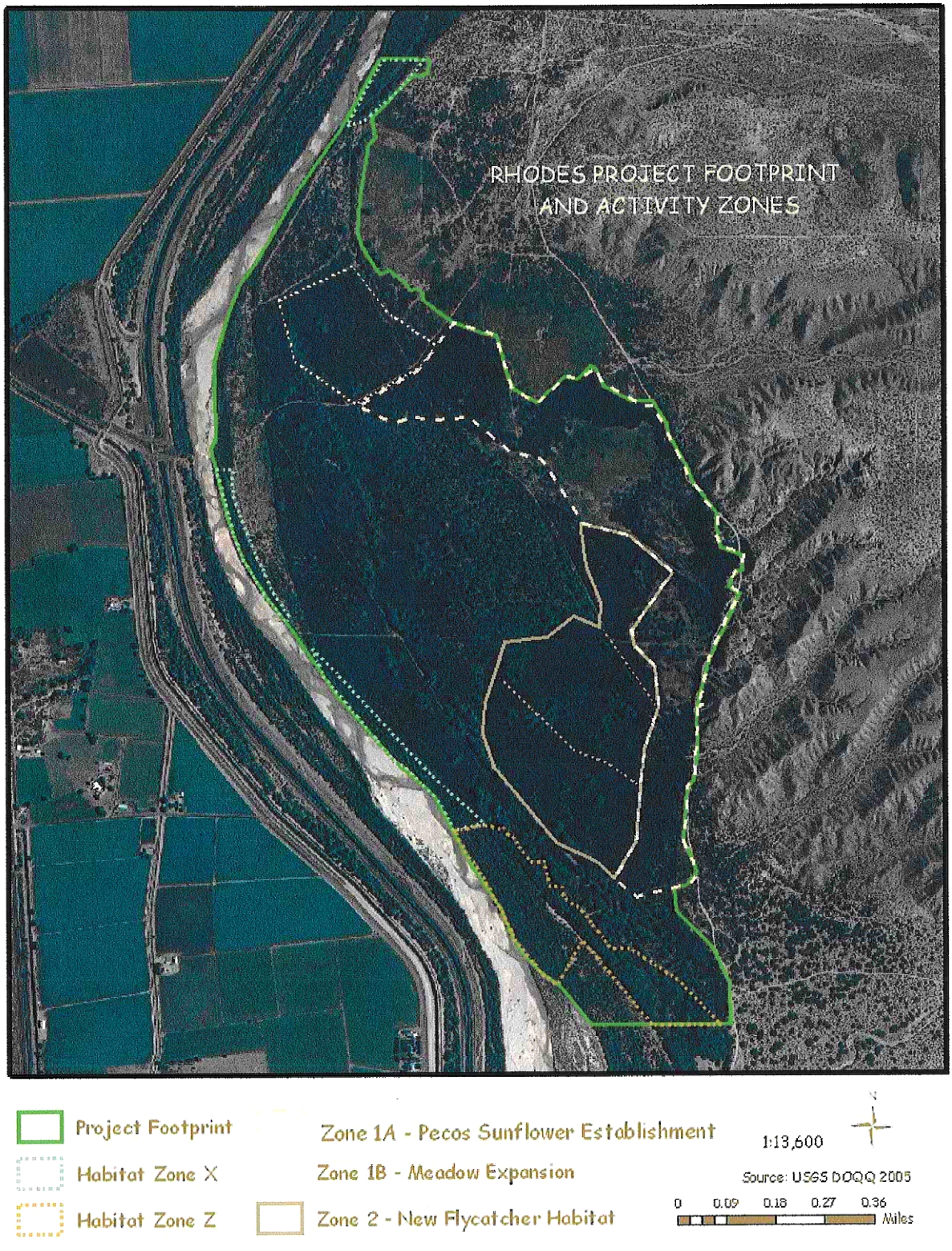

Figure 3. Activity zones in project footprint. This 2005 aerial photography postdates the aerial herbicide treatment but predates the 2006 Bosquecito fire.

2.2.4 Detailed Project Activities, Methods, and Timelines.

The project is divided into four phases, each of which is detailed in the table below. Table 2 details the activities that would accomplish the restoration objectives. Each of these is described by the area(s) in which it would be applied, the timing of the activity, and the methodology.

Table 2. Detailed Project Activities

Phase 1 – Preproject Implementation Activities	
Activity 1. Soil, vegetation, and topographic mapping	ocation: Project footprint Timeline: Spring 2007 Methods: Contractors would be hired to map: 1) soil chemistry and texture; 2) vegetation and 3) topography. All mapping would be done by small crews of personnel on foot. Results of this mapping would be used to inform later decisions on nonnative vegetation treatments, native vegetation planting techniques, and types of equipment that are suitable for use on the site.
Activity 2. Groundwater monitoring well installation.	Location: Project footprint Timeline: Spring 2007 Methods: No more than 6 wells would be established on the project footprint; one well per plant community. Specific sites would be selected as the project is implemented. 2-in (5 cm) PVC pipe piezometers would be established to a depth of 10 ft (3 m) below groundwater table at the time of establishment. These would be screened for a depth of 10 ft (3m). They would be installed using a hand auger or an auger rig similar to that used for pole planting (Activity 9).

Phase 2 – Treat Nonnative Vegetation; Prepare Site for Habitat Restoration	
Assess infestation of nonnative vegetation.	Location: Project footprint Timeline: The activity would begin no sooner than April 1, 2007. The activity is expected to be ongoing throughout the duration of the project. Methods: The entire project footprint would be visually assessed in an informal manner, in order to determine the presence and density of various nonnative species including but not limited to saltcedar (*Tamarix* spp.) and Russian olive (*Elaeagnus angustifolia*) which are expected to be the dominant nonnatives. Based on the results of this assessment, combined with the information from the earlier assessments (soil mapping, topographic mapping, etc.), methods for treatment of nonnative vegetation would be selected and implemented that are appropriate to the specific conditions occurring within various vegetation types, soil types, and other current conditions e.g., moisture. The visual assessment would be completed by personnel on foot or driving light utility vehicles.
Activity 4. Mechanical treatment of nonnative vegetation.	Location: Project footprint, except Habitat Zone X. (This zone to be treated later, only if replacement habitat has been created. See Activity 12.) Habitat Zone Z would be limited to Treatment Method 3, Hand Mechanical Clearing. Timeline: The first round of treatment would start no earlier than September 1, 2007 and would be completed no later than April 15, 2008. Subsequent rounds would be completed within the same time window of each of the next 4 years, as needed, based on the ongoing assessment in Activity 3. Methods: This activity is a follow-up from, and builds on, the aerial herbicide spraying of nonnative vegetation completed on the property in 2003. This activity would be fully coordinated with Activity 6 (herbicide treatment) to maximize effective control of nonnative vegetation. A contractor would be hired to perform this work. The contract would specify the techniques and precautions listed below and in the sections 2.2.5 (impact avoidance and minimization measures) and in 2.4.6 (conservation measures). The menu of potential treatment methods is briefly described below. Photos and more detailed descriptions of the methods can be found in Appendix D. The results of Activity 3 would inform the selection of a treatment method from this menu at various times during the project and over the variety of microsites found within the project footprint. A treatment method would be selected on a site by site basis across the activity area that is deemed the most effective and appropriate treatment based on the specific nonnative species, the abundance, density, or life stage of the nonnative species, the presence of native vegetation intermixed with nonnative, soil type and moisture conditions and other

Phase 2 – Treat Nonnative Vegetation; Prepare Site for Habitat Restoration	
Activity 4 Continued	conditions existing at the time. For all methods below, all equipment would enter site on existing unpaved road and park at existing property work center. Most cottonwood trees that do not recover from fire impacts would be left in place to form snags, or fall as large debris; a few would be removed for worker safety. Treatment Method 1. Mastication and mulching. This method would be utilized in areas where the water table is sufficiently low to allow for heavy equipment without soil impacts and in the following conditions: 1) Where there are monotypic stands of dead saltcedar and other nonnative vegetation remaining from previous aerial herbicide treatment; 2) Where there are debris piles of dead nonnative and/or native vegetation remaining from previous wildfire suppression efforts. Technique: A trackhoe and chipper or other mastication equipment (see Appendix D) would move through vegetation, pulling plant biomass into equipment, grinding it into small pieces and expelling these chips from the equipment onto the surrounding ground. Chips would be evenly spread in the area to a depth no greater than 4 in (10 cm) over mineral soil. Contractor would use a low ground disturbance vehicle, preferably tracked. Treatment Method 2. Rootplowing and raking. This method would be utilized in areas where soils are not wet or easily compactable and in the following conditions: 1) Where there is moderate root-sprouting from live roots of saltcedar. 2) Along bank (but above high water mark) of project footprint outside of Habitat Zones X and Z to remove roots that are currently stabilizing bank. Technique: Roots remaining after mastication would be rootplowed and raked (see Appendix D) 2 times in opposite directions each to extract the salt cedar rootball (located an average of 18 in (46 cm) below soil surface). The resulting rootballs and above ground brush would then piled and burned under prescription (Activity 5) to minimize sprouting from root pieces. Contractor would use a low ground disturbance vehicle, preferably tracked. Treatment Method 3. Hand mechanical clearing, mulching. This method would be utilized in areas of: 1) Standing water, wet or compactable soils, or other areas where heavier mechanical work is inappropriate for all types of nonnative vegetation, dead standing, live, dense or sparse infestations, or; 2) Areas of dry or noncompactable soils, but which host low-density nonnative vegetation, or mixed saltcedar-

Phase 2 – Treat Nonnative Vegetation; Prepare Site for Habitat Restoration	
	native vegetation, or other mixed nonnative-native vegetation, (e.g. areas of mixed xeric shrub and saltcedar). Because these nonnative species are present at low densities, they would be removed carefully in order to prevent increases in their abundance and while maintaining intact the native vegetation. No live native vegetation would be intentionally removed; minor amounts may be removed incidental to removal of nonnative vegetation; 3) Areas where safety concerns for personnel and equipment preclude the use of larger vehicles or equipment; 4) Habitat Zone Z would be treated exclusively with this method in order to maintain the maximum possible native vegetation present. In addition, all work would be conducted outside of the SWWF migratory and breeding seasons. Technique: Personnel crews with chain saws and/or other hand tools would cut individual saltcedar trees. The resulting debris would be either chipped in place using light utility vehicles with attached small chippers, or hauled from the area using light utility vehicles for chipping elsewhere on the site, via Treatment Method 1. All chipping products would be spread evenly over the site to a depth no greater than 4" above mineral soil.
Activity 5. Prescribed Burning	Location: Project footprint, except Habitat Zones X and Z, but limited to areas at least 50 feet (15 m)from live vegetation. Timeline: Would potentially occur in any project year between August 15 and April 15. Methods: Prescribed burning would be utilized to reduce or eliminate above ground biomass or root tissues of nonnative vegetation when conditions indicate that mulching is ineffective, or is inappropriate because it would promote undesirable vegetative propagation or other secondary effects. For details of burning prescription, see Appendix A.
Activity 6. Herbicide Treatment	Location: Project footprint, except habitat zones X. (These zones to be treated later, contingent upon fulfillment of conditions specified in Activity 12.) This activity would take place in: 1) Areas that are inappropriate for the initial mechanical treatment (Activity 4) for the purpose of initial control of nonnative vegetation; 2) Over the entire project footprint, as needed, for the purpose of maintenance control of nonnative vegetation, both resprouts, and new infestations, following initial mechanical treatment. This activity is a follow-up and builds on both the aerial herbicide spraying of nonnative vegetation completed on the property in 2003 and the initial mechanical treatment described in Activity 4. All activity would be coordinated with Activities 3 and 4 to maximize effectiveness of control measures.

Phase 2 – Treat Nonnative Vegetation; Prepare Site for Habitat Restoration	
Activity 6, Herbicide Treatment, Continued	Timeline: Starts after August 15, 2007, continues throughout duration of project. Vehicles would be used as part of application or transportation related support for application only between August 15 and April 15 each year. In the event that control measures need to be applied during a specific life stage of a nonnative plant that falls within flycatcher breeding season, only back pack sprayers may be utilized (no vehicles). *However, no treatment of any type would occur in Habitat Zones X and Z, or in any area in which SWWF are detected during the annual surveys required by the conservation measures, or in a 0.25 mile buffer established around these zones and areas, between April 15 and August 15 of each year.* To the extent possible, but in compliance with the above paragraph, when performed as a follow-up to previous mechanical clearing (Activity 4) a first treatment would occur approximately 6 months after the mechanical work, and a second treatment approximately 12 months after the mechanical treatment. Methods: The results of Activities 3 and 4 would inform the need for treatment at various times and over the variety of microsites found within the project footprint. A treatment product would be selected that is deemed the most effective and appropriate treatment based on the specific nonnative species, the abundance, density, or life stage of the nonnative species, the proximity to sensitive species or habitats, and the conditions existing from site to site within the project footprint. <u>Treatment method 4. Hand spraying</u> This method would be utilized in: 1) Initial nonnative vegetation treatment in areas of standing water, wet soils, sensitive vegetation or other areas that are inappropriate for heavy equipment mechanical clearing or hand mechanical clearing as described in Activity 4, but which contain nonnative vegetation. 2) Follow-up treatment over the project footprint, as needed, to control resprouting of vegetation previously treated via mechanical or aerial herbicide spray. The area that received aerially herbicide spraying in 2003 will be a priority. Technique: Herbicide application would be done via hand spraying, using a 75/25 mix Garlon 4 and vegetable oil or Habitat –vegetable oil mix, per the Herbicide Prescription (Appendix B) with the mix applied within 6 in (15 cm) of the ground. Sprouts and new infestations would be left standing to decay in place. See Appendix B for full herbicide application prescription.

Phase 2 – Treat Nonnative Vegetation; Prepare Site for Habitat Restoration	
Activity 7. Install protective fencing	Location: The perimeter of the combined area of zones 1A, B and zones 2A, B. When funding is obtained, remainder of floodplain would also be fenced. Timeline: Construction of fence shall be completed by a contractor. The contract would specify that the work comply with the following: ▪ Work would begin no earlier than August 15, 2007 (after the expiration of the current grazing lease, and completion of the flycatcher 2007 nesting season). ▪ Work would be completed no later than April 14, 2008, the start of the next flycatcher nesting season. Fencing of footprint must be completed prior to initiation of meadow restoration/Pecos sunflower establishment in the spring of 2008, to ensure wandering livestock are excluded and cannot browse or trample newly established vegetation. Methods: All fencing shall be constructed to exclude domestic livestock but allow the passage of wildlife. The fencing contract would specify the following construction materials and methods: ▪ Fencing would be constructed of metal posts with metal H-braces on line (every 50 yards) and at corners where needed. In areas where there is subsurface or standing water, posts would be placed every 12 ft (3.7 m). In areas that do no have sub-surface of standing water, they would be placed every 15 ft (4.6 m) ▪ In areas of dry soil, posts would be pounded with a tractor-mounted pounding attachment. In areas of wet soils or those subject to compaction, posts and holes would dug and/or pounded with hand tools. ▪ Fence wire would be two strands of slick wire and two strands of 2-point barbed wire. These shall be placed with the slick wire on the top and bottom and barbed wire in the middle. Metal stays would be placed as needed, with at least 1 per span. The bottom wire shall be at a height of 16 in (from the ground, which would allow the passage of small to mid-size animals underneath. The middle two strands shall be barbed wire at 24" and 32" from the ground. The top strand height shall not exceed 40 in above ground level. Some variation in the measurement of heights from the ground is unavoidable due to ground surface variation. Wire strands would be installed with hand tools. Metal gates would be installed where practical and necessary.

Phase 3 – Restore Southwestern Willow Flycatcher Habitat and And Establish Pecos Sunflower Population	
Activity 8. Establish Pecos sunflower population in existing saltgrass meadow.	Location: Zone 1. Seeding would occur over the entire area of zone 1. Timeline: Project year 2 (spring 2008) and project year 3 (spring 2009). All on-the-ground activity to be completed each year prior to April 15th. Methods: Harvesting of sunflower seeds will occur offsite in the fall of 2007 and fall of 2008. The expected seed source would be the New Mexico Department of Game and Fish. Seeding techniques shall include both hand broadcast and light mechanized seeding; seed to be placed around the perimeter of saltgrass areas where the topography slopes slightly upwards.
Activity 9. Southwestern Willow Flycatcher habitat /Gooding willow restoration.	Location: Zone 2A. Timeline: This activity would continue over 3 years, starting in project year 2 (winter and spring 2007-2008). Willow poles would be planted between the months of January 1st and March 15th. All field work to be completed prior to April 15th. Methods: Planting is staggered over project years to establish different age classes. Goodding willow would be pole planted. The plantings would consist of approximately 4 patches of 2 acres (0.8 ha) each. 6-in diameter (15.2 cm) holes would be drilled to a depth of at least 1 ft (30.5 cm) below the water table in a clumped pattern with eventual density to be 600-800 poles/acre. This work would be done with either: 1) hand-held auger or auger mounted on the back of a Bobcat light utility vehicle, or similar vehicle. Willow poles would be planted in these clumps to re-establish the willow clumps found along the river in natural environments. The first year, plantings would employ swale and trench plantings to evaluate these techniques for potential use the following year. Both techniques include only minimal localized and shallow disturbance of the soil surface. Location: Zone 2B Timeline: Project year 3 (winter 2008-9 and spring 2009) Methods: Results from the previous year's plantings would be assessed for success. Whichever method used in zone 2A- trench or swale planting- that demonstrated the best results relative to the type of conditions found in zone 2B, would be repeated in this year. All other methods described in for first year planting would remain the same for this activity. Location: Zone 2C Timeline: Project year 4 (winter 2009-2010 and spring 2010) Methods: Results from the previous 2 years of plantings would be assessed for success. Method(s) that have demonstrated the best results would be used in Zone 2C. All other methods described in the first year planting would remain the same.

Phase 4 – Maintenance of nonnative plant control, Assess restoration success, final nonnative plant control	
Activity 10. Monitoring of outcomes	Location: Project footprint. Timeline: Activity would begin fall of 2006 and continue throughout project. All field work to be completed between August 15 and April 15th, in each year. Methods: This monitoring would assess the success of treatments and restoration activities. Monitoring would be conducted by personnel teams on foot or in small vehicles on existing unpaved roads. Any monitoring activities conducted during SWWF nesting season would conform to accepted protocols to avoid disturbance.
Activity 11. Modify treatments based on monitoring results	Location: Project footprint Timeline: Activity would begin approximately 6 months after initiation of Activity 4. Methods: Based on results of monitoring, project activities would be assessed and modified. No methods would be employed that have not been analyzed in this document. Modifications would be limited to combining methods, changing the order or timing of methods, eliminating methods, minor modifications in method implementation.
Activity 12. Treatment of nonnative vegetation in SWWF Habitat Zone X.	Location: Habitat Zone X. Timeline: Estimated October 1, 2011 – April 1, 2012. ▪ Habitat Zone X would be treated only ***after*** replacement nesting/foraging/migratory habitat has been established in Zones 2A, B, C. Methods: All treatment methods and decision criteria from Activities 3, 4, 5 and 6 would be utilized.

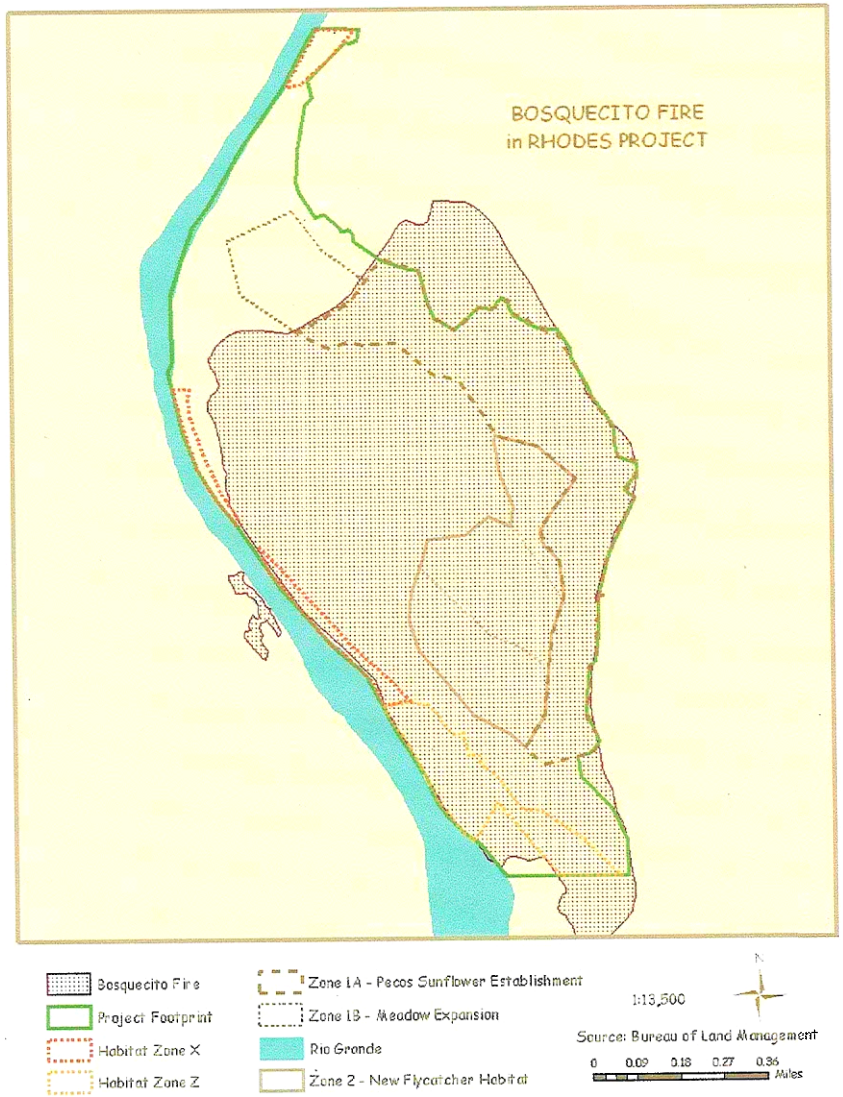

Figure 4. Area of 2006 Bosquecito fire overlaid with project zones.

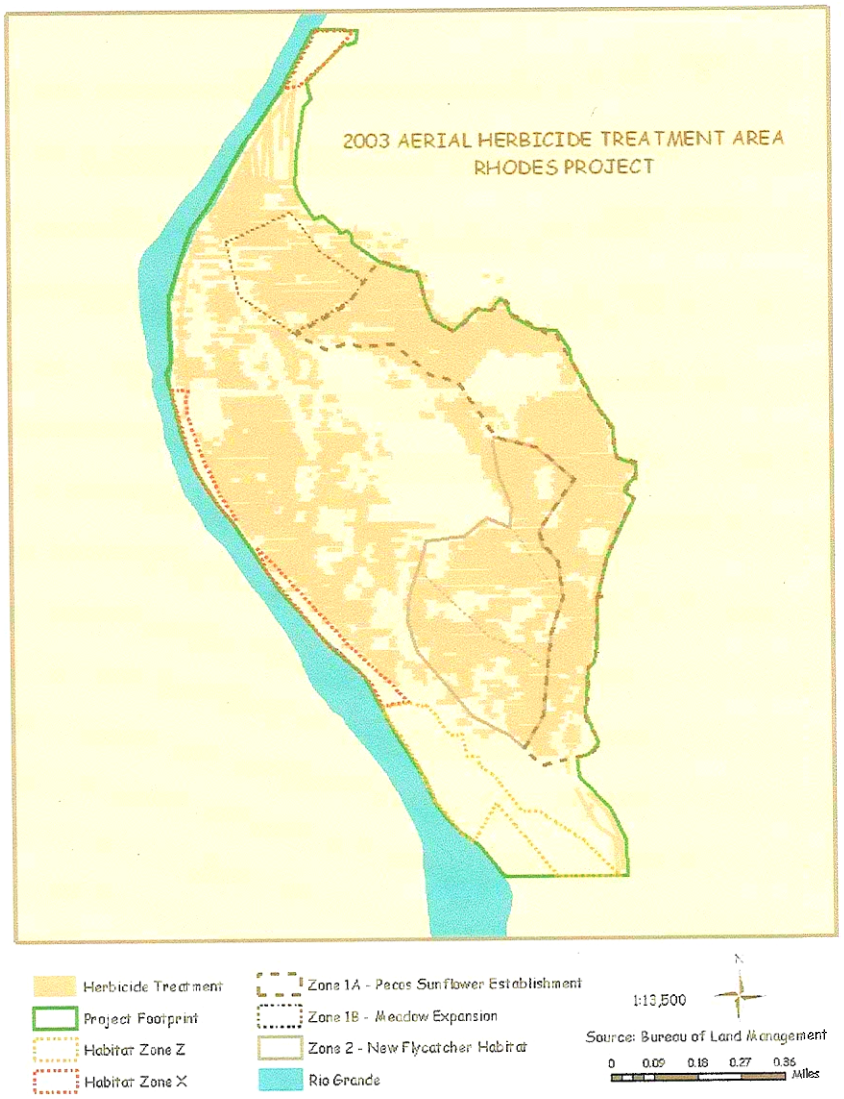

Figure 5. Area of 2003 herbicide treatment overlaid with project zones..

2.2.5 Impact Avoidance and Minimization Measures

General Construction Activities

- Equipment access to the work site must be done using existing roads to the extent possible.
- No vehicles may be parked on public roads at any time to ensure roadways are open for emergency vehicles and law enforcement.
- Construction and maintenance materials will be prevented from entering the river channel and any other standing water, or sensitive area.
- Any gates on the property will be locked or otherwise secured, as requested by the property owners, after completion of each day's activities.
- Outside areas of planned nonnative vegetation treatment, all other soil disturbance will be minimized and native vegetation will be retained.
- Contractors shall observe a 15-mph speed limit on access roads and yield to all public road users.

Procedures for Toxic Materials including Herbicides, and Spills

- The project proponents and contractors will prepare a spill prevention and response plan that regulates the use of hazardous and toxic materials, including petroleum-based vehicle fuels, lubricants for construction equipment, and herbicides. The plan will be incorporated into all relevant contracts, and kept readily available for contractor use in a prominent location. The plan will include the following provisions, at a minimum:
  - Workers will be trained in advance to monitor for spills, avoid spills, and correctly manage spills.
  - A list of emergency phone numbers and contact people will be readily available to workers at all times.
  - Emergency spill control kits appropriate for the types of chemicals utilized in the project will be kept readily available to workers at all times.
  - Vehicle and equipment maintenance areas will be located to avoid spillage of oil, fuel and other hazardous materials into waterways or wetlands. These areas shall be located at least 100 ft (30 m) away from the river channel, wetlands or other water sources.
  - Supplies of toxic materials will be stored at least 100 ft (30 m) away from the river channel, wetlands or water sources.
  - No lubricants or other fluids may be drained from vehicles on site. No routine maintenance will be done on site.
  - Containers will be kept available on site at all times to collect fluids.
  - All spills will be cleaned up immediately and appropriate agencies are notified of any spills, as required, and of the clean-up procedures employed.
  - Vehicles that are discovered to be leaking will be immediately removed from the work area.

Herbicide-specific

- All products will be stored, mixed, applied and disposed of in compliance with material safety data sheets and label instructions.
- Herbicides will not be applied during windy conditions exceeding 15 mph or when rain is forecast within 3 days.
- Spray equipment will be properly maintained and calibrated to insure accurate application according to manufacturer's and label instructions.
- For all application methods, no treatment will be made within 30 ft (6 m) of water to avoid the possibility of spray drift.

Soil and Water

- To the extent not precluded by species or habitat conservation measures related to project activities, activities will be conducted during the dry season.

- Removal of native vegetation will be minimized.
- All activities will be conducted in accordance with site-specific plans that minimize sediment and herbicide runoff input to river streams, ponds, arroyos, or any other water source.
- Spoils and stockpile sites, including ash from prescribed burns, will be graded and stabilized to minimize erosion of sediment into the river, streams, ponds, arroyos, or any other water source. At the completion of the project, all remaining stockpiles will be removed from the site or graded into the site contours.
- Silt fencing, fiber rolls, erosion control blankets and/or other measures will be utilized to limit erosion from channel banks during vegetation removal. When native vegetation is reestablished in the project area, these temporary measures will be removed to allow natural river dynamics to alter the banks.
- Best management practices identified in the storm water pollution prevention plan must be implemented in advance of any soil disturbance.

Use of Heavy and Light Equipment, Access Roads, etc., for Nonnative Vegetation Treatment

- Equipment selected for use will in all cases be the lightest weight, or have the least possible impact on soil compaction.
- Low ground pressure equipment will be used when possible, or tracked vehicles, on both organic soil wetlands and mineral soil wetlands where soils have greater than 18 percent fines as defined by the Natural Resources Conservation Service.
- Use of high flotation tires on areas that are marginally operable with conventional equipment will result in minimal impact.
- Access routes appropriate for equipment, weather conditions and site conditions will be designated by project proponents in advance of entry by contractor.
- Equipment entry into arroyos, irrigation canals, or other waterways, natural or artificial, is prohibited without a U.S. Army Corps of Engineers permit.
- Equipment entry into wetlands or into areas of wet soils will be avoided.
- Where equipment entry into wetlands or areas of wet soils is unavoidable:
  - The area disturbed will be minimized.
  - The same trail will not be used more than twice.
  - Ruts over 6 in (15 cm) in depth can block normal subsurface drainage and create surface channels resulting in either a raised water table or shorter residence time and excessive drainage. Ruts of this depth will not be created.
  - Treatments will be scheduled into the drier season of the year or when the ground is frozen.

Air Quality and Dust Control

- All construction, restoration and maintenance activities will include fugitive dust control measures.
- All construction activities will be prohibited when winds exceed 30 mph.
- Vehicle speed on unpaved roads will not exceed 15 mph.
- Water and/or non-toxic dust-suppressing chemicals or soil binders will be applied to unpaved project roads and to any active (in use) storage piles (dirt, ash, vegetation debris) at a frequency sufficient to minimize air quality impacts, maintain visibility and safety for the general public.
- Inactive soil storage piles will be covered and secured.
- Any haul trucks utilized will have a covered load area.
- Disturbed areas will be mulched or planted with appropriate species as soon as practicable after disturbance.

Noise

- Work within 1000 ft (300 m) of residences or other noise sensitive uses or areas shall be restricted to daytime hours.
- No construction shall be performed within 1000 ft (300 m) of an occupied dwelling on Sundays, legal holidays, or between 7 pm and 7 am on all other days.

- All construction equipment shall have sound-control devices that are at least as effective as those devices provided on the original equipment.
- As directed by the project proponents, the contractor shall implement additional noise mitigation, including but not limited to, changing the location of stationary construction equipment, shutting off idling equipment, notifying adjacent residents in advance of construction work, and installing acoustic barriers.

Vegetation Removal and Replacement

- Areas of desirable native vegetation will be delineated on construction plans as areas not to be disturbed or as areas of limited activity and marked accordingly.
- Where extraction of saltcedar or other trees results in depressions or holes, contractor shall backfill to original grade.
- Trees removed manually (prescriptive cutting or cut-stump method) will be cut as close to the ground as possible. No stumps may be left higher than 6 in (15 cm) above the ground surface.
- All stumps greater than 1 in (2.5 cm) in diameter and any stems less than 1 in diameter will be treated as described in the herbicide prescription.
- Rootplowing and raking slash /root material will be piled in locations away from waterways or residual trees and other desirable vegetation. Piles will be separated by a minimum distance of 100 ft (30 m) of bare ground, no larger than 20 ft (6 m) in diameter and 10 ft (3 m) in height.
- No living cottonwood trees will be removed; dead cottonwoods, standing or down, will be removed, mulched or burned if necessary during project implementation for safety reasons. It is not anticipated that the number of trees removed will amount to more than 10% of dead trees.
- A minimum 30% of dead and down rotting logs will be left on the ground surface for wildlife habitat.
- Dead, down wood, or slash more than 4 in (11 cm) diameter should be moved outside the drip lines of cottonwoods and other native trees where possible or at least 10 ft from the base of the trees, in order to remove excess fuels and potential heat kill from these areas.

Repairs to Damaged Roadways

- The project proponents and/or their contractors shall repair any damage to the existing roadways caused as a result of construction activities for this project.
- Repair work shall be coordinated with the agencies having jurisdiction over each roadway, with the intent to return the roadway to the conditions existing immediately prior to the commencement of the project.

Mulching

- To the extent possible, mechanical mulching operations will be performed uniformly over the project site and will distribute mulched material uniformly over the ground surface.
- In all cases, mulching operations will be conducted so as to reduce fuel loading on the project site.
- If large mobile chipping machinery (such as horizontal grinders) is used for wood disposal, chipped material may be temporarily stockpiled but must be spread over the ground surface to a depth not to exceed 4 in (10 cm) or removed before completion of the project.
- Mulched material left on site must not exceed 3 in (8 cm) in diameter and any single piece may not exceed 6 in (16 cm) in length.

Prevention of Human-caused Fire

- No smoking will be allowed on the site.
- All equipment will have approved spark arrestors and other such devices to protect against accidental fire ignitions.
- During Regional Preparedness Levels 3 and above, the contractor will be required to have a small firefighting unit (+/- 125 gallons with pump) at hand to prevent the spread of any accidental ignitions.

- Any finished operation may not have high concentrations of logs, piled brush, or woody debris that will add significant fuel loading to the cleared site.

Invasive Species Prevention and Control

- If straw or hay bales are used for erosion control, they must be sterile and/or certified weed free.
- If any imported topsoil is used in the restoration project, it shall be clean and certified free of weeds, including seeds.
- Feral or free-ranging cats and dogs shall be reported to the local office of Animal Control.
- Signs shall be posted labeling the area as an ecological restoration/study area and prohibiting trespass and the release of pets or animals of any kind.
- Once ground-disturbing activities have begun in this project, the activity areas will be monitored for the presence of nonnative weedy species. Any nonnative species found will be immediately be evaluated and addressed with appropriate control measures.

2.2.6 Conservation Measures

The following conservation measures to avoid adverse effects to listed species and their critical habitats are required.

1. The action area will be analyzed by species experts for:
   a. all listed species' suitable habitat;
   b. critical habitat for the SWWF and silvery minnow (*Hybognathus amarus)*;
   c. and the nearest documented flycatcher territories.
2. If suitable habitat is present, service-approved survey protocols will be conducted.
3. If any flycatcher territories are present, a 0.25–mile buffer will be established around each territory. Project activity will be excluded from the buffer. Mechanical vegetation management will be conducted outside of the flycatcher breeding season, which extends from May 1 through August of each year, to avoid potential effects from human disturbance such as noise.
4. If a bald eagle (*Haliaeetus leucocephalus)* is present within 0.25 mile upstream or downstream of the riparian work zone on the morning before project activity starts, or following breaks in project activity, the contractor will suspend all activity until the bird leaves of its own volition, or a project biologist in consultation with the Service determines that the potential for harassment is minimal. If an eagle enters the construction zone during work activity, the activity can continue.
5. Following establishment of Pecos sunflower population, a 5-m (5.5-yd) buffer will be established around Pecos sunflower occupied habitat patches for all mechanical and hand treatments. A 100-m (109-yd) buffer will be established around occupied and suitable habitat patches for all aerial applications. Mechanical vegetation management will be excluded from the occupied habitat, unoccupied suitable habitat in the patch, and buffer. A botanist or species expert will be present during vegetation removal projects in close proximity to occupied habitat. Any reduction in water supplies to suitable habitats for the Pecos sunflower will be avoided.
6. Project activity, specifically vegetation management, within designated critical habitat for the flycatcher will adhere to guidance in the Southwestern Willow Flycatcher Recovery Plan (U.S Fish and Wildlife Service, 2002a), Middle Rio Grande Ecosystem: Bosque Biological Management Plan (Crawford et al, 1993) , Middle Rio Grande Endangered Species Act Collaborative Program: Habitat Restoration Plan for the Middle Rio Grande (Tetra Tech, Inc., 2004b) and Strategy for Long-term Management of Exotic Trees in Riparian Areas for New Mexico's Five River System , 2005-2014 (Parker et al, 2005) This will ensure that only insignificant and discountable effects will occur to the Primary Constituent Elements (PCEs) of flycatcher critical habitat. There will be no permanent loss of critical habitat, only short-term modification to PCEs.
7. Rio Grande Silvery Minnow/Critical Habitat – all heavy equipment activities will occur within dry areas of the 100-year floodplain. Standard Best Management Practices (BMPs) will be used to prevent pollution and unnaturally high level of sediment loading in the river. BMPs will be enforced

to minimize potential effects to Rio Grande silvery minnow from direct construction impacts and erosional inputs into the river during periods of work. BMPs include:

a. Prior to mobilization, all equipment will be washed to ensure that it is oil free and inspected while running to ensure it has no oil leaks;
b. Spill cleanup equipment will be kept on-site for containing accidental leaks of fluids;
c. Staging areas for crew, equipment and materials will be established in the uplands at least 5 m (16 ft) from the 100-year floodplain or highly erodable soils;
d. Stationary fuel and oil storage containers should remain within the staging area or another confined area to avoid accidental spills into the Rio Grande;
e. Excess concrete and wash water from trucks and other concrete mixing equipment should be disposed of where this material cannot enter the stream systems;
f. An emergency response plan will be developed to ensure adequate protection for the Rio Grande silvery minnow population from hazardous-materials spills, including prevention or and quick response to hazardous-materials spills;
g. The project will use conventional construction equipment that will operate from the bank;
h. Equipment will be parked each night and refueled in the ranch center area (described in section 3.2), well away from the river and the wetland area.

2.3 Alternatives Considered But Not Analyzed in Detail

No other alternative actions were considered.

3.0 AFFECTED ENVIRONMENT

Information in this EA is focused on aspects of the ecosystem that relate to the proposed project and does not include general background information on the Middle Rio Grande, bosque ecosystems, cultural and historic resources in these areas, etc. For excellent overviews on the Middle Rio Grande ecosystem, including climate, hydrology, geology, ecology, and legal and institutional water management, see the following documents: *Conceptual Restoration Plan, Active Floodplain of the Rio Grande, San Acacia to San Marcial, NM.* (Tetra Tech, 2004a); *Habitat Restoration Plan for the Middle Rio Grande* (Tetra Tech, Inc., 2004b), *Middle Rio Grande Ecosystem: Bosque Biological Management Plan* (Crawford et al, 1993), and *Programmatic Biological Assessment of Bureau of Reclamation's water and river maintenance operations, Army Corps of Engineers' flood control operation, and non-federal actions on the Middle Rio Grande, New Mexico. Albuquerque NM* (U.S. Dept of the Interior, 2003).

3.1 Setting

The land north and south of the project site is private property and the predominant use in the riparian corridor is livestock grazing or other rural uses. To the west of the project site and the river channel boundary lie numerous cultivated fields. To the east, the terrain almost immediately becomes folded into a series of small dry hills and is primarily under state and federal ownership. The tiny settlement of Bosquecito is immediately south of the site; the nearest community is San Antonio, with an estimated population of several hundred, approximately 5 miles south of the project site. The Bosque del Apache National Wildlife Refuge is approximately 8 miles south along the Rio Grande.

3.2 Land Use

The majority of the site is private property that has been owned by the Rhodes family since 1979. BLM and the State own small sections of the property as well (Figure 2.)

The current generation of the Rhodes family does not live on the property and is not aware of the complete history of land use prior to or following their 1979 purchase. Current operations on the property include livestock grazing and a small beekeeping operation. According to the Rhodes family, the property

is leased at this time for cattle grazing; this lease will expire in May 2007. The number of animals grazing the area now or in the past is not known. Approximately 20 head of cattle were observed grazing in the saltgrass meadow on the date of the first site visit on August 29, 2006 and again on the second site visit on October 21, 2006. The beekeeping operation consists of approximately 30 bee hive boxes. According to the owners, this operation has been in place on the property for a number of years.

Infrastructure on the property consists of an unpaved portion of Bosquecito Road, which passes near the eastern project boundary and an unpaved 1-lane road that branches from Bosquecito Road to access an area that appears to have previously served as the center of ranching activities, and several more lightly used roads that access various parts of the property. These roads apparently have served past ranching operations or other access needs.

The "ranch center" area includes a parked travel trailer, windmill, livestock watering tank, livestock holding pens, several abandoned vehicles, outhouse, other dilapidated buildings, some areas of trash disposal, etc. None of these facilities are currently in use; all are old and in various states of disrepair and none are in the floodplain acreage of the project footprint.

Photo 1. Cattle and bee hive boxes in saltgrass meadow. Areas of dead saltcedar in the background. 10/21/06.

The perimeter and interior of the property includes various discontinuous sections of barb wire fence which appear to have been installed to control livestock. The State and BLM lands are not fenced separately from the Rhodes property.

Significantly, this reach of the Rio Grande, and thus the project footprint, lacks a common form of river infrastructure: a levee. No levee exists along the eastern side of the river here, so overbank inundation of the floodplain portion of this property is still possible, given the necessary flow conditions.

A separate project to treat nonnative saltcedar began the process of ecosystem restoration on this site in 2003. This earlier project consisted of aerially spraying monotypic saltcedar stands with Arsenal® (isopropylamine salt of imazapr) herbicide. Herbicide was applied to approximately 197 acres (80 ha) over the project footprint. Figure 4 shows the boundaries of the area treated with herbicide in 2003. This treatment was successful in killing the majority of the saltcedar present at the time, although new saltcedar has appeared since.

Photo 1. Standing sprayed dead saltcedar in background. Piled dead saltcedar and equipment tracks in foreground from fire suppression efforts. Date: 10/21/06

Most recently, the "Bosquecito" wildfire occurred over a large portion of the property (Figure 5) from June 6, 2006 to June 9, 2006. The fire burned approximately 496 acres (201 hectares), including most of the cottonwood gallery forest located on the property, and parts of the saltgrass meadow and xeric vegetation. Fire suppression efforts included the use of bulldozers to create fire breaks in the dead standing saltcedar. Piles of dead saltcedar and relatively bare earth areas remain on the property.

3.3 Topography and Climate

Topography

As suggested by the name Middle Rio Grande Valley, the entire area is relatively flat. The topography of the project footprint however, is extremely flat, as the footprint lies completely within the floodplain of the river. The USGS topographic map of the footprint, which illustrates elevation contours of 20 ft (6 m), shows no contour lines within the project footprint. Soil data (section 3.7) describes the footprint as 0%-2% slope. The only elevational variations on site appear to be the remnants of old ditches constructed for previous agricultural use, and some piles of dirt resulting from fire suppression efforts. Figure 6, derived from flood modeling, illustrates that the lowest points on the floodplain are on the eastern side of the project footprint, lying roughly 2.5 - 3 ft (0.75 - 1 m) below the western side. Immediately to the east of the project footprint are slightly elevated terraces formed by the river over time. These terraces drain to the project footprint.

Climate

This reach of the Rio Grande is considered semiarid and temperate, with average annual high temperature of 76° F (24° C) and average low temperature of 40° F (4° C) (Crawford et al, 1993). In an average year, the area receives 7.9 in (20.1 cm) of precipitation. Approximately half of the annual precipitation occurs in the form of summer thunderstorms and half in the form of winter and spring storms that move into the region from the Pacific Ocean (Crawford et al, 1993).

3.4 Air Quality

Socorro County has excellent air quality, due to the rural land uses in most of the county. It lies within the Southwestern Mountains-Augustine Plains Intrastate Air Quality Control Region 156. It is an attainment area for National Ambient Air Quality Standards. The project area lies 8 miles north of the Bosque del Apache NWR, which is a Class I area.

3.5 Noise

Ambient noise in the area is very low, and limited to occasional vehicles passing on Bosquecito Road, or occasional construction or agricultural activities conducted in the neighborhood.

3.6 Water Resources

Strictly speaking, the project footprint is delimited on the west by the high water mark of the active channel of the Rio Grande and so the river channel is not included within the area of project activities. However, the immediate proximity of the channel and river necessitate consideration of this area for potential impacts and therefore baseline condition information is included.

3.6.1 Water Quality

The New Mexico Environment Department has established water quality standards for river reaches throughout New Mexico, including the reach in which the proposed action is located. The following New Mexico Water Quality Control Commission Standards, as amended through February 2006, are for the reach between Elephant Butte reservoir and the Alameda Bridge (20.6.4.105, Rio Grande Basin):

A. Designated Uses: irrigation, marginal warmwater aquatic life, livestock watering, wildlife habitat and secondary contact.

B. Criteria:

(1) In any single sample: pH within the range of 6.6 to 9.0 and temperature 32.2°C (90°F) or less. The use-specific numeric criteria set forth in 20.6.4.900 NMAC are applicable to the designated uses listed above in Subsection A of this section.

(2) The monthly geometric mean of E. coli bacteria 126 cfu/100 mL or less; single sample 410 cfu/100 mL or less (see Subsection B of 20.6.4.14 NMAC).

(3) At mean monthly flows above 100 cfs, the monthly average concentration for: TDS 1,500 mg/L or less, sulfate 500 mg/L or less and chloride 250 mg/L or less.

Irrigation:

(1) dissolved selenium 0.13 mg/L

(2) dissolved selenium in presence of >500 mg/L SO4 0.25 mg/L

Secondary Contact: The monthly geometric mean of E. coli bacteria of 548 cfu/100 mL and single sample of 2507 cfu/100 mL apply to this use.

Marginal Warmwater: Dissolved oxygen 5 mg/L or more, pH within the range of 6.6 to 9.0 and on a case by case basis maximum temperatures may exceed 32.2°C (90°F). The total ammonia criteria set out in Subsections K, L and M of this section and the human health criteria listed in Subsection J of this section are applicable to this use.

Wildlife Habitat: Wildlife habitat shall be free from any substances at concentrations that are toxic to or will adversely affect plants and animals that use these environments for feeding, drinking, habitat or propagation; can bioaccumulate; or might impair the community of animals in a watershed or the ecological integrity of surface waters of the state. The discharge of substances that bioaccumulate, in excess of levels listed in Subsection J for wildlife habitat is allowed if, and only to the extent that, the substances are present in the intake waters that are

diverted and utilized prior to discharge, and then only if the discharger utilizes best available treatment technology to reduce the amount of bioaccumulating substances that are discharged. The numeric criteria

General Criteria (relevant to project)
Bottom Deposits and Suspended or Settleable Solids:
(1) Surface waters of the state shall be free of water contaminants including fine sediment particles (less than two millimeters in diameter), precipitates or organic or inorganic solids from other than natural causes that have settled to form layers on or fill the interstices of the natural or dominant substrate in quantities that damage or impair the normal growth, function or reproduction of aquatic life or significantly alter the physical or chemical properties of the bottom.
(2) Suspended or settleable solids from other than natural causes shall not be present in surface waters of the state in quantities that damage or impair the normal growth, function or reproduction of aquatic life or adversely affect other designated uses.

Turbidity: Turbidity attributable to other than natural causes shall not reduce light transmission to the point that the normal growth, function or reproduction of aquatic life is impaired or that will cause substantial visible contrast with the natural appearance of the water. Turbidity shall not exceed 10 NTU over background turbidity when the background turbidity is 50 NTU or less, or increase more than 20 percent when the background turbidity is more than 50 NTU. Background turbidity shall be measured at a point immediately upstream of the turbidity-causing activity. However, limited-duration activities necessary to accommodate dredging, construction or other similar activities and that cause the criterion to be exceeded may be authorized provided all practicable turbidity control techniques have been applied and all appropriate permits and approvals have been obtained.

K. Total Dissolved Solids (TDS): TDS attributable to other than natural causes shall not damage or impair the normal growth, function or reproduction of animal, plant or aquatic life. TDS shall be measured by either the "calculation method" (sum of constituents) or the filterable residue method. Approved test procedures for these determinations are set forth in 20.6.4.14 NMAC.

3.6.2 Hydrology

This reach of the Rio Grande is exclusively a warm water ecosystem (Crawford et al, 1993; Platania, 1993) with a shifting sand bed. It is characterized by warm summer water temperature, low velocity, high turbidity, more pools than riffles, and a lack of shade and cover over water (Winger 1981 as cited in U.S. Bureau of Reclamation, 2000). Channel width in this reach varies from approximately 50 ft (15 m) to approximately 650 ft (198 m) (U.S. Fish and Wildlife Service, 2003b).

The maximum daily flows generally occur in the spring, triggered by snowmelt runoff from the upper Rio Grande watershed and the watersheds of its tributaries. Peak flow events typically occur during April and May, although in any given year the peak event may occur in June, July, and August or more rarely in September and October. Annual peak flow events tend to occur more frequently in the late summer (July and August) in the lower reaches and in the spring (April and May) in the upper reaches of the Middle Rio Grande. Sustained high volume flows are more likely to occur in the spring rather than in the summer months. Short, intense flood pulse events are more typical of summer months, resulting from the seasonal monsoon (Tetra Tech, Inc., 2004b). The last major floods on the Rio Grande occurred in 1941 and 1942, with flows of about 25,000 cfs recorded at the Bernalillo and Albuquerque gages.

Seasonal low flows may occur at virtually any time of the year, depending on a wide variety of variables. Channel drying can and does occur in the reach relevant to the project (see section 5.7). Drying probably

occurred in this reach historically (U.S Fish and Wildlife Service, 2003b) but is more likely to occur under the current system of water management and withdrawals (Dudley and Platania, 2003). Channel drying is permitted is certain river reaches, under established restrictions and circumstances per the Biological Opinion (U.S. Fish and Wildlife Service, 2003b).

Flood control operations at Abiquiu, Cochiti, Galisteo, and Jemez Canyon Reservoirs reduce peak flows below Cochiti Dam in some years. Cochiti Dam releases are restricted to the maximum nondamaging downstream channel capacity, which is typically estimated to be 7000 cfs at the Albuquerque gage. Flows from the Rio Puerco or Rio Salado are not controlled via upstream dams. Flows as high as 18,800 cubic feet/second have been measured on the Rio Puerco. High flows typically occur during the summer monsoon season, and indeed this occurred during the summer of 2006. Lacking controls, these flood pulses will recur.

The flow of the Rio Grande is regulated along its length and that of most of its tributaries, including five mainstem reservoirs on the Chama River and the Rio Grande itself, numerous smaller irrigation diversion dams throughout the drainage. Of these, the most significant is Cochiti Reservoir, located 47 miles (76 km) upstream of Albuquerque and in operation since 1973. This is the primary flood control reservoir and the principal regulatory control point on flow in the mainstem of the Middle Rio Grande. Water flow is also affected by the complex system of ditches, drains, and conveyance channels that provide irrigation water for agriculture in the Rio Grande valley.

The flow of Rio Grande water is also regulated by a host of institutional and legal requirements. The March 17, 2003, *Biological Option on the Programmatic Assessment of Bureau of Reclamation's Water and River Maintenance Operations, Army Corps of Engineers' Flood Control Operation, and Related Non-Federal Actions on the Middle Rio Grande, New Mexico* established a set of Reasonable and Prudent Alternatives addressing water operation elements to be followed during wet, average, and dry years and hydrology requirements for habitat improvement. The Biological Opinion also promotes releases of water to stimulate Rio Grande silvery minnow spawning under Reasonable and Prudent Alternative V. Despite much attention paid to water conservation and improved use, research into the Rio Grande ecosystem, and assorted legal actions, the Rio Grande remains a highly altered system, and actual flows, releases of water for the minnow and other events continue to depend on climate as the recent drought years have illustrated.

Flood control, channelization, channel degradation, and recent climatic conditions have reduced the frequency of flood events. These events are critical triggers for the recycling of riparian vegetation and more specifically, for the creation of new stands (Crawford et al, 1993; Tetra Tech, Inc., 2004b). Overbank flooding coincident with spring runoff has been recognized as a mechanism for regenerating cottonwood and willow communities (Ellis et al., 1996; U.S. Fish and Wildlife Service, 2003b), but implementation remains elusive.

Restoring fundamental hydrologic factors such as overbank flooding is critical for the success of riparian restoration projects along the Rio Grande (Crawford et al, 1993; Finch and Stoleson, eds., 2000; U.S. Fish and Wildlife Service, 2002a; U.S. Fish and Wildlife Service, 2003b; Tetra Tech, Inc., 2004b) As part of SOBTF's effort to develop the regional restoration plan, *Conceptual Restoration Plan, Active Floodplain of the Rio Grande, San Acacia to San Marcial, NM.* (section 2.2) flood inundation was predicted for various return period flows, based on existing conditions in the channel (Tetra Tech, Inc., 2004a) and using the FLO-2D modeling software (http://www.flo-2d.com/). Four return period floods were simulated including the 1.25-year event (3,700 cfs), 2-year flood (5,660 cfs), the 5-year return period flood (8,480 cfs) and the 10-year event (10,400 cfs). Flows less than or equal to 10,000 cfs were selected because of the limitation on peak discharge release from Cochiti Dam.

The modeling predicts that the project site will not flood at 3700 cfs. Expected flooding at 5660 cfs is depicted in Figure 6. However, the timing and magnitude of any actual flood event remains dependent on weather and conflicting water demands, and is therefore uncertain. There is no written information available regarding spring flooding that has occurred on the site in recent decades but personal accounts attest to flooding during the 2005 spring runoff (U.S. COE documentation).

3.6.3 Net Depletion Analysis

The Rio Grande Compact limits the amount of surface water that can be depleted (utilized for all purposes) annually in the Middle Rio Grande based on the flow of the river as measured at the Otowi Gage near Los Alamos (Rio Grande Compact, 1939). In addition, the New Mexico State Engineer has determined that the MRG is fully appropriated. As a result, any increase in water use by one user must be offset by a reduction by another use or user, so that senior water rights and New Mexico's ability to meet its downstream delivery obligations are not impaired. Therefore, the New Mexico State Water Plan (Office of the State Engineer/Interstate Stream Commission, 2003) requires that habitat restoration projects do not result in increased net water depletion, or that any increases are offset by purchased or leased water rights.

3.6.4 Wetlands and Floodplains

National Wetlands Inventory mapping exists for this region and does not indicate any mapped wetlands on the site. Nevertheless, a large shallow wetland was observed within the saltgrass meadow during a visit to the site on August 31, 2006 and again on October 21, 2006 (Photo 2). By the November 28th visit, the pond had largely disappeared. It is unclear whether the source of the pond water was collected rainfall, overbank flooding, a rise in the local water table or a combination of these factors. The summer of 2006 monsoon season was significantly above average. This, combined with the fact that there was no visible evidence of flooding (deposition of fresh sediment, debris, flattened grass, etc.), suggests that the likely sources were groundwater recharge from an unknown source, ponded rain, and/or a temporarily elevated water table. The wetland is presumed to be seasonal. The location of the wetland was consistent with the predicted flooded areas from the FLO-2D modeling.

The depth to shallow ground water at most points along the Middle Rio Grande is the result of a complex set of factors that input and extract water, including flows laterally into and out of the river, acequias, irrigation canals and the system of drains that exist in the Middle Rio Grande Valley, plus extraction from wells for domestic and agricultural use, irrigation inputs, evaporation, and transpiration from vegetation (Tetra Tech, Inc., 2004b; Crawford et al, 1993).

Since the depth to water table is a fundamental determinant of the type and abundance of vegetation present, several studies have been conducted on shallow water level within the Middle Rio Grande basin (Bartolino and Niswonger, 1999; Bowman et al., 2002; Eichhorst et al., 2002). These studies found that in general the depth to the ground water table within the bosque ranges from several inches near the river bank to more than 10 ft (3 m) near the riverside drains as the terrain slowly rises moving away from the channel. Shallow groundwater data, collected as part of the Bosque Ecosystem Monitoring Program (BEMP) (Eichhorst et al., 2002), show that at most BEMP sites shallow groundwater is not responsive to river stage, and in general is only weakly correlated. There are no BEMP sites on the active river floodplain within the vicinity of the project area. There are no riverside drains in the project area as well. So it will be necessary to acquire more detailed information on the site specific ground water levels. This will be collected early in the project and contribute to refining the site construction details (Activity 1,10).

3.7 Geology and Soils

Geology

The project site lies within a region known as the Middle Rio Grande Valley, an area roughly bounded by Cochiti dam in the north, the terminus of Elephant Butte reservoir in the south, (near the town of San Marcial) and various mountain ranges to the east and west. The valley is underlain by the Rio Grande Rift. The rift is the primary geologic feature in the region, and remains seismically active, but is completely filled with alluvium from the surrounding mountains. In the flatter valley sections of the Rio Grande, like the Middle Rio Grande Valley, this alluvium is termed the Santa Fe Group, and consists of deep deposits of unconsolidated to poorly consolidated sands and gravels, silts, and clays. These sediments constitute important aquifers that yield large quantities of potable groundwater (Crawford et al, 1993; Tetra Tech, Inc., 2004b).

Soils

Soil testing and/or mapping in the project footprint has not been completed, so currently there is no microsite information available regarding soil salinity, chemistry, texture etc. Information from the Natural Resource Conservation Service (Natural Resources Conservation Service Web Soil Survey) indicates that the soils within the project footprint consist almost entirely (estimated 95+%) of Typic Ustifluvents at 0-2% slope. These soils are further described as:

> *This component is on flood plains, valleys. The parent material consists of stream alluvium derived from sandstone and shale. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches is low. Shrink-swell potential is low. This soil is occasionally flooded. It is not ponded. A seasonal zone of water saturation is at 57 inches during June, July, August, September. Organic matter content in the surface horizon is about 1 percent.*

Small amounts (estimated at less than 5%) of the footprint is composed of Bluepoint loamy fine sand with a slope of 1-9%. Both soils are rated as having a slight potential for erosion hazard and a moderate rutting potential hazard.

Watershed Considerations

The Rio Grande watershed, at 355,500 square miles (920,741 square km), is the fifth largest in North America. More directly relevant to this project are the tributaries in the immediate vicinity. Two major tributaries enter the Rio Grande within 30 miles (48 km) upstream of the project and contribute to the surface water quantity and quality.

The Rio Puerco drains 7,350 square miles (19,036 square km) and joins the Rio Grande approximately 30 miles (48 km) upstream of the project site. This river is an archetypal southwestern ephemeral stream: it is dry most of the time, and over most of its length, but in response to significant storm events carries very large flows. The Rio Puerco drains an area composed of erodable shales and mudstones and hence is famous for its large sediment loads (Lagasse, 1980 as cited in Crawford et al, 1993). Fox et al (1995) estimated that it contributed more than 50 percent of the total sediment to the Rio Grande in central New Mexico, but only about 16 percent of the water.

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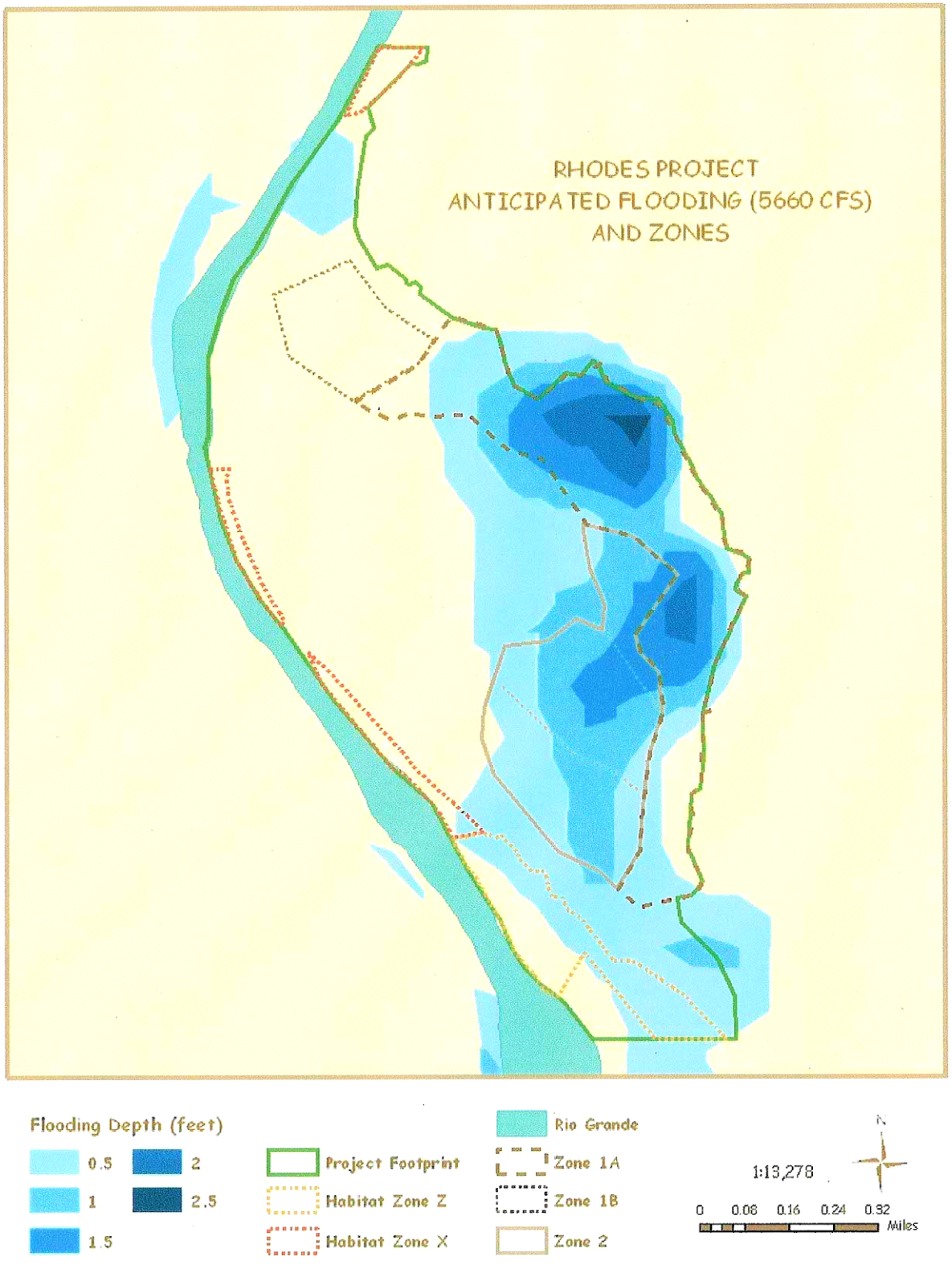

Figure 6. Anticipated flooding at 5660 cfs, based on FLO-2D modeling.

The Rio Salado drains approximately 1,380 square miles (3,574 square km) and merges with the Rio Grande roughly 20 miles (32 km) upstream from the project site. It too is an ephemeral river, and can contribute large quantities of sediment when flowing. Because the Rio Salado watershed includes a wider range of rock types, including volcanic, metamorphic and sedimentary, sediment ranges from fine suspended particles to larger coarse particles.

3.8 Biological Resources

3.8.1 Vegetation Communities and Nonnative Species

Photo 3. Severely burned cottonwoods near center of project footprint, with saltcedar recruits in the understory. 10/21/06.

A comprehensive inventory of plant species or communities on the site was not conducted for this project. The description in this section is based on vegetation mapping perform by BOR in 2002 and by personal observation by the consulting team during site visits performed on August 31, 2006 and October 21, 2006.

Currently, vegetation on the site consists of a mosaic of several communities. All of these communities have been affected to various degrees by the 2006 wildfire, related suppression efforts, and the 2003 saltcedar herbicide treatment.

The riparian corridor vegetation of the site is patchy. Portions are occupied by very dense dead standing saltcedar and a few standing dead cottonwoods, resulting from the herbicide spray treatment. Other patches (Zone X of Figures 3 and 4) include a large narrow band of living saltcedar, where it appears that the aerial spraying attempted to avoid too close to the channel. In the northernmost patch, (Also Zone X) this saltcedar is alive, tall, very dense and well developed. This patch appears to extend onto the neighboring property; however staff conducting the reconnaissance did not have permission to enter this private property to confirm this possibility.

In the southernmost area, (Zone Z) there is a large patch of remnant cottonwood gallery forest, which was lightly burned and contains some saltcedar mixed with considerable native vegetation. Russian olive is also present in the riparian area. Conspicuously lacking from most of the riparian corridor and elsewhere on the site are stands of willow.

Much of the river bank is difficult to access due to the very thick saltcedar vegetation. However, at the time of the site visit on October 21, 2006, 2 bare mud/sand bars were observed; one of these had some willow and cottonwood recruits.

The central section of the project site contains a large patch of open xeric native scrub and grassland, primarily composed of screwbean mesquite (*Prosopis pubescens*), seepwillow (*Baccharis* spp.) 4-wing saltbush (*Atriplex canescens*), alkali sacaton (*Sporobolus airoides*), giant sacaton (*Sporobolus wrighti*)

and various grama grasses (*Bouteloua* spp.). This community was burned in places by the Bosquecito wildfire.

The central section of the project footprint was the area most severely burned by the Bosquecito wildfire. Within the burn area are patches of soil that are completely bare and appear heat-sterilized, as well as patches of lesser effect. In the severely burned areas, it was not possible to identify the vegetation that existed prior to the burn. Rapid and dense new saltcedar colonization is occurring in parts of the burned area, and in other parts, saltcedar stumps are resprouting.

Photo 4. Saltgrass meadow on eastern portion of site. 10/21/06

Many of the large cottonwood trees within this area were seriously burned; although others appear to have sustained superficial damage only. The fire occurred after spring leaf out of the cottonwoods, so as of the date of writing this BA, the impacts to individual cottonwood trees are not clear and will remain unclear until the spring of 2007. This gallery forest community appears to be the remnant of a previous river channel or previous overbank flooding event that occurred on site, since the trees are mature, but no young recruits, smaller trees, or the burned remnants of these, were observed in the area.

Photo 5. Severely burned area of site. 10/21/06

The eastern edge of much of the project site is occupied by a saltgrass (*Distichlis stricta*) meadow. This area too sustained damage from the fire, but is recovering rapidly.

In 2002, prior to both the herbicide treatment and the fire, BOR updated the vegetation maps of the floodplain, using the Hink and Ohmart (1984) vegetation classification, modified to include additional structural information. Since the property was never formally inventoried or mapped for vegetation, this coarse-scale mapping is the only source of information available about the vegetation that existed prior to the herbicide treatment and fire. Mapping was done via photo interpretation and partial subsequent field verification. The mapping indicated that vegetation on the site was largely dominated by saltcedar, with patches of Russian olive, honey and screwbean mesquite, small amounts of seepwillow, and the large "donut hole" of cottonwood forest, which was damaged in the fire. Zone 1A, the area that is currently saltgrass meadow and targeted for

Pecos sunflower restoration, was classified by this mapping effort as a mix of saltcedar and "open area" defined as less than 25% vegetation coverage. It is possible that the saltcedar obscured the understory of saltgrass or open water in the photo interpretation process. Zones 2A-C, the area currently targeted for willow restoration was mapped as a mix of saltcedar and cottonwoods. No willows were mapped on the site.

3.8.2 Wildlife and Fish

A comprehensive wildlife survey of the action area has not been performed. Common fish species in the region which could be reasonably expected to occur in the section of the Rio Grande bordering the project area include river carpsucker (*Carpiodes carpio*), flathead chub (*Platygobio gracilis*), mosquitofish (*Gambusia affinis*), and red shiner (*Cyprinella lutrensis)* (Platania, 1993). Less common fish species include longnose dace (*Rhinichthys cataractae*), channel catfish (*Ictalurus punctatus*), fathead minnow (*Pimephales promelas*), white sucker (*Catostomus commersoni*), and the federally listed Rio Grande silvery minnow.

Common reptiles and amphibians in the region that may occur on the site include the eastern fence lizard (*Sceloporus undulatus*), New Mexico whiptail (*Cnemidophorus neomexicanus*), Couch's spadefoot toad (*Scaphiopus couchii*), New Mexico spadefoot toad (*Spea muliplicata*), tiger salamander (*Ambystoma tigrinum*), western chorus frog (*Pseudocris triseriata*), bullfrog (*Rana catesbeiana*), northern leopard frog (*Rana pipiens*), Great Plains skink (*Eumeces obsoletus*), New Mexico garter snake (*Thamnophis sirtalis dorsalis*), Sonoran gopher snake (*Pituophis catenifer affinis*),Western diamondback rattlesnake (*Crotelus atrox),* painted turtle (*Chrysemys picta*), and spiny softshell turtle (*Trionyx spiniferus*).

Common mammals in the region that may occur on the site include kit fox (*Vulpes macrotis*), grey fox (*Urocyon cinereoargenteus),* black-tailed jackrabbit (*Lepus californicus*), desert cottontail (*Sylvilagus audubonii*), white-footed mouse (*Peromyscus leucopus*), western harvest mouse (*Reithrodontomys megalotis*), house mouse (*Mus musculus*), rock squirrel (*Spermophilus variegatus),* raccoon (*Procyon lotor*), muskrat (*Ondatra zibethinus*), porcupine (*Erethizon dorsatum*), long-tailed weasel (*Mustela frenata*), striped skunk (*Mephitis mephitis*), Botta's pocket gopher (*Thomomys bottae*), and coyote (*Canis latrans*) (Hink and Ohmart, 1984).

A small sampler of common bird species found in the area includes American robin (*Turdus migratorius*), red-winged blackbird (*Agelaius phoeniceus),* mallard (*Anas platyrhynchos*), cinnamon teal (*Anas cyanoptera*), American coot (*Fulica americana*), belted kingfisher (*Ceryle alcyon*), spotted sandpiper (*Actitis macularia*), kildeer (*Charaddrius vociferus*), great blue heron (*Ardea herodias*), snowy egret (*Egretta thula*), white-faced ibis (*Plegadis chihi*), mourning doves (*Zenaida macroura*), blue grosbeaks (*Passerina caerulea*), northern mockingbirds (*Mimus polyglottos*), lark sparrows (*Chondestes grammacus*), western meadowlarks (*Sturnella neglecta*), red-tailed hawks (*Buteo jamaicensis*), greater roadrunner (*Geococcyx californianus*) sandhill crane (*Grus canadensis*), and American kestrel (*Falco sparverius*).

Portions of this reach of the Rio Grande were surveyed by Hink and Ohmart (1984). They listed 227 species of birds in that survey and that list will not be reproduced here. Perhaps even more impressive, they estimated densities of 1000 birds per 100 acres (40 ha) of certain riparian habitats during certain seasons. The riparian corridor has changed in the years since Hink and Ohmart completed their survey, with additional habitats lost to urban development and additional acres of native vegetation lost to nonnative vegetation or to fire. Nevertheless, the riparian corridor remains vital habitat for the majority of bird species that live in or migrate through New Mexico. The presence of specific species will vary from season to season and habitat patch to patch.

The Rio Grande is a major migratory corridor for songbirds (Yong and Finch 2002), waterfowl, and shorebirds. At various times of the year, riparian areas support the highest bird densities and species numbers in the Middle Rio Grande. The complex of habitats and resources found in the area contribute to supporting these species, including the river channel, drains, the bosque, agricultural fields, grassy areas, and shrublands. The peak nesting season for birds is April through August.

3.8.3 Special Status Species

Primary responsibility for the conservation of plants and animal species in New Mexico lies with the U.S. Fish and Wildlife Service, under authority of the Endangered Species Act, the New Mexico Department of Game and Fish, under authority of the New Mexico Wildlife Conservation Act of 1974, and the New Mexico Energy, Minerals and Natural Resources Department, under authority of the New Mexico Endangered Plant Species Act.

A separate Biological Assessment was prepared for compliance with the Endangered Species Act for this proposed action. The New Mexico Wildlife Conservation Act and New Mexico Endangered Plant Species Act protect state-listed species by prohibiting taking without proper permits. Two species that may occur within the project footprint but for which analysis is not required within the Biological Assessment are discussed below.

Western Yellow-billed Cuckoo (*Coccyzus americanus occidentalis*)
The Western yellow-billed cuckoo is a federal candidate species that occurs along riparian corridors throughout New Mexico. In New Mexico, historical accounts indicate that the yellow-billed cuckoo was locally very common along the Rio Grande, but rare statewide (BISON-M). Hink and Ohmart (1984) reported yellow-billed cuckoo as a nesting bird in the bosque of the Middle Rio Grande.

Yellow-billed cuckoos are migratory, overwintering in South America. They arrive in New Mexico in late April and early May and nest from late May through August (Howe, 1986). Cuckoos nest in dense riparian shrub habitat, preferring habitat patches of at least 25 acres (10 ha) in size (Elphick et al., 2001) with a well developed willow understory and mature cottonwood canopy (Buffington et al., 1997; Gaines and Laymon, 1984). While willows appear to be a preferred nest tree, the species will also nest in dense saltcedar stands (Howe, 1986).

BOR conducts informal surveys for yellow-billed cuckoo and other species of concern along the Middle Rio Grande while surveying for the Southwestern willow flycatcher. In the 2005 survey effort (U.S. Bureau of Reclamation 2006a), BOR detected no cuckoos were detected in the reach between the Escondida Bridge and the northern boundary of the Bosque del Apache NWR; however in the 2006 survey effort, one cuckoo was detected on the project site, and nine cuckoos were detected within the reach defined previously (U.S Bureau of Reclamation, 2006b). The 2006 survey reported noted that more cuckoos were detected in 2006 than in 2005 primarily due to increased survey effort (U.S Bureau of Reclamation, 2006b) suggesting that similar numbers of cuckoos are typically present in the area.

New Mexican Jumping Mouse (*Zapus hudsonius luteus*)
The New Mexican jumping mouse is listed by the U.S. Fish and Wildlife Service as a Species of Concern and is considered Threatened by the State of New Mexico. The species is endemic to New Mexico and Arizona. The mouse is restricted to mesic habitats, preferring permanent streams, moderate to high soil moisture, and dense and diverse streamside vegetation consisting of grasses, sedges, and forbs (BISON-M). In the Rio Grande Valley, the species occurs mainly along the edges of permanent ditches and cattail stands. The proposed project area does not contain any wetland areas with cattails or dense herbaceous vegetation. It is therefore very unlikely that the species occurs within the project footprint.

3.9 Hazardous or Solid Waste

During the site visits conducted by Keystone Associates staff for this project, there were no indications that hazardous or solid waste were illegally buried on the property. There were no suspect materials stored near the homestead and no subsided areas indicating previous waste burial. Because all past land use activities on this property are not known, further information regarding hazardous and solid waste is not available.

3.10 Minerals

There are no known mineral resources on the property.

3.11 Visual Resources

The property currently has a limited view of the river, due to the dense vegetation that lines the channel. There are views of the hills to the east and west of the project site from Bosquecito Road.

3.12 Recreation

The project footprint is primarily private property, and as such any public recreation that has occurred or is currently occurring on the property is without permission. Recreational use of the property was not evident during the two site visits. The small parcels of State and BLM land that occur within the project footprint are unsigned and not visible as public land. There are no developed recreational facilities on these parcels, nor in the vicinity.

3.13 Cultural and Historical Resources

A qualified archaeologist from the U.S. NRCS will conduct a pedestrian survey of the project areas that will receive site disturbance from mechanical equipment. This will include mechanical vegetation control areas, planting areas, project fence line, and project staging and stockpiling areas (including a 100 foot buffer zone around these areas). If necessary, boundary stakes will be placed to mark areas to be avoided. The entire area set aside for staging and stockpiling will probably not be needed and only the amount needed would be disturbed. The NRCS will document all findings in a report to the State Historic Preservation Officer (SHPO).

If any sacred sites are identified in the project area by any of the Tewa tribes, then NRCS and the SHPO would enter into discussions with those tribes to determine how the proposed project can avoid the sacred sites.

3.14 Socioeconomics

The principal socioeconomic activity in the area is livestock or other agricultural production, as is the case on the project footprint.

3.15 Indian Trust Assets

Indian Trust Assets are legal interests in property held in trust by the United States for Indian tribes or individuals. Examples of trust assets include land, minerals, hunting and fishing rights, and water rights. The United States has an Indian Trust Responsibility to protect and maintain rights reserved by or granted to Indian tribes or individuals by treaties, statues, executive orders, and rights further interpreted by the courts. This trust responsibility requires that all Federal agencies take all actions reasonably necessary to protect such trust assets.

No Indian Trust Assets were identified on the project footprint.

3.16 Transportation and Access

Bosquecito Road, which passes along the eastern boundary of much of the project footprint, is the only access to the project site. This is an unpaved road, often passable only by four-wheel drive vehicles, and receives very little traffic.

On site access is described in section 3.2. On site, there are several unpaved roads that access various parts of the property. These would be used for the majority of vehicle movement around the project footprint. Equipment would need to depart from these access roads in order to reach various work areas.

3.17 Environmental Justice

Executive Order 12898 (Federal Actions to Address Environmental Justice in Minority and Low-Income Populations; February 11, 1994) was designed to focus the attention of Federal Agencies on the human health and environmental conditions of minority and low-income communities.

The proposed project is not located near or associated with any low-income or minority populations. No disproportionately high environmental and/or socioeconomic effects on minority or low-income communities could result from the proposed project.

3.18 Summary of Potentially Impacted Resources

Table 3 below summarizes resources that may potentially be impacted by the activities of the proposed action. Some resource categories that are included in the Affected Environment section either do not exist in the project or the proposed action clearly would not affect them. These resources are not further analyzed in the Environmental Consequences section.

Table 3. Summary Table of Potentially Impacted Resources.

Environmental Resource	Region of Influence	Potentially Impacted by Project?
Land Use	Property	Yes
Air Quality	Footprint and 0.25 mile buffer	Yes
Noise	Footprint and 0.25 mile buffer	Yes
Water Resources – water quality	Rio Grande channel	Yes
Water Resources – hydrology	Rio Grande basin	Yes
Water Resources – net water depletion	Rio Grande basin	Yes
Water Resources – wetlands and floodplains	Project footprint	Yes
Geology and Soils	Project footprint	Yes
Biological Resources – vegetation communities and nonnative species	Property	Yes
Biological Resources – wildlife and fish	Local region	Yes
Biological Resources – special status species	Western hemisphere	Yes
Hazardous or Solid Wastes	Project footprint	No
Minerals	Project footprint	No
Visual Resources	River and adjoining properties	No
Recreation	Project footprint	No

Cultural and Historic Resources	Project footprint	Yes
Indian Trust Assets	Project footprint	No
Socioeconomics	Region	No
Transportation and Access	Project footprint, access road	Yes
Environmental Justice	Local region	No

4.0 ENVIRONMENTAL CONSEQUENCES

Resource categories that were described in the section 3.18, Summary of Potential Resource Impacts, as having no effect on the environment or as not present on the project site are not considered in the analyses below.

4.1 Land Use

No Action Alternative
No impacts to land use would occur under this alternative.

Proposed Action Alternative
Livestock production on the site would be terminated per the proposed conservation easement, while the future status of the beekeeping operation remains undecided. There are no other anthropogenic uses currently underway on the site. This change in use could potentially affect the individuals leasing the property for agricultural production, if equivalent replacement resources are not available in the area.

4.2 Air Quality

No Action Alternative
The No Action Alternative would not impact air quality in the in the project area or vicinity.

Proposed Action Alternative
Under the Proposed Action Alternative, potential impacts would include particulate dust from construction activities, fumes from construction equipment, and smoke from prescribed burning

Particulate dust is always a possibility during construction activities; however, the BMPs require that vehicle equipment speeds would be limited, water would be applied to unpaved roads and exposed soils, and/or piles would be covered. These BMPs would reduce fugitive dust and would be implemented at all times during construction. The proposed project would result in a localized but negligible amount of dust.

Construction equipment would temporarily generate fumes and air emissions under the Proposed Action. The level of air emissions is anticipated to be low and in compliance with local and federal air emission standards.

Prescribed burning is planned for a relatively small amount of material, limited to saltcedar root material that is not mulched. All required permits would be acquired and regulations would be followed for open burning of this type. Burning is expected to be conducted on days of light or no wind; however, the prevailing air movement pattern is to the north and east, away from the village of Bosquecito and the town of San Antonio. Air quality would be impacted within the project area on a temporary and localized basis during the prescribed burning (Activity 5) only.

4.3 Noise

No Action Alternative
The No Action Alternative would hold ambient noise levels to the current condition.

Proposed Action Alternative
Equipment to be used during construction would include pieces generating a fair amount of noise. Other sources of project-related noise would come from the use of chainsaws and from vehicle traffic to and from the site. However, since the operation of equipment would occur away from local residences (*i.e.* within the bosque) noise increases would be significantly attenuated. In addition, The BMPs for noise require that all work would take place during normal work hours between 7:00 am and 5:00pm in order to

minimize disturbance. This increase in noise levels should be moderate, short-term, and limited to daytime work hours.

4.4 Water Resources

4.4.1 Water Quality

No Action Alternative
The No Action Alternative would not impact or modify water quality in the in the project area or vicinity and would be expected to maintain water quality that meets New Mexico standards.

Proposed Action Alternative
Under the Proposed Action Alternative potential impacts to water quality could potentially result from runoff of sediment, herbicide, or equipment related products (fuel, lubricants etc.).

Section 402 of the Clean Water Act, (CWA; 33 U.S.C. 1251 *et seq.*) as amended, specifies that storm-water discharges associated with construction activities shall be conducted under National Pollutant Discharge Elimination System (NPDES) guidance and is administered by the US Environmental Protection Agency (EPA). Construction activities associated with storm-water discharges regulated by NPDES include activities such as clearing, grading, and excavation, *which result in a disturbance to five or more acres of land.* These types of activities subject the underlying soils to erosion by storm water.

Since ground disturbance would take place in Activity 4, Treatment Method 2, an NPDES permit would be required. A Notice of Intent would be filed, and a Storm Water Pollution Prevention Plan (SWPPP) for the project would be developed by the contractor and be kept on file at the construction site and become part of the permanent project record. The SOBTF contractor would obtain the NPDES permit prior to commencement of construction activities. Best Management Practices, including the use of silt curtains and other methods would temporarily stabilize areas where needed. These BMPs are already incorporated into the Impact Avoidance and Minimization Measures (section 2.2.5).

Biomass masticated under Activity 4, Treatment Method 1 would be spread as mulch over all any areas of bare soil created by Treatment Method 2. This mulch would serve to minimize the impact of rain on surface layers of the soil, as well as to stabilize the soil against both wind and water erosion. Generally, erosion impacts from storm-water are expected to be negligible, due to the extremely flat topography of the site, mulching, and high permeability of the soil.

Section 404 of the Clean Water Act, (CWA; 33 U.S.C. 1251 *et seq.*) as amended, provides for the protection of waters of the United States through regulation of the discharge of dredged or fill material. All work associated with the project would be accomplished outside of aquatic areas regulated by this law. The U.S Army Corps of Engineers was contacted for a review of the project activities, and determined that the project is not regulated under the provisions of Section 404 of the Clean Water Act and a permit would not be required (personal communication between Keystone Associates and Don Borden, U.S. Army Corps of Engineers, 11/14/2006).

Under Activity 5 (prescribed burning), burning of some debris piles would generate ash. Per the Impact Avoidance and Minimization Measures, and burn prescription, (Appendix A) all spoils piles, including ash, would be stabilized, covered, and/or watered, depending on the phase of project. Burning the debris in the piles a minimum of 300 ft (90 m) distant from the river channel or seasonal wetland areas would ensure that ash cannot reach these sites.

Per Activity 6, herbicide may be applied as a follow-up treatment to treat resprouts of nonnative vegetation or for initial treatment of nonnative where initial mechanical treatment is inappropriate. Two

herbicides were selected for use in the Proposed Action Alternative, Garlon® 4 and Habitat®. Garlon 4 is a formulations of triclopyr; Habitat is an isopropylamine salt of Imazypyr (see Appendices for material safety data sheets, labels and herbicide prescription). Garlon 4 would be used as needed throughout most of the project footprint, except within a 30ft (9 m) buffer of the river channel and seasonal pond. Habitat is approved for aquatic use and would be applied within this buffer area where needed.

Garlon 4 is the preferred herbicide for control of saltcedar as it is effective year-round, affects only woody broad-leaved plants (not grasses), and has limited mobility in soil. The active ingredient, triclopyr, acts by interrupting plant growth. It is absorbed by green bark, leaves and roots and moves throughout the plant. Triclopyr accumulates in the meristem (growth region) of the plant. Basal bark and cut stump techniques can be done at any time of year. The BMPs ensure that both Garlon 4 and Habitat would be applied in a very targeted fashion and only when there is little or no hazard of spray drift to ensure that the minimum amount of herbicide contacts non-target vegetation, soil or water.

Garlon 4, to the extent that it comes into contact with soil, adheres tightly to soil particles; the potential to leach from soil into ground water is minimal.

Compliance with the BMPs, burning prescription and herbicide prescription would ensure that the Proposed Action would have no significant effect on the water quality of the Rio Grande or the seasonal wetland.

Under the Proposed Action, no adverse impacts to surface water or groundwater quality are anticipated.

4.4.2 Hydrology

Under both the No Action and the Proposed Action Alternatives, there would be no change in the amount or duration of flow in the river. The Proposed Action utilizes exclusively passive restoration methods to with the existing hydrologic conditions to develop the desired habitat types.

4.4.3 Net Depletion Analysis

No Action Alternative

Under the No Action Alternative, saltcedar would be expected to densely reinfest the project site over the next decade. As compared to the current denuded state of vegetation on the footprint, water depletion via evapotranspiration would increase *considerably* with this scenario.

Proposed Action Alternative

Under the Proposed Action Alternative, native vegetation would be expected to re-colonize the project site over the next decade. As compared to the current denuded state of vegetation on the footprint, water depletion via evapotranspiration would increase *moderately* with this vegetation trajectory. As compared to the trajectory of the No Action Alternative, the Proposed Action Alternative would create a net depletion savings. The amount of savings cannot be quantified at this time, as it is impossible to accurately predict the acreages of each community type of vegetation that would re-establish on the project footprint in the future. Some project areas are targeted for planting or seeding, while others are targeted for natural regeneration. The eventual vegetation present in both planted and non-planted areas will be determined by a host of factors that will continue to evolve over time.

No activity of the project includes in-water work of any kind. No changes would be made to the existing channel shape, location, or form. No mechanical manipulation of the floodplain (e.g. bank lowering) would occur. No water would be temporarily or permanently directed onto the project footprint or out of the mainstem channel. There would be no changes to water deliveries, nor would any additional water be consumed as a result of the removal of the mostly dead vegetation that exists on the site.

It is possible that overbank flooding would occur on this project site during future high flows. Although this outcome is a desired restoration objective, it is not possible to assess the likelihood that it would actually occur. Further, if these overbank floods occur at the modeled flows of 5660 cfs, this would not be a new event, or attributable to the project activities. At the flow rate of 5660 cfs, overbank flooding currently occurs on sites in this reach of the river that have not received "restoration," due entirely to the channel and bank morphology in the reach.

In sum, a small positive change to net water depletion would occur in this reach of the Middle Rio Grande due to the Proposed Action.

4.4.4 Wetlands and Floodplains

No Action Alternative
The seasonal wetland has already been invaded by saltcedar. Over additional years, saltcedar would likely increase its dominance in this area. With its consumption of large amounts of water, saltcedar may eventually lower the water table, and become further entrenched in the area, effectively reducing the size of or eliminating the pond and saltgrass vegetation.

Proposed Action Alternative
Executive Order 11990 (Protection of Wetlands) requires the avoidance, to the greatest extent possible, of both long *and* short-term impacts associated with the destruction, modification, or other disturbance of wetland habitats. Further, Section 5(b) calls for the maintenance of natural systems, including the conservation and long-term productivity of existing flora and fauna, species and habitat, diversity and stability, hydrologic utility, fish, wildlife, timber, and food and fiber resources.

Under the Proposed Action Alternative, and the relevant BMPs, no vehicles or equipment would be used in the seasonal wetland area or other areas of short-term or long-term wet soils.

Fencing would be installed around the perimeter of the area utilizing small vehicles and teams of personnel with hand-held tools. Exclusion of livestock from this area would decrease the existing level of soil disturbance and trampling of vegetation. Pecos sunflower would be seeded by personnel teams. Saltcedar would be controlled in this area, again, by personnel teams using either chainsaws, or backpack sprayers or both, thus ensuring the diversity of habitats on the site that makes this property so valuable to wildlife.

4.5 Geology and Soils

No Action Alternative
Under the No Action Alternative saltcedar is expected to increase in density over most of the project site. Saltcedar, through various metabolic processes concentrates and exudes salt in leaves, which then fall to the ground as leaf litter, where the salt is released to the surface soil via decomposition. Dense saltcedar would increase the salinity of soils in the vicinity of infestations.

Proposed Action Alternative
Under the Proposed Action Alternative potential impacts to soils could potentially result from soil compaction or rutting by vehicles and construction equipment; soil disturbance created from rootplowing and raking, and other construction activities, followed by erosion; herbicides

Control of saltcedar on the project footprint would truncate the salinity increase described above. Root removal (Activity 4, Treatment Method 2) would cause a direct impact by disturbing soils. Soil disturbance would generally be limited to the area where rootplowing and raking occurs. These areas are

primarily in the vicinity of the channel bank, between the northern and southern sections of Habitat Zone X, where removal of root mass is considered a restoration objective, in order to facilitate bank evolution.

Following disturbance, these areas would be covered with mulched saltcedar material to minimize wind erosion. The extent of wind-related erosion resulting from the ground disturbance should be minimal once mulch is applied. If ample spring moisture occurs during the first year, dense annual vegetation should germinate and provide long-term wind erosion control.

Some compaction of soils may occur in areas where masticating and other equipment is used. These impacts should be minor, since the impact avoidance and minimization measures call for use of the lightest possible equipment, tracked vehicles, and avoidance of wet soils. Revegetation of the site following mulching, flooding and colonization by native species would help to reverse any compaction effects.

For the Garlon 4 that does contact soil, microorganisms degrade triclopyr rapidly; the average half-life in soil is 46 days. Triclopyr is slightly toxic to practically non-toxic to soil microorganisms and quite immobile in soil, typically remaining within 12 in (30 cm) of the contact point.

4.6 Biological Resources

4.6.1 Vegetation Communities and Nonnative Species

No Action Alternative

The areas previously treated with herbicide in 2003 and/or burned in 2006 are already being re-colonized by nonnative species, primarily saltcedar. Over time, if no additional restoration efforts are attempted, this process would consume most of the project footprint and the assorted communities of native bosque vegetation would be largely replaced by a monoculture of saltcedar. The transition to a non-native state is entrenched and advancing throughout the Middle Rio Grande Valley and the conversion of this project site would contribute to that process.

The wholesale replacement of native vegetation by nonnative would change the fire regime, as saltcedar is considerably more flammable than native vegetation. Since fire does not stop at fence lines or property lines, dense saltcedar poses an elevated fire risk (relative to native vegetation) to vegetation, habitats, and structures off site as well as on site.

Equally, the replacement of a patchwork of native vegetation communities with a monoculture of saltcedar has impacts for most of the other species of life in the bosque. An assortment of studies have been carried out on the pros and cons of this vegetation change, most of which examined the diversity or abundance of specific taxon (e.g. birds) with variable results. The specific results of any one study or the impacts for any one taxon are less important than the overall, long-term loss of habitat diversity, which supports fundamental ecosystem integrity, structure and function.

Proposed Action Alternative

Under the Proposed Action Alternative impacts to vegetation communities and non-native species could potentially result from several of the project activities.

Implementation of the Proposed Action Alternative would minimize the presence of saltcedar within the project footprint; it is unlikely to be eradicated, given the extensive seed sources in the region and the favorable hydrologic conditions for its establishment. Minimizing the presence of saltcedar would provide conditions favorable for re-establishment and persistence of the variety of native vegetation originally on site due to reduced competition and reduced soil salinity. Part of the value of this particular site lies in the

variety of vegetation communities that previously existed on it. Most of these have been degraded to some extent by the invasion of saltcedar, but are expected to recover following treatment.

Control of saltcedar on the project site would eliminate the elevated fire risk that would have occurred if saltcedar was allowed to recolonize the site as described under the No Action Alternative.

Increased frequency of flooding is anticipated under the Proposed Action Alternative and constitutes a restoration objective. Riparian vegetation is inherently subject to and dependent on flooding disturbance. Effects from this increase in flooding are expected to be wholly beneficial to native vegetation communities.

Mastication, mulching, rootplowing and raking are large-scale non-native vegetation removal techniques. These would completely remove the target non-native vegetation and likely cause incidental and minor loss of and disturbance to some non-target native vegetation. These techniques would not be utilized in areas where there is more than a minor amount of native vegetation remaining.

Prescribed burning would only be utilized for disposal of extracted and piled root biomass to ensure the resprouting would not occur. It would not be used as a management tool. There would be no effect on living vegetation.

Fencing would be installed in limited areas for the purpose of protecting vegetation plantings. It is expected to have a wholly beneficial effect.

Some herbaceous floodplain species may be trampled by vehicles and equipment during construction, but impacts would be moderate and transitory in all areas except roads (further discussed under section 4.8.

Herbicide that contacts non-target woody broad-leaved vegetation would be lethal to that vegetation. Some desirable native vegetation would be lost incidental to the herbicide treatment. This loss is expected to be minor.

In sum, implementation of the Proposed Action Alternative will result in short-term minor adverse impacts to desirable native vegetation communities, and greatly decreased abundance of nonnative vegetation.

4.6.2 Wildlife and Fish

No Action Alternative

Under the No Action Alternative, there would be no impacts to fish. Wildlife would not be impacted by project activities, but there would be long-term impacts from loss of habitat diversity. This impact would be minor, due to the small size of the project footprint; only when viewed cumulatively does this impact become serious.

Proposed Action Alternative

Project activities in the Proposed Action Alternative would clearly disturb and displace wildlife. The nonnative vegetation removal activities would create the greatest disturbance. Although the majority of the saltcedar on the site is dead, it still provides cover and shelter for some species. Animals would be displaced from these areas, and would be forced to relocate to adjacent vegetated areas that would not be affected. These replacement areas are limited. Some wildlife species that likely inhabit the proposed project area, such as reptiles, small mammals, and amphibians, could experience mortality during the implementation of the vegetation removal activities.

The fencing, ground water well installation, planting, seeding and other activities would create less noise and less human presence, but would still constitute a disturbance and some of these activities would occur in the more valuable habitat areas (e.g. Habitat Zone Z). Almost any presence of humans on the site constitutes a minor disturbance for the most sensitive species. Further, the impacts to wildlife in the area from equipment noise would extend an estimated 0.25 miles beyond the footprint perimeter. This disturbance would continue sporadically over an estimated 2-3 winter seasons, as vegetation removal, fencing, and planting activities are spaced around the receipt of funding, weather conditions, and other factors. These activities may disrupt wildlife behaviors but are not expected to cause mortality.

The Migratory Bird Treaty Act protects migratory bird species and requires activities to take place outside of general bird nesting season, which is April through August. The only disturbance that would potentially occur within the breeding season is the application of herbicide via personnel teams and backpack sprayers, thereby avoiding impacts to species migrating through or attempting to nest in the area.

There will be no direct impacts to fish, as project activities will not occur in the channel; however some may be impacted by equipment noise. The BMPs in place for erosion, storm water and run off controls are exceeding strict and will prevent inputs to the river channel.

Effects on wildlife from Garlon 4 are minor. Triclopyr is slightly toxic to practically nontoxic to invertebrates. Slightly toxic is defined as a probable lethal oral dose for humans at 5-15 g/kg. Triclopyr is slightly toxic to mammals. In mammals, most triclopyr is excreted, unchanged, in the urine. Triclopyr and its formulations have very low toxicity to birds. Triclopyr is non-toxic to bees (Durkin, 2003).

Habitat was selected for use within 30 feet (9 m) of water bodies. Although the BMPs minimize the possibility of spray drift or overspray into aquatic areas, the use of Habitat in these areas is an extra level of protection. Habitat is labeled for aquatic use and is specifically formulated for use where inadvertent application to water may occur. There are no restrictions on applying it to public or private waters, on livestock consumption or recreational use of waters downstream from the application point.

In sum, the Proposed Action would produce short-term minor impacts on wildlife in the immediate area of disturbance and long-term beneficial effects on wildlife from improved ecological function.

4.6.3 Special Status Species

No Action Alternative

No short-term impacts are expected to special status species under this alternative. Long-term impacts would result from continued degradation of habitat quality and loss of habitat diversity, based on the expected conversion of the site to dense saltcedar.

Proposed Action Alternative

A separate Biological Assessment was completed for the proposed action as compliance with the Endangered Species Act, and analyzes the potential impacts of the action on listed species. The yellow-billed cuckoo, as a candidate species, does not require analysis in a Biological Assessment. Potential impacts to that species are discussed below.

Under the Proposed Action Alternative, most of the restoration activities designed to benefit Southwestern willow flycatcher will also benefit yellow-billed cuckoo, since the nesting habitat requirements are quite similar. Much of the vegetation that currently exists on the project footprint is degraded or dead, as a result of the 2003 herbicide treatment and the 2006 fire. The remnant areas that offer migratory, foraging or nesting habitat value to the cuckoo are the same ones that offer those values to the SWWF, namely, Habitat Zones X and Z (Figure 3) and the remaining patches of xeric scrub and

saltgrass meadow. These areas will entertain only limited activities during the initial stages of the project, so that the habitat will remain intact and relatively undisturbed. Activities of higher disturbance level will only occur in Habitat Zone Z after replacement habitat has been created. In addition, all activities have been scheduled for the time period outside of migration and nesting by the cuckoo, further reducing the possibility of disturbance. Any impacts to this species will be minor and short-term.

4.7 Cultural and Historic Resources

There would be no impacts to cultural or historic resources under either alternative.

4.8 Transportation and Access

No Action Alternative

There would be no impacts to local or regional transportation, traffic circulation, road conditions, on-site access or other factors under the No Action Alternative.

Proposed Action Alternative

Under the Proposed Action Alternative, there would be a minor increase in traffic on Bosquecito Road during the periods of time when activities are occurring (primarily during the winter months). Some of this traffic would be standard vehicles for personnel, and some would be larger equipment. For reasons of cost-savings, the equipment would be generally be parked overnight on site at the ranch center for activities that require multi-day schedules. This means that equipment passage over Bosquecito Road would not occur twice daily, but rather a few times per project, depending on the weather and other scheduling factors.

Slow movement of vehicles on Bosquecito Road is expected to have minor and short-term impacts on the very light existing traffic on this road. The BMPs require that the contractor repair any damage or degradation to the road resulting from equipment passage.

Use of the roads on the project site by vehicles and larger equipment would result in moderate impacts to these areas. The roads, which are currently faint, would become more visible and defined. Impacts would be limited to these roads by the design of the project in order to minimize impacts to soils and vegetation on the remainder of the site.

4.9 Cumulative Impacts, Irreversible and Irretrievable Commitments of Resources

A number of environmental impacts have occurred in the bosque of the Rio Grande associated with changes in the water regime and the large-scale invasion by saltcedar. These past impacts have largely stabilized and can be considered baselines against which impacts of the proposed action can be compared. The control of saltcedar and restoration of native vegetation habitats would be a step in mitigating these past impacts. A number of other saltcedar control and revegetation projects are being implemented along the Rio Grande. The completion of each additional project such as this action would help to leverage the positive cumulative impact of these efforts.

The adverse cumulative impacts upon the biological and cultural resources of the proposed project would be negligible, while the positive impacts would be positive. The proposed project would substantively restore an area degraded by nonnative vegetation and an altered fire regime to one.

An irreversible and irretrievable impact is a commitment of a resource(s) that is, through a given action, lost forever. There are no foreseeable irreversible and irretrievable commitments of resources associated with the proposed action.

5.0 CONCLUSIONS

This Environmental Assessment described and analyzed the impacts of the proposed Rhodes Habitat Restoration project. The description included information about the existing site resources and conditions, use, cultural and historic resources, relevant regional context, the project's restoration objectives, specific activities to accomplish those objectives, and measures that would be employed to ensure that the project activities result in improvements to the ecosystem of the Rio Grande bosque without negative impacts to resources. The analysis then examined in depth the potential effects that activities could have on resources. For each type of resource, a determination of impact was made based on the project design.

5.1 Summary of Impacts by Alternative

The overall effects of the No Action Alternative versus the Proposed Action Alternative are summarized in Table 4.

Table 4. Summary of Environmental Consequences by Alternative.

Environmental Resource	No Action Alternative	Proposed Action Alternative
Land Use	No impact	Negligible impact
Air Quality	No impact	Minimal, short-term impact
Noise	No impact	Moderate short-term impact
Water Resources – water quality	No impact	No impact
Water Resources – hydrology	No impact	No impact
Water Resources – net depletion	Minor long-term adverse impact	Minor long-term beneficial impact
Water Resources – wetlands and floodplains	No impact	No impact
Geology and Soils	No impact	Minimal impact
Biological Resources – vegetation and nonnative species	Continuing trend of Ecosystem modification, long-term adverse impacts	Short-term minor adverse impacts; Long-term moderate beneficial impacts
Biological Resources – Wildlife and fish	Minor long-term adverse effects	Moderate short-term adverse impacts; beneficial long-term effects
Biological Resources – special status species	Moderate impact	Minor, short-term impacts (see Biological Assessment)
Cultural and Historic Resources	No impact	No impact
Transportation and Access	No impact	Minimal impact

6.0 DOCUMENT PREPARATION

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Mr. Carlos Madril
U.S Bureau of Land Management

Mr. Chad McKenna
Parametrix Consulting

Mr. Marcus Miller
U.S. Natural Resources Conservation Service

Ms. Yasmeen Najmi
Save Our Bosque Task Force/Middle Rio Grande Conservancy District

Ms. Doris Rhodes
Property Owner

Ms. Jan Rhodes
Property Owner

Mr. Matt Schmader
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Mr. Robert Sivinski
New Mexico Department of Forestry

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Ms. Sheila Williams
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Ms. Pat Zenone
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United States Department of the Interior

FISH AND WILDLIFE SERVICE
New Mexico Ecological Services Field Office
2105 Osuna NE
Albuquerque, New Mexico 87113
Phone: (505) 346-2525 Fax: (505) 346-2542

March 22, 2007

Mr. Jim Norwick
Director, Field Operations
310 Old Santa Fe Trail
P.O. Box 1148
Santa Fe, New Mexico 87504

Dear Mr. Norwick:

The Save Our Bosque Task Force, in conjunction with the U.S. Fish and Wildlife Service (Service) is preparing to initiate public scoping for the Rhodes Property Habitat Restoration Project Biological and Environmental Assessment (BA/EA). As the lead agency for this project, the Service is seeking your cooperation based on either your jurisdiction by law or special expertise on environmental issues that should be addressed in the BA/EA.

We are inviting the New Mexico State Land Office to be a "Cooperating Agency" in this project as defined by the Council on Environmental Quality's (CEQ) Regulations for Implementing the National Environmental Policy Act (NEPA), Section 1508.5. We expect Cooperating Agencies to participate in the scoping process leading to identification of significant issues for the EA purpose and need statement. If you decide to act as a Cooperating Agency for the BA/EA, we hope you will commit personnel adequate to develop pertinent information and to prepare environmental analyses based on your expertise and area of jurisdiction, with direction from the Service. The Service will focus the efforts of Cooperating Agencies on topics for which the New Mexico State Land Office has expertise and appropriate data or information. For example, we may request assistance in the analysis of geospatial data if the Cooperating Agency has access to a geographic information system and the necessary staff resources to complete the analyses. We will use the environmental analyses and proposals of Cooperating Agencies to the extent possible, consistent with our responsibility as lead agency.

If your agency is not inclined, or does not have the resources to act in a Cooperating Agency status, but would like to be involved in the BA/EA process, a potential forum for involvement is through the Save Our Bosque Task Force (Task Force). The Task Force provides another avenue for the New Mexico State Land Office participation in the restoration process without taking on the responsibilities of a Cooperating Agency. However, we do recognize a distinct difference between Task Force and Cooperating Agency roles. While the role of the Task Force is to provide restoration advice and to implement actions in the project, we expect our Cooperating Agencies to help fashion alternatives to the proposed action for the EA. We encourage you to

United States Department of the Interior

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March 22, 2007

Mr. Marcus Miller
State Biologist
New Mexico State Office
Natural Resources Conservation Service
6200 Jefferson NE, Rm 305
Albuquerque, New Mexico 87109-3734

Dear Mr. Miller:

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SOCORRO FIELD OFFICE
EA COMMENT FORM
NM-120-07-02

LOCATION COMMENT	DISPOSITION	
SECTION: Page Paragraph Line **Critical** *or* Suggested **REVIEWER** Flores	This document has to be in conformance with our Land use plan. Please include something under the Regulatory Compliance Section along the lines of: The proposed action is in conformance with the terms and the conditions of the approved Resource Management Plan for the Public Lands Administered by the Bureau of Land Management, Socorro Field Office, August 1989, Socorro Resource Management Plan FEIS (BLM-NM-PT-89-021-4410) , as required by 43 CFR 1610.5.	**INCORPORATE:** Part All N/A (circled) **AUTHOR**
SECTION: Page Paragraph Line **Critical** *or* Suggested **REVIEWER** Flores	We have emergency stabilization money to accomplish things on BLM in the Fall-Spring of 07. This falls out of the timeline for Zone 2B and the monitoring for success in this area.	**INCORPORATE:** Part All N/A (circled) **AUTHOR**
SECTION: Page Paragraph Line **Critical** *or* Suggested **REVIEWER** Flores	There is no cultural section for this EA. Below is an example of what we include in our affected environment section, environmental consequences, and mitigation section. **I. Cultural Resources** Cultural resources consist of non-renewable archeological sites of both prehistoric and historic origin, as well as living cultural traditions of resident populations. An allotment-specific cultural resource records review was conducted in the Socorro Field Office files, Archeological Records Management System (ARMS) data and a library of reports and documents related to Socorro and Catron Counties. Class I overviews for Socorro FO have been prepared by Berman (1979); Stuart and Gauthier (1981); and Carroll (1989). Additional Class I and II Inventories covering portions of the SFO area include Cordell (1978); Tainter and Levine (1987); Camilli, Ford, and Larralde (1988); Kayser and Carroll (1988); and Marshall and Walt (1984). SFO maintains a comprehensive map atlas	**INCORPORATE:** Part (circled) All N/A **AUTHOR**

	documenting cultural sites and surveys, which was reviewed for this allotment. For Management purposes, all proposed actions requiring federal authorization, including those associated with livestock facilities, are subject to prior archaeological survey to identify and evaluate potential effects on the resources. Because federal regulation prohibits disclosure of information to the public on the nature and location of cultural resource sites, documentation and results of the detailed records review for this allotment are incorporated by reference in the form of Cultural Resource report number CRR-NM-02-06-28, on file in the Socorro Field Office. No sites have been recorded within the boundaries of the Wineglass allotment that require monitoring, or that require mitigation of the effects of livestock grazing. **Environmental Consequences** **Cultural Resources** Prehistoric and historic archeological sites can be adversely affected by livestock activity. The primary source of impacts by livestock are from long-term reduction of site mounds, features and artifacts on the ground surface, and rubbing against standing walls, structures, or vertical features such as rock art panels. These types of direct impacts become accelerated when cattle are either contained in a site area, or attracted to the location. Cattle often are attracted to larger, structural archeological sites either by standing walls for shelter or rubbing, or by the fact that such sites often retain moisture causing differential vegetative cover. Cattle may also be attracted to sites, such as south-facing rockshelters, for shelter and warmth in the wintertime. Any permitted facilities that cause cattle concentration, such as earthen tanks, troughs, corrals, "grazing cell centers," etc., are subject to concentrated impacts and are routinely surveyed prior to authorization to ensure no conflict with cultural resources. Secondary impacts may include local increases in sheet erosion or gullying along cattle trails, and increased potential for unlawful collection and vandalism due to access provided to facilities in remote locations. Typically, when moderate to high site densities are present on grazing allotments, some sites may be protected from impacts by natural barriers, such as topography, dense	

	vegetation, etc. while other sites may be more exposed to long-term impacts. By observation, it appears that over time sites tend to lose standing walls, and that structural mounds and middens tend to become reduced. After this, rapid deterioration slows down, and many sites become partially stabilized under long-term, low to moderate grazing. This holds true as long as no intense concentration of cattle occurs, and that no secondary effect (such as critical erosion) is triggered. This is the observed current condition of the great majority of structural sites in the SFO region. One of the cultural program's goals is to identify sites which are either being unduly affected by grazing, or which for any reason become destabilized due to direct or indirect effects from grazing or any other cause. Such sites should receive special attention for administrative or archeological mitigating measures to control impacts. Measures and Conclusion Cultural resource surveys would continue to be conducted for all rangeland improvements for the purpose of mitigation through avoidance. Whenever sites are identified which are subject to undue effects from grazing conditions, each case will be evaluated to determine the correct administrative procedure (such as fencing), or intensive measure (such as scientific excavation) which should be carried out. Any intensive measures will be carried out in accordance with appropriate laws and regulations affecting archeological and Native American issues. Because federal regulation prohibits disclosure of information to the public on the nature and location of cultural resource sites, documentation and results of a detailed records review for this allotment are incorporated by reference in the form of Cultural Resource report number CRR-NM-02-06-28, on file in the Socorro Field Office. No sites have been recorded within the boundaries of the Wineglass allotment that require monitoring, or that require mitigation of the effects of livestock grazing.	
SECTION: Page / Paragraph	We have not yet established a Memo of Understanding outlining what or how BLM will participate in the	**INCORPORATE:** Part / All

Line **Critical** *or* Suggested **REVIEWER** Flores	project. Once that is determined it can be incorporated into the EA. MERES money is only going to be spent on the private land. No MERES money will be spent on BLM, State as I remember. May want to state that additional funding will be provided by cooperating agencies.	N/A **AUTHOR**
SECTION: Page Paragraph Line Critical or Suggested REVIEWER	Include a gate & walk-through for public access & interpretation of the area and possible trespass cattle	INCORPORATE: Part All N/A AUTHOR
SECTION: Page Paragraph Line Critical or Suggested REVIEWER		INCORPORATE: Part All N/A AUTHOR
SECTION: Page Paragraph Line Critical or Suggested REVIEWER	All of the land west of Bosquecito Rd is in a summer use only pasture according to the Allotment Management Plan. This pasture also has the only source of water for livestock on the allotment, due to the age of the pipeline watering the other two pastures.	INCORPORATE: Part All N/A AUTHOR
SECTION Page Paragraph Line Critical or Suggested REVIEWER		INCORPORATE: Part All N/A AUTHOR

SECTION	COMMENT Rhodes Proposal	DISPOSITION
Page EA-7 Paragraph 2.2.2 Line Critical or uggested Reviewer Sheila L. Williams	Has the property had a recent survey to determine location of BLM, State properties? (EA indicates the last survey was done in 1979).	INCORPORATE: Part All N/A AUTHOR
Page EA-12 Paragraph Activity 3 Line Critical or Suggested Reviewer SWilliams	Should take into consideration other noxious weeds common in the area-perennial pepperweed (*Lepidium latifolium*) and Russian knapweed (*Acroptilon repens*). Need to include these in surveys and mitigation. Mitigations should include standard stips from BLM, such as cleaning equipment prior to working on site to prevent noxious weed introductions from other localities.	INCORPORATE: Part All N/A AUTHOR
Page EA-12 Paragraph Activity 4 Line Critical or Suggested Reviewer SWilliams	Contractor performing herbicide treatments should have a herbicide applicators license with the State of NM.	Incorporate: Part All N/A Author
Page EA-17 Paragraph Activity 8 Line Critical or Suggested Reviewer SWilliams	What collection methods will be used from the native Pecos sunflower location on La Joya (percentage of seed from the population, consideration for drought if it occurs (i.e. low seed production), handling of seed, etc)	Incorporate: Part All N/A Author
Page EA-20 Paragraph 2.2.5 Line Critical or Suggested Reviewer SWilliams	Contractor or whoever is using herbicides should be licensed applicator with the State of NM	Incorporate: Part All N/A Author
Page EA-21 Paragraph 2.2.5 Soil and Water Line 2nd bullet on pg Critical or Suggested Reviewer SWilliams	Understandably you would still have some sediment runoff, but you can minimize sediment runoff with BMP's. Don't we want to prevent herbicides from getting in the water (the BMP's regarding chemicals/herbicides strive in that direction)?	Incorporate: Part All N/A Author
Page EA-45 Paragraph 4.6.3 Line Critical or Suggested Reviewer SWilliams	Even though consultation and BA are separate, effects on special status species should be noted in the EA under the Environmental Consequences.	Incorporate: Part All N/A Author
Page EA-46 Paragraph 4.7 Line	As a Federal Action, the project area needs cultural inventory and report approved by BLM (mitigation if necessary). At any rate without this information it is unknown if there are impacts to cultural or historical resources....	Incorporate: Part All N/A Author

Critical or Suggested		
Reviewer SWilliams		

Page BA-2	If Pecos sunflower is not treated as a nonessential experimental population, then I assume it does have full protection under the ESA?	Incorporate: Part All N/A Author
Paragraph 1.1		
Line 4th bullet on pg		
Critical or Suggested		
Reviewer SWilliams		

Page 1, 9		Incorporate: Part All N/A Author
Paragraph General comment	The following is from the NMRPTC website; "**Habitat:** Saturated saline soils of desert wetlands. Usually associated with desert springs (cienegas) or the wetlands created from modifying desert springs, 1,000-2,000 m (3,300-6,600 ft). *Helianthus paradoxus* is a true wetland species that requires saturated soils; adult plants still grow well when inundated." Introducing Pecos sunflower into a degraded saltgrass meadow is a long shot for the plant's survival. The loamy soils do retain water when it rains, but there is no source for a saline springs or cienegas in the project area footprint, which according to literature this species is restricted to.	
Line		
Critical or Suggested		
Reviewer SWilliams		

Page BA-18	Should describe collection techniques from the Pecos sunflower population at La Joya (percentage of seed from the population, consideration for drought if it occurs (i.e. low seed production), handling of seed, etc)	Incorporate: Part All N/A Author
Paragraph Activity 8		
Line		
Critical or Suggested		
Reviewer SWilliams		

Page BA-37	No direct effects for Pecos sunflower planting; indirect effects could be effects from seed collection on the native population at La Joya.	Incorporate: Part All N/A Author
Paragraph Activity 8		
Line		
Critical or Suggested		
Reviewer SWilliams		

Page BA-37	Potential indirect effects from pile burning (Activity 5) could sterilize soil under it (if the wildfire hasn't already	Incorporate: Part

	taken care of this in spots). Indirect effects of Activity 6: Could add "based on timing of application, winds, etc (BMP's)". This would prevent herbicides from getting in the river. Other indirect effects could be overspray hitting non-target species. Indirect effects from Activity 7 would be forbs and grasses reestablishing, and survival of pole plantings, and Pecos sunflower after fencing.	All N/A Author
Paragraph 3.2		
Line		
Critical or Suggested		
Reviewer SWilliams		

Page BA-40	Pecos sunflower. As is stated in this section, there is not potential habitat present in the project area. There are a couple of effects to be considered to the species. One is the low potential for survival for the introduced seeds and/or plants if some manage to germinate. There is no mention in either document modifying the habitat or providing any more water than what is available on site. Possibly some may sprout with late winter precipitation and the retention of rainwater in the saltgrass meadow area (Grunstra and Auken, 2007 mention that Pecos sunflower sprouts in January in populations in Texas). The second effect to be considered is the effects on the native population on La Joya that the seed will be collected from, as I have mentioned in previous comments. The documents need information on seed collection methods, and conditions of the La Joya population should be taken into account prior to seed collection (drought effects, disease, predation, etc). Seed collection will be removing a percentage of viable seed from that population, and will affect it. I am not sure I understand the conclusion in the BA that this species would have no further analysis (I do understand that there is no potential habitat, and no Pecos sunflower present, but this does not exclude the above effects to consider). The other question I have is that I am assuming since it was said in the beginning of the BA that the introduced Pecos sunflower will have full protection under the ESA, since it is not considered a nonessential experimental population.	Incorporate: Part All N/A Author
Paragraph 7.5, 7.7	Considering that there is an affect on critical habitat for the Rio Grande silvery minnow, I am confused by the no affect call for the minnow. The habitat will be affected in the short term after mechanical treatments, and there will	

	be an increase in sediment until native vegetation reestablishes itself (see page 68 of BA). Added sediment into the river for the short term must affect the minnow, so shouldn't the call be "may affect, not likely to adversely affect", due to use of BMP's and the layout of the project proposal (little slope) preventing any large additions of sediment to the river.	
Line 59, 68		
Critical or Suggested		
Reviewer SWilliams		

Page		Incorporate:
Paragraph		Part
Line		All
Critical or Suggested		N/A
Reviewer SWilliams		Author

Page		Incorporate:
Paragraph		Part
Line		All
Critical or Suggested		N/A
Reviewer SWilliams		Author

Page		Incorporate:
Paragraph		Part
Line		All
Critical or Suggested		N/A
Reviewer SWilliams		Author