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**FINAL  
ENVIRONMENTAL ASSESSMENT**

and

**FINDING OF NO SIGNIFICANT IMPACT**

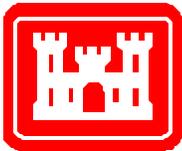
for

**RIO GRANDE  
HABITAT RESTORATION PROJECT,  
LOS LUNAS,  
NEW MEXICO**

March 2002



Prepared by



**US Army Corps  
of Engineers®**

Albuquerque District



## **FINDING OF NO SIGNIFICANT IMPACT (FONSI)**

### **RIO GRANDE HABITAT RESTORATION PROJECT, LOS LUNAS, NEW MEXICO**

On June 29, 2001, the US Fish and Wildlife Service (USFWS) issued a Biological Opinion (BO) regarding the effects of certain water management practices upon the Rio Grande silvery minnow (*Hybognathus amarus* [RGSM]), the Southwestern Willow Flycatcher (*Empidonax traillii extimus* [WIFL]), the Bald Eagle (*Haliaeetus leucocephalus*), the Interior Least Tern (*Sterna antillarum*), and the experimental-nonessential population of the Whooping Crane (*Grus americana*). Specifically, the BO evaluated the implications of the US Bureau of Reclamation's (BOR) discretionary actions related to water management and the US Army Corps of Engineer's (Corps) water operation rules and non-federal actions related to ordinary operations on the middle Rio Grande. The USFWS concluded that the above management practices would likely jeopardize the continued existence of the RGSM and WIFL and, therefore, developed a Reasonable and Prudent Alternative (RPA) that they believe must be implemented in order to avoid placing these species in jeopardy in accordance with the Endangered Species Act (ESA) 16 U.S.C. 1531 *et seq.* The Corps and the BOR have made an initial determination to accept and implement, on an interim basis, the general provisions of the RPA.

This restoration project is intended to fulfill the requirement of habitat restoration in the Belen Reach; one of eight reaches in which habitat restoration must be conducted in accordance with Element J of the RPA. Further, it is meant to fulfill the requirement to initiate construction on at least one restoration project within six months from the date of the BO. The BOR and the Corps are the joint lead Federal agencies and the Middle Rio Grande Conservancy District (MRGCD) is the primary non-federal cooperator.

The objectives of the proposed project are to improve habitat conditions for the RGSM and WIFL such that, in combination with other elements of the RPA, jeopardy to the two species would be avoided. In general, the proposed project is intended to mechanically widen the active river channel and to improve the adjacent riparian habitats. These alterations would produce additional shallow water/low velocity habitats for the RGSM during high runoff flows. At reduced flows, the restoration area would still experience an increased degree of inundation, at various levels, thus facilitating a post-fire regeneration of high-value terrestrial habitats within and adjacent to the restoration area.

The area under consideration for this restoration project suffered a severe burn in April of 2000. As a result, it offers an ideal opportunity for restoration as it avoids impacting a non-burned area. Nonetheless, the extensive restorative goals would require a great deal of work. The project has been divided into three broadly defined phases. First, approximately 1,355 jetty jacks would be permanently removed. Second, excavation of approximately 40 acres would be completed to allow for the widening of the river channel and, accordingly, the creation of extensive shallow water/low velocity aquatic habitats. Lastly, all areas of terrestrial disturbance would be revegetated with native plants, which will stimulate and begin the process of post-fire reclamation ultimately leading to a high-value riparian habitat. Although temporally separated, the various phases of construction would last approximately one year. Monitoring activities would continue for at least 15 years from the completion of construction.

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Conversely, if no restoration actions are taken, it is likely that the burn area will be colonized by invasive plant species such as saltcedar and Russian olive; a trend that is replete and advancing throughout the Rio Grande Valley. In addition, the burned vegetation represents a fire hazard as it continues to dry and accumulate. This increasingly dangerous scenario would ultimately threaten unburned areas, as it would provide a potential fire with a tremendous amount fuel and vigor.

Impacts to physical and biological resources during the various construction phases would be moderate but generally localized. Considering the requirements of the BO, the objectives of the proposed project, and the degraded state of the existing environment the net gains in aquatic and terrestrial habitat improvements outweigh the impacts. There would be no impacts to cultural resources.

The overall goal of this project is to produce inundation of the project area at flows of greater than or equal to 2,500 cubic feet/second (cfs). For flows below 2,500 cfs, a variety of substrate elevations would be incorporated into the project design, which would allow for the inundation, to a lesser degree, of certain regions within the project area. This would include design features such as networks of side-channels. In addition, the increased inundation frequency would begin the process of post-fire regeneration of high-value terrestrial habitats in portions within and adjacent to the restoration site boundary. This restoration project is also, in part, an effort that seeks to gain knowledge and experience in the applications of channel expansion and riparian/aquatic restoration. Further, the goals of the proposed project are an integral part of the recommendations made under the *Middle Rio Grande Ecosystem: Bosque Biological Management Plan* (Crawford et al. 1993) and would set a positive precedent in the Middle Rio Grande Valley in the application and viability of extensive restoration efforts.

The proposed project was evaluated for permit authorization under Section 404 of the Clean Water Act (33 CFR 320-331). Information provided by the joint applicants, all interested parties, and the Environmental Assessment were included in the evaluation. The permit action will not have a significant impact on the quality of the human environment.

Based on the findings of this Environmental Assessment, the proposed project would not have any significant adverse impacts on the quality of the human, natural, or cultural resources. Therefore, an Environmental Impact Statement (EIS) will not be prepared for this project.

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Date

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Date

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## 1.0 INTRODUCTION

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### 1.1 BACKGROUND, PURPOSE and NEED

On June 29, 2001, the US Fish and Wildlife Service (USFWS) issued a Biological Opinion (BO) regarding the effects of certain water management practices upon the Rio Grande silvery minnow (*Hybognathus amarus* [RGSM]), the Southwestern Willow Flycatcher (*Empidonax traillii extimus* [WIFL]), the Bald Eagle (*Haliaeetus leucocephalus*), the Interior Least Tern (*Sterna antillarum*), and the experimental-nonessential population of the Whooping Crane (*Grus americana*). Specifically, the BO evaluated the implications of the US Bureau of Reclamation's (BOR) discretionary actions related to water management and the US Army Corps of Engineer's (Corps) water operation rules and non-federal actions related to ordinary operations on the middle Rio Grande. The USFWS concluded that the above management practices would likely jeopardize the continued existence of the RGSM and WIFL and, therefore, developed a Reasonable and Prudent Alternative (RPA) that they believe must be implemented in order to avoid placing these species in jeopardy in accordance with the Endangered Species Act (ESA) 16 U.S.C. 1531 *et seq.* The Corps and the BOR have made an initial determination to accept and implement, on an interim basis, the general provisions of the RPA.

This restoration project is intended to fulfill the requirement of habitat restoration in the Belen Reach; one of eight reaches in which habitat restoration must be conducted in accordance with Element J of the RPA. Further, it is meant to fulfill the requirement to initiate construction on at least one restoration project within six months from the date of the BO. The BOR and the Corps are the joint lead Federal agencies and the Middle Rio Grande Conservancy District (MRGCD) is the primary non-federal cooperator.

In April of 2000, a large area, including the entire restoration area, suffered a severe fire that destroyed virtually all of the area's aboveground vegetation, leaving only isolated stands of surviving vegetation. However, these islands are limited to areas adjacent to the river where moist soils precluded the total destruction of existing vegetation. These stands, while potentially viable, suffered severe edge and crown damage that make their long-term survival and overall value uncertain. Generally, the remaining vegetation is dominated by saltcedar (*Tamarix chinensis*) and Russian olive (*Eleagnus angustifolia*), invasive and aggressive colonizers that are, among other non-native species, threatening the overall health of the native riparian forest (bosque). The inherent ability of these non-native species to colonize and dominate an area, particularly following a fire, considerably lowers the overall value of the surviving vegetation and underscores the necessity for restorative action.

### 1.2 OBJECTIVES

The objectives of the proposed project are to improve habitat conditions for the RGSM and WIFL such that, in combination with other elements of the RPA, jeopardy to the two species would be avoided. In general, the proposed project is intended to mechanically widen the active river channel and to improve the adjacent riparian habitats. These alterations would produce additional shallow water/low velocity habitats for the RGSM

during high runoff flows. At reduced flows, the restoration area would still experience an increased degree of inundation, at various levels, thus facilitating a post-fire regeneration of high-value terrestrial habitats within and adjacent to the restoration area.

### 1.3 REGULATORY COMPLIANCE

This Environmental Assessment (EA) was prepared by the U.S. Army Corps of Engineers, Albuquerque District, and the US Bureau of Reclamation, Albuquerque Office 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)
- Procedures for Implementing NEPA (33 CFR 230; ER 200-2-2)
- National Pollutant Discharge Elimination System, as amended (33 U.S.C. 1251 *et seq.*)

This EA also 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.

In addition, the BOR, as the joint lead Federal agency, is participating in the preparation of this EA pursuant to NEPA regulations 40 CFR 1501.6.

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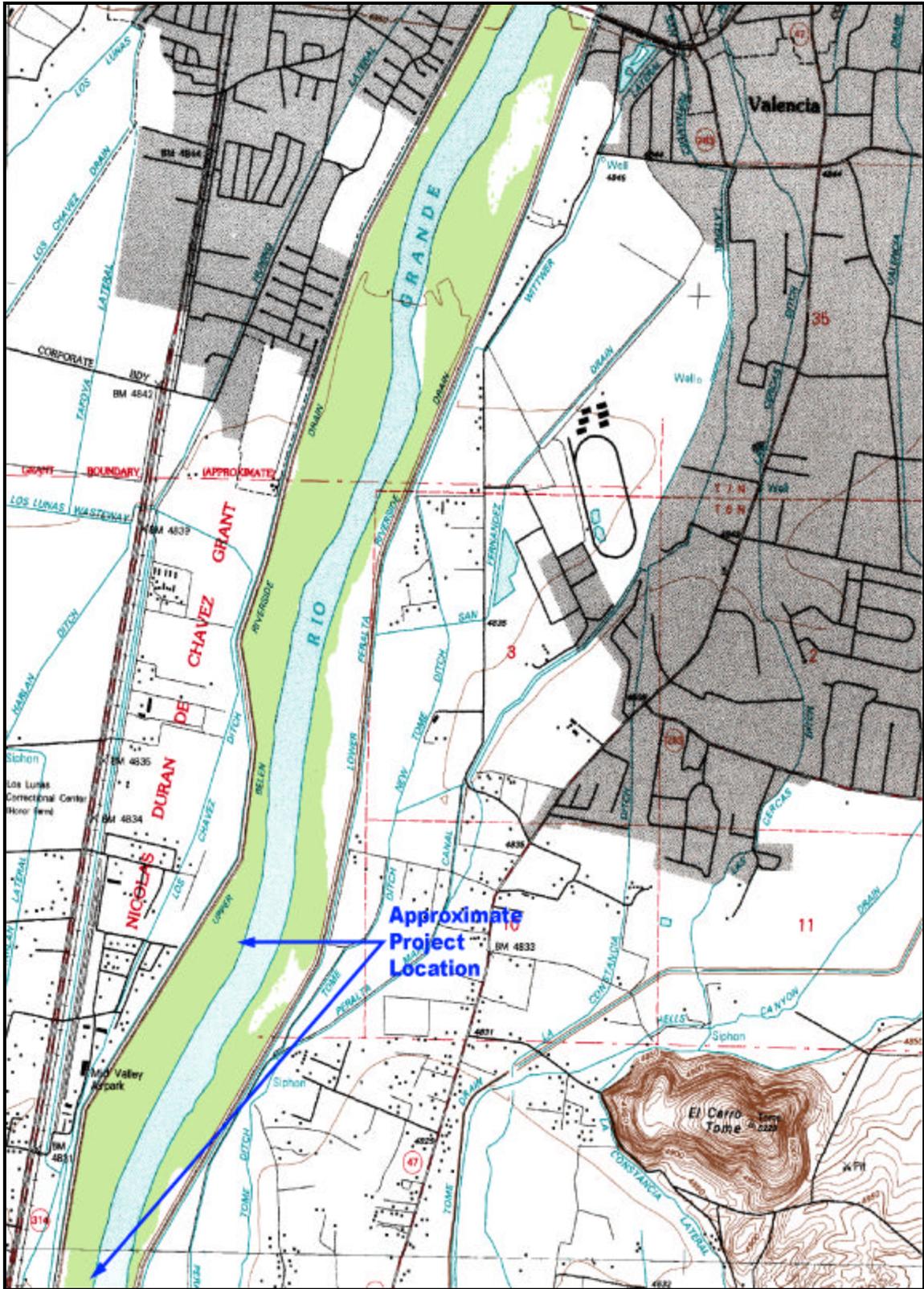


FIGURE 1. Vicinity map for proposed Los Lunas restoration project (USGS 7½ minute quadrangle; Los Lunas, New Mexico, Zone 13)

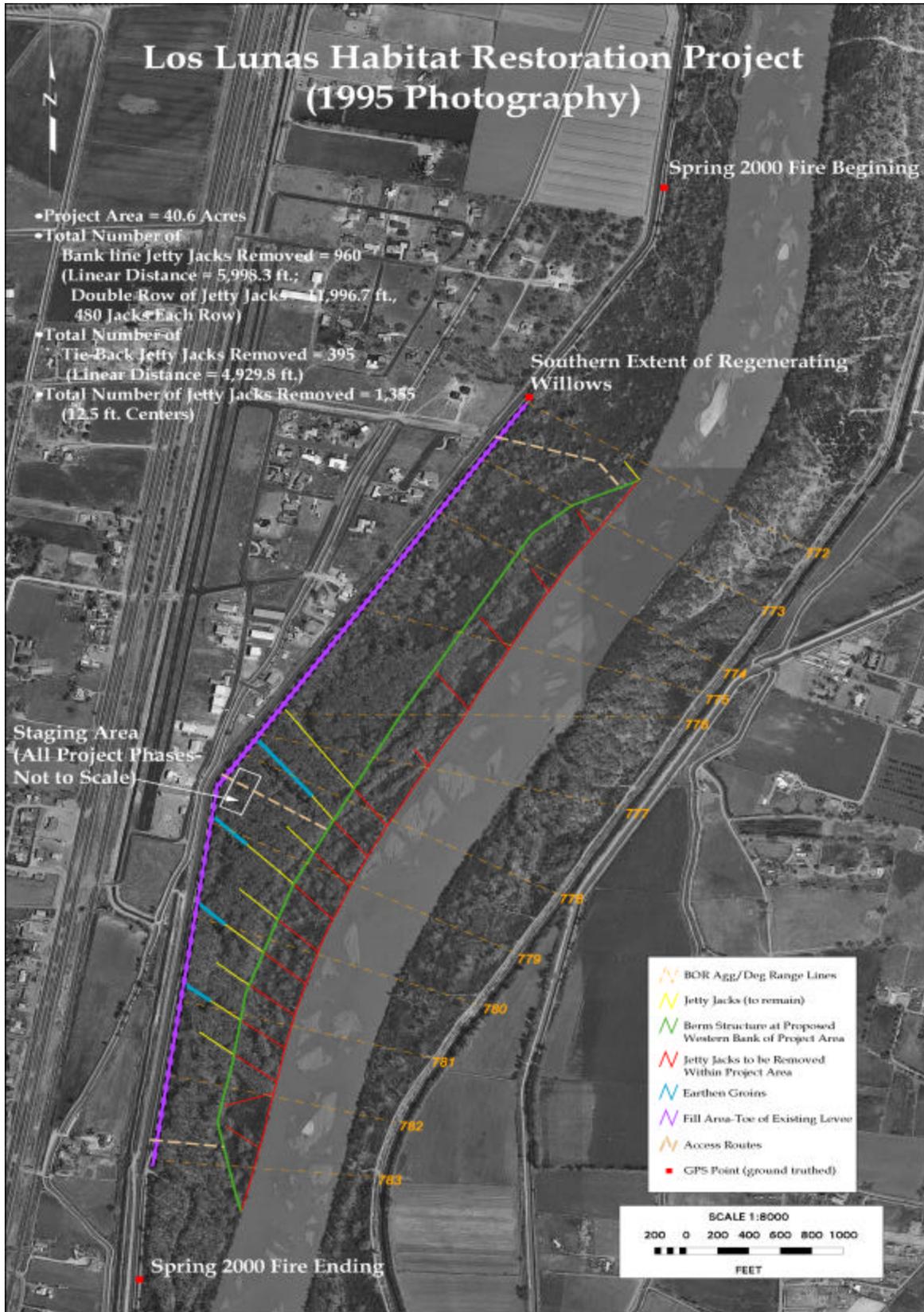


FIGURE 2. Plan view of proposed Los Lunas restoration project

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## 2.0 ALTERNATIVES AND PROPOSED ACTION

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### 2.1 ALTERNATIVE SITES CONSIDERED: LOS LUNAS BRIDGE and BELEN BRIDGE SITES

Two alternative sites were considered for this restoration project. The Los Lunas Bridge site is located directly upstream from the Los Lunas bridge (NM Hwy 6), which spans the Rio Grande. The Belen Bridge site is located directly above the Belen Bridge (NM Hwy 309) also spanning the Rio Grande.

Three factors influenced the dismissal of these sites from further consideration. First, both of the alternative sites have not been impacted by fire. The mature bosque at these locations represent a significant source of intrinsic and ecological value. Second, the cross sections/bank profile indicated that a significantly greater amount of excavation work would be required thus complicating the issue of spoil disposal. Third, proximity to the bridges poses a slight risk to the integrity of the bridge abutments. This condition, while not a pronounced threat, is unacceptable as it is difficult to predict any impacts to the bridges or their supportive structures. For these reasons the above alternative sites were excluded from further consideration.

### 2.2 NO-ACTION ALTERNATIVE: IMPACT and IMPLICATIONS

The No-Action Alternative would provide no Federal funding for restoration efforts at this location. The only activities at the site would likely be funded by the MRGCD and generally be limited to the removal of the burned cottonwoods and the associated fire suppression.

Over time, if no restoration efforts are attempted, the burn area would be colonized by exotic species such as saltcedar and Russian olive and the native bosque would eventually be supplanted by non-native vegetation. The transition to a non-native state is entrenched and advancing throughout the Middle Rio Grande Valley as regenerative periodic flooding has been virtually eliminated in the Middle Rio Grande Valley. Therefore, the effects of the No-Action Alternative are potentially serious and far-reaching.

The No-Action Alternative would allow for the proliferation of a non-native ecosystem and a continued degradation of the native ecosystem. As such, the No-Action Alternative should be viewed, on both local and regional scales, as an ecologically unsound alternative.

In addition, the No-Action Alternative would not allow for the implementation of Element J of the RPA.

### 2.3 LOCATION OF PROPOSED PROJECT

The proposed project site is located on the west bank of the Rio Grande adjacent to the Los Lunas, New Mexico Airpark. Figure 2, a 1995 aerial photograph, defines the proposed restoration area (green), and outlines the overall project objectives with regard to the removal of approximately 1,355 jetty-jacks (red). The proposed restoration area is approximately 1,829 meters (6,000 ft.) as measured along the

existing riverbank and is a relatively uniform width of approximately 107 m (350 ft.). The restoration area is approximately 16.4 hectares (40.6 acres). The approximate UTM coordinates along the riverbank (from north to south end) are: .N 3847960, E 341273 and N3846221, E340413 (NAD 27, zone 13). The site is managed by the MRGCD.

#### **2.4 PROPOSED ACTION: SITE RESTORATION**

The overall goal of this project is to produce inundation of the project area at flows of greater than or equal to 2,500 cubic feet/second (cfs). For flows below 2,500 cfs, a variety of substrate elevations would be incorporated into the project design, which would allow for the inundation, to a lesser degree, of certain regions within the project area. This would include design features such as networks of side-channels. In addition, the increased inundation frequency would begin the process of post-fire regeneration of high-value terrestrial habitats in portions within and adjacent to the restoration site boundary. This restoration project is also, in part, an effort that seeks to gain knowledge and experience in the applications of channel expansion and riparian and aquatic restoration. Further, the goals of the proposed project are an integral part of the recommendations made under the *Middle Rio Grande Ecosystem: Bosque Biological Management Plan* (Crawford et al. 1993) and would set a positive precedent in the Middle Rio Grande Valley in the application and viability of extensive restoration efforts. The body of knowledge and experience gained here would benefit future restoration efforts throughout the Middle Rio Grande Valley.

To accomplish these goals, the project would be divided into three phases that are detailed below.

##### **2.4.1 PRELIMINARY SURVEY WORK**

The proposed restoration area would be surveyed by the BOR and the Corps to establish the position of the proposed new bank line and current cross sections specific for the restoration site. Once established, the survey information would allow for the clear and consistent recognition of the proposed project boundary during the various stages of work. In addition, baseline data would allow for the accurate assessment of the bank alignment over time. This is both a precautionary measure and a means to study the physical effects and success of increasing the channel width and the self-maintenance characteristics. Bank position and properties can be closely monitored by a comparative analyses between the baseline data and a new set of measured cross sections that are to be taken after project completion and during various monitoring stages. These data analyses would help insure the safety and integrity of the levee in the future. Many of the project survey needs (*i.e.* access routes) would be surveyed at this time.

##### **2.4.2 PHASE I: JETTY JACK REMOVAL**

Phase 1 of the proposed project would be accomplished by the Corps and would consist of the removal of the bank line and tieback jetty jacks (Fig. 2). Currently, removal work is scheduled to commence in February 2002 and would be largely completed prior to the spring snowmelt runoff period. However, additional jetty jack

removal may take place in the spring and early summer. A cross section of a typical jetty jack and deadman anchoring specifications is shown in Figure 3.

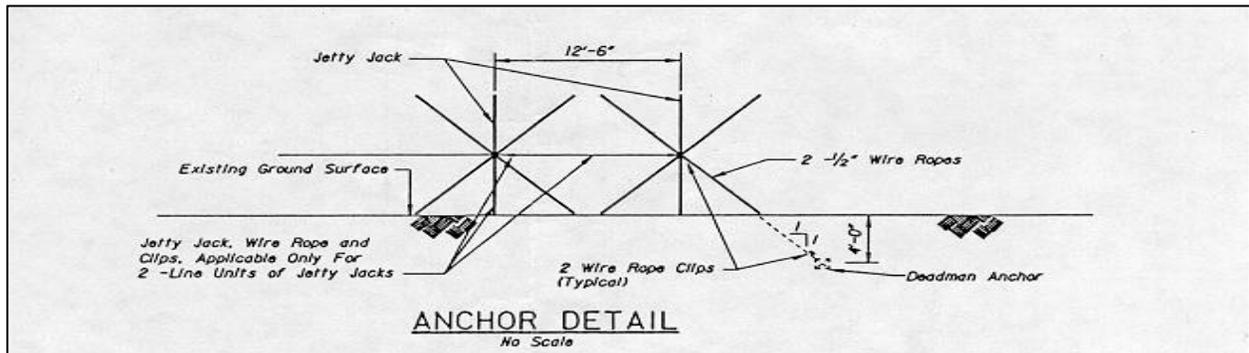


FIGURE 3. Detail of typical jetty jack and deadman anchoring

Two parallel rows of jetty jacks are currently aligned along the entire length of the bank line on 12.5-foot centers. The riverward row is positioned on the toe of the bank and is buried such that only 1-3 feet of each upward facing limb is exposed. The landward row is similarly positioned along the bank itself. However, these jetty jacks are buried to a lesser extent; approximately 4-6 feet of each upward facing limb being exposed. Both bank line rows show signs of corrosion.

Removal of the bank line jetty jacks would likely proceed from upstream to downstream using an excavator and pulling the jacks landward. If only a portion of the jack can be removed in this manner, minimal excavation may then be required to remove the jetty jack to the greatest extent possible. In that event, any excavated material would be placed landward of the existing bank. After the jack is removed, any excavated area would fill from natural sloughing along the bank. Approximately 960 jetty jacks would be removed along the bank and would be salvaged for recycling or otherwise disposed of off-site in an appropriate manner.

Removal of approximately 395 tieback jetty jacks would occur in areas above the ordinary high water. The remaining tieback jetty jacks would be secured and deadman anchored (Fig. 3) to guard against additional bank erosion and channel widening and bank erosion. Disposal would be as stated above.

To facilitate the jetty jack removal, access routes would be constructed from the levee road into the restoration area (Fig. 2). All vegetation, including the standing dead Rio Grande Cottonwoods (*Populus deltoides wislizenii*), would be removed and windrowed immediately adjacent to the access routes. Wood from windrowed dead trees would be offered to the public at no charge. These access routes would be the primary heavy equipment/worker access for the duration of the project and would serve as controlled and safe entry points into the project area. Three access routes measuring a maximum of 300' in width would be established and allow for the large equipment and windrowing of the vegetation. Additionally, vegetation would need to be removed from an area around the tieback rows as the dead cottonwoods present a significant safety hazard. These trees would also be windrowed as stated above. One equipment staging area,

for storage and refueling purposes, measuring a maximum of 500' x 500' (Fig. 2), would also be established at this time. The removal of the jetty jacks would not affect the levee.

### 2.4.3 PHASE II: OVERBANK EXCAVATION of the RESTORATION AREA

Following the spring 2002 snowmelt runoff, the BOR, or their contractor, would clear and grub the vegetation within the entire restoration area. The herbaceous and smaller woody vegetation would be piled and placed near the proposed new west bank in preparation for mulching/chipping or other appropriate disposal. Any woody remnants purposefully left within the inundated restoration area should provide a measure of cover and refugia for aquatic species such as the RGSM. Large dead cottonwood trees and rootwads would be stockpiled for future placement along the toe of the proposed new west bank line (bioengineered bank stabilization) or windrowed along the access routes.

The overbank excavation area is aligned parallel to the existing channel with smooth tapered transitions at each end. This alignment would allow flows to enter and exit the excavated area, while maintaining a parallel flow direction with respect to the river mainstem. This would minimize the possibility of establishing an undesirable flow pattern downstream from the project area. Excavation of the restoration site would begin at elevations above the ordinary high water mark and would continue down to elevations below the ordinary high water mark. However, final elevations within the site would range from approximately the 1,000 cfs water surface elevation (WSE) up to the 5,200 cfs (approximately 2 year frequency) WSE in order to simulate the natural variation of the river channel and riparian floodplain. Figure 4 is a typical cross section of the site depicting the extent of excavation that would occur and the associated project features.

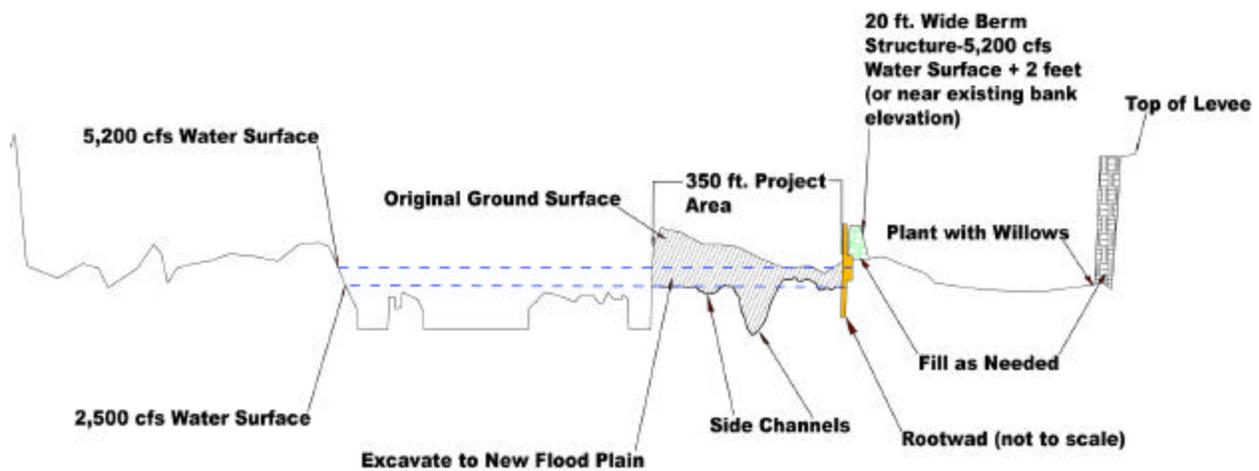


FIGURE 4. Typical project cross section

Approximately 80,000-100,000 cubic yards of material would be generated from the excavation of the proposed restoration area. The proposed new west bank would be approximately 350 feet from the existing bank at the widest point; tapering at the

northern and southern ends (Fig. 2). An earthen berm would be constructed along the new west bank to the elevation of the current bank using approximately 10,000-15,000 cubic yards of spoil material. The berm freeboard (height of earthen berm) above the 2-year WSE event would be at least two feet, or near the existing bank elevation. This exact elevation is not yet known, as current cross sections of the river channel are not available. However, prior to construction, cross sectional data would be gathered for these design purposes.

In addition, to enhance levee integrity, excavated material (60,000-70,000 cubic yards) would be placed along the riverward toe of the levee. Three to four wetlands directly adjacent to the levee and measuring approximately 50 x 25 feet would be filled. Excavated material (10,000-15,000 cubic yards) not used for the berm or placed along the levee toe would be placed on dry sandbars within the river channel.

#### **2.4.4 PHASE III: FILL STABILIZATION and RIPARIAN IMPROVEMENTS**

Following Phases 1 and 2, coyote and black willows would be planted in patches along the newly established west bank. The highest density of willows would be planted at the northern and southern ends of the site, where the greatest potential for erosion is anticipated. In combination with the substantial distance between the site and the levee, and the considerable amount of vegetation already established, the new willows and remaining secured jetty jacks would inhibit any further channel expansion and protect the integrity of the levee adjacent to the project area. Native vegetation, including cottonwood and willow poles and New Mexico olive, would be planted on all disturbed areas (fill placed along levee toe, the access routes, staging areas, berm structure, etc.). Desirable vegetation present would be avoided to the greatest extent possible during all construction activities.

#### **2.4.5 OTHER MONITORING**

The US Department of Agriculture Forest Service, Rocky Mountain Research Station (USDAFS) is currently conducting a study entitled "*Effects of Fuels-Reduction and Exotic Plant Removal on Vertebrates, Vegetation, and Water Resources in Southwestern Riparian Ecosystems*". The proposed restoration site is in proximity to one or more of the study-area transects and the USDAFS has agreed to work closely with Corps and BOR to coordinate and modify their study parameters and experimental design with regard to the monitoring needs of the proposed project. The association of the two projects would thus provide an added feature to the above research in that channel expansion may now exert a significantly different driving force in the overall community ecology and organization. The data gathered from this cooperative effort would clearly add to our understanding of southwestern riparian and aquatic ecosystems and thus provide managers with valuable data and insight on river and bosque restoration.

As discussed previously, the immediate and foreseeable monitoring efforts would focus on the success of the revegetation of disturbed areas, channel expansion, bank profile characteristics, levee safety, and wildlife colonization and use. These monitoring efforts would be largely carried out by the Corps and BOR. The overall restorative goals of the

project would likely take several years, as sculpting of the underlying terrain by the river is a gradual process. Ultimately, however, when channel expansion is accomplished, long term wildlife (including RGSM and WIFL) use, habitation, and reproductive success would need to be assessed and quantified. Existing RGSM and WIFL monitoring regimes by the USFWS, the BOR, the Corps, and other entities could be employed at the site. These long-term monitoring efforts, totaling 15 years, would be addressed in detail at a future point when channel and habitat characteristics have stabilized.

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### **3.0 EXISTING ENVIRONMENT AND FORESEEABLE EFFECTS OF THE PROPOSED ACTION**

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#### **3.1 PHYSICAL RESOURCES**

##### **3.1.1 PHYSIOGRAPHY, GEOLOGY, and SOILS**

The Los Lunas Habitat Restoration Project is located in the Rio Grande subsection of the Basin and Range Physiographic Province (Williams 1986). More specifically, the site is nestled within the Rio Grande Rift Valley. Formed by the extension and fracture of the Earth's crust, this physiographic feature is generally bounded by fault-block uplifted mountains. The crust extension/mountain-building processes forms a corresponding depression in the overall topography in which the Rio Grande ultimately flows.

Soil associations in the project area are classified as Torrfluvents-Calciorthids-Torriorthents (New Mexico State University-Agriculture Experiment Station, 1978). This association includes the level to sloping floodplain of the Rio Grande in Doña Ana, Sierra, Valencia, Bernalillo, Socorro, and Sandoval counties. It also includes the gently sloping to moderately steep terraces and alluvial fans that occur adjacent to, and just above, the greater Rio Grande floodplain. Typically, within the greater floodplain, these soils are used for irrigated croplands, irrigated pasture, urban and community developments, wildlife habitat, and native grazing. Although a wide variety of crops are grown in the Middle Rio Grande Valley, hay and alfalfa are generally the most widespread. Other crops of importance include fruits, vegetables, oats, wheat, and sorghum.

These soil associations, which are deep and highly stratified, are developing in alluvium of mixed origin. The surface layers of Torrfluvents can range from sand to clay but most are of medium to fine textures. The subsurface layers are similar but may also include moderately coarse elements. Although most of these soils are well drained, some areas are subject to high water tables and inadequate permeability. As a result, small areas become saline or saline-sodic soils. Calciorthids occur on the gently to strongly sloping alluvial fans and terraces. These soils typically have light-colored and strongly calcareous gravelly sandy loam or very gravelly sandy loam surface layers. The subsurface layers are a pinkish-white and contain moderately coarse materials with a high concentration of lime. The degree of lime cementation is highly variable and usually decreases with depth. Torriorthents occur on the gently to strongly sloping

uplands of the Rio Grande floodplain. These soils lack an extensive lime component found in Calciorthid soils. Textures of Torriorthents are generally gravelly sandy loam surface layers underlain by moderately coarse subsurface layers. Gravel content of Torriorthents can be up to 50 percent or more.

Impacts to soils generated by the proposed project implementation would generally be limited to the disturbance of the current bank line and the excavation of the restoration area. As outlined previously, all excavated material would be placed in three fill areas. First, excavated material would be used to construct the berm structure located at the proposed restoration project boundary. The estimated amount necessary to construct this berm is 10,000-15,000 cubic yards. Berm dimensions are estimated at 6,000 ft. long x 20 ft. base-width x 2 ft. high. This, in combination with the placement of the rootwads, would provide a measure of inundation containment that is equal to at least two feet above the 5,200 cfs WSE (approximately the two-year flood event). Second, approximately 60,000-70,000 cubic yards of excavated material would be placed along the riverward toe of the western levee (Fig. 4). The dimensions of this fill area are estimated at 6,000 ft. long x 50 ft. base-width x 7-8 ft. high. The placement of this material would not harm the integrity of the levee and may provide a slightly increased degree of protection from higher flows. The total estimated amount of excavated material is 80,000-100,000 cubic yards. However, final excavation estimates would be made when current site cross sections are taken. Disposition of the excavated material may then be adjusted while still maintaining the previously stated safety margins. Impacts to soils would be short-term (approximately one year construction time) and moderate. Final soil stabilization would be accomplished through native vegetation planting.

Other impacts to soils would be associated with the construction of the access routes, staging area, berm structure, and fill zone along the toe of the levee (Fig. 2). These impacts should be short-term and negligible given the overall aquatic and riparian habitat restorative goals of the project and native revegetation of all areas of disturbance. The extent of riparian habitat improvements (native revegetation) resulting from disturbance would be approximately 14.9 hectares (36.7 acres).

### **3.1.2 CLIMATE**

The climate is typical of the central Rio Grande Valley and can be generally characterized by hot summers and cold winters. From 1951-1980, the average annual high temperature was 100.8°F and the average low temperature was 3.6°F (Williams 1986). Average annual precipitation is approximately 8.0 inches/year. Nearly half that amount comes in the form of late summer and early fall thunderstorms. These storms can be quite intense and highly localized but are typically of short duration. Humidity is generally low. Snowfall is common averaging approximately nine inches/year. The average frost-free season is 120 days.

### **3.1.3 WATER RESOURCES & QUALITY**

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. Therefore, a Storm Water Pollution Prevention Plan (SWPPP) is required and would be prepared for this project. Generally, erosion impacts from storm-water are expected to be negligible, as soils at the site should sufficiently retain and hold storm water inputs throughout the project duration.

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. The Corps' Regulatory Program (33 CFR Parts 320-330) requires that a Section 404 evaluation be conducted for all proposed construction that may affect waters of the United States. The 404-evaluation process, which addresses the effects of discharged fill material on waters of the United States, would be conducted by and acquired through the Corps' Albuquerque District Regulatory Branch. The proposed project would require an individual authorization (permit) under section 404 of the CWA. This public notice for the 404 application is contained in Appendix A.

Section 401 of the CWA, (CWA; 33 U.S.C. 1251 *et seq.*) as amended, requires that an applicant for Section 404 authorization also obtain water quality certification for the proposed action prior to initiating any proposed construction. For projects located on public or private lands in New Mexico, the New Mexico Environment Department administers the water quality certification (Appendix A).

The documentation contained in Appendix A should be referenced for specific issues and questions relating to impacts upon water resources governed by these regulations (Sections 404 & 401 of the CWA). Significant measures were geared at coordinating the processes of CWA and NEPA compliance. As a result, all general and special conditions of both permits/certifications would be addressed in the final design plans and specifications for the proposed restoration project. Further, all CWA documentation will become part of the permanent project record for all Federal and State agencies involved. The 404 application and permit number is 2001-00520. The final permit documentation will be available for review through the Corps' Albuquerque District Regulatory Office when completed.

The Corps and BOR, in close coordination with any and all contractors, would be responsible for meeting the general and special conditions of the above permits and would use best management practices, and avoidance by design, to prevent or minimize effects to water resources during and after construction. BOR and Corps Contracting Officers, or their representatives, would be required to monitor and inspect any contractor's compliance with project specifications regarding the conditions set forth under the CWA permits and any best management practices employed to conform to those permit conditions.

Foreseeable effects to water resources should be negligible to moderate. Bank line jetty jack removal would create slight increases in turbidity but would be relatively short-term and localized, as this work would be conducted during low flows (currently scheduled for January-April of 2002). Removal of the remaining jetty jacks would have no impact on water resources or quality. Bank excavation immediately adjacent to the river would have similar impacts. However, timing of the excavation work would also be conducted during low flows (currently scheduled for July-October of 2002). The cumulative effects generated from these activities should be moderate but temporally separated. As a result, the cumulative impacts realized downstream should be low. Potential placement of excavated material on dry sand bars would be governed by the CWA permits, as these areas are largely below the ordinary high water mark. All conditions set forth by these permits, as well as the effects of this activity are contained, and discussed, within the documentation of Appendix A. Permit conditions, both 404 and 401, would be observed at all times and will play a key role in the final project design and specifications.

No effects to groundwater are foreseeable from the perspective of water quality. As mentioned previously and further discussed in sections to follow, some groundwater ponding has been observed in the past within the restoration site; although the fire has ostensibly reduced the extent of ponding throughout the burn area as these ponds were absent during several recent site visits. Additionally, the fill area at the toe of the levee would ultimately cover 3-4 small groundwater ponds. However, the net gain of ponding microhabitats from project implementation would be considerable and clearly an improvement over the existing post-fire conditions. Although it impossible to quantify the amount of ponding habitat that would be constructed within the restoration area, the networks of side-channels would clearly provide for a net increase of this type of habitat, either by design or circumstance, as a wide variety of diverse elevations would be represented within the project area. In addition, an equal number of filled groundwater ponds would be created on or near the access roads as Phase II concludes and heavy equipment leaves the site.

### **3.1.4 NET WATER DEPLETION ANALYSES**

#### **Water Budget Methodology**

In order to assess the hydrologic effect of the Los Lunas Restoration Project, an evapo-transpiration water budget has been constructed to analyze the projected net water depletions at both the short (monthly) and long-term (15 years) time scales. This budget uses the best available evapo-transpiration data for the Middle Rio Grande Valley, places these data into a monthly time step, extends those results to a future point, and analyzes water consumption at the site for future conditions without restoration and future conditions with restoration. This methodology is based, in part, on that used in the technical memorandum "Hydrologic Effect of Expanded Place of Use at the Bosque Del Apache National Wildlife Refuge" by Kevin Flannigan and Peter Balleau (1998). This investigation established water budgets for restored vs. non-restored riparian forests at Bosque Del Apache NWR and was the basis for a water rights application that was reviewed and approved by the New Mexico Office of the State Engineer (1999). The primary sources for water consumption values in this report

are the Bureau of Reclamation's Middle Rio Grande Water Assessment reports (1997a, 1997b, 1997c). The methodology presented herein differs from the Flannigan and Balleau investigation in three key aspects: 1) the numbers for consumptive uses of each category have been normalized and corrected to reflect the site-specific weather conditions in the Los Lunas area, 2) the Los Lunas Site water balance is done on a monthly time step, not annual; however, the extrapolation of the monthly data is used for an annual summation value and then extended into the future for 15 years, 3) several of the consumptive categories (open water, sweet clover/sunflower [*Melilotus albus/Helianthus spp.*], cottonwood, non-native phreatophytes, and grasses) incorporate a range of consumptive values from various sources in an effort to evaluate depletions in a more rigorous manner.

Future condition water consumption with and without restoration at the Los Lunas Site may be calculated in six general categories: 1) evaporation from open water, 2) evaporation of water from sand bars with groundwater at 1-2 feet beneath the surface, 3) evapo-transpiration from a rehabilitated cottonwood tree forest, 4) evapo-transpiration from dense willow stands, 5) evapo-transpiration from dense non-native phreatophytes composed of a mixture of Russian olive and saltcedar trees, 6) evapo-transpiration from grasslands. The growing season for all species is from April 1 through October 31. The season for evaporation from open water and sand bars is year round. The water-consumption rates for each category are determined by normalizing the annual consumptive values to a monthly time step using the evapo-transpiration curve for Los Lunas. Additionally, a range of annual consumptive values were grouped into a high and low series of values and locally corrected in the same fashion. The low/high grouping is designed to estimate depletions throughout a broad range of plausible values for each category, which is, in turn, carried through both short- and long-term periods of depletion estimates. The array of categorical consumptive values used in this analysis is summarized in Table 1.

**TABLE 1.** Monthly consumption values for the Los Lunas Restoration Project water budget estimate. All values represent feet of consumption. ? = Coefficient of pan evaporation; **ETWG** = Evapo-transpiration Work Group; **BOR** = Bureau of Reclamation; **N-Ph.** = Non-phreatophytic; **SG** = Salt grass; **Alf.** = Alfalfa; **M.Wht.** = Mature Wheat (Reicosky et al. 1994).

Month	Open water ? =		Cottonwood		Willow	Sand-bar	Grassland		Saltcedar/ Russian olive		Sweet clover/ Sunflower	
	0.70	0.85	ETWG	BOR			N-Ph.	SG	BOR	ETWG	Alf.	M. Wht.
January	0.14	0.17	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00
February	0.19	0.23	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00
March	0.34	0.41	0.00	0.00	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00
April	0.46	0.56	0.43	0.69	0.60	0.19	0.00	0.28	0.60	0.70	0.43	0.84
May	0.54	0.66	0.50	0.80	0.70	0.23	0.00	0.33	0.70	0.82	0.50	0.98
June	0.60	0.72	0.55	0.88	0.77	0.25	0.00	0.36	0.77	0.90	0.55	1.08
July	0.53	0.64	0.49	0.78	0.68	0.22	0.00	0.32	0.68	0.79	0.49	0.96
August	0.47	0.57	0.44	0.70	0.61	0.20	0.00	0.39	0.61	0.71	0.44	0.86
September	0.37	0.45	0.34	0.55	0.48	0.15	0.00	0.23	0.48	0.56	0.34	0.67
October	0.28	0.34	0.26	0.41	0.36	0.12	0.00	0.17	0.36	0.42	0.26	0.51
November	0.16	0.20	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00
December	0.12	0.14	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00
<b>Annual</b>	<b>4.2</b>	<b>5.1</b>	<b>3.0</b>	<b>4.8</b>	<b>4.2</b>	<b>1.75</b>	<b>0.00</b>	<b>1.99</b>	<b>4.2</b>	<b>4.9</b>	<b>3.0</b>	<b>5.9</b>

**Evaporation from open water: 4.2 feet/year & 5.1 feet/year.**

The net annual evaporation rate for Los Lunas is calculated from the site-specific climate station "Los Lunas 3 SSW" (NMSU Climate Data Center). The mean annual net pan evaporation rate for the station is 71.98 inches or 6.0 feet/year (period of record = 08/1962 through 11/1995). The pan coefficient is assumed to be 0.70 (Dunne and Leopold, 1978), which constitutes the low range value for open water ( $0.70 \times 6.0$  feet/year = 4.2 feet/year). Alternatively, a coefficient of 0.85 (pers. comm. Rolf Schmidt-Pederson, Interstate Stream Commission) is also applied in an effort to capture the widest plausible range of open water evaporative values ( $0.85 \times 6.0$  feet/year = 5.1 feet/year). This rate constitutes the high range value for open water. Both values (4.2 and 5.1 feet/year) are used in this analysis.

**Evaporation of water on sand bars: 1.75 feet/year.**

The evaporation rates for sand bars within shallow groundwater have never been synthesized for the Middle Rio Grande. However, the phreatophyte investigations at Bernardo (Bureau of Reclamation, 1997b), found that evaporation through a sandy soil with a ground water depth between 1 and 3 feet averaged 1.75 feet/year.

**Evapo-transpiration from sweet clover/sunflower: 3.0 feet/year & 5.9 feet/year.**

Evapo-transpiration rates of herbaceous plants, such as sweet clover and sunflower, have never been measured or calculated for the Middle Rio Grande. By necessity, approximations for herbaceous cover-types have been generated as analogs of known crop-species data. This approach, while not ideal, is effectively the best consumptive estimating methodology given the current lack of empirical data. For this study, evapo-transpiration data for alfalfa and mature wheat have provided the framework for an evaluation of the sweet clover/sunflower cover-type. However, supplanting these values may present some problems. For example, alfalfa is typically swathed (mowed) 3-4 times per growing season. As a result, the value of 3.0 feet/year may underestimate the cumulative consumption of alfalfa, as recent data suggests that the leaf area index (LAI) of any given plant is the greatest driving force of water consumption (pers. comm. Dr. Clifford N. Dahm, Department of Biology, University of New Mexico). Conversely, early re-growth of alfalfa may consume proportionally more water as mature stages. Either case is certainly possible but neither case is currently conclusive. Alternatively, mature wheat is another analog for herbaceous cover-types, as wheat is typically allowed to grow to maturity. In order to capture a plausible range of possibilities and given the lack of empirical data, both 3.0 feet/year (alfalfa; Interstate Stream Commission) and 5.9 feet/year (mature wheat; Reicosky et al. 1994) are included in this analysis as the low and high estimates respectively.

**Evapo-transpiration from rehabilitated cottonwood trees: 3.0 feet/year & 4.8 ft/yr.**

The consumption value for cottonwood trees presented in the Bureau of Reclamation Water Assessment (1997a) is 4.8 feet/year; however, this value appears to be high in light of recent values generated from a multi agency task force (Evapo-transpiration Work Group, Bureau of Reclamation). Consumptive numbers for cottonwood trees derived from this task force found that a 10-year old cottonwood forest at Bosque Del Apache National Wildlife Refuge (NWR) consumes

approximately 3.0 feet/year. These values (3.0 and 4.8 feet/year) define the plausible range of consumptive values for cottonwood trees used in this analysis.

**Evapo-transpiration from dense willow stands: 4.2 feet/year.**

Evapo-transpiration rates of willow have never been calculated for the Middle Rio Grande. For the purpose of this study, dense willow vegetation is given a consumptive figure similar to the non-native phreatophytes. This is a conservative approach since willow stands probably consume significantly less water than the non-native phreatophytes. Willow stands tend to be shorter and contain less of a leaf area per square meter (LAI) than saltcedar and Russian olive.

**Evapo-transpiration from non-native phreatophytes: 4.2 feet/year & 4.9 feet/year.**

The long-term (years 6-15) future condition without restoration of the Los Lunas site is estimated to be largely composed of an even mix of saltcedar and Russian olive trees. Russian olive trees have a consumptive use of 5.3 feet/year, and saltcedar have a consumptive use of 3.1feet/year, thus the consumptive use for the mixed forest is assumed to be an average of these two, or 4.2 feet/year (Bureau of Reclamation, 1997a). The consumption number for saltcedar trees presented in the Bureau of Reclamation 1997a appears to be low in light of recent values derived from a multi agency task force (EvapoTranspiration Work Group, Bureau of Reclamation). Consumptive values derived from this task force have found that a dense saltcedar forest in the active river floodplain at Bosque Del Apache consumes roughly 4.5 feet/year. When this value is considered, the average consumption increases to 4.9 feet/year. These values (4.2 and 4.9 feet/year) define the plausible range of consumptive values for non-native phreatophytes used in this analysis.

**Evapo-transpiration from grasslands: 0.0 feet/year & 1.99 feet/year.**

Two potential grassland cover-types are considered in this analysis. First, it is assumed that grasslands composed of bunch grass are entirely supported by precipitation inputs and do not require supplemental groundwater. Hence, the water consumption factor for this cover-type is zero. In contrast, native salt grass (*Distichlis spp.*), with an ability to establish root tips at depths within the water table, consumes approximately 1.99 feet/year (Bureau of Reclamation 1997b). These values (0.0 and 1.99 feet/year) define the plausible range of consumptive values for grasslands used in this analysis.

### **Water Budget Estimates**

As outlined previously, some of the evapo-transpiration values have been ordered into two broad subsets. The "Low" estimate is the subset that contains the least consumptive value of a given cover-type. The "High" estimate is that which contains the most consumptive value. In both low and high estimates some cover-types do not include a range and the same value is used in both subsets (willow and sand bar). In short, this grouping allows for a plausible and bounded range of depletions to be considered. This is summarized in Table 2.

**TABLE 2.** Subsets of Low and High evapo-transpiration estimates. ET = evapo-transpiration (feet/year).

<b>Low Estimate</b>		<b>High Estimate</b>	
<b>Cover-type</b>	<b>ET Value (feet/year)</b>	<b>Cover-type</b>	<b>ET Value (feet/year)</b>
Open water	4.2	Open water	5.1
Cottonwood	3.0	Cottonwood	4.8
*Willow	4.2	*Willow	4.2
*Sand bar	1.75	*Sand bar	1.75
Grassland	0.0	Grassland	1.99
Salt cedar/Russian olive	4.2	Salt cedar/Russian olive	4.9
Sweet Clover/sunflower	3.0	Sweet Clover/sunflower	5.9

\*No range of ET values. The same value is included in both Low and High estimates.

Using the above monthly consumptive use numbers, a water budget estimate has been constructed for the Los Lunas site for: a) 15-year future restored and b) 15-year future without restoration. In addition, the range of values detailed in Table 2 has been applied to both future states (restored and non-restored). These estimates have been constructed using aerial extent estimates (in acres) for the two conditions based on what is generally understood about the fire-ecology of riparian systems and the predicted restored-state flow regime. The site is composed of approximately 16.4 hectares (40 acres) of floodplain.

In order to capture a degree of the vegetative succession continuum, both the restored and non-restored states have been broken down into years 1-5 and 6-15. In years 1-5, it is assumed that both states (restored and non-restored) are immature and transitioning toward the mature state described by years 6-15. It must be emphasized that this temporal grouping of the ecological states does not capture the entirety of vegetative growth and succession, but it does reveal a portion of the temporal differences anticipated at the site. For the current conditions, an evapo-transpiration value of 4.4 feet/year was applied to all mixed stands of woody vegetation (salt cedar, Russian olive, willow, and cottonwood). This is an average value of all woody species present. Tables 3-6 summarize these acreage estimates.

**TABLE 3.** Monthly acreage estimates for the current condition without restoration. Data used for non-restored, years 1-5.

<b>Month</b>	<b>Open water (as wetlands)</b>	<b>Cottonwood/ Willow</b>	<b>Saltcedar/ Willow</b>	<b>Sand bar (as open ground)</b>	<b>Sweet clover/ Sunflower</b>	<b>Salt Cedar/ Russian olive/ Willow/Cottonwood</b>
January	1.55	0.00	0.00	0.47	0.00	0.00
February	1.55	0.00	0.00	0.47	0.00	0.00
March	1.55	0.00	0.00	0.47	0.00	0.00
April	1.55	6.58	7.3	0.47	22.52	1.81
May	1.55	6.58	7.3	0.47	22.52	1.81
June	1.55	6.58	7.3	0.47	22.52	1.81
July	1.55	6.58	7.3	0.47	22.52	1.81
August	1.55	6.58	7.3	0.47	22.52	1.81
September	1.55	6.58	7.3	0.47	22.52	1.81
October	1.55	6.58	7.3	0.47	22.52	1.81
November	1.55	0.00	0.00	0.47	0.00	0.00
December	1.55	0.00	0.00	0.47	0.00	0.00

**Note:** Current condition acreages derived from satellite imagery and supplied by the Interstate Stream Commission.

**TABLE 4.** Monthly acreage estimates without Restoration. Data used for non-restored, years 6-15.

Month	Saltcedar/ Russian olive	Willow
January	35	5
February	35	5
March	35	5
April	35	5
May	35	5
June	35	5
July	35	5
August	35	5
September	35	5
October	35	5
November	35	5
December	35	5

**TABLE 5.** Monthly acreage estimates for restored future condition. Data used for restored, years 1-5.

Month	Open water	Cottonwood	Willow	Sand bar	Grassland
January	10	5	5	15	5
February	10	5	5	15	5
March	5	5	5	20	5
April	5	5	5	20	5
May	40	0	0	0	0
June	40	0	0	0	0
July	5	5	15	10	5
August	5	5	15	10	5
September	5	5	15	10	5
October	5	5	15	10	5
November	10	5	10	10	5
December	10	5	10	10	5

**TABLE 6.** Monthly acreage estimates for restored future condition. Data used for restored, years 6-15.

Month	Open water	Cottonwood	Willow	Sand bar	Grassland
January	10	10	10	5	5
February	10	10	10	5	5
March	5	10	10	10	5
April	5	10	10	10	5
May	40	0	0	0	0
June	40	0	0	0	0
July	5	10	15	5	5
August	5	10	15	5	5
September	5	10	15	5	5
October	5	10	15	5	5
November	10	10	10	5	5
December	10	10	10	5	5

Estimation of the individual types of cover, either with or without restoration efforts, is difficult at best. Nonetheless, the need for an estimation is required if any net depletion values are to be calculated. Therefore, estimates of the individual types of cover were derived from the average monthly flows at the Albuquerque and Bernardo, NM gauges and how, given an adaptive management approach to the excavation process, the restoration site could be excavated. This is not necessarily an ideal design, but more a pragmatic approach with regard to the amount of spoil material that further excavation

would generate while maximizing the habitat restoration goals of the project. With regard to the current conditions under the non-restored state, satellite imagery and ground characterization was used to estimate the cover-types present. Satellite imagery, with the complementary acreage estimates, was supplied by the Interstate Stream Commission and the Corps supplied ground characterization.

For net depletion estimates, open water is derived from river connectivity and is greatest in May and June when the entire site is flooded by spring run-off. However, the entire 40 acres would not be completely inundated for 60 days, as the average flow calculations, which ultimately guided the restored acreage estimates, are somewhat biased and tends to smooth the daily/weekly variations that might occur. In short, the assumption that a 40-acre inundation would occur for 60 days (May-June) is only used as a means to model and estimate net water depletions under a most consumptive scenario. Restored and non-restored estimates theoretically begin at the completion of construction. Effects outside of the restoration area (*i.e.* access routes and other areas of disturbance) are not included the net depletion analysis.

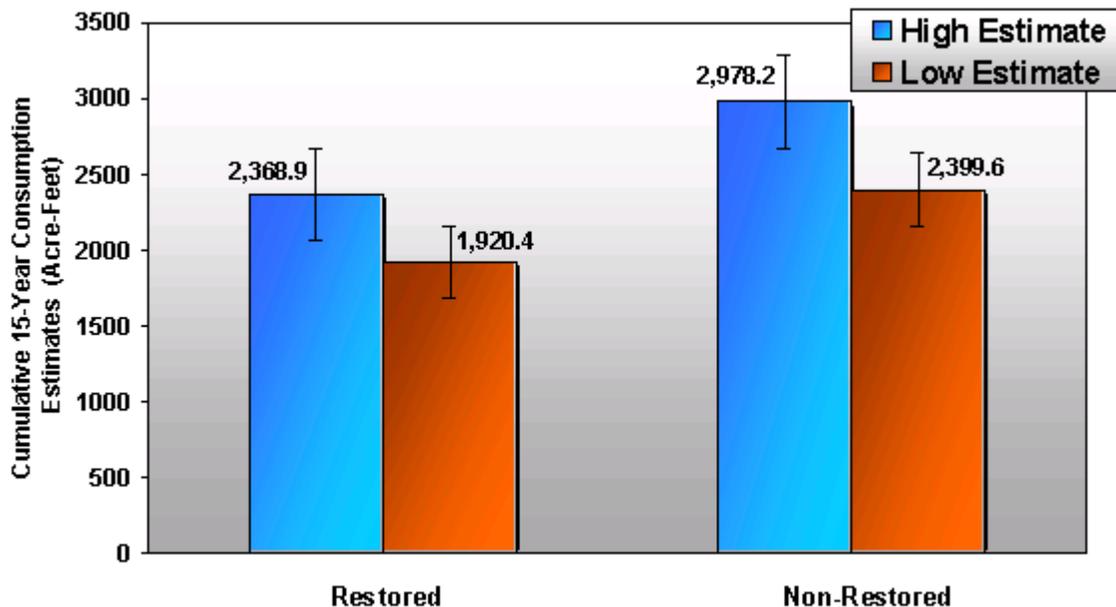


FIGURE 5. Net depletion estimates

Net Depletion estimates from the analyses are as follows and summarized in Table 7:

- **Future Condition with restoration (High Estimate): 2,368.9 acre-feet/15 years.**
- **Future Condition with restoration (Low Estimate): 1,920.4 acre-feet/ 15 years.**
- **Future Condition without restoration (High Estimate): 2,978.2 acre-feet/ 15 years.**
- **Future Condition without restoration (Low Estimate): 2,399.6 acre-feet/15 years.**

TABLE 7. Summary of 15-year evapo-transpiration estimates.

Consumptive Comparison	Water Consumption Estimates in 15 years (Acre/Feet)	Amount of Water Savings in 15 years (Acre-Feet)
High Restored/Low Non-Restored	2,368.9/2,399.6	30.7
Low Restored/Low Non-Restored	1,920.4/2,399.6	479.2
High Restored/High Non-Restored	2,368.9/2,978.2	609.3
Low Restored/High Non-Restored	1,920.4/2,978.2	1,057.8
Mean	2,416.8	544.3

Using this methodology for estimating evapo-transpiration water budgets for the Los Lunas Restoration Site, there is a predicted *net savings* of water of between **30.7** (High restored vs. Low non-restored consumptions) and **1,057.8 acre-feet** (Low restored vs. High non-restored consumptions) over a 15-year period through the future restored condition. The bounded range presented above defines a plausible set of depletion estimates; however, the range of actual savings over the 15-year period is likely to be closer to the Low vs. Low or High vs. High estimates (479.2-609.3 acre-feet/15 years). Again, this estimate is valid for the excavated area only and does not include other areas of disturbance. Nonetheless, given the same assumptions for future without restoration (*i.e.* dominance by exotics), the trend of a net water savings should be expected with site restoration, as these areas would be revegetated with native species.

### 3.1.5 WETLANDS and FLOODPLAINS

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.

The existing flora within the burn area is currently in the early, post-fire succession stage of herbaceous growth. This is largely a result from the release of sequestered nutrients brought about by the process of fire. Although these primary species are part of a natural succession process, the passage of time will likely lead to an ecosystem dominated by non-native invasive species (Anderson et al. 1984, Busch and Smith 1995, Stuever 1997, Smith et al. 1998) that will substantively decrease the overall quality of the entire burn area. This restoration project, proposed in the aftermath of the April 2000 fire, would serve to substantively improve the riparian, aquatic, and wetland habitats in the area as inundation frequency, at a variety of elevations, would increase and thereby promote the growth of the native flora that have evolved in Rio Grande bosque.

The small areas of groundwater ponding discussed previously would, under current planning, be filled in by the placement of spoil along the toe of the levee. These ponds are the result of the excavation of fill needed for the construction of the earthen groins that run roughly perpendicular to the levee (Fig. 2). This excavation produced a corresponding depression in the bosque immediately adjacent to the earthen groins,

which then filled with groundwater. As also discussed previously, the goals of this restoration project would accord the area with a greater level of wetland-type (groundwater ponding) habitats that would ultimately be associated with an even greater diversity of aquatic and riparian habitats: a substantively more integrated and functional system than currently exists. This stands in stark contrast to the existing situation where these ponds essentially exist as small isolated systems that do not function as a part of a larger, more functional system. Alternatively, these small ponds could be spared by simply not filling the area surrounding them with spoil material. This would extend the linear distance needed along the levee to accommodate the amount of material excavated within the restoration site. The distance needed would be approximately 200-500 ft. and would remain within the greater burn area.

In summation, the impacts to wetlands would be minimal. Evidently, the fire has served to eliminate the wetland areas within the local bosque and the loss of these wetlands is now moot. The proposed project would reestablish this site characteristic. The filling of the ponds adjacent to the earthen groins would be supplanted by the significant gains in wetlands accorded by the goals of the proposed project. Further, the end-result would be a more functional ecosystem that reflects the historic conditions of the Rio Grande bosque, thus holding far greater intrinsic and ecological value. Therefore, the proposed project is a beneficial process that would help to restore the area to a more natural state.

Executive Order 11988 (Floodplain Management) provides Federal guidance for activities within the floodplains of inland and coastal waters. This order requires Federal agencies to take action to reduce the risk of flood loss, to minimize the impact of floods on human safety, health, and welfare, and to restore and preserve the natural and beneficial values served by floodplains. The proposed project site is situated within the active floodplain of the Rio Grande between the channel mainstem and the west levee. In the Middle Rio Grande Valley, the regions within the levees are typically reserved for floodway purposes, wildlife habitat, and recreation of various types.

While previous channelization activities have reduced the frequency at which this area will experience flooding, the potential for such natural flooding does exist. This restoration project seeks to allow for the inundation, of both greater extent and frequency, to occur within a defined area bounded by the placement of the berm structure indicated in Figure 1. The berm structure is essentially the relocation of the current bank line and flood containment characteristics. However, the berm would offer a measurably greater level of protection to the levee than does the existing elevation of the current bank (*i.e.* 5,200 cfs WSE plus two feet) as existing bank elevations would allow for extensive overbank flooding throughout the area. In addition, the excavated material placed on the toe of the levee would provide a slightly increased degree of protection to the levee for flows that would reach the levee. This fill material would be convert from a fringe riparian area to essentially an upland area, as the elevation would be roughly equal to the levee crown. The total area of this fill is approximately seven acres. This fill would be planted with willow at the base and seeded with upland natives further upslope.

Therefore, the proposed restoration project offers a slightly greater level of flood protection within the limits of the project area. Beyond this area, flood protection would be unaffected. The impacts to the natural and beneficial values of the floodplain would be enhanced as described above in the discussion describing effects to wetlands.

### **3.1.6 AIR QUALITY**

The proposed restoration site is in the New Mexico intrastate Region 2 (EPA Region 152) for air quality monitoring. Region 2 is in attainment/maintenance status for carbon monoxide (CO) and is in attainment for all other criterion pollutants (sulfur oxides [SO<sub>x</sub>], nitrogen oxides [NO<sub>x</sub>], lead [Pb], ozone [O<sub>3</sub>], hydrocarbons [C<sub>n</sub>H<sub>n+2</sub>], and particulate matter of greater than or equal to 10 microns [μm] in size [PM<sub>10</sub>]). These standards are determined by National Ambient Air Quality Standards (NAAQS) established by the EPA (NMEDAQB 1994). As such, levels for the above attainment pollutants do not exceed State of New Mexico or Federal EPA air quality standards.

Region 2, located in central New Mexico, is considered Class II under the Prevention of Significant Deterioration (PSD) program as required by the Clean Air Act of 1972 (42 U.S.C. 7401 *et seq.*), as amended. PSD Class II areas allow for moderate levels of development accompanied by the resulting air quality impacts. PSD Class I areas have a pristine air quality and virtually no increases in contaminant levels are allowed (NMEDAQB 1988). Activities near PSD Class I areas may impact the pristine air quality. Therefore, such activities are subject to limitations set forth by PSD Class I standards. The closest Class I area to the project site is Bosque del Apache National Wildlife Refuge located approximately 60 miles to the south along Interstate 25. By virtue of distance, Bosque del Apache National Wildlife Refuge would not be affected by project activities.

Air quality in the area is generally good. Suspended particulate dust is always a concern during construction activities; however, water applied to moisten exposed soils would reduce fugitive dust and erosion impacts. These best management practices would be implemented at all times during construction. The proposed project would result in a temporary but negligible impact on air quality.

### **3.1.7 NOISE**

Ambient noise levels in the project area are generally low. The major sources of noise in the area emanate from aircraft traffic at the Los Lunas Airpark located along State Highway 314. Low-level highway noise is also noticeable at the site. During the various stages of construction, noise levels should increase slightly from the operation of heavy equipment. However, since the operation of equipment would occur away from local residents (*i.e.* within the bosque) noise increases would be significantly attenuated. This increase in noise levels should be moderate, short-term, and limited to daytime work hours.

Other sources of project related noise increases would come from the operation of chainsaws and vehicle traffic to and from the site by agency personnel and members of

the public cutting and gathering firewood from the dead cottonwoods. Again, these increases would be moderate, short-term, and limited to daytime work hours.

### 3.1.8 AESTHETICS

The aesthetics of the area have suffered in the aftermath of the fire. Throughout the entire burn area the standing trees are blackened and scared. The once mature canopy has been reduced to a skeleton of leafless branches that are beginning to fall to the forest floor. The understory has erupted with dense herbaceous growth that dominates the landscape. At the end of the growing season, these annuals lie wilted and decomposing in a thick tangled layer. Overall, the burn area appears as a highly degraded system with little outward aesthetic value.

The aesthetic improvements of the proposed restoration project would not be immediately apparent. The construction stages (jetty jack removal and excavation) would clearly have a short-term adverse impact on the aesthetics, however degraded they may be, throughout the site. The construction of the access routes and staging areas in the region between the project boundary and the levee would clearly have distinct impacts that transcend the impacts generated within the restoration site itself. However, the results of the proposed restoration activities would ultimately provide a setting that promotes an aesthetically appealing environment that is significantly more conducive to wildlife. Willow and other native plantings would be carried out in all areas that suffer disturbance. In time, the area would rebound from the impacts associated with the fire and project construction; providing a suite of diverse aquatic and terrestrial habitats that are both ecologically and aesthetically sound.

## 3.2 BIOLOGICAL RESOURCES

### 3.2.1 VEGETATION COMMUNITIES

Prior to the 2000 fire, the Hink and Ohmart (1984) vegetation classification system described the general burn area by two distinct groups. The first, being largely separated from the river-channel itself, consisted of Rio Grande cottonwood, Russian olive, coyote willow (*Salix exigua*), and saltcedar. Abbreviated C/RO-CW-SC 1, this assemblage has vegetation in all layers, with trees 15-18 m (50-60 ft) in height (Type 1). The second, being directly adjacent to the river channel itself, consisted of Rio Grande cottonwood, peachleaf or Goodding's willow (*S. amygdaloides* or *S. gooddingii*), coyote willow, and Russian olive. Abbreviated C-TW/CW-RO 5, this significantly different assemblage is characterized by dense vegetation up to about 4.6 meters (15 feet) in height and is often associated with dense grasses and annuals in the understory and in clearings (Type 5).

Subsequent to the 2000 fire, herbaceous plants such as white sweet clover, spiny aster (*Aster spinosus*), and sunflower (*Helianthus annuus*) have aggressively colonized most of the burn area. Mortality due to the fire among the Rio Grande Cottonwoods is almost complete with only discontinuous individual live trees remaining. Most of the burned trees are still standing but will certainly fall within several years. During the various

phases of construction, approximately 1,000 dead cottonwoods will be removed. These trees would be windrowed along the access routes and offered to public at no charge.

Generally, willow colonization is patchy but modest stands are present and are scattered throughout the burn area with one exception being located immediately north of the restoration site. In addition, vegetative root-growth from the various tree species, both native and non-native, is also occurring. It is unclear, however, if the new root-growth is sustainable and will survive given the changing site conditions. Over time, if no actions are taken, the burn area would likely be colonized by invasive species such as saltcedar and Russian olive.

The scope of work necessary to meet the restoration goals is considerable. The excavation work within the restoration area would supplant the existing vegetative community with shallow water/low velocity river channel habitat. Outside the restoration area, the impacts to the existing vegetation would be along on the access routes and staging areas (Fig. 2). However, native vegetation planted along the berm structure, levee toe, and other areas of disturbance would begin the process of reclaiming the area and establishing a viable riparian habitat dominated by native vegetation. Recovery time of the greater project area is dependent on the extent of runoff flows, which is related to snow pack in the northern mountains. However, notable site improvements, both within and outside of the restoration area, should be evident within the first year of inundation after project completion. Annuals would still dominate the area for the first several years but willow and cottonwood growth would quickly become established and thus begin the successive progression of vegetative communities. In addition, excavation activities would remove the remaining saltcedar within the restoration area that survived the fire. These surviving stands would ultimately seed and spread throughout the burn area: a trend replete throughout the Rio Grande bosque.

### 3.2.2 WILDLIFE

Wildlife species in the adjacent riparian areas are typical for Middle Rio Grande Valley. Neotropical migrants and resident avian species frequent the area and live within the bosque. These species would include: Coopers Hawk (*Accipiter cooperii*), Red-Tailed Hawk (*Buteo jamaicensis*), Great-Horned Owl (*Bubo virginianus*), Turkey Vulture (*Cathartes aura*), Greater Roadrunner (*Geococcyx californianus*), Downy Woodpecker (*Picoides pubescens*), Belted Kingfisher (*Ceryle alcyon*), White-Crowned Sparrow (*Zonotrichia leucophrys*), American Crow (*Corvus brachyrhynchos*), White-Breasted Nuthatch (*Sitta carolinensis*), Summer Tanager (*Piranga rubra*), Black-Headed Grosbeak (*Pheucticus melanocephalus*), House Finch (*Carpodacus mexicanus*), American Robin (*Turdus migratorius*), Black-Crowned Night Heron (*Nycticorax nycticorax*), Black-Chinned Hummingbird (*Archilochus alexandri*), Rufous Hummingbird (*Selasphorus rufus*), and Broad-Tailed Hummingbird (*Selasphorus platycercus*). Aquatic species in the area include Pied-Billed Grebe (*Podilymbus podiceps*), Common Merganser (*Mergus merganser*), Canada Goose (*Branta canadensis*), and various waterfowl (*Anus spp*, *Aythya spp*, *Oxyura jamaicensis*, *Aix sponsa*). In addition, various

mammals and reptiles such as mice, rabbits, skunks, coyote, beaver, and lizards, also inhabit or transit the area.

Wildlife would clearly be disturbed and/or displaced during construction. Further, the impacts to the area would extend beyond the bounded restoration site due to the necessity of access route construction and the windrowing of dead cottonwoods. The project duration would be approximately one year with the various phases being temporally separated. However, upon project completion, the restoration efforts would significantly improve the condition of the site and provide a variety of viable habitats for a much wider range of wildlife species than currently inhabit the fire-damaged area. Although, the immediate short-term impacts of construction would be considerable, the long-term benefits to wildlife (both aquatic and terrestrial) would far outweigh the impacts generated from construction.

### **3.2.3 SPECIAL STATUS SPECIES**

While all Federal, State, and Tribal agencies have a responsibility for the protection and conservation of plant and animal species in the proposed project area, two agencies have this task as their primary responsibility. The United States Fish and Wildlife Service (USFWS), under authority of the Endangered Species Act of 1973 (16 U.S.C. 1531), as amended, has the responsibility for Federal listed species. The New Mexico Department of Game and Fish (NMDGF) has the responsibility for state-listed wildlife species. Each agency maintains a continually updated list of species, which are classified, or are candidates for classification, as protected based on their present status and potential threats to future survival and recruitment into viable breeding populations. These types of status rankings represent an expression of threat level to a given species survival as a whole and/or within local or discrete populations. Those wildlife species that have the potential for occurring in the proposed project area are presented in Table 4. In addition, the New Mexico Department of Minerals Natural Resources, Forestry Division has the responsibility for maintaining the list of state-listed endangered plant species. There are no endangered plants affected by the proposed project's construction or implementation.

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**TABLE 8.** Federal and State Special Status Species with potential to occur at or near the proposed project area.

Common Name	Federal Status (USFWS) <sup>a</sup>	State of New Mexico Status (NMDGF) <sup>b</sup>
Bald Eagle	T	E2
Whooping Crane	XN	E1
Yellow-billed Cuckoo	C	---
Rio Grande Silvery Minnow	E	E1
Southwestern Willow Flycatcher	E	E1

<sup>a</sup> **Endangered Species Act (ESA) status as prepared by the USFWS;**

**E** = Endangered: any species that is in danger of extinction throughout all or a significant portion of its range.

**T** = Threatened: any species that is likely to become an Endangered Species within the foreseeable future throughout all or a significant portion of its range.

**C** = Candidate: taxa for which the USFWS has on file sufficient information on biological vulnerability and threat(s) to support proposals to list as Threatened or Endangered Species.

**XN** = Nonessential Experimental Population.

<sup>b</sup> **State of New Mexico Status;**

**E1** = Endangered Animal Species whose prospects of survival of recruitment within the State are in jeopardy.

**E2** = Endangered Animal Species whose prospects of survival of recruitment within the State are likely to become jeopardized in the foreseeable future.

This EA is also intended to meet the consultation requirements pursuant to Section 7 of the ESA. A determination of affect to Federally listed species is included in the discussion for each species that follows.

The Bald Eagle (*Haliaeetus leucocephalus*), a Federal and State Threatened Species, is typically found near waterways and lakes where adequate food supplies can be found. In New Mexico, the Bald Eagle primarily occurs in late fall and winter months. A shy and observant animal, the Bald Eagle can often be seen perched in large trees or foraging for fish or carrion along rivers and local reservoirs. Clearly, project activities would constitute a considerable, but localized, short-term disturbance. Due to the animal's inherent shyness and current degraded condition of the site, the Bald Eagle is not likely to be adversely affected by the construction of the proposed project. Over time, the restoration efforts would provide an improved riparian habitat that would be more conducive to Bald Eagle habitation and conservation. In addition, any dead cottonwoods left standing at project completion would provide perch or roost sites for various species including the Bald Eagle.

The Whooping Crane (*Grus americana*) was listed as a Federally Endangered species on March 11, 1967 (32 FR 4001; 35 FR 8495). Whooping Cranes are associated with marshes, potholes, prairies, and agricultural fields. In New Mexico, they typically winter at Bosque del Apache in association with Sandhill Cranes (*Grus canadensis*). They

often feed in agricultural fields or wetland units and roost on sand bars in the Rio Grande or nearby wetlands. Small agricultural fields lie to the northwest of the proposed project site. Given the localized nature of the proposed project and the extremely low numbers of Whooping Cranes reported in the Rocky Mountain flyway, the experimental nonessential population of the Whooping Crane is not likely to be adversely affected by the construction or implementation of the proposed project.

The Yellow-billed Cuckoo (*Coccyzus erythrophthalmus*), common in woods, orchards, and streamside willow and alder groves, is a Federal Candidate species. As with other species, construction activities would likely displace the cuckoo. Again, however, due to the localized nature of disturbance and the bird's mobility, the Yellow-billed Cuckoo is not likely to be adversely affected by the construction or implementation of the proposed project and should also benefit from the restoration efforts.

The Rio Grande silvery minnow (*Hybognathus amarus*) would not suffer any adverse impacts, as the construction activities would not take place within the river channel. Only slight increases in turbidity and disturbance are expected from jetty jack removal and excavation. This activity would have no considerable impact to the fish. The potential placement of a limited amount of spoil (10,000-15,000 yards) on dry sand bars would have an insignificant impact on local minnow habitat. Ultimately, this material will be redistributed downstream and serve to create more shallow water habitats.

The RGSM should benefit significantly from the proposed project and is not likely be adversely affected by the construction phases. Reduced shallow water/low velocity habitat, caused by channelization, is a fundamental cause for the decline of the minnow throughout many reaches of the Rio Grande. This project represents the first concerted effort in restoring such habitat and thus improving the chances of recovery and long-term survival of the species.

The Southwestern Willow Flycatcher (*Empidonax traillii extimus*), a Federally and State listed species, typically inhabits dense thickets of Coyote willow (*Salix exigua*) or saltcedar (*Tamarix chinensis*) near slow-moving water sources. In addition, a dense overstory of large riparian trees, such as Rio Grande Cottonwood, is often present and can be considered partially diagnostic in the Middle Rio Grande Valley.

An important and required preliminary phase of this project involved the completion of WIFL surveys and overall post-burn habitat assessment. The surviving potentially suitable WIFL habitat in the area is approximately 3.0 acres (1.2 hectares). Located in the middle and southern portions of the restoration area, the majority of the potentially suitable habitat is linear, the widest portion being approximately 21 meters (70 feet), and is burned on the crowns and edges. No additional potentially suitable habitat is present within the restoration site nor is any potentially suitable habitat present in the area impacted by the access routes, staging areas, or regions between the levee and the site boundary. The survey forms submitted to the USFWS are shown Appendix C. The results of the five required surveys revealed one call response at the middle portion

of the survey area on May 24, 2001. This individual bird was clearly a migrant and no other call responses or sightings were noted during any of the subsequent surveys.

As detailed previously, the surviving/potentially suitable WIFL habitat would be removed as it lies within the excavation area. However, this loss would be compensated for by the planting of willow and cottonwood poles along the berm structure, levee toe, and other areas of disturbance. Therefore, the WIFL is not likely to be adversely affected by the construction or implementation of the proposed project and should benefit substantively from the restoration efforts.

In conclusion, the Corps and BOR have determined that the proposed action is not likely to adversely affect any Federally listed special status species.

### **3.3 CULTURAL RESOURCES**

Given the project's location on the riverside of the levee within the ancestral floodway of the river, no archaeological sites occur within the project area. Access is provided by existing roads and the dirt roads on the river side of the levee used in the early 1960s for the placement of the jetty-jacks and construction of the groins. Approximately 50 percent of the land involved in this undertaking did not exist until after 1962 when the jetty-jacks were placed in the river and caused sediment to be deposited. Excess soil would be deposited immediately adjacent to the existing levee on its river side. This project would have no effect on the cultural resources of the Los Lunas area. In the unlikely event that cultural resources are discovered, work would cease in the vicinity of the discovery and consultation with the State Historic Preservation Office would take place. For a more detailed discussion on cultural resources, see Appendix B.

Consultation with the New Mexico State Historic Preservation Officer is underway at this time and a draft concurrence letter is also presented in Appendix B.

#### **3.3.1 INDIAN TRUST ASSETS**

Indian Trust Assets (ITA) 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, statutes, 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.

The construction or implementation of the proposed project is not anticipated to impact any Indian Trust Assets.

### **3.4 LAND USE and SOCIOECONOMIC CONSIDERATIONS**

Current land use is degraded wildlife habitat. The Spring 2000 fire has drastically reduced the overall environmental value of the area. Currently, the burned cottonwoods pose a continued fire and safety hazard. This situation would worsen over time as these trees begin to fall to the forest floor. In addition, the fire would provide an

opportunity for the eventual colonization by invasive species. Current conditions and land use would likely remain unchanged until site restoration is initiated. There is no evidence of toxic spills or contaminants.

The rapid growth in Bernalillo and Valencia counties has rendered, in part, the Middle Rio Grande Valley a single metropolitan unit. Although each community in the area is geographically distinct, many of the social and economic relationships/interactions are intimately related. The local (within the town of Los Lunas) revenue benefits would largely be limited to a demand for goods and services. For example, meals for work crews and lodging, when required, would likely be sought in the Los Lunas area. In addition, fuel for work vehicles would be purchased, in part, from local suppliers. Contractors would most likely come from Albuquerque; however, some may also reside locally. In any event, the economic benefits would be retained within the greater metropolitan area. The demand for goods and services would last, at various levels, for the entire construction period, resulting in a minor benefit to the local and greater metropolitan economies. In addition, the free firewood offered to the public would benefit the community.

The construction area is considerably removed from any local residents, as it is located deep within the Rio Grande bosque. However, several houses and the Los Lunas Airpark are located on the landward side of the western levee. The impacts, such as heavy equipment noise and vehicle traffic along the levee road, generated from the proposed project would be minor but temporally separated into the phases described earlier. All work would be limited to daytime work hours and impacts should be somewhat attenuated by the considerable distance between the restoration area, where the majority of work would take place.

### **3.5 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. It requires Federal agencies to adopt strategies to address environmental justice concerns within the context of agency operations and proposed actions. In an accompanying memorandum, President Clinton emphasized that existing laws, such as the National Environmental Policy Act (NEPA), should provide an opportunity for federal agencies to assess the environmental hazards and socioeconomic impacts associated with any given agency action upon minority and low-income communities. In April of 1995, the EPA released a guidance document entitled *Environmental Justice Strategy: Executive Order 12898*. In short, this document defines the approaches by which the EPA will ensure that disproportionately high environmental and/or socioeconomic effects on minority and low-income communities are identified and addressed. Further, it establishes agency wide goals for all Native Americans with regard to Environmental Justice issues and concerns.

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

### **3.6 CUMULATIVE IMPACTS, IRREVERSIBLE & IRRETRIEVABLE COMMITMENTS OF RESOURCES**

In consideration of past, present, and future actions that are reasonable and foreseeable, the adverse cumulative impacts upon the biological and cultural resources of the proposed project would be negligible. Conversely, the proposed project would substantively restore a fire-damaged and degraded area to one of significant intrinsic and ecological value.

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 this project. Procedures to ensure the security and integrity of any resource would be diligently maintained at all times.

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## **4.0 CONCLUSIONS**

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This project proposes to conduct aquatic and riparian habitat restoration in a fire-damaged and degraded area located along the west bank of the Rio Grande adjacent to the Los Lunas, New Mexico Airpark. The restoration effort proposed here is largely in response to the Biological Opinion (BO) issued by the USFWS, being part of the Endangered Species Act, regarding certain water practices of the Corps and BOR. In short, the BO requires the Corps and BOR to begin a restoration project in one of eight reaches of the Rio Grande within six months of the date of the BO. The proposed project satisfies this requirement and constitutes habitat restoration in the Belen reach.

The area under consideration for this restoration project suffered a severe burn in April of 2000. As a result, it offers an ideal opportunity for restoration as it avoids impacting a non-burned area. Nonetheless, the extensive restorative goals would require a great deal of work. The project has been divided into three broadly defined phases. First, approximately 1,355 jetty jacks would be permanently removed. Second, excavation of approximately 41 acres would be completed to allow for the widening of the river channel and, accordingly, the creation of extensive shallow water/low velocity aquatic habitats. Lastly, the all areas of terrestrial disturbance would be revegetated with native plants, which will stimulate and begin the process of post-fire reclamation ultimately establishing a higher-value riparian habitat. Although temporally separated, the various phases of construction would last approximately one year. Monitoring activities would continue for 15 years from the completion of construction.

Conversely, if no restoration actions are taken, it is likely that the burn area will be colonized by invasive plant species such as saltcedar and Russian olive; a trend that is replete and advancing throughout the Rio Grande Valley. In addition, the burned vegetation represents a fire hazard as it continues to dry and accumulate. This

increasingly dangerous scenario would ultimately threaten unburned areas, as it would provide a potential fire with a tremendous amount fuel and vigor.

Impacts to physical and biological resources during the various construction phases would be moderate but generally localized. Considering the requirements of the BO, the objectives of the proposed project, and the degraded state of the existing environment the net gains in aquatic and terrestrial habitat improvements outweigh these impacts. Net water depletion estimates indicate a water savings from 30.7-1,057.8 acre-feet through the restored site condition over a 15 year period. There would be no impacts to cultural resources. Therefore, the proposed project is recommended.

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## 5.0 CONSULTATION, COORDINATION, and DOCUMENT PREPARATION

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This Environmental Assessment was prepared by the US Army Corps of Engineers, Albuquerque District and the US Department of Interior Bureau of Reclamation, Albuquerque Office.

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Nancy Umbreit  
Biologist, US Bureau of Reclamation

Art Coykendall  
Biologist, US Bureau of Reclamation

Paul Tashjian  
Hydrologist, US Fish and Wildlife Service

**For further information or document copies contact:**

Mr. Mark W. Horner, Biologist  
US Army Corps of Engineers, Albuquerque District  
Environmental Resources Branch  
CESPA-EC-R  
4101 Jefferson Plaza NE  
Albuquerque, New Mexico 87109-3435  
(505) 342-3787  
E-mail: [mark.w.horner@spa02.usace.army.mil](mailto:mark.w.horner@spa02.usace.army.mil)

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## 6.0 REFERENCES

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*FINAL*

**APPENDIX A**  
**CLEAN WATER ACT (CWA) DOCUMENTATION**

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# PUBLIC NOTICE

US Army Corps  
of Engineers  
Albuquerque District  
4101 Jefferson Plaza, NE  
Albuquerque, NM 87109-3435  
Fax No. 505-342-3488  
cempa-od-@usace.army.mil

Permit Application No:	Date:
2001_00520	December 27, 2001
Phone:	Suspense Date:
(505) 342-3283	JANUARY 17, 2002
In Reply Refer to:	
District Engineer, ATTN: CESP-OD-R	

## PERMIT APPLICATION UNDER SECTION 404 OF THE CLEAN WATER ACT (33 USC 1344)

**Summary of Proposed Project:** We are requesting public comment on the following project before the above suspense date. The application is for a permit to place dredged and fill material during jetty jack removal and overbank habitat improvement at a burn site in and adjacent to the Rio Grande near Los Lunas, Valencia County, New Mexico. The project will include a temporary diversion of river flow along 6000 ft of river bank during removal 960 jetty jacks (Phase 1). Phase 2 will include overbank excavation with sand deposit on uplands and on river sandbars. Approximately 10,300-15,300 cu. yds. of excavated sands will be placed in waters of the United States as temporary and permanent fill. Details of the proposed project are provided below.

**Name of Applicant:** Albuquerque District Corps of Engineers,  
**Environmental Branch (EC-R),** 4101 Jefferson Plaza, NE, Albuquerque, NM  
87109-3435, ATTN: Mark Harberg, phone (505) 342-3423.

**Joint Applicant:** U.S. Bureau of Reclamation, Albuquerque Area Office, Ken  
Maxey, Area Manager, 505 Marquette NW, Suite 1313, Albuquerque, NM  
87102-2162, POC: Hector Garcia, phone (505) 248-5412.

**Location:** The project site is located on the west bank of the Rio Grande  
adjacent to the Mid Valley Airport south of Los Lunas, Valencia County,  
New Mexico, (34° 45.2' N Latitude, 106° 44.5' W Longitude).

**Description of Work:** The Los Lunas Habitat Restoration project includes  
the following features:

## NEWS RELEASE

### Introduction

The U.S. Fish and Wildlife Service (USFWS) issued a Biological Opinion (BO), June 29, 2001 regarding the effects of U.S. Bureau of Reclamation's (BR) "Discretionary Actions Related to Water Management, U.S. Army Corps of Engineers (Corps) "Water Operation Rules", and "Non-Federal Actions Related to Ordinary Operations on the Middle Rio Grande" on the Rio Grande silvery minnow (minnow), southwestern willow flycatcher (flycatcher), bald eagle, experimental nonsensical population of the whooping crane, and the interior least tern. The BO concluded that these actions would likely jeopardize the continued existence of the minnow and flycatcher and therefore developed a Reasonable and Prudent Alternative (RPA) that they believed must be implemented in order to avoid jeopardy. The Corps and the BR have made an initial determination to accept and implement, on an interim basis, the general provisions of the RPA. The proposed Los Lunas Habitat Restoration Project (Los Lunas project) is intended to fulfill the requirement of conducting habitat restoration in the "Beien Reach"; one of eight reaches in which habitat restoration must be conducted in accordance with element J of the RPA. It is also meant to fulfill the requirement to initiate construction on at least one restoration project within six months from the date of the BO. The Corps and the BR are joint lead federal agencies on this project with the Middle Rio Grande Conservancy District (MRGCD) as the primary non-federal cooperator.

### Purpose

The underlying purpose and need of the proposed project is to improve habitat conditions for the minnow and flycatcher so that in combination with other elements of the RPA, jeopardy to the minnow and flycatcher will be avoided. The proposed project is intended to widen the river channel and lower riverbanks to produce shallow water habitats, over bank flooding and regenerating stands of willows and cottonwoods. Implementation of the project will begin in December 2001 and will be completed by December 2004. Long term monitoring is planned following construction completion.

### Location

The project site is located on the west bank of the Rio Grande adjacent to the Mid Valley Airport south of Los Lunas, NM (Figure 1). Figure 2 is a graphic of the proposed restoration site and outlines the major features of the project. This entire project site burned in April 2000 and vegetation consists of standing dead timber, annuals, and willow, cottonwood, Russian olive and salt cedar regrowth. The actual area of restoration is approximately 6000 ft along the existing west riverbank and, at the widest point, is approximately 350 ft wide. This area is approximately 40.6 acres. The site is managed by the MRGCD.

**Phase 1 (Jetty Jack Removal)**

Phase 1 will be accomplished by the Corps of Engineers and will consist of removing the bank line and tieback jetty jacks. Work will commence in December 2001 and will be completed prior to spring runoff.

A cross section of a typical jetty jack with 16 foot limbs and deadman anchoring is shown in Figure 3. Two rows of jetty jacks exist along the entire 6000 feet of bank line and their limbs overlap so that there is no space between the rows. Within each row, the jacks are spaced at approximately 12.5-foot centers. The riverward row is at the toe of the bank and is buried to an extent that only approximately 1-3 feet of each limb is exposed. The landward row is directly on the bank line and is buried so that only about 4-6 feet of each limb is exposed. Removal will proceed from downstream to upstream using an excavator and pulling the jacks landward. If only a portion of the jack can be removed in this manner, excavation may be required in between each jack to a point where either the center attachment can be cut and the limbs pulled, or the entire jack pulled. Excavated material will be placed landward of the bank. If necessary (not anticipated) for equipment access, a small temporary cofferdam may be used to temporarily divert river flows from the immediate jack removal site and a small ramp down the riverbank may be constructed. After the jack is removed, any excavated area will fill from natural sloughing along the bank. Approximately 960 jetty jacks will be removed along this bank and will be disposed of off-site.

**Phase 2 (Over Bank Excavation)**

Following spring 2002 runoff, the Bureau of Reclamation (BR) will clear and grub the vegetation within the project area. Much of this vegetation will be spread and placed immediately landward of the proposed new west bank. Large dead cottonwood trees and root wads will be stockpiled for future placement along the toe of the proposed new west bank line.

Excavation of the restoration site will begin at elevations above the ordinary high water mark (OHWM) and will proceed down to elevations below the OHWM. However, final elevations within the site will range from approximately the 1000 cfs water surface elevation (WSE) up to the 5200 cfs (~2 year frequency) WSE in order to simulate natural variation in the river channel. Figure 4 is a typical cross section of the site depicting the extent of excavation that will occur. Approximately 80,000-100,000 cubic yards of material will be generated. The proposed new west bank will be approximately 350 feet from the existing bank at the widest point. A berm will be constructed along the new west bank to the elevation of the existing bank using approximately 10,000-15,000 cubic yards. In addition, to

enhance levee integrity, excavated material will be placed (60,000-70,000 cubic yards) along the riverward toe of the levee that exists along the western edge of the site. Three to four wetlands directly adjacent to the levee and approximately 50 x 25 feet in size will be filled (approx 300 cu yds of fill). Excavated material (10,000-15,000 cubic yards) not used for the berm or placed along the levee will be placed on dry sandbars in the river channel accessible by a dry land route.

The total quantity of fills within waters of the U.S. is 10,300 - 15,300 cu. yds. In-river work is expected to begin upon permit issuance and be completed in December 2004.

**Related Work:** Access to the jetty jack removal area will be from the levee road along the west side of the site. Access lanes from the levee road to the project area would be established such that damage to the levee road will be minimized and impacts rendered by equipment and worker transit would be minimized and controlled. Staging areas will be located at the north and south end of the project area within the burned bosque.

Approximately 350 ft of 16 lines of tieback jetty jacks (~395) will be removed and occur in areas above the normal high water mark. The remaining tieback lines will be secured and anchored to guard against additional bank erosion and channel widening.

**Mitigation Proposed by the Applicants:** Following excavation, some of the large cottonwood trees and root wads will be placed along the toe of the new west bank and covered with excavated material to anchor in place. This will provide bank stabilization and habitat for the aquatic community.

**Phase 3 (Vegetation Planting)**

Following Phase 1 and 2, coyote and tree willows will be planted in patches along the new west bank. The highest density of willows will be planted at the northern and southern ends of the site, as this is where the greatest potential for erosion is anticipated. In combination with the substantial distance between the site and the levee, and the considerable amount of vegetation already established, the new willows and remaining secured jetty jacks will inhibit any further channel expansion and assure the integrity and protection of the levee. Cottonwood poles and grass will be planted on the fill placed along the levee toe and on the access lanes.

**Plans and Data:** Drawings showing the location of the work site and other data are enclosed with this notice. If additional information is desired, it may be obtained from the applicants, or from:

CESPA-OD-R  
2001 00520

Jean E. Manger  
Albuquerque District, Corps of Engineers  
4101 Jefferson Plaza, NE  
Albuquerque, NM 87109-3435  
(505) 342-3216

**Statement of Findings:** The District Engineer has consulted the National Register of Historic Places and no properties listed in the Register are present at the site of the proposed construction. Consultation with the New Mexico State Historic Preservation Office (NMSHPO) has not revealed any pending nominations. This constitutes the extent of cultural resource investigations by the District Engineer. It is possible, however, that presently unknown archeological, scientific, prehistoric, or historic data may be inadvertently lost or destroyed by the work accomplished under the requested permit. In the event that cultural resources are found, the NMSHPO will be contacted for advice on the appropriate action to be taken.

The following is a list of endangered (E) and threatened (T) species and/or critical habitat (CH) for Valencia County, New Mexico:

Whooping crane, Grus americana, E  
Mountain plover, Charadrius montanus, T  
Mexican spotted owl, Strix occidentalis lucida, T  
Southwestern willow flycatcher, Empidonax traillii eximius, E  
Rio Grande silvery minnow, Hybognathus amarus, E  
Bald eagle, Haliaeetus leucocephalus, T

Our preliminary review indicates this project will affect, but is not likely to adversely affect, the southwestern willow flycatcher, Rio Grande silvery minnow, whooping crane, interior least tern, and bald eagle. The project is proposed as habitat restoration for threatened and endangered species.

The joint applicants have applied to the New Mexico Environment Department for certification that this work is in compliance with applicable State water quality standards. The applicants are responsible for obtaining all other required Federal, state, and local authorizations for this work.

In accordance with environmental procedures and documentation required by the National Environmental Policy Act of 1969, an environmental assessment (EA) is being prepared for this project. The

draft EA is available for review in January 2002 at the following web site: [www.spa.usace.army.mil/FONSI/DEFAULT.htm](http://www.spa.usace.army.mil/FONSI/DEFAULT.htm). Comments on the draft EA should be sent to Mark Horner, Environmental Branch (EC-R), Albuquerque District Corps of Engineers, 4101 Jefferson Plaza, NE, Albuquerque, NM 87109-3435, ph (505) 342-3187.

**Comment:** Any comments concerning this Section 404 project should be received by the District Engineer no later than **January 17, 2002**. Comments received after the end of the Public Notice comment period will not be considered. However, more time may be given if a request, with a valid reason, is received prior to the suspense date. The Corps of Engineers is soliciting comments from the public; Federal, state, and local agencies and officials; Indian Tribes; and other interested parties in order to consider and evaluate the impacts of this proposed activity. Any comments received will be considered by the Corps of Engineers to determine whether to issue, modify, condition, or deny a permit for this proposal. To make this decision, comments are used to assess impacts on endangered species, historic properties, water quality, general environmental effects, and the other public interest factors listed below. Comments are used in the preparation of an Environmental Assessment and/or an Environmental Impact Statement pursuant to the National Environmental Policy Act. Comments are also used to determine the need for a public hearing and to determine the overall public interest of the proposed activity.

The decision whether to issue a permit will be based on an evaluation of the probable impact, including cumulative impacts, of the proposed activity on the public interest. That decision will reflect the national concern for both protection and utilization of important resources. The benefit which reasonably may be expected to accrue from the proposal must be balanced against its reasonably foreseeable detriments. The evaluation of the impact of this activity will include application of the guidelines promulgated by the Administrator, EPA, under authority of Section 404(b) of the Clean Water Act. All factors relevant to the proposal and the cumulative effects will be considered; among these are conservation, economics, aesthetics, general environmental concerns, wetlands, historic properties, fish and wildlife values, flood hazards, floodplain values, land use, navigation, shore erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, considerations of property ownership, and, in general, the needs and welfare of the people.

CESPA-OD-R  
2001 00520

At the request of the Department of Public Safety, Emergency Management Preparedness, State Coordinator, we are sending a copy of this notice to the local flood plain administrator to apprise the administrator of proposed development within their jurisdiction. In accordance with 44 CFR Part 60 (Flood Plain Management Regulations Criteria for Land Management and Use), participating communities are required to review all proposed development to determine if a flood plain development permit is required. The local Flood Plain Administrator is required to perform this review for all proposed development and maintain records of such review. You may contact:

Department of Public Safety  
Attn: Mr. Jerry Lazzari  
email: [jazzari@dps.state.nm.us](mailto:jazzari@dps.state.nm.us)  
Phone: 505-476-9681

If the District Engineer determines that the project complies with the 404(b)(1) guidelines, he will grant the permit unless issuance would be contrary to the public interest.

Any person may request a public hearing. The request must be submitted, in writing, to the District Engineer within 21 days of the date of this notice and must clearly set forth the reasons for holding a public hearing.

Raymond G. Mickiff  
Lieutenant Colonel, EN  
District Engineer

Enclosure

*FINAL*

FINAL



GARY E. JOHNSON  
GOVERNOR

State of New Mexico  
ENVIRONMENT DEPARTMENT  
Surface Water Quality Bureau  
Harold Runnels Building  
1190 St. Francis Drive, P.O. Box 26110  
Santa Fe, New Mexico 87502  
Telephone (505) 827-0187  
Fax (505) 827-0160



PETER MAGGIORE  
SECRETARY

February 8, 2002

LTC Raymond Midkiff  
District Engineer  
4101 Jefferson Plaza NE  
Albuquerque NM 87109

RE: 401 Water Quality Certification with Conditions - NMED File #2001-082  
Habitat Restoration Project on the Rio Grande near Los Lunas

Dear Lieutenant Colonel Midkiff:

The Surface Water Quality Bureau (SWQB) of the New Mexico Environment Department (NMED) has reviewed your joint 404/401 application for habitat restoration on the Rio Grande in cooperation with the Bureau of Reclamation (BOR) and the Middle Rio Grande Conservation District (MRGCD). The project is located on the west bank of the Rio Grande near Los Lunas in Valencia County, New Mexico (UTM Zone 13 N3847960, E341273). The SWQB has assigned NMED file #2001-082 to this project. The proposed project involves removing jetty jacks, clearing vegetation, and replanting native vegetation to improve habitat for endangered species, including the Rio Grande Silvery Minnow and the Southwestern Willow Flycatcher, in accordance with the biological opinion issued by the U. S. Fish and Wildlife Service. The U.S. Army Corps of Engineers (USACE) will regulate this project under an individual 404 Permit (USACE File # 2001-00520).

Additionally, a State Water Quality Certification is required pursuant to Section 401 of the Federal Clean Water Act and Condition #9 in the USACE permit. The purpose of the certification is to ensure that your project will comply with applicable State water quality standards and the Antidegradation Policy (*Standards for Interstate and Intrastate Surface Waters (New Mexico Water Quality Control Commission, 20.6.4 NMAC 10/12/00)*). State water quality standards in the Rio Grande from Elephant Butte Reservoir upstream to the Alameda Bridge are designed to protect the following designated uses:

- Irrigation
- Limited warmwater fishery
- Livestock watering
- Wildlife habitat

# FINAL

These designated uses are protected by specific standards, including the following:

1. 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.
2. Floating Solids, Oil, and Grease: Surface waters of the state shall be free of oils, scum, grease and other floating materials resulting from other than natural causes that would cause the formation of a visible sheen or visible deposits on the bottom or shoreline, or would damage or impair the normal growth, function or reproduction of human, animal, plant or aquatic life.
3. Stream Bottom Deposits: Surface waters shall be free of water contaminants from other than natural causes that will settle and damage or impair the normal growth, function, or reproduction of aquatic life or significantly alter the physical or chemical properties of the bottom.
4. Dissolved oxygen shall not be less than 5 mg/l
5. Temperature shall not exceed 32.2°C (90°F)
6. pH shall be within the range of 6.6 – 9.0

This is only a partial list of the water quality standards for this segment of the Rio Grande. **For a complete list of the standards that apply to your project area, refer to the following sections of the enclosed *Standards for Interstate & Intrastate Surface Waters, New Mexico Water Quality Control Commission, 20.6.4 NMAC 10/12/00*:**

- 20.6.4.8 *Antidegradation Policy and Implementation Plan*
- 20.6.4.12 *General Standards*
- 20.6.4.105 *Rio Grande Basin*
- 20.6.4.900 *Standards Applicable to Attainable or Designated Uses*

#### **401 Water Quality Certification with Conditions:**

Pursuant to Section 401 of the Clean Water Act and 40 Code of Federal Regulations Part 121, the SWQB hereby issues a 401 Water Quality Certification for USACE Action # 2001-00520: Los Lunas Habitat Restoration Project. The SWQB is reasonably assured that the project will comply with the state water quality standards and the Antidegradation Policy, if it is implemented in accordance with the conditions of this certification.

**The following conditions for certification are required to ensure that the project does not cause significant degradation of water quality. Therefore, this Certification is not valid unless these conditions are adhered to:**

# FINAL

1. The jetty jacks that are below the ordinary high water mark must be removed only during low-flow periods, such as during the winter months prior to spring runoff.
2. To avoid operating heavy equipment in the river channel and the associated impacts to water quality, the jetty jacks along the bank must be pulled away from the river by heavy equipment stationed outside of the river channel.
3. SWQB staff must be present during the initial phase of jetty jack removal to determine if the above conditions are effective in preventing a violation of the water quality standards. This will include monitoring for a substantial visible contrast in the appearance of the water as described in the narrative turbidity standard.
  - a. If it is determined that the jetty jack removal procedure specified in conditions 1 and 2 results in a violation of the turbidity standard, then flowing water must be temporarily diverted around the work area to minimize increases in turbidity due to the project. Acceptable diversion structures are non-erodible, and some examples include water bladders, diversion boards, sand bags, and concrete barriers (Jersey barriers) lined with plastic.
  - b. The SWQB must be notified at least 5 days before starting construction, to allow time to schedule monitoring.
4. Measures must be taken to prevent the movement of disturbed soil, dredged material, or other contaminants into surface water from any worksites outside the channel. Erosion control measures such as silt fences or straw bales must be installed to prevent the movement of these potential contaminants into surface water. The erosion control measures must be inspected and maintained on a regular basis to ensure that they are working properly.
5. All areas that are disturbed during the project must be replanted or reseeded with native vegetation until the area is no longer subject to erosion into surface water. Native riparian and/or wetland species must be used in areas that support such vegetation. Silt fences or other erosion control measures must remain on-site and maintained until the disturbed areas are permanently vegetated.
6. All heavy equipment used in the work area must be clean before the start of the project and inspected daily for leaks. Leaking equipment must not be used in or near any watercourse.
7. Spill clean-up materials (e.g., booms, absorbent pads) must be available on-site at all times during construction. Report all spills immediately to the SWQB as required by the New Mexico Water Quality Control Commission regulations (20.6.2.1203 NMAC).
8. Fuel, oil, hydraulic fluid, or substances of this nature must be stored only in the designated staging areas at least 100 feet from surface water. Storage units must have a

# FINAL

secondary containment system to prevent spills if the primary storage container leaks. Refuel and lubricate equipment at least 100 feet from surface water.

9. A copy of this 401 certification must be kept at the project site during all phases of construction. All contractors involved in your project must be provided a copy of this certification before starting construction.

Violations of State water quality standards could lead to penalties under the New Mexico Water Quality Act. Section 74-6-10.1 B of the Act states, "Any person who violates any provision of the New Mexico Water Quality Act other than Section 74-6-5 NMSA 1978 or any person who violates any regulation, water quality standard, or compliance order adopted pursuant to that act shall be assessed civil penalties up to the amount of ten thousand dollars (\$10,000) per day for each violation."

The SWQB specifically reserves the right to amend or revoke this 401 Certification at any time to ensure compliance with water quality standards.

If you have any questions regarding this 401 Water Quality Certification please contact Daniel Guevara at (505) 476-3017. Thank you for your cooperation.

Sincerely,



James H. Davis, Ph.D.  
Bureau Chief

JHD: dg

xc: NMED District I Manager, Albuquerque  
Jean Manger, U.S. Army Corps of Engineers, Albuquerque District  
Jim Herrington, Wetlands, Region 6, USEPA  
Tod Stevenson, NM Department of Game and Fish  
Joy Nicholopoulos, U.S. Fish and Wildlife Service  
401 Certification File #2001-082

*FINAL*

**APPENDIX B  
CULTURAL RESOURCES: DETAILED REPORT AND STATE  
HISTORIC PRESERVATION OFFICER CONSULTATION**

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## *FINAL*

Early archaeological investigations in this area of New Mexico were conducted by Bandelier, Yeo, and Mera, with Hodge, Mecham, Hackett and Shelby; and Hammond and Rey investigating the historical period (Marshall and Walt 1984:12-14). Additional information can be found in Cordell (1997), Schroeder (1979), Stuart and Gauthier (1984), and Levine and Tainter (1982), all referenced in Marshall and Walt (1984:14). Marshall and Walt's Rio Abajo survey report (1984) and Tainter and Levine's overview (1987) provide significant compilations on the Rio Abajo-Piro Province regarding the history, the archaeology, and the research and investigations thereof. Recent archaeological work in the area has primarily been associated with cultural resources compliance and management requirements for projects such as highway construction and maintenance and related borrow areas, and for the installation of utility lines.

The culture history of this area broadly follows that of the Southwest and has been chronologically generalized into major periods based on noticeable changes in the cultural record. The major periods and their approximate dates include the PaleoIndian 9,500 B.C.- ~5,500 B.C.; the Archaic 5,500 B.C.- ~A.D. 1; the Puebloan ~A.D. 1 - A.D. 1540; and Historic, A.D. 1540 to the Present.

These Periods are further subdivided to describe specific regional and local variations in the archaeological record. This general area is located in the transition zone between the Puebloan (Anasazi) peoples to the north and the Mogollon area to the south. Wiseman (1995:9) believes that Marshall and Walt's (1984) broad cultural outline should be applicable to the central Rio Grande Valley slightly to the north of their study area.

PaleoIndian sites in New Mexico are known primarily from the eastern plains and the Rio Grande valley, with a few being known in the western part of the state (Stuart and Gauthier 1984; Simmons *et al.* 1989:33-34). There are also numerous, scattered isolated artifacts reported from across the state. The PaleoIndian studies in the Rio Grande valley, reported by Judge and Dawson (1972) and Judge (1973) indicate that Clovis, Folsom, and Plano sites occur in the Rio Grande valley and consist mostly of surface finds of isolated artifacts; however, occasional stratified sites have been found. The PaleoIndian peoples were primarily mobile big game hunter-gatherers who also scavenged.

The chronology defined by Irwin-Williams (1973) for the Arroyo Cuervo region has been the most widely utilized for the Archaic Period in New Mexico. Huckell (1996) brought together recent documentation for the period in the Southwest. Many Paleo and Archaic Period sites are difficult to distinguish and many sites recorded only as lithic scatters undoubtedly date to these periods. Dating sites is usually accomplished with diagnostic projectile points although many newly discovered Southwestern sites are producing dateable materials (Huckell 1996:325-327). Archaic peoples remained very mobile, but, as a result of major climatic changes, they adapted to an essentially modern ecological setting and increased reliance on small game and the collecting and gathering of plant foods in a seasonal migratory pattern. Toward the end of the Archaic Period, many social and technological changes occurred including increased

## *FINAL*

dependence on wild plants and the adoption of Meso-American cultigens and the introduction of the bow and arrow about A.D. 200.

Generally in the Rio Grande Valley, the prehistoric Puebloan Period is characterized by increasing population sizes, movement of people across the landscape, more sedentism and aggregation of peoples into larger villages, an increasing dependence on agriculture, and a more intense and efficient use of the environment. Small pithouse villages, larger above-ground roomblocks, and eventually huge adobe pueblos with scattered fieldhouses are common. There is an increasing use of water control features and local and long distance trade is important.

The earliest Puebloan Phase, the San Marcial (A.D. 300-800) is contemporaneous with the Basketmaker III and characterized by small sites with pithouses and surface jacal storage rooms. These sites contain a predominance of plain brown ceramics similar to those in the Mogollon area but include such Anasazi wares as Lino Gray.

The Tajo phase (A.D. 800-950 or 1000) is a north-central cultural expression of the Mogollon subarea contemporary with the Pueblo I and early Pueblo II phases farther north. The ceramics consist primarily of plain and ribbed brownwares with an admixture of Red Mesa Black-on-white and, in later sites, some Gallup and Puerco-Escavada style Black on white (Wiseman 1995:10). Pithouses remain in use; however, there are more surface structures of jacal and masonry construction, which come with a clear occupational shift from upland to lowland riverside locations (Marshall and Walt 1984:47).

The Early (A.D. 950 or 1000-1100) and Late Elmendorf phases (A.D. 1100-1300) continue to be Mogollon expressions of riverside occupation and are chronologically similar to the northern Pueblo II and Pueblo III phases (Marshall and Walt 1984:75, 95). Population aggregation is clearly evident with settlement in closely spaced unit pueblos where there are more surface rooms and increased site size. During the Early Elmendorf, the production of locally made ceramic whiteware develops. In the Late Elmendorf phase, pueblos are larger and fortified and are primarily of masonry construction, and the whiteware is replaced by intrusive White Mountain redware.

The Ancestral Piro phase (A.D. 1300-1540) coincides with the Glaze A thorough Glaze D horizons although Glaze B is nearly absent and Glazes C and D are infrequent (Marshall and Walt 1984:135). The locally indigenous population is affected by an influx of intrusive populations of unknown affinity (Marshall and Walt 1984:135). The Ancestral Piro phase is characterized by a dramatic increase in regional population; a coalescence of the populace into large plaza-type villages; the expansion into and colonization of riverside areas previously unoccupied; and the prevalent but not ubiquitous use of puddle-coursed adobe architecture (Marshall and Walt 1984:135). Colonial Piro phase (A.D. 1540-1680) is marked by the coming of the Spaniards, introduced artifacts, and the changes associated with Spanish influence such as architectural changes, and by the abandonment of the region in the 1670s due to droughts, Spanish oppression and disease, and nomadic raiding (Marshall and Walt

## FINAL

1984:138-139).

In regard to irrigation in the Southwest, from about the 1250s to 1600s, Puebloan peoples were becoming more sedentary and increasingly dependent on domesticated crops that supplemented their hunting and gathering subsistence economy. In these horticultural/ agricultural pursuits, Puebloans developed numerous soil and moisture conservation systems, and some limited irrigation, however expedient, was practiced in New Mexico in the late sixteenth century (Wozniak 1987:15).

A detachment, from Coronado's 1540 exploratory expedition, led by a Captian Franciso de Ovando, and later perhaps Coronado himself, visited several of the Piro Pueblos along the river. Subsequent expeditions traveling along the Rio Grande from the south to the north into New Mexico included that of Father Agustín Rodríguez and Francisco Sánchez Chamuscado who followed indigenous trails in 1581 and that of Antonio de Espejo in 1582 (Tainter and Levine 1987:78-80; Simmons 1979:178). Espejo, visiting several Piro Pueblos over the course of four days, reported that the area had an estimated population of 12,000 souls (Twitchell 1917:337). Espejo also reported on the abundance of crops produced in the Piro province. Traveling up the Pecos River in 1590, Gaspar Castano de Sosa made an unauthorized attempt to establish a colony in New Mexico; however, he was arrested by Captain Juan Morlete in late winter 1591 and was marched down the Rio Grande back to Mexico (Tainter and Levine 1987:82).

In 1598, Oñate and his colonist followers traveled the route along the Rio Grande from Mexico, and established the first Spanish colonial settlement near the immediate vicinity of today's San Juan Pueblo (Simmons 1988:35-38). During his expedition to the north, Oñate visited a pueblo that he called Nueva Sevilla at or near old La Joya (approximately 30 miles south of the project location). Oñate, arrived at Sevilleta Pueblo on June 15<sup>th</sup> and stayed until the 21<sup>st</sup>.

Oñate's Rio Grande route, upon gaining some permanence, became known as the *El Camino Real de Tierra Adentro*, the Royal Road, and provided the major link for numerous travelers, traders, and provincial supply caravans between *Nuevo Mexico* and other cities in Mexico (Boyle 1994:1-2). Much later, Americans would also use the route to extend the Santa Fe Trail trade (1820-1880) down the *Camino Real*/Chihuahua Trail into Mexico making the route an international-trade network (Boyle 1994).

By the 1670s practically all of the Piro and Tompiro area was abandoned, due to regional droughts, Spanish oppression and disease, and intensive nomadic raiding. At the time of the Pueblo Revolt of 1680, many of the remaining Piro people had joined other northern Pueblos or moved south to El Paso with the fleeing Spaniards, possibly fearing retaliation, since the Piro people had always supported the Spaniards. Several reconquest attempts were made in the 1680s, with the Spaniards generally following the old trail up the Rio Grande (Tainter and Levine 1987:91-93). Upon de Vargas' return to New Mexico, many of the Piro remained in the El Paso area (Schroeder 1979:236-239). After de Vargas' reconquest, the Spaniards made an effort to redirect their colonization by issuing community land grants that were intended to be self-sufficient farming and

## FINAL

herding communities (Tainter and Levine 1987:93-95). Wanting to provide more protection for travelers on the road between Santa Fe and El Paso, the Comandante General of the Provincias Internas had ordered Governor Nava to extend the southern boundary of the Rio Abajo by reestablishing the settlements at Senecu, Socorro, Alamillo, and Sevilleta; however, at first Governor Nava had trouble attracting volunteers (Wozniak 1987:50, 83; Tainter and Levine 1987:97). By 1805, Sevilleta is reported to having been well established, and by 1817, a sizable population was living at Socorro when they petitioned Governor Allande for legal ownership of the grant (Tainter and Levine 1987:97-98). Those at Sevilleta soon followed suit and were placed in legal possession of their lands in June 1819 (Tainter and Levine 1987:99; Wozniak 1987:52-53). Spanish land grants given in the area in the early part of the 1800s include: the Town of Socorro (1817), Sevilleta (1819), the Pedro Armendariz # 33 and #34 (1819 and 1820, respectively), and the Mexican grant at Bosque de Apache (1845)(GAO 2001; Williams 1986:105-107).

Zebulon Montgomery Pike is among the first Anglo-Americans to pass the project area during March, 1807 (Tainter and Levine 1987:97-98; Marshall and Walt 1984:274-275). The Texan-Santa Fe expedition also passed through the area in 1841 (Tainter and Levine 1987:102; Marshall and Walt 1984:237-238). Another famous American, James W. Abert who was assigned to General Stephen Watts Kearny's Army of the West, traversed this area in November 1847. Union and Confederate troops also traveled the local roads during the Civil War. By 1880, the Atchison, Topeka and Santa Fe Railroad had laid track down the west side of the Rio Grande as far as San Marcial (Tainter and Levine 1987:126). The coming of the railroad brought many social changes to the small, local communities by providing wage labor jobs, and the competition for those jobs, and thereby took many of the local residents away from their traditional agricultural pursuits (Tainter and Levine 1987:124-136).

Many of the Lunas in New Mexico are descended from Diego de Luna who was born in 1635. In 1716 the *San Clemente Land Grant*, which encompassed the present village of Los Lunas, was given to Felix Candelaria. Around 1750, Domingo Luna purchased land here from Baltazar Baca, who had purchased land from Candelaria. In 1808, Antonio Jose Luna 'the father of Los Lunas' was born. A sheep rancher, he married Isabella Baca, from a prominent Belen family and became a civic and political leader. Their son, Solomon Luna, married into the Otero family of Valencia thereby uniting two powerful and rich families that dominated regional politics for almost a century. He played a major role in drafting the New Mexico constitution. Through the influence of the Lunas, the seat of Valencia County was moved from Tome to Los Lunas in 1876 (Julyan 1996:209-210).

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**DRAFT STATE HISTORIC PRESERVATION OFFICER CONSULTATION LETTER**

Engineering and Construction Division  
Environmental Resources Branch

Mr. Elmo Baca  
State Historic Preservation Officer  
New Mexico State Historic Preservation Bureau  
228 East Palace Avenue, Room 101  
Santa Fe, New Mexico 87503

Dear Mr. Baca:

Pursuant to 36 CFR Part 800, the U. S. Army Corps of Engineers (Corps), Albuquerque District, is seeking your concurrence in our determination of “No Historic Properties Affected” for the proposed project entitled **Habitat Restoration Project, Los Lunas, New Mexico.** The Corps, in cooperation with the Bureau of Reclamation (BOR) and the Middle Rio Grande Conservancy District (MRGCD), is planning the restoration project. On June 29, 2001, the U.S. Fish and Wildlife Service (USFWS) issued a Biological Opinion regarding the effects of certain water management practices upon several threatened and endangered (T&E) species. The USFWS concluded that certain management practices utilized by the Corps and BOR would likely jeopardize the continued existence of some T&E species and, therefore, developed a Reasonable and Prudent Alternative (RPA) that they believed must be implemented in order to avoid placing these species in jeopardy. The Corps and the BOR have made an initial determination to accept and implement, on an interim basis, the general provisions of the RPA. The Los Lunas Habitat Restoration Project is intended to fulfill the requirement of habitat restoration in the Belen Reach, one of eight reaches in which habitat restoration must be conducted in accordance with Element J of the RPA. Other habitat restoration projects that may develop from the USFWS’s BO and RPA will be documented on a project by project basis. A severe bosque fire that occurred in April of 2000, destroyed major portions of the riparian vegetation in the Los Lunas project area and made the area a prime location for habitat restoration.

The Los Lunas project area, located about 4.8 kilometers (3 miles) south of the community of Los Lunas, Valencia County, New Mexico, is along the west bank of the Rio Grande adjacent to the Mid-Valley Air Park. This area is located within the historic Nicolás Durán de Cháves (Chavez) Grant, a community land grant that was confirmed in 1896 (GAO 2001:25). Access to the project area would be along the river-side levee with entry points from what is known as the Los Chavez gate (on the south) or from the Los Lunas, NM Highway 6 bridge (on the north). All work will occur between the west side of the existing river channel and the levee. Construction work would include the removal of Kellner jetty-jacks and overbank excavation that will reshape the west bank of the river. Information regarding project location and dimensions and map figures is provided in the documentation attached to this letter report.

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The major area of earth disturbance, approximately 16.2 hectares (40.0 acres), will be where jetty-jacks are removed and excavation will remove earthen materials, adjacent to the river channel (see attached aerial orthophoto, between green and red lines). The excavated materials, sedimentary sand and gravel deposits practically all of which have been deposited since 1960, will be placed adjacent to the levee (purple line). Therefore, the lowered overbank area could be easily flooded, promoting vegetation species diversity and potential habitat for T&E species. The floodplain area between the excavation and placement areas will receive only minimal surface disturbance from equipment operation. The total project area encompasses approximately 53 hectares (130 acres; north point to south point and west river bank to west levee; see attached aerial orthophoto). Existing aerial photography taken in 1962, indicates that approximately 50 percent of the total project area was part of the active river channel. The upstream (north) end of the proposed construction area begins at a Universal Transverse Mercator (UTM), Zone 13 location at 341273 Easting, 3847960 Northing and the downstream (south) end has a location at 340413 Easting, 3846221 Northing (NAD-27; see attached Table 1, Figures 1 and 2, and the aerial orthophoto).

The MRGCD was organized in 1923 “to deal with severe flooding, waterlogged lands, and failing irrigation facilities” (Scurlock 1998:281; Wozniak 1987:134). By 1928 a reclamation, flood control, and irrigation plan was developed and between 1930 and 1934 major portions of the plan that including the construction of flood control levees, riverside drainage canals, and irrigation ditches and diversions were constructed (Scurlock 1998:281). Starting in 1951, the Corps and BOR installed thousands of Kellner jetty-jacks to armor the river bank and maintain the floodway, and a major channel modification project to maintain channel capacity was completed by the BOR in 1959 (Scurlock 1998:282, 354). Subsequent to this work, significant sediment deposition has occurred within the floodplain between the flood control levees and specifically within the jetty-jack field. Sediment deposition in the project area averages about 2 to 5 feet in depth.

Documentary evidence regarding the project area indicates that, if cultural resources sites were located within the floodplain, either prior to or after to the major construction and rehabilitation efforts that occurred between the 1930s and 1960s, they would have been either washed away by the river and/or buried by significant sediment deposition as evidenced by the river’s historic flood events, or significantly disturbed by the Middle Rio Grande construction and rehabilitation projects. Therefore, the project area that is located within the levee-controlled floodplain has little or no potential to contain artifacts or cultural resource manifestations of significant antiquity that would maintain archaeological integrity. Due to this fact, the Corps has not conducted an archaeological survey of the project area.

A search of the New Mexico Historic Preservation Division’s Archeological Records Management Section database was conducted to identify cultural resources sites that may have been reported to occur within the vicinity of the project area. The database search found that no archaeological sites have been reported to occur within or adjacent to the project area. The nearest reported site, LA 88332, a small to medium,

*FINAL*

highly disturbed, Pueblo IV adobe pueblo (Marshall and Marshall 1992:13, 135-136), is located more than 1.0 kilometer (more than 0.6 miles) from the project area and west of US Highway 85/NM Highway 304; LA 88332 would not be affected by the proposed project.

A database search of the State Register of Cultural Properties and of the National Register of Historic Places found that no State or National Register properties occur in the general vicinity of the project area. The historic community of Los Chavez is located about 2.5 kilometers southwest and the historic community of Tome, located east of the Rio Grande, is about 1.4 kilometers southeast of the project area. El Cerro Tomé (Tome Hill), listed on the State (NMHPD No. 1637) and National Registers, is also located east of the Rio Grande, about 2.4 kilometers directly east of the project area. The historic communities of Los Chavez and Tome, and Tome Hill would not be affected by the proposed project.

Based on this information, the Corps is of the opinion that there would be “No Historic Properties Affected” by the proposed habitat restoration project. Should previously unknown artifacts or cultural resource manifestations be encountered during construction, work would cease in the immediate vicinity of the resource, a determination of significance made, and a mitigation plan formulated in consultation with your office pursuant to 36 CFR 800.11.

Please review this letter report and attached documentation and provide concurrence, and/or if necessary make comments, **within 10 days**. If you have any questions or require additional information, please contact Gregory Everhart of my staff at (505) 342-3352 or myself at (505) 342-3359.

Sincerely,

John D. Schelberg  
Acting Chief, Environmental Resources Branch

Date \_\_\_\_\_

I CONCUR \_\_\_\_\_

ELMO BACA  
NEW MEXICO STATE HISTORIC  
PRESERVATION OFFICER

Enclosure

Copy Furnished w/o enclosure:  
Don Klima, Director  
Advisory Council on Historic Preservation  
Office of Planning and Review  
12136 W. Bayaud Ave., #330  
Lakewood, Colorado 80228-2115

FINAL

**STATE HISTORIC PRESERVATION OFFICER CONCURRENCE LETTER**



Reply to  
Attention of:

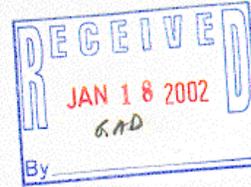
DEPARTMENT OF THE ARMY  
ALBUQUERQUE DISTRICT, CORPS OF ENGINEERS  
4101 JEFFERSON PLAZA, NE  
ALBUQUERQUE, NEW MEXICO 87109-3435  
FAX (505) 342-3199

EC-R

January 17, 2002

Engineering and Construction Division  
Environmental Resources Branch

064036



Mr. Elmo Baca  
State Historic Preservation Officer  
New Mexico State Historic Preservation Bureau  
228 East Palace Avenue, Room 101  
Santa Fe, New Mexico 87503

Rec'd 1-25-2002  
GDE

Dear Mr. Baca:

Pursuant to 36 CFR Part 800, the U. S. Army Corps of Engineers (Corps), Albuquerque District, is seeking your concurrence in our determination of "No Historic Properties Affected" for the proposed project entitled "**Habitat Restoration Project, Los Lunas, New Mexico.**" The Corps, in cooperation with the Bureau of Reclamation (BOR) and the Middle Rio Grande Conservancy District (MRGCD), is planning the restoration project. On June 29, 2001, the U.S. Fish and Wildlife Service (USFWS) issued a Biological Opinion (BO) regarding the effects of certain water management practices upon several threatened and endangered (T&E) species. The USFWS concluded that certain management practices utilized by the Corps and BOR would likely jeopardize the continued existence of some T&E species and, therefore, developed a Reasonable and Prudent Alternative (RPA) that they believed must be implemented in order to avoid placing these species in jeopardy. The Corps and the BOR have made an initial determination to accept and implement on an interim basis, the general provisions of the RPA. The Los Lunas Habitat Restoration Project is intended to fulfill the requirement of habitat restoration in the Belen Reach, one of eight reaches in which habitat restoration must be conducted in accordance with Element J of the RPA. Other habitat restoration projects that may develop from the USFWS's BO and RPA will be documented on a project by project basis. A severe bosque fire that occurred in April 2000, destroyed major portions of the riparian vegetation in the Los Lunas project area and made the area a prime location for habitat restoration.

The Los Lunas project area, located about 4.8 kilometers (3 miles) south of the community of Los Lunas, Valencia County, New Mexico, is along the west bank of the Rio Grande adjacent to the Mid-Valley Air Park. This area is located within the historic Nicolás Durán de Chaves (Chavez) Grant, a community land grant that was confirmed in 1896 (GAO 2001:25). Access to the project area would be along the river-side levee with entry points from what is known as the Los Chavez

# FINAL

gate (on the south) or from the Los Lunas, NM Highway 6 bridge (on the north). All work will occur between the west side of the existing river channel and the levee. Construction work would include the removal of Kellner jetty-jacks and overbank excavation that will reshape the west bank of the river. Information regarding project location and dimensions and map figures is provided in the documentation attached to this letter report.

The major area of earth disturbance, approximately 16.2 hectares (40.0 acres), will be where jetty-jacks are removed and excavation will remove earthen materials, adjacent to the river channel (see attached aerial orthophoto, between green and red lines). The excavated materials, sedimentary sand and gravel deposits practically all of which have been deposited since 1960, will be placed adjacent to the levee (purple line). Therefore, the lowered overbank area could be easily flooded, promoting vegetation species diversity and potential habitat for T&E species. The floodplain area between the excavation and placement areas will receive only minimal surface disturbance from equipment operation. The total project area encompasses approximately 53 hectares (130 acres; north point to south point and west river bank to west levee; see attached aerial orthophoto). Existing aerial photography taken in 1962, indicates that approximately 50 percent of the total project area was part of the active river channel. The upstream (north) end of the proposed construction area begins at a Universal Transverse Mercator (UTM), Zone 13 location at 341273 Easting, 3847960 Northing and the downstream (south) end has a location at 340413 Easting, 3846221 Northing (NAD-27; see attached Table 1, Figures 1 and 2, and the aerial orthophoto).

The MRGCD was organized in 1923 "to deal with severe flooding, waterlogged lands, and failing irrigation facilities" (Scurlock 1998:281; Wozniak 1987:134). By 1928, a reclamation, flood control, and irrigation plan was developed and between 1930 and 1934 major portions of the plan that included the construction of flood control levees, riverside drainage canals, and irrigation ditches and diversions were constructed (Scurlock 1998:281). Starting in 1951, the Corps and BOR installed thousands of Kellner jetty-jacks to armor the river bank and maintain the floodway, and a major channel modification project to maintain channel capacity was completed by the BOR in 1959 (Scurlock 1998:282, 354). Subsequent to this work, significant sediment deposition has occurred within the floodplain between the flood control levees and specifically within the jetty-jack field. Sediment deposition in the project area averages about 2 to 5 feet in depth.

Documentary evidence regarding the project area indicates, that if cultural resources sites were located within the floodplain, either prior to or after to the major construction and rehabilitation efforts that occurred between the 1930s and 1960s, they would have been either washed away by the river and/or buried by significant sediment deposition as evidenced by the river's historic flood events, or significantly disturbed by the Middle Rio Grande construction and rehabilitation projects. Therefore, the project area that is located within the levee-controlled floodplain has little or no potential to contain artifacts or cultural resource manifestations of significant antiquity that would maintain archaeological integrity. Due to this fact, the Corps has not conducted an archaeological survey of the project area.

A search of the New Mexico Historic Preservation Division's Archeological Records Management Section database was conducted to identify cultural resources sites that may have been reported to occur within the vicinity of the project area. The database search found that no

FINAL

archaeological sites have been reported to occur within or adjacent to the project area. The nearest reported site, LA 88332, a small to medium, highly disturbed, Pueblo IV adobe pueblo (Marshall and Marshall 1992:13, 135-136), is located more than 1.0 kilometer (more than 0.6 miles) from the project area and west of US Highway 85/NM Highway 304; LA 88332 would not be affected by the proposed project.

A database search of the State Register of Cultural Properties and of the National Register of Historic Places found that no State or National Register properties occur in the general vicinity of the project area. The historic community of Los Chavez is located about 2.5 kilometers southwest and the historic community of Tome, located east of the Rio Grande, is about 1.4 kilometers southeast of the project area. El Cerro Tomé (Tome Hill), listed on the State (NMHPD No. 1637) and National Registers, is also located east of the Rio Grande, about 2.4 kilometers directly east of the project area. The historic communities of Los Chavez and Tome, and Tome Hill would not be affected by the proposed project.

Based on this information, the Corps is of the opinion that there would be "No Historic Properties Affected" by the proposed habitat restoration project. Should previously unknown artifacts or cultural resource manifestations be encountered during construction, work would cease in the immediate vicinity of the resource, a determination of significance made, and a mitigation plan formulated in consultation with your office pursuant to 36 CFR 800.11.

Please review this letter report and attached documentation and provide concurrence, and/or if necessary make comments, **within 10 days**. If you have any questions or require additional information, please contact Gregory Everhart of my staff at (505) 342-3352, or myself at (505) 342-3359.

Sincerely,

*John D. Schelberg*

John D. Schelberg, Ph.D.  
Acting Chief, Environmental Resources Branch

Date 1/18/02

I CONCUR *Elizabeth Duncan*  
for ELMO BACA  
NEW MEXICO STATE HISTORIC  
PRESERVATION OFFICER

Enclosure

*MR. GREGORY EVERHART EXPLAINS  
VIA TELEPHONE 1/22/02 THAT  
THIS IS OFFENTIMOS STANDARD  
PROCEDURE FOR COE.*



*We appreciate the nice graphics. We  
are curious, however, as to why the project  
undertaking is in letter form and is separate  
from the cultural resources <sup>section</sup>, which itself appears to  
be a stand alone document but is not.*

*FINAL*

Copy Furnished: (w/o enclosure)

Don Klima, Director  
Advisory Council on Historic Preservation  
Office of Planning and Review  
12136 W. Bayaud Ave., #330  
Lakewood, Colorado 80228-2115

*FINAL*

**APPENDIX C**  
**SOUTHWESTERN WILLOW FLYCATCHER (WIFL) SURVEY**

---

# FINAL

## Willow Flycatcher Survey and Detection Form (rev. 4/98)

Site Name Los Lunas SW Levee Was site surveyed in previous year?  Yes  No (1995)  
 If yes, what site name was used? Same as above  
 County Valencia State NM USGS Quad Name Los Lunas

Is copy of USGS map marked with survey area and WIFL sightings attached (as required)?  Yes  No  
 Site Coordinates: Start: N 3847374.29 E 340816.28 UTM  
 Stop: N 3846549.49 E 340429.87 UTM Zone 13  
 Elevation 4831 (feet/meters (circle one))

\* **Fill in additional site information on back of this page** \*\*

Survey # Observer(s)	Date (m/d/y) Survey time	Number of WIFLs Found	Estimated Number of Pairs	Estimated Number of Territories	Nest(s) Found? Y or N	Cowbirds Detected? Y or N	Presence of Livestock, Recent sign Y or N	Comments about this survey (e.g., evidence of pairs or breeding, number of nests, nest contents or number of fledges seen; potential threats)
1 <u>MARK</u> <u>HORNER</u>	Date <u>5/24</u> <u>5/31</u> start <u>7:00 AM</u> stop <u>10:00 AM</u> total hrs <u>4.5</u>	1	-	-	N	N	N	cell response only, located at northern end of survey area; migrant
2 <u>MARK</u> <u>HORNER</u>	Date <u>6/13</u> Start <u>7:30 AM</u> Stop <u>10:30 AM</u> total hrs <u>3.0</u>	∅	-	-	N	N	N	
3 <u>MARK</u> <u>HORNER</u>	Date <u>7/3</u> Start <u>7:30 AM</u> Stop <u>10:00 AM</u> total hrs <u>2.5</u>	∅	-	-	N	Y	N	
4 <u>MARK</u> <u>HORNER</u>	Date <u>7/6</u> start <u>7:30 AM</u> stop <u>9:30 AM</u> total hrs <u>2.0</u>	∅	-	-	N	Y	N	
5 <u>MARK</u> <u>HORNER</u>	Date <u>7/16</u> start <u>7:30 AM</u> stop <u>10:00 AM</u> total hrs <u>2.5</u>	∅	-	-	N	Y	N	
Overall Site Summary (Total only resident WIFLs)		Adults	Pairs	Territories	Nests	Were any WIFLs color-banded? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> (could not tell.) If yes, report color combination(s) in the comments section on back of form		
Total survey hrs <u>14.5</u>		1	-	-	-			

Name of Reporting Individual MARK W. HORNER Date Report Completed 7-16-01

Submit the original of this form. Retain a copy for your records.

\*NOTE: 1995 survey does NOT appear to cover entire 2001 survey area.

12001

Fill in the following information completely. Submit original form. Retain copy for your records.

Name of Reporting Individual MARK W. HORWETZ Phone # (505) 342-3187  
 Affiliation US Army Corps of Engineers Email Mark.W.Horwetz@SPe22.usace.army.mil

Site Name Los Lunas SW Levee  
 Did you verify that this site name is consistent with that used in previous years?  Yes No (circle one)

Management Authority for Survey Area (circle one): Federal Municipal/County  State Tribal Private

Name of Management Entity or Owner (e.g., Tonto National Forest) MIRGCD

Length of area surveyed: 2,800 ft. (specify units, e.g., miles = mi, kilometers = km, meters = m)  $2800' \times 70' = 1.8 \text{ ha}$

Did you survey the same general area during each visit to this site this year?  Yes No If no, summarize in comments below.

If site was surveyed last year, did you survey the same general area this year? Yes  No If no, summarize in comments below.

1995 Survey does NOT appear to cover entire 2001 Survey area.

Vegetation Characteristics: Overall, are the species in tree/shrub layer at this site comprised predominantly of (check one):

- Native broadleaf plants (entirely or almost entirely, includes high-elevation willow)
- Mixed native and exotic plants (mostly exotic)
- Mixed native and exotic plants (mostly native)
- Exotic/introduced plants (entirely or almost entirely)

Identify the 2-3 predominant tree/shrub species: Salt Cedar, Possum Olive, Some Coyote Willow

Average height of canopy: 20-30 ft. (specify units)

Was surface water or saturated soil present at or adjacent to site?  Yes No (circle one)  $\rightarrow$  Surface water, Main Stem of River

Distance from the site to surface water or saturated soil: 0-25ft. (specify units)  
 $\rightarrow$  Directly adjacent to Rio Grande

Did hydrological conditions change significantly among visits (did the site flood or dry out)? Yes  No (circle one)  
 If yes, describe in comments section below.

Remember to attach a xerox copy of a USGS quad/topographical map (REQUIRED) of the survey area, noting the survey site and location of WIFL detections. You may also include a sketch or aerial photograph showing details of site location, patch shape, survey route in relation to patch, and location of any willow flycatchers or willow flycatcher nests detected. Such sketches or photographs are welcomed, but DO NOT substitute for the required USGS quad map.

Comments (attach additional sheets if necessary): Entire area burned in April 2000. Remaining WIFL habitat is linear adjacent to Rio Grande and is limited on crown and fringes. Wider portions do exist along reach with widest berth & 20 ft. for less standing water in areas than 1995 reports; probably due to reduced overstory.

In addition, woody species showing regrowth after fire. Some habitat (almost exclusively salt cedar) remains unburned but is marginal habitat at best. It is largely linear.



*FINAL*

**APPENDIX D**  
**PUBLIC NOTICE OF DRAFT EA AVAILABILITY (NOA)**

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STATE OF NEW MEXICO  
County of Bernalillo SS

Bill Tafoya, being duly sworn, declares and says that he is Classified Advertising Manager of The Albuquerque Journal, and that this newspaper is duly qualified to publish legal notices or advertisements within the meaning of Section 3, Chapter 167, Session Laws of 1937, and that payment therefor has been made or assessed as court cost; that the notice, copy of which is hereto attached, was published in said paper in the regular daily edition, for 1 times, the first publication being on the 20<sup>th</sup> day of January, 2002, and the subsequent consecutive publications on \_\_\_\_\_, 2002.

*[Handwritten Signature]*

Sworn and subscribed to before me, a Notary Public, in and for the County of Bernalillo and State of New Mexico this 20<sup>th</sup> day of January of 2002.

PRICE 18.16

Statement to come at end of month.

ACCOUNT NUMBER C88913

CLA-22-A (R-1/93)

**Public Notice**  
The Draft Environmental Assessment entitled: Draft Environmental Assessment and Finding of No Significant Impact (FONSI) for Rio Grande Habitat Restoration Project, Los Lunas, New Mexico is available for review by contacting:  
Mr. Mark Horner, Biologist  
U.S. Army Corps of Engineers  
Albuquerque District  
Environmental Resources  
Branch  
CESPA-EC-R  
4101 Jefferson Plaza NE  
Albuquerque, New Mexico  
87105-3435  
(505) 342-3167  
E-mail: mark.w.horner@sp02.usace.army.mil  
The review and comment period will begin on January 22, 2002 and conclude on February 1, 2002.  
In addition, an electronic version in pdf format is available at the U.S. Army Corps of Engineers, Albuquerque District homepage, <http://www.spa.usace.army.mil>, under the "Environmental Assessments & FONSI" link. Submit all comments to Mr. Horner at the above address and should be postmarked no later than February 1, 2002.  
Journal: January 20, 2002

**OFFICIAL SEAL**  
Samantha Weiss  
NOTARY PUBLIC  
STATE OF NEW MEXICO  
1012104  
*[Handwritten Signature]*

*FINAL*

**APPENDIX E  
US FISH AND WILDLIFE SERVICE  
COORDINATION AND CONSULTATION**

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FINAL



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

February 6, 2002

Cons. # 2-22-02-I-176  
(2-22-01-F-431)

Lt. Colonel Raymond G. Midkiff  
U.S. Army Corps of Engineers  
4101 Jefferson Plaza, NE  
Albuquerque, New Mexico 87113

Dear Lt. Colonel Midkiff:

This responds to your January 18, 2002, request to the U.S. Fish and Wildlife Service (Service) for consultation pursuant to section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. § 1531 *et seq.*). This consultation concerns the effects of the proposed habitat restoration project near Los Lunas, New Mexico on the threatened bald eagle (*Haliaeetus leucocephalus*), endangered southwestern willow flycatcher (*Empidonax traillii extimus*), endangered whooping crane (*Grus americana*), and endangered Rio Grande silvery minnow (*Hybognathus amarus*).

It is our understanding that this project is tiered from the "Programmatic Biological Opinion on the Effects of Actions Associated with the U.S. Bureau of Reclamation's, U.S. Army Corps of Engineers', and Non-Federal Entities' Discretionary Actions Related to Water Management on the Middle Rio Grande, New Mexico" issued on June 29, 2001. We also understand that this project is intended to fulfill or partially fulfill element J of the Reasonable and Prudent Alternative which states:

In consultation with the Service, conduct habitat/ecosystem restoration projects in the Middle Rio Grande to increase backwaters and oxbows, widen the river channel, and lower river banks to produce shallow water habitats, overbank flooding and regenerating stands of willows and cottonwoods to benefit the silvery minnow and flycatcher and their habitats. Restoration will take place on at least one site per reach on the Rio Grande from the area of Velarde to the headwaters of Elephant Butte Reservoir. The reaches include the following, as described on page 13 of the assessment: Velarde, Española, Cochiti, Middle, Belen, Rio Puerco, Socorro, San Marcial. Based on the size of a successful breeding area used by a group of flycatchers on the Middle Rio Grande, each restoration site will encompass approximately 60 acres (approximately 100 meters wide by 2.5 kilometers long) along

the river's edge, incorporating modifications of these dimensions based on site-specificity, as needed. Monitoring for effectiveness of each restoration project to benefit the silvery minnow and flycatcher will be conducted at each site annually for a period of at least fifteen years post-project completion in order to assess whether native riparian habitats are self-sustaining and successfully regenerating, and whether the habitats are maintaining suitability for recovery of listed species. Monitoring reports will be provided to the Service by January 31 of each year. Adaptive management principles will be used, if necessary, to obtain successful restoration of silvery minnow and flycatcher habitats. The environmental evaluation process for each project should begin when this opinion is issued and construction at the first restoration site should begin no later than six months from the date of this opinion. At least four reaches must be completed by the end of this consultation period. Consultation with the Service on each site will tier to this programmatic biological opinion.

**Proposed Action**

An analysis of project impacts is provided in the Draft Environmental Assessment/Final Biological Assessment (DEA/FBA). It is our understanding that approximately 37 acres of native riparian and 40 acres of aquatic habitat will be created as a result of this project. This project is designed to produce inundation of the area at flows greater than or equal to 2,500 cubic feet/second (cfs). A variety of substrate elevations would be incorporated into the project allowing for the inundation of some areas when flows are less than 2,500 cfs. The project will also include design features such as side-channels resulting in increased inundation frequency and will begin the process of post-fire regeneration of high-value terrestrial habitats within and adjacent to the restoration site boundary.

Based on the information provided in the DEA/FBA, the Service concurs with the Corps of Engineers determination of "may affect, not likely to adversely affect" for the southwestern willow flycatcher, bald eagle, whooping crane, and Rio Grande silvery minnow.

Please contact the Service if: 1) future surveys find threatened or endangered species in areas where they have not been previously observed; 2) the project is changed or new information reveals effects of the actions to the listed species or their habitat to an extent not considered in the biological assessment; or 3) a new species is listed that may be affected by these projects.

*FINAL*

Lt. Colonel Raymond G. Midkiff

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We would like to thank you for your efforts in coordinating this consultation with our office. If we can be of further assistance, please contact Jude Smith of my staff at the letterhead address or at (505) 346-2525, extension 104.

Sincerely,



 Joy E. Nicholopoulos  
Field Supervisor

cc:

Area Manager, U. S. Bureau of Reclamation, Albuquerque Area Office, Albuquerque, New Mexico

*FINAL*

**APPENDIX F  
DRAFT ENVIRONMENTAL ASSESSMENT  
COMMENTS AND REPSONSES**

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FINAL

**A) NEW MEXICO INTERSTATE STREAM COMMISSION**  
**NEW MEXICO INTERSTATE STREAM COMMISSION**

**COMMISSION MEMBERS**

RICHARD P. CHENEY, Chairman, Farmington  
HOYT PATTISON, Vice-Chairman, Clovis  
THOMAS C. TURNEY, PE, Secretary, Santa Fe  
PALEMON A. MARTINEZ, Valdez  
JOHN S. BULSTERBAUM, Deming  
PHILIP R. GRANT, Albuquerque  
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(505) 827-6161  
FAX: (505) 827-6188

February 1, 2002

**VIA FACSIMILE (505) 342-3435 AND U.S. MAIL**

Dr. John D. Schelberg  
Attn: Mr. Mark Horner  
U.S. Army Corps of Engineers  
Albuquerque District  
Environmental Resources Branch  
CESPA-EC-R  
4101 Jefferson Plaza, N.E.  
Albuquerque, New Mexico 87109-3435

**RE: Comment to Draft Environmental Assessment for the Los Lunas Habitat Restoration Project ("Comment")**

Dear Dr. Schelberg:

On behalf of the New Mexico Interstate Stream Commission (the "ISC"), this letter sets forth the ISC's Comment to the January 2002 Draft Environmental Assessment ("DEA") for the Rio Grande Habitat Restoration Project, Los Lunas, New Mexico ("Project"). The DEA was prepared by the U.S. Army Corps of Engineers (the "Corps") and the U.S. Department of the Interior, Bureau of Reclamation (the "Bureau"), to determine the impacts of implementing the Los Lunas restoration project. Also, this comment letter incorporates the ISC's January 17, 2002, Comments on Section 404 Permit Application No. 2001 00520 by reference.

The ISC is the public agency entrusted by the State of New Mexico "to negotiate compacts with other states to settle interstate controversies or looking toward an equitable distribution and division of waters in interstate stream systems," and to "investigate water supply, to develop, to conserve, to protect and to do any and all other things necessary to protect, conserve and develop the waters and stream systems of this state, interstate or otherwise." NMSA 1978, § 72-14-3 (1935).

Dr. John D. Schelberg  
February 1, 2002  
Page 2

The ISC is fully committed to aggressive pursuit of the process of recovery for the minnow and flycatcher, within the meaning of the Endangered Species Act, 16 U.S.C. § 1531 *et seq.* ("ESA"). The ISC believes that this project, with some relatively minor modifications, can be implemented in a manner that meets the requirements of the June 29, 2001 Biological Opinion; is beneficial to the minnow and flycatcher; and does not increase water depletions.

The NMISC appreciates that the Corps conducted a water budget assessment for the proposed project. We believe that the methodology presented in the Environmental Assessment (with some refinements as discussed below) can be used to assess the impacts of proposed habitat restoration activities on the middle valley water budget. We look forward to working with you on the refinements so that the habitat restoration activities can proceed in a timely manner.

This Comment consists of an analysis of the impact of the Project, as described in the DEA, as it relates to the applicable laws and obligations of the State of New Mexico, the Corps and the Bureau, specific technical comments and a summary and conclusions.

Federal Obligations.

The Bureau and the State entered into a Memorandum of Understanding ("MOU") and Conservation Water Agreement ("CWA"), implemented by a permit to be issued by the New Mexico State Engineer. The MOU provides for the capture and storage of native Rio Grande water that would otherwise have flowed downstream to Elephant Butte Reservoir and contributed to New Mexico's delivery obligations under the Rio Grande Compact. The MOU and CWA also provide for the release of this stored water for the benefit of listed species. BO, page 3. The BO explicitly acknowledges the obligations of the Parties to the MOU and CWA which are described in those documents and in: (1) New Mexico's Rio Grande Compacts obligations, (2) the Middle Rio Grande Collaborative Program Work Group spending plan, and (3) Rio Grande Compact Commission's resolution of April 11, 2001. A detailed discussion of these obligations is set out at pages 2-6 of the ISC's January 17, 2002, Comments on Section 404 Permit Application No. 2001 00520. The DEA must provide for offsets, in the event of net depletions, to avoid impairing the State's ability to comply with its water delivery obligations. New Mexico did not agree to any other diminution of its Rio Grande Compact deliveries or credits. See BO, page 4. The DEA must provide for offsets, in the event of net depletions, to comply with the signatories' obligations under the MOU and CWA.

As noted in the BO, the Bureau's river maintenance program acknowledges the need to offset net depletions for any such program. The Bureau's future goals and considerations for the implementation of river maintenance include minimizing net depletions in order to insure a "healthy bosque ecosystem." BO, page 30. Any 404 permit issued by the Corps must thus be conditioned upon offsetting of net depletions out of consideration of "potential adverse impacts on the aquatic environment."

1

2

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Federal Law.

The Corps and the Bureau are obligated to offset such depletions as a condition of the proposed activities described in the public notice for the following reasons detailed below: (1) Section 7(a)(2) of the Endangered Species Act ("ESA"), (2) applicable EPA regulations, (3) the general requirements of the Clean Water Act ("CWA"), (4) Section 8 of the Reclamation Act of 1908, and (5) the Flood Control Acts of 1948, 1950 and 1960. See detailed discussion at pages 2-6 of the ISC's January 17, 2002, Comments on Section 404 Permit Application No. 2001 00520.

3

Furthermore, 40 C.F.R. Part 230.50(b) dictates that among the adverse impacts considered in making any factual determinations and findings of compliance with EPA guidelines for 404 permit applications, the Corps shall consider the effects on "the quantity of water available for municipal and private water supplies."

Technical Comments

Page 5, Section 2.2:

The statement "The transition to a non-native state is entrenched and advancing throughout the middle Rio Grande Valley as regenerative periodic flooding has been virtually eliminated in the Middle Rio Grande Valley" is only partially correct. The NMISC concurs that non-native species are entrenched and advancing. However, such entrenchment and advancement is occurring even in areas that receive periodic regenerative river flooding (south of the confluence of the Rio Puerco and Rio Grande in general). It is clear to the NMISC that a number of conditions affect the entrenchment and advancement of salt cedar and Russian Olive. For example, it appears likely that the timing of periodic flooding may be one of the more important factors in salt cedar establishment. Please either remove the clause beginning with "as regenerative periodic flooding..." or provide a more complete description of the range of potential causative effects.

4

Page 6, Section 2.4

Please provide more detail regarding the rationale for incorporating a variety of substrate elevations for flows less than 2500 cubic feet/second (cfs). Are these features designed to provide habitat for the minnow, flycatcher, or both? Please describe how such features will not provide habitat for fish species that prey on the minnow.

5

Page 11, Section 3.1.2

The statement that average annual precipitation is approximately 16 inches appears incorrect. A number on the order of 8 inches/year seems more likely.

6

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Page 4

Page 13, Section 3.1.4

Water Budget Methodology

Please revise the introduction to this section to indicate that the reason for conducting the Net Water Depletion Analysis is to comply with requirements of the June 29, 2001 Biological Opinion, the Conservation Water Agreement, and applicable state water law.

7

In general, the methodology employed in the DEA, based upon the methodology employed in the 1999 application to the New Mexico Office of the State Engineer (OSE) to Expand Place of Use of Surface Waters and Add Point of Diversion at the Bosque del Apache National Wildlife Refuge (refuge), is technically appropriate. However, that methodology, and the approved OSE application, did not establish the water budget for restored vs. non-restored riparian forests at the refuge as suggested in the DEA. That methodology was a non-peer reviewed attempt to estimate the hydrologic effects associated with the application using one of many possible approaches. There is much on-going research on the consumptive use of riparian vegetation and evaporation from lakes and rivers in the southwest, in general, and the middle Rio Grande in particular, including research currently being conducted at the refuge. The NMISC is providing funding for several of these projects and believes they (cumulatively) will result in more accurate determinations of both open water evaporation and evapotranspiration that will help us better manage the water resources of the state. However, no concretely established or widely accepted scientific methodology is currently available for estimating water budgets due to land use changes.

Because application of the proposed water budget methodology for the project area in the DEA contains a number of unsupported assumptions, it is difficult for the NMISC to assess whether the project, if implemented and maintained, will result in a net savings of water. Therefore, the NMISC requests that the Corps and BOR work with ISC staff prior to finalizing the EA to develop a more refined water budget analysis methodology; specifically, one that incorporates uncertainty. In addition, the Corps and BOR must commit to a monitoring and evaluation program that assesses site conditions annually for at least five years after the restoration has been completed to determine how the water budget is actually being affected and to provide offsetting water, as necessary.

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Further, the NMISC requests that the Final EA include a description of the calculations that the water-consumption figures are based upon. That information should be included in either a modeling, spreadsheet or calculations format included in Section 3.1.4 or as a separate appendix.

9

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The NMISC's concerns regarding the water budget methodology described in Section 3.14 of the DEIS include:

- 1) Development of the future scenario
- 2) Evaporation from open water
- 3) Evaporation of water from sand bars

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February 1, 2002  
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- 4) Evapotranspiration from Native Plant Species
- 5) Evapotranspiration from grasslands,
- 6) Incremental river seepage losses

#### Development of the Future Scenario

Selecting the worst-case future scenario without restoration as the baseline condition appears to ensure a net savings of water by the project. The NMISC maintains that selection of the worst-case future scenario without restoration as the baseline condition will result in a net water savings no matter what the restoration project consists of or the restored area looks like upon completion of project activities. Therefore the NMISC requests that the water budget methodology be revised to evaluate the water budget under the following additional scenarios:

11

- 1) the current site conditions, and
- 2) the condition of the project area prior to the April 2000 fire.

#### Evaporation From Open Water

The use of a pan coefficient of 0.70 is not justified. When estimating the evaporation from a body of open water, a coefficient is required to adjust the measured pan evaporation because of the difference in thermal characteristics between the pan and the open water body. This difference in thermal characteristics results in higher evaporation rates from the pan as compared to the water body. Pan coefficients in the continental United States vary from 0.64 to 0.88 (Farnsworth et al, 1982)<sup>1</sup>. A pan coefficient of 0.7 is commonly used in the absence of more specific data to adjust measured pan evaporation to estimate evaporation from large bodies of water such as a lake or reservoir.

12

A more correct approach to estimating evaporation from the Rio Grande at the project site would be to use the free water surface evaporation value. A free water surface is defined as a thin film of water having no appreciable capacity to store heat. Southwestern rivers and streams approach this definition since they are generally quite shallow. Plate 3 of Farnsworth et al. (1982) provides a value of free water surface evaporation for the project area of about 61 inches per year.

#### Evaporation of Water from Sand Bars

Given that site-specific soil type data does not exist, the evaporation numbers used in the water budget methodology appear reasonable as a first approximation. However, the NMISC recommends that NMISC staff, the Corps, and BOR develop a procedure to estimate evaporation from moist soils and sand bars that is specific in the area to be restored. Specifically regarding this proposed project, the NMISC is concerned that,

13

<sup>1</sup> Farnsworth, R.K., E.S. Thompson and E.L. Peck. 1982. Evaporation Atlas for the Contiguous 48 United States. NOAA Technical Report NWS 33. U.S. Department of Commerce.

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depending on site soil types, the excavation of the project area to an elevation that allows its inundation at flows of or greater than 2500 cubic feet/second may result in additional evaporation from moist soils throughout large portions of the project area. Therefore, the NMISC requests that the agencies work collaboratively to develop the above described procedure, that a soil survey be conducted in the project area once the excavation has been completed and that the results of the soil survey be used in the procedure to revise the water budget methodology to reflect actual site conditions.

Evapotranspiration From Native Plant Species:

The NMISC concurs that the evapotranspiration rates for cottonwood in the Water Budget Methodology may be high. We recommend that the range of more recent consumptive use numbers for Cottonwood developed through the efforts of the Evapotranspiration Workgroup be used, taking into account the dependence of consumptive use on depth to groundwater, in the refined analysis that includes an analysis of uncertainty.

14

Evapotranspiration From Grasslands:

Do the Corps and BOR anticipate developing a seed bed once the earthwork has been concluded and then conducting seeding? If so, what methodology(s) is proposed and what types of grasses will be seeded?

15

The assumption in the water budget methodology that grasses will not transpire from the groundwater appears unrealistic given that the depth to water table after restoration will be on the order of a few feet. Based upon the experience of NMISC staff, even in cases where the depth to groundwater was on the order of 10-12 feet below ground surface native grasses can send roots down to the capillary fringe.

16

In all likelihood, the amount of grass cover on the site in years after the restoration will provide the best evidence regarding its water use. If it is very sparse, like a typical upland, then the assumption of no groundwater use might be appropriate. Alternatively, if the grass cover is relatively dense it would tend to suggest the grasses are using water from a source in addition to incident precipitation. Therefore, the NMISC requests that the Corps and BOR work with NMISC staff prior to finalizing the EA to research the water use of native grasses under shallow water table conditions to develop an estimate of the magnitude and range of use for input to the water budget methodology and that the Corps and BOR include evaluation of grass cover into the project monitoring plan.

17

Additional River Seepage Losses: Impact on Streamflow

The water budget analysis presented in the DEA focuses on a depletion analysis of the hydrologic system considering the river and shallow groundwater system as a single unit. It is not clear that the anticipated salvaged water will be materialized as streamflow or not. Therefore, additional analysis is needed that focuses on the water budget of the river channel (streamflow, open water evaporation loss and riverbed seepage loss). Riverbed seepage loss is a function of the channel width, bed material

Dr. John D. Schelberg  
February 1, 2002  
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depth, the vertical hydraulic conductivity of the bed material and the hydraulic gradient. The hydraulic gradient is primarily controlled by the elevation and location of the river bed relative to the existing riverside drains. In this particular case changes to channel width may have an impact on the seepage loss. However, since under low flow conditions the channel width is projected to stay the same as before the restoration project, the seepage loss most likely will stay unchanged and streamflow should not be affected. Nonetheless, the DEA should contain an analysis of the impact of the restoration project on streamflow because of the critical importance of streamflow to the endangered silver minnow in this reach.

18

#### Monitoring, Assessment, and Maintenance

In the absence of a commitment from the Corps and BOR for long-term maintenance of the project area, any predicted future condition of the restoration project is speculative. There is no way to accurately predict what the project area will look like five years after completion, ten years after completion, and so on. For instance, removal of the jetty jacks currently installed at the project location will allow the river to meander in this area, with the result that the entire project area could be eroded away shortly after project completion. Or invasive salt cedars and Russian olives might dominate the project area in the absence of long term maintenance activities. Therefore, guarantees of long-term maintenance and monitoring by the Corps and BOR will help ensure that that the project area remains in the same condition as that anticipated and that depletions of water do not increase.

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#### Summary and Conclusions.

The ISC is concerned that this DEA does not anticipate the possibility of increased net depletions of water that could result from the Project. That conclusion is premature. The depletion analysis incorporates several unsupported assumptions and technical factors that require refinement and a commitment by the Corps and BOR for monitoring and maintenance so that water depletions do not increase or are offset. Because of its reliance upon the net water savings conclusion the DEA does not proceed to the next step, which is to address the method by which potential increased net depletions would be offset. Without the final Environmental Assessment providing a procedure for offset in the event of increased net depletions, the Project impacts are in potential conflict with state and federal obligations and laws. The final Environmental Assessment should revisit the DEA's conclusion that there will be a net savings of water. Thus, Section 3.1.4 of the DEA should be amended to reflect the possibility of additional net depletions, and then to identify an offset formula. ISC staff are available to aid the Corps and BOR in refining the water budget methodology and developing an offset procedure.

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On behalf of the State of New Mexico, the ISC wishes to thank the Corps for the opportunity to comment on the appropriate scope of this administrative action. The ISC looks forward to continuing cooperation with the Corps in restoring the habitats of threatened and endangered species within the middle valley in a manner which

*FINAL*

Dr. John D. Schelberg  
February 1, 2002  
Page 8

promotes recovery of these species while providing for current and future beneficial water use and meeting Rio Grande Compact requirements.

Sincerely,



Norman Gaume, P.E.  
Director

cc: Steven R. Farris  
Kenneth Maxey  
Raymond G. Midkiff

rriograndschelberg1.f02

**CORPS AND BOR RESPONSES TO DRAFT ENVIRONMENTAL ASSESSMENT  
COMMENTS SUBMITTED BY THE NEW MEXICO INTERSTATE STREAM COMMISSION**

---

**1) River Maintenance Program.**

The proposed project is not part of or contained in the BOR's River Maintenance Program.

**2) Offsetting of net depletions and potential adverse impacts on the aquatic environment.**

The Water Depletion Analysis in Section 3.1.4 of the Environmental Assessment concluded that there would be a net savings of water; therefore there would be no potential adverse impacts on the aquatic environment. Clean Water Act and 404 issues and conditions are contained within Appendix A.

**3) Federal Law.**

**a) Section 7(a)(2) of the Endangered Species Act:**

Requires Federal agencies, in consultation with US Fish and Wildlife Service, to insure their actions do not jeopardize the continued existence of listed species. The Corps and BOR have complied with this requirement as indicated by the US Fish and Wildlife; Section 7 coordination letter dated 6 February 2002 (Appendix E). This project is intended to support and comply with the June 29, 2001 Biological Opinion in that the aquatic and riparian restoration goals of the proposed project are intended to improve the chances for survival of the listed species.

**b) Applicable Environmental Protection Agency (EPA) regulations:**

- 40 CFR Part 230.10(a)(3)-See above response regarding Section 7(a)(2) of the Endangered Species Act;
- 40 CFR Part 230.10(d)-See response to comment number 2;
- 40 CFR Part 230.50(b)-Section 3.1.4 of the Environmental Assessment concluded that there would be a net savings of water as a result of the implementation of the proposed project. This analysis employs the best available data and is reasonable. Therefore, based upon these conclusions, there would be no adverse effects on the quantity of water available for municipal and private water supplies.

**c) Clean Water Act:**

The general requirements of the Clean Water Act state that the proposed project not interfere with a state's administration of water rights. Again, the depletion analysis concluded a net savings of water as a result of implementation of the proposed project and therefore would not interfere

## *FINAL*

with the State's administration of water rights. The commitment to long-term monitoring, pursuant to the guidelines in the Biological Opinion (US Fish and Wildlife Service 2001), shall provide for an ongoing measure of depletions and will continue to employ the best and most current data to analyze the proposed project as such data/methodology becomes available.

**d) Section 8 of the Reclamation Act of 1908:**

Section 3.1.4 of the Environmental Assessment concluded that there would be a net savings of water as a result of the implementation of the proposed project. This analysis employs the best available data and is reasonable. Therefore, based upon these conclusions, project implementation should not conflict with Section 8 of the Reclamation Act of 1908.

**e) Flood Control acts of 1948, 1950, and 1960:**

Section 3.1.4 of the Environmental Assessment concluded that there would be a net savings of water as a result of the implementation of the proposed project. This analysis employs the best available data and is reasonable. Therefore, based upon these conclusions, project implementation should not conflict with the Flood Control Acts of 1948, 1950, or 1960.

**4) Further definition of “regenerative periodic flooding”.**

While the statement within the Environmental Assessment is correct, the Corps and BOR agree that a more precise explanation of “regenerative periodic flooding” is in order.

The widespread reduction of periodic flooding in the Middle Rio Grande Valley has hastened the transition of the bosque to a non-native state. More specifically, however, the timing and duration of such flooding appears to be the most important driving force in the regeneration of the native forest. Historically, native plant species have evolved to thrive and reproduce during spring run-off (May-June) when over-bank flooding was replete and of significant duration. In the absence of over-bank flooding, native plants are not able to out-compete the exotics, since exotic reproductive cycles and physiology are not as dependent upon inundation. Further, exotic fecundity allows for rapid colonization and dispersal rates, which, in conjunction with the reduction in over-bank flooding, generally explains the transition to a non-native plant community currently observed in many areas of the Rio Grande Valley.

**5) Explanation of rationale for creating a variety of substrate elevations in excavated area and potential increased predation upon RGSM.**

This project feature is intended to benefit the RGSM by increasing the extent and amount of shallow water/low velocity habitats at a wide range of flows within the excavated area. The Rio Grande Silvery Minnow Recovery Plan (USFWS 1999)

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provides an in-depth discussion, on a reach-by-reach basis, of minnow habitat characteristics and preferences. In addition, the recovery plan also provides a summation of RGSM threat factors within each reach and can be further referenced for a more detailed discussion on these aspects. This project falls within the Belen Reach of the recovery plan.

The practical design features of this project were formulated to best suit the known characteristics for RGSM recovery as discussed in the recovery plan. In short, no project design can guarantee that RGSM predation will not occur within the restoration area. Nevertheless, the substrate material of the restored aquatic habitat would largely consist of finer particle sizes (silts and sand), which characterized over 99% of RGSM habitat (USFWS 1999). In addition, the nature of the planned excavation would create a variety of shallow water/low velocity habitats, which are also preferred habitat characteristics (nearly 80% of RGSM showing bimodal depth distribution of 20 cm and 31-40 cm; 86.5% of RGSM located in velocities  $\leq$  10 cm/sec.). Conversely, predatory species in this reach, the most abundant likely being the Channel Catfish (*Ictalurus punctatus*), prefer habitats consisting of deep pools and runs over sand or rocks. The Corps and BOR therefore conclude that while predation could certainly occur within the restored aquatic habitat, the overall habitat improvements will benefit the RGSM and provide for recovery efforts. The USFWS has concurred with this conclusion in Section 7 (Endangered Species Act) and Biological Opinion coordination (Appendix E).

### **6) Statement of average annual precipitation of 16 inches as incorrect.**

Corps and BOR agree that this value is incorrect. The average annual precipitation for Albuquerque is 8.12 inches/year (Williams 1986) and Los Lunas should be expected to closely reflect that value. The text within the Final Environmental Assessment will be changed to “approximately 8.0 inches/year”.

### **7) Introduction of Section 3.1.4 (Water Budget Methodology) and reason for conducting water budget analysis.**

The Corps and BOR do not believe the introduction to this section requires revision. The Net Water Depletion Analysis was conducted to determine if there would be significant effects to the aquatic environment, to municipal or private water supplies, and to provisions under the Rio Grande Compact.

### **8) Subsequent discussions with the Interstate Stream Commission.**

In response to the Interstate Stream Commission’s Draft Environmental Assessment comment letter of February 1, 2002, the Corps and BOR conferred with representatives from the Interstate Stream Commission and agreed to expand the depletion analysis in order to address some of the technical concerns expressed by

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the Interstate Stream Commission. The revised analysis of the Final Environmental Assessment (Section 3.1.4) incorporates the following aspects:

- a) The use of a range of categorical consumptive values in an attempt to capture some of the uncertainty regarding existing evapo-transpiration data
- b) Applying these ranges throughout the depletion analysis
- c) Extending the period of depletion analysis 15 years into the future

These changes provide a plausible range of depletions that could be reasonably expected at the Los Lunas Restoration Site upon project implementation and represents a genuine collaborative effort from both State and Federal agencies. The revised analysis is therefore intended to augment the specific response numbers 10-14 and 16-17 indicated previously.

The discussions between the Interstate Stream Commission, the Corps, and BOR were especially productive. In addition to the modifications of the Los Lunas water budget, an agreement on future directions regarding restoration projects and depletion analyses was also formulated. In summation, all participants recognized the need for additional evapo-transpiration research and application methodology and agreed that the best-suited entity to accomplish this task was the ET Workgroup. Further, the outcome from such an effort should produce a standard method that could be applied to a wide variety of applications, should include the most current data and data analysis techniques, and be user-friendly to facilitate widespread usage.

### **9) Offsetting water, as necessary.**

The BOR and Corps acknowledge the Interstate Stream Commission's concerns regarding potential increased river depletions associated with habitat restoration projects. Analysis of the proposed Los Lunas project shows that this particular project could result in a net water savings. Therefore, the BOR and Corps do not believe offsetting future depletions is necessary. The BOR and Corps believe that offsetting increased depletions, which may occur due to other restoration projects under the collaborative program, is the responsibility of the collaborative program participants, and not solely or necessarily a responsibility of the BOR and/or the Corps.

### **15) Seedbeds and Revegetation.**

The Corps and BOR do not anticipate developing a seedbed for the proposed project. The planned site revegetation would consist of woody species such as willows, cottonwood, and New Mexico olive. Colonization by annuals and grasses should occur naturally as existing propogules are replete throughout the area. However, some grasses or other native herbaceous plants may be seeded on the fill

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area along the levee, as temporary soil stabilization, but these should have little or no impact on depletions. An adaptive management approach will be used to monitor and control noxious weeds and exotic reestablishment. See also number 19.

### **18) Additional River Seepage Losses: Impacts on Streamflow.**

Upon initial project planning, the Corps and BOR considered the hydrologic implications of channel widening. The Corps and the BOR do not anticipate any significant change in bed material as the site is composed of sediments deposited since 1962; previous to that date the majority of the site was active channel. The Corps and BOR agree that:

“...under low flow conditions the channel width is projected to stay the same as before the restoration project, the seepage loss most likely will stay unchanged and streamflow should not be affected” (page 7 Interstate Stream Commission comment letter).

### **19) Monitoring, Assessment, and Maintenance.**

As a requirement of element J of the Reasonable and Prudent Action (RPA) of the Biological Opinion, the Corps and BOR are to continue to monitor the site for habitat suitability and to utilize an adaptive management approach to maintain its intended wildlife value. Page 2 of the USFWS coordination letter states:

“Monitoring for effectiveness of each restoration project to benefit the silvery minnow and flycatcher will be conducted at each site annually for a period of fifteen years post-project completion in order to assess whether native riparian habitats are self-sustaining and successfully regenerating, and whether the habitats are maintaining suitability for recovery of listed species. Monitoring reports will be provided to the Service by January 31 of each year. Adaptive management principals will be used, if necessary, to obtain successful restoration of silvery minnow and flycatcher habitats.”

The Corps and BOR are obligated to conduct long-term monitoring according to the guidelines in the Biological Opinion. It was stated in the Draft Environmental Assessment (page 27) that long term monitoring would continue for at least five years. This statement was in error and will be changed to 15 years in the Final Environmental Assessment. In addition, the US Department of Agriculture Forest Service, Rocky Mountain Research Station will aid in monitoring efforts as explained on page 9 (Other Monitoring) of the Environmental Assessment.

### **20) Depletions in conflict with State and Federal law.**

See Corps and BOR responses 2,3,9, and 21.

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### **21) Refining the Water Budget Methodology and development of offset procedure.**

The BOR and Corps acknowledge the Interstate Stream Commission's concerns regarding potential increased river depletions associated with habitat restoration projects. Analysis of the proposed Los Lunas project shows that this particular project could result in a net water savings. Therefore, the BOR and Corps do not believe offsetting future depletions is necessary. The BOR and Corps believe that offsetting increased depletions, which may occur due to other restoration projects under the collaborative program, is the responsibility of the collaborative program participants, and not solely or necessarily a responsibility of the BOR and/or the Corps.

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## **B) MIDDLE RIO GRANDE CONSERVANCY DISTRICT**

February 4, 2002



Lt. Col. Raymond G. Midkiff, EN  
District Engineer  
U.S. Army Corps of Engineers, Albuquerque District  
4101 Jefferson Plaza NE  
Albuquerque, NM 87109-3435

VIA FAX 342-3197

Re: Comments on Draft EA and FONSI for Rio Grande Habitat Restoration Project, Los Lunas, New Mexico, January 2002

Dear Lt. Col. Midkiff:

The Middle Rio Grande Conservancy District (the Conservancy District) is pleased to provide these comments on the Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) for the Rio Grande habitat improvement project at Los Lunas. The Conservancy District is the owner of the property where the project will take place and is cooperating with the Corps of Engineers and Bureau of Reclamation to expedite the pending Conservancy District License Agreement and the project. The License Agreement must be signed by all parties before work on the project can begin.

The Conservancy District agrees with the Finding of No Significant Impact and with the conclusions of the EA. However, there are a few minor areas in the text that may benefit from revision. Those are addressed below.

1. Page 6, paragraph 1, line 4: The site is owned and managed by the MRGCD.
2. Page 7, paragraph 2, line 2: It is our understanding from the last site visit that some small parts of some jetty jacks may be left behind. This should be clarified.
3. Page 7, paragraph 4, last line: It is our understanding from the last site visit that there will be only one equipment staging area, not two. This should be clarified. The Conservancy District does not object to two equipment staging areas, as long as both areas are rehabilitated when the project is finished.
4. Page 13, paragraph 2, line 5: The Corps should be sure that this paragraph is accurate with respect to plans for covering and replacing ponds.
5. Page 16, Table 2: The "monthly acreage estimates" for cottonwood and willow during May and June are puzzling. For example, on the restored site, why would the number of acres of cottonwood or willow diminish during inundation, then in July return to the number of acres present before flooding or, in the case of cottonwood, increase by 50%? That does not usually happen at the Albuquerque Overbank Project, where the bank was lowered as is contemplated at Los Lunas and monitoring has been in place since 1999.

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6. Page 21, paragraph 4: Revegetation plans should explicitly account for the possibility that noxious weeds, such as perennial pepper weed, or exotic trees such as salt cedar or Russian olive, may occupy the site after the first flooding. A plan should be prepared to deal with this eventuality.

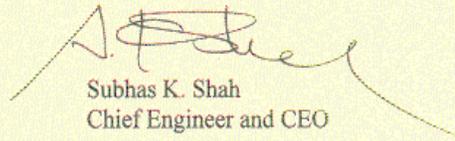
7. Page 23, paragraph 2: To improve habitat, some snags could be left on or adjacent to the project site for bald eagle roosting.

8. Page 26, paragraph 2: Although it is mentioned elsewhere, it may be advantageous to repeat here that wood removed from the project site will be made available to the public, thus providing another benefit to the community.

9. Page 26, paragraph 5, line 1: It may not be entirely accurate to say that no low-income populations exist near the project site. For example, the neighborhood just north of the Los Lunas sewage treatment plant may be a low-income neighborhood.

Thank you for this opportunity to comment. Should you have any questions, please call me.

Sincerely yours,



Subhas K. Shah  
Chief Engineer and CEO

**CORPS AND BOR RESPONSES TO DRAFT ENVIRONMENTAL ASSESSMENT  
COMMENTS SUBMITTED BY THE MIDDLE RIO GRANDE CONSERVANCY DISTRICT**

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**1) Inclusion of “owned and” to Page 6, paragraph 1, line 4 of the Draft Environmental Assessment.**

There can be no assertions of ownership made at this time. The language of the Draft Environmental Assessment is correct and appropriate.

**2) Potential that small parts of jetty jacks being left behind.**

The Corps and BOR agree. Given the corroded condition of some of the jetty jacks and upon further consultation with construction personnel after the issuance of the Draft Environmental Assessment, it is likely that small portions of some jetty jacks may break apart under the strain of removal. If the remainder cannot be readily removed with minimal excavation, then those portions will remain in place until such time that their removal is practical. This statement will be incorporated into the Final Environmental Assessment.

**3) One staging area, not two.**

The Corps and BOR agree. Upon further consultation with construction personnel after the issuance of the Draft Environmental Assessment, it was agreed to limit the staging area to one more centrally located (Fig. 2 in the Final Environmental Assessment). The area of the single staging area would be 1-2 acres. This aspect of the project has been changed and text references within the Final Environmental Assessment and 404/401 permit/certification conditions reflect this change.

**4) Plans for covering and replacing ponds.**

Current project plans include the replacement of approximately 0.15 acres of pond-type habitats that have been historically noted adjacent to the earthen groins. These would likely be filled in by the placement of the spoil material next to the levee. The replacement has been included in the Final Environmental Assessment (Water Resources and Quality, Section 3.1.3, page 13) and 404 application.

**5) Monthly acreage estimates and net water depletion analyses.**

The acreage estimates reflect the dominant cover-type present for the purposes of the depletion analyses only and is not intended to describe the mosaic as it would physically exist. The acreage of cottonwood or willow diminishes during inundation because existing empirical data does not allow for the modeling of an amalgam of cover-types (cottonwood *plus* open water). A number of intrinsic properties complicate this kind model such as shading of the water surface, which, in theory, should decrease the evaporation from the open water portion of the combination. In short, a strictly additive water-use value (cottonwood *plus* open water or 4.8+4.2 =

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9.0 feet/year) is not a scientifically tested estimation of total water usage. When these particular categories can be spatially delineated (*i.e.* 10 acres open water, 10 acres cottonwood, etc.) then a sum total can be reasonably calculated. However, when open water occupies the same physical space then the relationship would likely assume a multivariate or non-linear characteristic. Again, however, researchers have not investigated this situation and it remains to be a distinct gap in the overall understanding of evapo-transpiration processes and dynamic interactions. Finally, in July, it is assumed that the increased water availability would stimulate the growth of willows such that the extent of cover would increase by 50% (from 10 to 15 acres).

Likewise, upon the end of the irrigation season and closure of the Isleta Diversion (November), flows are projected to rise slightly and thus increase the extent of inundation (open water) while decreasing the extent of willow coverage. This change in cover is also a methodological artifact of the depletion analyses and does not reflect the physical cover-types; ultimately, the willows and open water will occupy some of the same physical space. Of course, it could also be said that the November flow increases would also occupy the same physical space as some of the cottonwoods and that their coverage extent should be adjusted as well. However, by leaving the cottonwood cover intact, allows for the associated error to be in the more consumptive direction. If the open water evapo-transpiration rate is increased to the value suggested by the Interstate Stream Commission (5.1 feet/year) then the values for both open water and cottonwood (5.1 and 4.8 feet/year respectively) are quite similar and the depletions associated with either cover-type is also similar. In that event, for the purposes of depletions, it makes little difference which cover-type is employed to describe any extent of cover.

In summation, the coverage estimates assigned to each cover-type in the depletion analyses only partially describes the mosaic that will take shape as a result of the restoration efforts. Estimations of cover-types, both with and without restoration, are difficult at best. Nonetheless, estimations are necessary if any depletion estimates are to be calculated. There are several factors that further complicate this process. For example, there is overlap of cover-types and seasonal flow-based variations that cannot be realistically or practically considered in the depletion analyses, as the existing data does not allow for the direct evaluation of a certain conditions, nor does the interpolation of that data reflect sound applications of the baseline science. The existing analysis uses the best available data and employs a degree of professional inference; the Corps and BOR believe it to be reasonable.

### **6) Noxious weeds and exotics.**

An adaptive management approach will be used for the abatement of noxious weeds and recolonization of exotics, as the maintenance of habitat quality is mandated under the guidelines set forth under the Biological Opinion. Monitoring and removal of noxious weeds and exotics will be an ongoing process and accomplished through a variety of appropriate measures such as herbicides and physical removal of woody

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exotics. See also number 15 in the responses to the Interstate Stream Commission comments.

### **7) Bald eagle roosting.**

See page 23 (The Bald Eagle; Section 3.2.3, Special Status Species) of the Environmental Assessment. In addition, dead cottonwoods outside of the excavation area that remain will provide roosting habitat for eagles, turkey vultures, northern harriers, and other birds of prey. The Corps and BOR agree and as many snags as practical will be left behind for habitat purposes.

### **8) Firewood availability.**

The Corps and BOR agree. This statement will be added to the suggested section.

### **9) Low-income area north of the Los Lunas Sewage Treatment Plant.**

The Corps and BOR agree. The area in question is approximately 1.9 miles north of the proposed project site. However, the distance to the site should mediate any adverse impacts and no disproportionate impacts would occur. Therefore, the conclusions of the Environmental Justice Section (3.5) remain valid. In fact, these residents could benefit from the free firewood as they have ready access and short travel time to the site (see firewood availability above).