

AESO/FA

June 20, 2005

Ms. Ruth Villalobos  
Chief, Planning Division  
U.S. Army Corps of Engineers, Los Angeles District  
P.O. Box 532711  
Los Angeles, California 90053-2352

Dear Ms. Villalobos:

The Fish and Wildlife Service (FWS) has reviewed the U.S. Army Corps of Engineers (Corps) proposed Rio Salado Oeste Feasibility Study. This report represents our evaluation of the Rio Salado Oeste ecosystem restoration project and is provided pursuant to Section 2(B) of the Fish and Wildlife Coordination Act (48 stat. 401, as amended; 16 U.S.C. 661 et seq.). This report is based on coordination with the Arizona Game and Fish Department, literature research, file reviews, and information provided by the Corps.

## **PROJECT DESCRIPTION**

The proposed project would provide ecosystem restoration, flood damage reduction, and public recreation within the portion of the Salt River that runs through Phoenix between 19<sup>th</sup> and 83<sup>rd</sup> Avenues, Maricopa County, Arizona. The Corps has been authorized to evaluate opportunities for environmental restoration on the Salt River under the Water Resources Development Act of 2001. The City of Phoenix would be the local non-Federal sponsor.

## **EXISTING ENVIRONMENT**

Due to dams and diversions, water flow in this portion of the Salt River is not perennial and is limited to summer or fall flood events. This has caused significant changes to the biotic communities historically found along the Salt River. The dense multi-storied cottonwood and willow gallery forests that once dominated the project area are gone. Scattered vegetation currently found in the project area includes velvet mesquite (*Prosopis velutina*), Fremont cottonwood (*Populus fremontii*), Goodding's willow (*Salix gooddingii*), seepwillow (*Baccharis salicifolia*), desert broom (*B. sarothroides*), burrobush (*Hymenoclea salsola*), rabbitbush (*Chrysothamnus* sp.), creosote (*Larrea tridentata*), and non-native salt cedar (*Tamarix* sp.). Substantial sand and gravel mining operations exist within the project area. Mining has created a

number of open water areas that support limited cottonwood, willow, cattail (*Typha* sp.), and bulrush (*Scirpus* sp.) vegetation.

Native wildlife species likely found in the project area include coyote (*Canis latrans*), black-tailed jackrabbit (*Lepus californicus*), tree lizard (*Urosaurus ornatus*), garter snake (*Thamnophis* sp.), great blue heron (*Ardea herodias*), turkey vulture (*Cathartes aura*), red-tailed hawk (*Buteo jamaicensis*), Gambel's quail (*Callipepla gambelii*), killdeer (*Charadrius vociferus*), black-necked stilt (*Himantopus mexicanus*), mourning dove (*Zenaida macroura*), and red-winged blackbird (*Agelaius phoeniceus*). We have no information on the occurrence of federally-listed threatened or endangered species within the project area.

## **ALTERNATIVES**

### **General Features Alternatives**

**Channel Restoration:** This would provide a flow connection through the study reach and be accomplished by grading and terracing to restore an active channel. Average depth would be five ft with a width of 200-400 ft. Due to a drop in the channel downstream of the 35<sup>th</sup> Avenue Bridge, a grade control structure is recommended in that vicinity. At this time erosion and scour do not appear to be a concern with project features or infrastructure. An estimated 660,000 c.y. would be removed from the channel to implement this measure. Material removed would be utilized onsite for terracing and construction of other project components, such as lake restoration.

**Stormwater outfalls:** There are stormwater outfalls throughout the study area supporting wetland habitat. In most cases it is dominated by invasive and exotic species, although conditions appear to be suitable for native riparian vegetation. Existing outfalls would be modified to discharge to a concrete/stone channel through the river terrace and directed toward the low-flow channel. Within that channel there would be a low weir to capture the low flows and allow floodwaters to pass. The weir would direct flows to a stormwater wetland constructed for the purpose of harvesting stormwater and supporting adjacent habitat.

**Cottonwood/Willow:** This would include restoration of riparian cottonwood/willow stands adjacent to water sources and low terraces throughout the study area. Cottonwood-willow would be dominated by Fremont cottonwood and Goodding's willow. In addition to cottonwood and willow, other plants species may include are *Baccharis* sp., arrowweed (*Pluchea sericea*), and ash (*Fraxinus* sp.). Other understory species would be planted, depending upon individual site conditions, including arrowweed, elderberry (*Sambucus mexicana*), or burrobrush. The cottonwood-willow areas would be planted with a combination of pole plantings and container plants with a density of approximately 50 cottonwoods, 50 willows, and 25 understory brush species per acre. Understory forbes would also be planted using a seed mix. It is assumed five years of irrigation would be required for establishment.

**Mesquite:** This habitat would be restored over a potentially large portion of the project area and require periodic watering for five years. Watering could be discontinued after five years or when roots reach groundwater or during rainfall. Mesquite bosques would be dominated by velvet mesquite intermixed with honey mesquite (*Prosopis glandulosa*), understory shrubs such as desert thorn (*Lycium spp.*), palo verde (*Parkinsonia florida*), and brittlebush (*Encelia farinosa*).

Mesquite bosques would be planted with a density of approximately 100 velvet mesquite, ten honey mesquite, and 40 understory shrubs per acre. Understory forbes would also be planted using a seed mix. In locations throughout the study area with less water supply, xeric stands of mesquite would be established. Planting densities would be less with approximately 25 velvet mesquite, five honey mesquite, and ten understory shrubs per acre.

**Wetland:** Wetlands can consist of open water, submerged vegetation, or mud flats; all requiring a high water table level at or near the surface. Due to porous soils in the project area, lining would be required to maintain surface water. Excavation and layering of a silt-clay soil substrate approximately 12 inches thick would be sufficient. Emergent wetlands contain primarily cattails, tule (*Scirpus acutus*), and sedges (*Carex sp.*). In addition to wetlands included in the stormwater outfall measure, wetland restoration would be included in several alternatives at various locations throughout the study area, mainly in existing gravel pits or open water bodies within the floodplain.

**Lakes:** There are existing features created from aggregate mining operations at 27th and 37th Avenues that would require modification to implement lake restoration. These modifications are recommended to restore the floodplain landscape and improve functionality: The existing banks would need to be reshaped for public safety and restoration; possible aeration of the existing water bodies; and potential substrate modification to reduce the annual fluctuation in the lake levels. This measure would be implemented through grading and filling with material excavated for other project features and onsite materials.

**Invasive Control:** Invasive species such as salt cedar and giant reed (*Arundo donax*) would require removal and management through the project life. Salt cedar is currently found in stands throughout the study area. *Arundo*, although not yet a significant problem in Arizona, is a problem in neighboring California. A stand of *arundo* can be found on the south side of the river near a stormwater outfall at 43rd Avenue.

**Water Supply:** In addition to the stormwater runoff that would be harvested, additional water would be required. Effluent from the 23rd Avenue Waste water Treatment Plant is available. The City of Phoenix estimates that approximately eight MGD (8,964 acre feet) is available. This would require construction of a pump and piping system to deliver water throughout the project area.

**Alternative 1 - No Action:** Under this alternative the Corps and local sponsor would not pursue environmental restoration in the study area.

**Alternative 2 - Stormwater and Channel:** This alternative would include the modification of existing stormwater outfall areas to improve retention and water spreading as well as increasing the existing habitat currently supported by these outfalls. It also would include modification and/or restructuring of the primary conveyance channel to a more natural state by grading and terracing the river corridor from 19th avenue to 83rd avenue. No additional water source would be included in this alternative.

**Alternative 3 - Stormwater, Channel, Water Supply, Cottonwood, Mesquite, Invasive Species:** This alternative would include the features described in alternative 2 and add a supplemental water supply in the form of effluent. At locations identified as suitable throughout the project area, cottonwood/willow and mesquite cover types would be restored. This alternative would also address the management, control, and removal of invasive species within the study area.

**Alternative 4 - Stormwater, Channel, Water Supply, Cottonwood, Mesquite, Invasive Species, Emergent Wetlands:** This alternative would add restoration of emergent wetlands at the existing lake in the channel immediately downstream of 19th Avenue.

**Alternative 5 - Stormwater, Channel, Water Supply, Cottonwood, Mesquite, Invasive Species, Emergent Wetlands, Lake:** Added to this alternative would be lake restoration at the existing gravel pits at 29th and 37th Avenues.

**Alternative 5A - Wetland Restoration in lieu of Permanent Open Water and Lakes:** In lieu of lake restoration this would include regrading of the existing gravel pits to restore them to the floodplain and restoration of emergent wetland and riparian areas.

**Alternative 5B - Hybrid of 5 and 5A:** This would include restoration of one gravel pit to a wetland/riparian complex and the other to include the lake.

## **WITHOUT-PROJECT PROJECTION**

In the absence of active restoration efforts, particularly the attainment of a secure water source, it is unlikely that significant wetland or hydro-riparian vegetation would become established within this reach of the Salt River. Due to river management, it is unlikely that this stretch of the Salt River would ever be characterized by perennial flow. Water would flow in the project area only during periods of flood releases or stormwater runoff.

## WITH-PROJECT PROJECTION

Implementation of the proposed project could restore water and native vegetation to an otherwise barren stretch of the Salt River. Each alternative would provide habitat for a diversity of fish and wildlife, particularly native species.

**Alternative 2:** This alternative would restore 66 acres of cottonwood/willow, 43 acres of mesquite, 28 acres of wetland at outfalls, and 17 acres of wetland in the low-flow channel.

**Alternative 3:** This alternative would restore 348 acres of cottonwood/willow, 409 acres of mesquite, 28 acres of wetland at outfalls, and 34 acres of wetland in the low-flow channel.

**Alternative 4:** This alternative would restore 348 acres of cottonwood/willow, 409 acres of mesquite, 33 acres of wetland at outfalls, and 34 acres of wetland in the low-flow channel.

**Alternative 5:** This alternative would restore 375 acres of cottonwood/willow, 417 acres of mesquite, 76 acres of wetland at outfalls and lakes, 34 acres of wetland in the low-flow channel, and 40 acres of open water.

**Alternative 5A:** This alternative would restore 375 acres of cottonwood/willow, 417 acres of mesquite, 156 acres of wetland at outfalls and lakes, and 34 acres of wetland in the low-flow channel.

**Alternative 5B:** This alternative would restore 375 acres of cottonwood/willow, 417 acres of mesquite, 136 acres of wetland at outfalls and lakes, 34 acres of wetland in the low-flow channel, and 20 acres of open water.

## DISCUSSION

We are pleased to participate in the development of your riparian restoration project. Riparian biotic communities within the State of Arizona have experienced dramatic degradation and decline over the past century. This has had detrimental effects on wildlife resources as the vast majority of native wildlife depend upon riparian areas to satisfy some portion of their life cycle. The Rio Salado Oeste project not only offers a tremendous opportunity to restore native biotic communities along the Salt River, but also offers the unique opportunity to provide a link between two other restoration projects, specifically Rio Salado and Tres Rios. We expect the resultant habitat contiguity and connectivity provided by the combined projects to substantially enhance the biological functions and values along the lower Salt River.

The most important aspect of wetland and riparian restoration is the identification and attainment of a secure water source to ensure adequate hydrologic conditions to support the desired biotic communities. Several parameters that should be used to describe proper hydrologic conditions include hydroperiod, water depth, and seasonal flood pulses. Accordingly, significant attention

should be focused on securing a permanent and sufficient source of water. A combination of effluent, groundwater, and stormwater may be beneficial.

Riparian restoration has the potential to benefit a diversity of native wildlife species by restoring critically important habitats, particularly within riverine systems severely degraded by urbanization. For example, most native bird species have not done particularly well in urban environments. Cities are typically dominated by an abundance of a few bird species, in contrast to relatively undisturbed environments that are characterized by high species richness. Vegetation in urban landscapes often lacks the structural components needed by native wildlife. For this reason, we suggest that the Corps and sponsor consider restoring a mosaic of heterogeneous vegetative cover types juxtapositioned to provide substantial edge and habitat diversity. Within this framework, we believe incorporation of dense multistoried patches with relatively tall canopies would be critical.

Assessments should be conducted prior to active restoration to ensure that chosen sites would be suitable environments for the establishment, regeneration, and survival of native riparian plants. Consideration should be given to microhabitat conditions such as depth to water table, soil texture, and salinity. Consideration should also be given to large-scale ecological processes such as flood regime which species such as cottonwood and willow depend upon for seed bed formation, seed dispersal, germination, seedling establishment, recruitment, and survival. Other considerations may include groundwater fluctuations, site preparation, protection of plantings from herbivory, necessity of irrigation, potential for competition from undesirable species, and long term management potential for the site.

This proposed project could eventually result in establishment of habitats suitable for a number of native species including those listed as threatened and endangered or those that are candidates for listing. We encourage the local non-Federal sponsor to consider developing a Safe Harbor Agreement, Candidate Conservation Agreement, or Habitat Conservation Plan, as appropriate, to avoid additional Endangered Species Act restrictions. We offer our assistance in exploring these options.

## **RECOMMENDATIONS**

- 1) Focus significant attention on securing a permanent and sufficient source of water, perhaps through a combination of effluent, groundwater, and stormwater.
- 2) Maximize opportunities to restore a mosaic of heterogeneous vegetative cover types that maximizes structural habitat complexity.
- 3) Ensure that site-specific microhabitat conditions would be conducive to establishment and growth of native riparian plants, especially cottonwood, willow, and mesquite.

4) Encourage the non-Federal sponsor to evaluate Safe Harbor Agreements, Candidate Conservation Agreements, or Habitat Conservation Plans.

We appreciate the opportunity to provide planning assistance for this proposed project. If we can be of further assistance or you have questions, please contact Mike Martinez (x224).

Sincerely,

/s/ Thomas A. Gatz  
Deputy Field Supervisor

cc: Regional Director, Fish and Wildlife Service, Albuquerque, NM (ARD-ES)  
Supervisor, Project Evaluation Program, Arizona Game and Fish Department, Phoenix, AZ  
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