



2004 RIVER MANAGEMENT PLAN

RIO GRANDE CANALIZATION PROJECT



Prepared for:

**United States Section,
International Boundary and
Water Commission**

El Paso, Texas

May 2004

Prepared by:

PARSONS

Austin, Texas

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- A. Permit Plan
- B. Field Trip Report
- C. River Management Unit Descriptions
- D. Grazing Management Guidelines
- E. Example Pasture Condition Score Sheet
- F. Mitigation Measures for Construction and Vegetation Treatments
- G. Managed Grassland and Grazing Areas
- H. Final RMP and Technical Support Documentation (*CD-format*)

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SECTION 1 INTRODUCTION

1.1 GOALS

This River Management Plan (RMP) was developed to provide an overall guide for preserving and enhancing the resources of the Rio Grande Canalization Project (RGCP) in a manner consistent with its mission requirements. The mission of the RGCP is to provide protection of life and lands along the RGCP from floods, and provide irrigation and water deliveries to users in Mexico and the United States.

The RMP will be used by the USIBWC as a planning guide for short and long term operation and maintenance (O&M) and environmental measures. The plan also includes information supporting permitting of proposed measures under U.S. Army Corps of Engineers (USACE) Rivers and Harbors Act Section 10 and Section 404 of the Clean Water Act.

1.2 PLAN ORGANIZATION

1.2.1 Basis for RMP Preparation

The scope and feasibility of environmental measures adopted in the RMP were evaluated in the August 2003 document *Reformulation of River Management Alternatives for the Rio Grande Canalization Project*. Combinations of those measures, arranged in four proposed alternatives, were subsequently evaluated for potential impacts in the *Draft Environmental Impact Statement for River Management Alternatives (Draft EIS)* released by the USIBWC on December 21, 2003 for agency and public review. Agency and public comments and recommendations received during the comment period, completed in March 1, 2004, were addressed for final selection of a preferred alternative. This RMP specifies the extent of management practices and environmental measures adopted as part of the preferred river management alternative, the Integrated USIBWC Land Management, addressed in the *Final EIS for River Management Alternatives*.

1.2.2 Organization

Management practices are described in three broad categories: floodway management, water delivery system management, and levee system management (Sections 2, 3 and 4 of the RMP, respectively). Table 1.1 summarizes management practices associated with each management category.

Three RMP components are presented following the description of management practices and environmental measures: a description of specific projects to be conducted (Section 5); an implementation program that addresses schedule, management strategies, permit requirements, and cooperation agreements (Section 6); and guidelines for project development (Section 7).

The following support information is provided in appendices:

- A. Permitting Plan describing consultations conducted with the USACE, and permit documentation for permit preparation and submittal;
- B. Field notes for an inspection trip conducted on January 28, 2004;
- C. Descriptions of seven geographically-distinct segments of the RGCP identified as River Management Units;
- D. Guidelines for grazing management;
- E. Example pasture condition score sheet; and
- F. Mitigation measures to be applied for future construction activities and vegetation treatments to be implemented.
- G. Aerial photographs indicating locations of managed grassland projects and leased areas within the ROW.
- H. Final RMP and the following technical support documentation (*CD format*):
 - 1) Photographs of the January 28, 2004 field visit;
 - 2) grass establishment;
 - 3) grazing guidelines; and
 - 4) USACE permits.

Table 1.1 Summary of Management Practices

CURRENT MANAGEMENT	20-YEAR MANAGEMENT TARGET
FLOODWAY MANAGEMENT	
Cooperative agreements for recreational use [266 acres]	Continue or expand cooperative agreements [816 acres]
Leased areas for grazing [3,552 acres] and croplands [66 acres]	Evaluate leases for compliance with erosion control requirements specified in USIBWC 2002 Directives [all leases]
Areas under direct USIBWC management [4,657 acres] Approximately 80 percent are mowed annually for vegetation control	Seasonal mowing partially retained for vegetation management [2,674 acres]
	Modified management for native grassland development [1,641 acres]
	Native bosque development, up to 350 acres, by lowering stream banks [127 acres], and tree planting [223 acres]. Planting areas include six former meanders considered for partial reopening.
Channel maintenance by sediment removal, tree/snag removal, and arroyo dredging with mitigation actions.	Continue current practices for dredging and tree/snag removal
	Modified arroyo dredging to provide aquatic habitat [12 arroyos]
WATER DELIVERY SYSTEM MANAGEMENT	
Stream bank maintenance	Continue current practices
Maintenance of irrigation structures and infrastructure protection	Continue current practices
Maintenance of American Diversion Dam and NRCS sediment dams	Continue current practices
LEEVE SYSTEM MANAGEMENT	
Routine levee and road maintenance	Continue current practices
Levee system rehabilitation	Rehabilitation program based on modeling, geotechnical evaluation, and risk/cost assessment

SECTION 2 FLOODWAY MANAGEMENT

The USIBWC has jurisdiction over 8,332 acres of land within the ROW. The ROW is maintained to reduce erosion potential, remove potential obstructions within the ROW that could obstruct flood containment capacity, help stabilize stream banks and, at suitable locations, provide wildlife habitat. All maintenance activities for the RGCP are directed by the USIBWC O&M Division, El Paso Projects Office, located at American Diversion Dam in El Paso, Texas. Specific maintenance is carried out by the USIBWC maintenance field office located at Las Cruces, New Mexico.

Vegetation is managed by annual mowing and through leases and cooperative agreements for recreational areas. Long-term vegetation management goals include managed native grasslands and native bosque development. Table 2.1 presents long-term vegetation management targets.

Table 2.1 Vegetation Management Within the ROW

CURRENT VEGETATION MANAGEMENT	2004 ACREAGE	20-YEAR TARGET
Recreational use	266	625 ac increase
Leased areas		
Crop leases	66	No change
Grazing leases in floodway and uplands	3,552	Some reduction at project sites (described in Section 5)
USIBWC-maintained areas		
Annual mowing (excluding parks)	2,408	20% reduction (approx.)
Managed grasslands	57*	Increase to 1,641 ac
Native bosque development	Scattered planting	Development of 350 ac

* Test no-mow zones established in 1999

2.1 RECREATIONAL USE AREAS

The USIBWC participates in various ongoing or proposed initiatives to increase recreational opportunities and expand public access to the RGCP natural resources. These cooperative agreements will be maintained as currently specified, or modified to respond to new or expansion plans by the operating organizations. A future potential expansion to be considered by the USIBWC is a master plan developed by the cities of El Paso and Sunland Park to eventually connect their parks with the El Paso County River Park along the RGCP. Table 2.2 list current and planned recreational areas within the ROW.

2.2 LEASED AREAS

2.2.1 Management

The USIBWC administers a land lease program in the RGCP. Approximately, 43 percent of the 8,332 acres of ROW are currently leased. No permanent structures may be constructed in leased areas. By leasing land within the floodway, the need for mowing by the USIBWC is reduced.

Table 2.2 Recreational Areas Within the ROW

RECREATIONAL AREA	OPERATING ORGANIZATION	MARCH 2004 ACREAGE WITHIN ROW	20-YEAR TARGET ACREAGE	DESCRIPTION
Rio Grande River Park	City of El Paso, Texas	101 acres, east and west floodways	No change	Downtown El Paso, 1.5 miles linear park, multi-purpose use
El Paso County River Park Extension	El Paso County, Texas	75 acres, east floodway	Increase to 150 acres	Park extension from Country Club Bridge to Vinton Bridge
Sunland Park	City of Sunland Park, NM	57 acres east floodway	No change	Upstream of Anapra Bridge, day use.
Anthony Country Club	Anthony Country Club, Anthony, NM	33 acres, east floodway	No change	62-acre privately-operated golf club
Rio Grande Ecological Corridor Project	City of Las Cruces, in cooperation with other agencies	0 acres	475 ac	11 linear miles planned for multi-purpose use from Shalem Colony bridge to Mesilla Dam (both floodways)

Lease management is regulated according to the USIBWC Directive Volume III, Chapter 501 “National Environmental Policy Act (NEPA) Procedures for USIBWC Real property Actions and Management of Environmental Impact” issued on March 13, 2002. The directive assigns to the Division Engineer, Operations and Maintenance Division the authority to issue revocable licenses and leases on USIBWC real property. Administration of the USIBWC real property program and preparation or oversight of the preparation of contractual agreements for USIBWC real property activities or works is assigned to the Boundary and Realty Division (BRD).

All licenses, leases, permits, and easements are initiated and coordinated through the BRD. The BRD Chief will coordinate and work with other USIBWC support divisions and field offices to assist in the monitoring of contractual agreements made with regard to USIBWC real state property. With input from appropriate staff elements, the BRD Chief has the authority to request corrective action of a lessee if a violation of an agreement is found, and/or to issue a notice of termination of the agreements.

2.2.2 Crop Easements

The USIBWC has leased floodway areas for crop production in the Rincon Valley. The majority of the land is in row crops, however pecans are grown in the Lower Rincon Valley within the east floodway. The initial estimate of crop easements from aerial photographs is 66 acres. No changes are anticipated in crop easement use.

2.2.3 Modified Grazing Leases for Erosion Control

Currently livestock grazing is allowed on 2,385 acres of the Rincon Valley RGCP and 1,156 acres in the Mesilla Valley (22 and 26 leases, respectively, listed in Tables D-1 and D-2 of Appendix D). Figures 2-1 and 2-2 detail the locations of each lease along the RGCP. Detailed location maps are included at the end of Section 5. The USIBWC will monitor lease condition, trend, utilization and actual use, as identified in a Grazing Management Plan. Lease inventories will be conducted to establish the existing

condition, estimate resource potential, evaluate changes in resource condition over time, and evaluate the effectiveness of management actions. The modified lease measures include the following components;

- Develop a grazing management plan,
- Conduct lease inventories, and
- Develop a grazing allocation management plan for each lease.

Develop a Grazing Management Plan

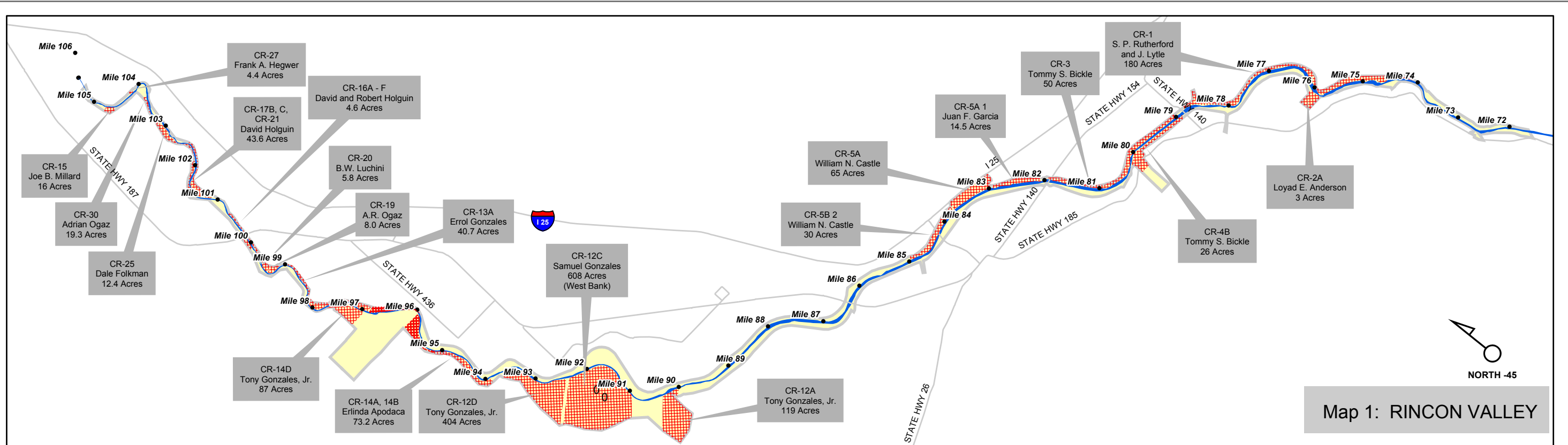
The grazing management plan would be implemented within the framework of the USIBWC 2002 directive for grazing lease management. This directive assigns responsibilities for monitoring grazing leases, and requires lease renewals to be in compliance with USEPA's guidance for grazing on public lands, as well as the Pollution Prevention/Environmental Impact Reduction Checklist for Grazing. The USIBWC directive and the USEPA grazing guidance are found in Appendix D. A grazing plan will emphasize the promotion of forage production for the purposes of wildlife and watershed protection. Subsequent vegetative response would result in increased vegetative cover and reduced soil erosion. Upland grazing leases could require vegetative treatments such as seeding, prescribed burns and mechanically thinning woody vegetation. The purpose of the treatments is to increase species and structural diversity, reduce soil erosion and increase the amount of cool-season grasses. The grazing plan will be based on an USIBWC plan currently under development for the Falcon Dam and Reservoir Project, taking into consideration RGCP site-specific conditions.

Modification of the floodway grazing regime would be adjusted based on site-specific conditions to achieve the desired community. Based on vegetation response, salt cedar control and/or mowing could be implemented to reduce recruitment of invasive vegetation. It is anticipated that renewal of floodway grazing leases could be suspended until the vegetation responds at the appropriate level at which time grazing will be instituted to manage forage production. Cessation of grazing from riparian areas until riparian function is restored is consistent with current guidelines by the Bureau of Land Management (BLM).

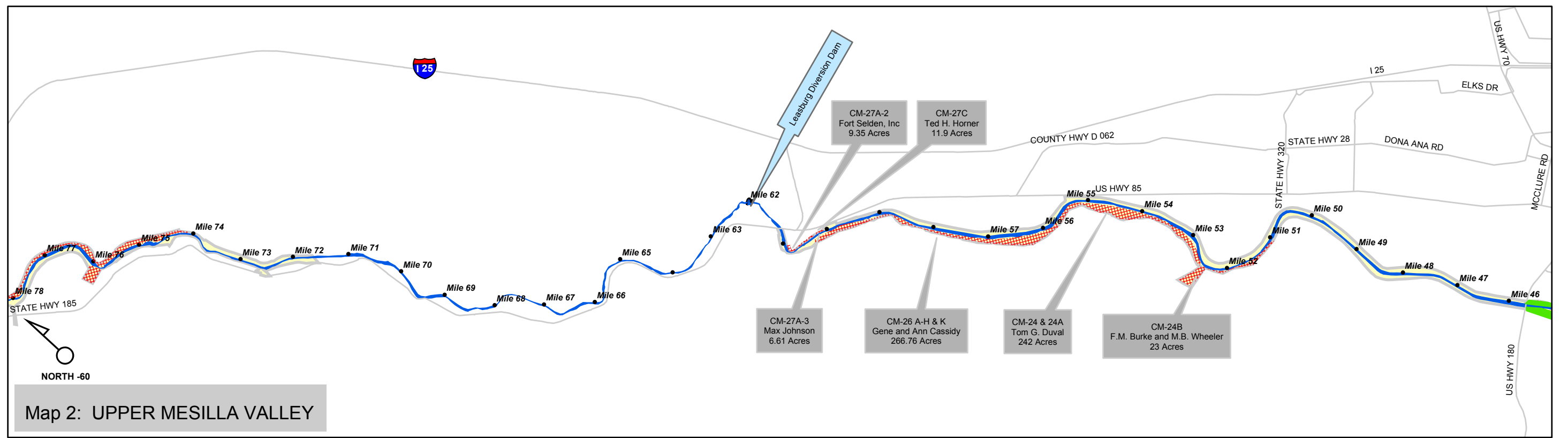
For upland and riparian areas, the grazing management plan will implement best management practices for erosion control that could include reducing mowing frequency and/or increasing mowing height to allow some vegetation recovery, and mulching and seeding graded areas to minimize erosion.

Conduct Lease Inventories

Leases will be inventoried to determine range condition. This condition is defined as the current condition of the range as compared to its ecological potential. Forage condition relates to aspects such as the quantity of forage available and its nutritional qualities (protein, energy, minerals and palatability). [For more information see: <http://texnat.tamu.edu/publications/1-5024/1-5024-3.htm>]. Specifics concerning score sheets and range condition methods will be identified in the grazing management plan. Appendix E provides an example score sheet used by the NRCS to assess range condition.



Map 1: RINCON VALLEY



Map 2: UPPER MESILLA VALLEY

SCALE = 1 : 150,000 or 1 INCH = 12,500 FEET
 UTM Zone 13 N / NAD 83

- Legend
- Grazing Leases
 - Rio Grande
 - Right of Way (ROW)
 - Recreational Areas

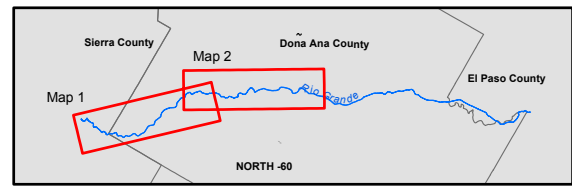
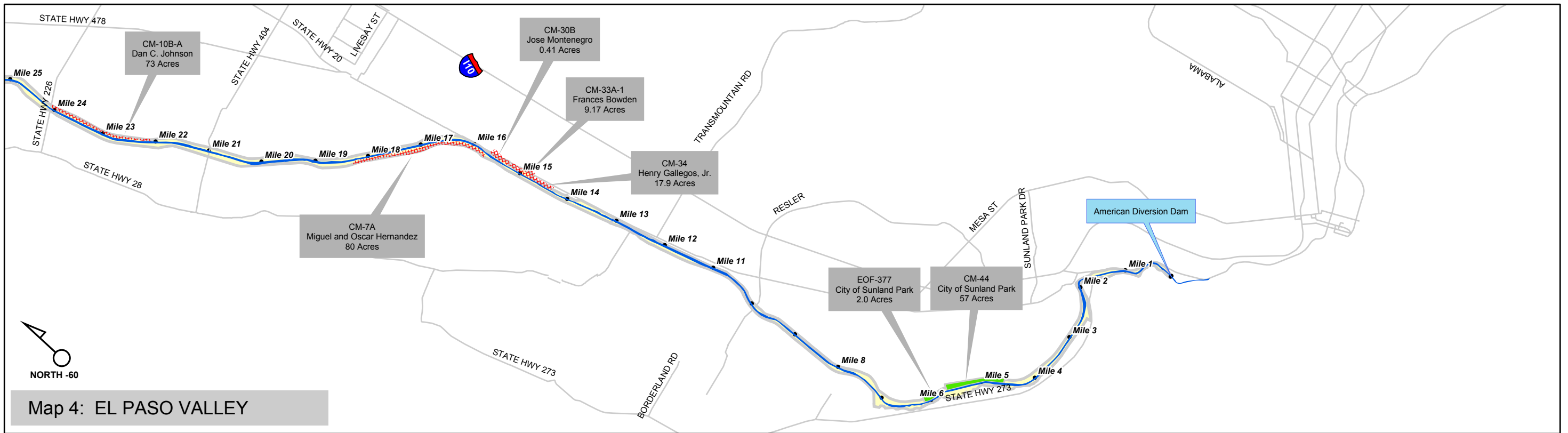
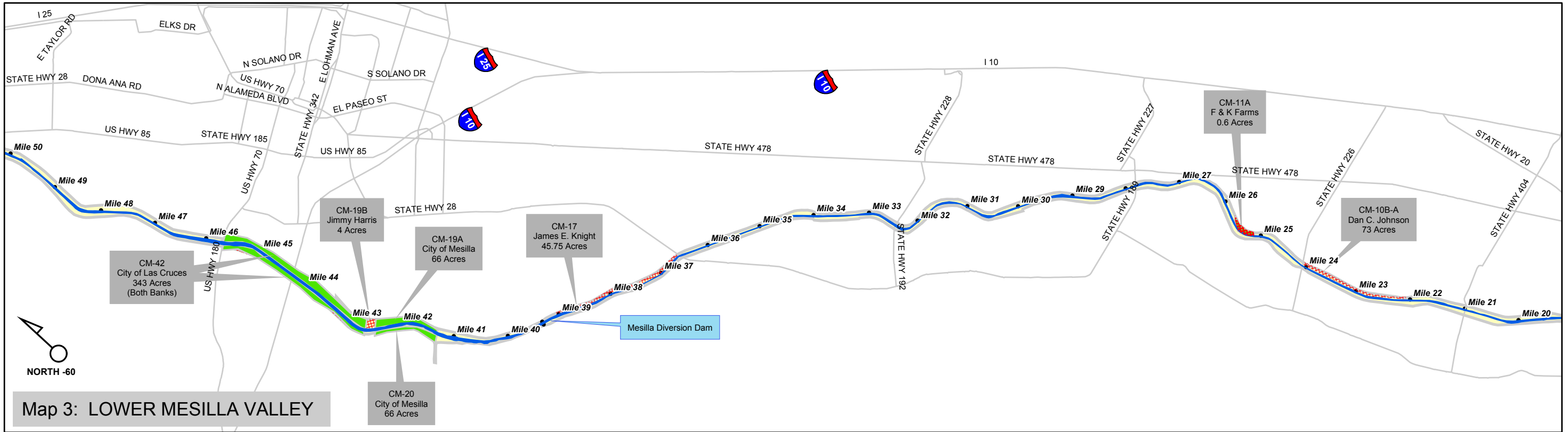
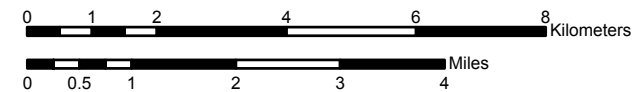


Figure 2-1
Leases in the Rincon and Upper Mesilla Valleys
 RGCP, 2004 River Management Plan
 United States Section,
 International Boundary Water Commission



SCALE = 1 : 150,000 or 1 INCH = 12,500 FEET
 UTM Zone 13 N / NAD 83



Legend

- Grazing Leases
- Rio Grande
- USIBWC Right of Way (ROW)
- Recreational Areas

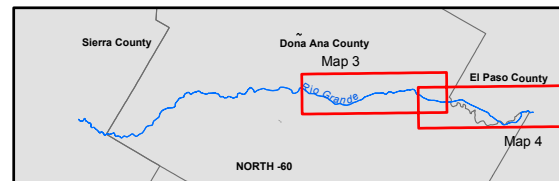


Figure 2-2
Leases in the Lower Mesilla
and El Paso Valleys

RGCP, 2004 River Management Plan
 United States Section,
 International Boundary Water Commission

Develop Grazing Allocation Management Plan for Each Lease

Grazing allotment plans will be developed after lease inventories are conducted. The grazing allotment plans will be specific to each lease and consistent with the USIBWC directive for management of grazing leases and the grazing. Components of each allotment plan will include location, grazing system, animals, season of use, vegetation treatments, range improvements and monitoring. Table 2.3 shows an example allotment plan for lease CR-01.

Table 2.3 Example Grazing Allotment Management Plan

GRAZING ALLOTMENT MANAGEMENT PLAN	
CR-01 IBM 00-13 180.00 Acres	Lessee Name: Address:
Location:	Floodway
Grazing System:	One 180 acre pasture with deferred rotation (deferred until after seed ripe).
Animals and AUMs:	Cattle; 10 allowable animal unit months (AUMs)
Season of Use:	October 1 to November 12
Vegetation Treatment:	Seed 40 acres with native species
Range Improvements:	Exclude river access and develop watering alternative
Monitoring:	Inventory and monitor range condition over next 2 years. Monitor trend every three years after growing season.

2.3 FLOODWAY AREAS UNDER DIRECT USIBWC MAINTENANCE

Approximately 4,657 acres of the ROW are not leased. An estimated 80 percent of the land is managed by annual mowing of the riparian zone to control weed and brush, particularly salt cedar. Two alternative methods, managed native grasslands and native bosque development areas, are incorporated into the RMP.

2.3.1 Annual Mowing of Floodway

Mowing is conducted at least once each year prior to July 15. Farm tractors with rotary slope mowers are used to mow the floodways. Slope mowers are used for vegetation maintenance on the channel banks. Some areas with dense vegetation may require a second late summer mowing.

The actual acreage cut by slope mowers has been estimated at approximately 3,725 acres, 80 percent of non-leased areas. The remaining areas within the ROW are not mowed because they are either inaccessible or wooded. During the mowing season, mower operators are directed to work around developing patches of native tree stands and well-established woodland patches within a designated mow area.

2.3.2 Managed Native Grasslands

Up to 1,641 acres of currently mowed areas have been identified for long-term development of managed native grasslands. These managed grasslands will improve soil conditions while providing wildlife habitat and interconnection with forested areas. These areas are located in RGCP segments where additional vegetation growth will not interfere with flood containment capacity as determined by hydraulic simulation. Areas identified for managed native grasslands are identified in Section 5 as individual projects extending along the ROW. Implementation of this measure includes:

- Site preparation, salt cedar treatments (e.g. mowing followed by herbicide application) and shallow disking to prepare soil and manage salinity;
- Seeding of native vegetation;
- Continued salt cedar control using treatments specific to site conditions and vegetation treatments which would promote native grass species; and
- Monitoring to assess treatment results and modification of methods as appropriate.

Treatment methods for salt cedar control to be evaluated include herbicide use, manual removal and/or burning, as dictated by site specific conditions.

2.3.3 Native Bosque Development

Development of native bosques has been adopted as an alternative management method for 350 acres in the ROW to stabilize stream banks while providing a riparian corridor on the floodway for wildlife species. Most native bosque development areas will be located in the upper reaches of the RGCP as allowed by flood containment capacity requirements. Additional acreage would be obtained from reopening of meanders (Section 3.1.3). Determination of seasonal groundwater depth will be required to ensure adequate conditions for establishment of new riparian vegetation. Long-term maintenance will be required to limit salt cedar competition and to reduce fire potential by dead wood accumulation (fuel reduction).

Planting

Planting will be conducted on 223 acres of the floodway to develop or enhance existing native riparian vegetation. Planting areas are located at relatively low-elevation areas within the floodway that are disconnected from the river channel. Each area will require a detailed site survey that includes soil analysis, seasonal groundwater elevations, and topographic survey. Revegetation will be accomplished by seeding and/or pole planting.

Seeding. Seeds of native plants will be purchased from suppliers. Success of seedling establishment will require knowledge of the ground water depth and removal of non-native vegetation, such as salt cedar. Salt cedar removal will occur at each site on an annual or bi-annual frequency.

Pole Planting. Cottonwoods and willows are two species which can be successfully grown from poles. Selected areas will be planted with trees that are

approximately 3 years old, placing the poles directly in contact with the shallow ground water. This is accomplished by digging a hole with an auger to the water table. Poles are then pushed through so that the root system is in contact with the water and the hole is refilled with good soil. Poles must be planted while they are dormant (i.e., from January through April of each year). Poles may be wrapped with chicken wire to protect them from girdling by beavers.

Pole planting techniques will be re-evaluated before the beginning of each planting season to assess success rates. Other establishment techniques include drilling holes to groundwater, backfilling with soil or mulch, and planting poles on top of the backfilled hole; and applying rooting hormone compounds.

Lowering of Stream Banks (Shavedowns)

A total of 127 acres of native bosque will be developed along the RGCP stream banks. Use of this measure will allow over bank flooding within the excavated stream bank (“shavedown”) to provide conditions suitable for establishment and maintenance of native riparian tree species. Excavation will be performed in selected locations of the floodway to re-shape the bank, forming a series of low terraces subject to intermittent overflows and allow the establishment of vegetation adapted for those patterns. Bank shavedown elevations will be within 1 foot of the irrigation level to promote inundation during moderately-high storm flows.

This measure is particularly useful for cottonwoods whose seeds have a short period of viability and will only germinate in moist soil. Cottonwood regeneration within the shavedown areas may require land preparation including disking and soil treatment.

Site specific conditions will dictate shavedown design, which includes:

- Detailed site survey to include soil analyses, groundwater level assessment, and topography survey;
- Identification of shavedown spoils disposal areas;
- Hauling and disposal of salt cedar (burning, chipping or piled as slash);
- Soil preparation including salinity management; and
- Erosion controls.

Three techniques will be used for erosion protection: back flooding, bench reconfiguration, and land grading.

Back Flooding. This technique may be used to minimize water velocity over shavedown areas. A open water area is cut into the shavedown area from the downstream end. This construction method would create a habitat similar to opening the downstream end of a former meander. For bank shavedown areas located on the outer bend of the river, a river diversion barrier parallel to the river and between the bank shavedown area and the river will be used to divert potential over bank flows.

Bench Reconfiguration. For bench reconfiguration, stream bank will be lowered in successively low benches. A few broad and shallow side channels will be cut to run through the benches to promote better seedling establishment.

Land Grading. Prior to grading, a plan will be prepared that establishes which areas of the site will be graded, how drainage patterns will be directed, and how runoff velocities will affect receiving waters. The grading plan will also include information regarding when earthwork will start and stop, establish the degree and length of finished slopes, and dictate where and how excess material will be disposed. Berms, diversions, and other storm water practices that require excavation and filling will also be incorporated into the grading plan. The grading plan is a precursor to the site map. [See http://cfpub.epa.gov/npdes/stormwater/menuofbmps/con_site.cfm for more details]

SECTION 3 WATER DELIVERY SYSTEM MANAGEMENT

This section of the RMP describes four water delivery system management categories: pilot channel, stream banks and irrigation facilities maintenance; and maintenance of American Diversion Dam and NRCS Sediment Control Dams.

3.1 PILOT CHANNEL MAINTENANCE

Maintenance of the pilot channel is performed during non-irrigation periods when water levels are lowest. The RGCP main channel is maintained by removing debris and deposits, including sand bars, weeds, and brush that grow along the bed and banks. Any major depositions or channel closures caused by sediment loads from arroyo flows are removed. Channel excavation is performed with bulldozers, excavators, front end loaders and scrapers either from the channel bank or from within the channel.

3.1.1 Trees and Snag Removal

Selected dead trees which are close to and threatening to fall into the channel are removed to prevent them from obstructing or deflecting river flows. Snag removal improves water delivery for irrigation by preventing damage to irrigation delivery structures. Removal of obstructions from the river channel maximizes the carrying capacity of the river for both water deliveries and for flood flows. Snags and dead and dying trees located on the floodway are not removed unless they are about to fall into the channel.

3.1.2 Channel and Arroyo Mouth Dredging

Sediment removal from the river channel and arroyo mouths maintains the RGCP flow capacity. Normal maintenance work on the main channel is conducted during the non-irrigation and non-flood seasons from September 15 to March 1. Channel excavation is performed with bull dozers, excavators, front end loaders and scrapers from the bank or within the channel. River water is diverted around the sediment excavation area during the maintenance period. Excavated sediment is deposited in the designated sediment disposal. See Section 6 for permit requirements.

Islands and sandbars with vegetation may remain in place as long as the river's carrying capacity is not significantly affected. If required, annual maintenance includes placement of additional riprap to protect stream banks and prevent channel meandering. Any scouring or gouging of the banks due to flooding is repaired immediately.

Locations of sediment removal areas from the mouth of the arroyos for diversification of fish habitat are identified in Section 5. This measure entails excavating the entrances of selected arroyos to increase the amount of backwater and bottom variation to increase the amount of slow-moving waters during the late spring and early summer. Twelve major arroyos in the Rincon Valley have been identified as having the most significant potential for diversification of aquatic habitat.

3.1.3 Reopening of Meanders Within the ROW

Partial re-opening of six former meanders was considered as part of a river management alternative to diversify aquatic habitat and increase native riparian vegetation development. This measure was not adopted as part of the preferred alternative for RGCP management. It is listed in the RMP for future revisions.

3.1.4 Sediment Disposal

Sediment collected from channel excavation, arroyo mouth maintenance, and other sediment control efforts is deposited on the floodway, on upland spoil areas, or on other federal or private lands approved for this purpose.

In the past, sediment has been deposited within the floodway; this practice however, is counter productive to maintaining adequate flood capacity. Some sediment could be used to repair erosion of the floodway, placed on privately owned lands, or stockpiled outside the levee containment area and offered for sale; however, most is transported to upland disposal sites owned by the USIBWC or other federal and state agencies. Project maps identify disposal sites by three categories: Still Usable, Available, and Full. These were identified in the late 1970s, and many of the sites are located within the levee containment area. Some of these sites may not be appropriate for spoil deposition since it could cause a negative effect on the flood capacity of the project. New sites would need to be identified.

3.2 STREAM BANK MAINTENANCE

Stream banks erode in a number of locations along the RGCP, but the degree of threat to adjacent levees varies considerably. Erosion is episodic, so identifying and prioritizing sites for treatment requires annual site inspection and review. Once the decision is made to provide bank protection, considerable cost is involved, loss of habitat and recreation values generally result, and considerable additional funds are expended to replace lost values.

3.2.1 Emergency Bank Protection

The USIBWC strives to minimize the need for emergency bank protection. Emergency actions usually taken during flood events involve major losses of floodway vegetation and dumping of coarse rock fill that is generally unsuited to naturally occurring or planted vegetation. If bank protection planning or funding does not keep abreast of bank erosion, the USIBWC may need to provide future bank protection on an emergency basis. Risks of levee failure and catastrophic flooding of protected areas are high in instances when emergency bank protection is required. If emergency action is required, habitat and visual impacts will be mitigated as follows:

- Install non-emergency bank protection at critical eroding sites in a timely manner to avoid the need for emergency action. This would ensure that sufficient lead time is available (typically 2 to 4 years) to budget and design bank protection at critical eroding sites.

- Install non-emergency bank protection in a timely manner at other eroding sites before critical conditions develop to avoid the need for emergency action. The episodic nature of bank erosion requires that timely action be taken at sites not considered critical as well.
- Where emergency action is undertaken, provide post-action mitigation for habitat and visual impacts. Onsite mitigation may prove difficult, and each site would be evaluated to determine actions that may be taken onsite to replace vegetation to the degree possible. In some instances, it would be necessary to provide enhancement of other areas in an attempt to provide compensating values.

3.2.2 Critical Eroding Sites

Non-emergency bank protection at critical eroding sites also tends to cause significant losses of habitat and open space values. Full-bank revetment entails considerable area of impact, and providing full onsite mitigation entails considerable cost. To address this issue, the USIBWC will employ bank protection designs through adaptive management that optimize onsite protection and replacement of habitat values. Potential measures include:

- Provide hard bank protection only to the degree needed to prevent further erosion.
- Combine hard protection with bioengineered mitigation features to provide in stream woody material; visually and hydraulically irregular surfaces; and extensive wetland and riparian vegetation on created low flood plain surfaces (benches or low berms for planting).
- Establish vegetation, to the extent possible considering water usage, in revetment near the normal edge of water.
- For sites at which onsite replacement of habitat values is not feasible, plan projects in groups for which full onsite mitigation occurs on a combined basis; recognizing that full replacement cover values may not be achieved at some bank protection sites.
- Seek to employ lower cost mitigation designs and vegetation establishment methods using bioengineered materials so that mitigation costs could be reduced over time. This would be applied as an adaptive management strategy, identifying potentially more cost-effective designs based on actual performance. Additionally, demonstration projects within the floodway to assess the feasibility of using various bioengineered materials to achieve needed mitigation is encouraged. Mitigation elements contributing to shaded riverine aquatic cover value would be analyzed in some detail to help identify the most cost-effective approaches. Innovative bank-protection designs that minimize habitat impacts would be employed where conditions are appropriate.

3.3 MAINTENANCE OF IRRIGATION FACILITIES

Maintenance on drainage structures such as spillways and drains from the canal system, culverts, and non-irrigation structures is performed by USIBWC. Spillways and drains allow for water to be drained from the irrigated fields and from subsurface soils back into the river. The channels carrying drain water within the USIBWC right of way are cleared periodically to ensure that water does not back up and cause high water levels within the irrigation system. Gates installed on many drains are kept in working order to allow them to be closed for flood protection on short notice. Maintenance of the gated structures includes painting, oiling, and cleaning.

Drainage and irrigation structures in the RGCP are licensed to other entities by the USIBWC. The USIBWC Project Manager must confirm that the licensee adequately maintains the structures, and that all inlet and outlet channels to the structures are kept open and free of debris.

The Hatch and Rincon Siphons, operated and maintained by the EBID, are subject to erosive forces that, if not controlled, would impact the integrity of the structures. The USIBWC completed the construction of erosion protection measures for the Hatch Siphon during the winter of 2003 and is scheduled to complete the Rincon Siphon this coming non-irrigation season. The engineering design for the Picacho Flume pier rehabilitation will be completed during mid 2004.

3.4 MAINTENANCE OF DAMS

The USIBWC maintains American Diversion Dam in El Paso, and five sediment control dams built by the Natural Resources Conservation Service (NRCS). Three other diversion dams associated with the RGCP (Percha Dam, Leasburg Dam and Mesilla Dam) are operated and maintained by the Elephant Butte Irrigation District (EBID).

3.4.1 American Diversion Dam

The American Diversion Dam, defining the southern boundary of the RGCP, is operated and maintained by the USIBWC. The USIBWC Upper Rio Grande Project Manager cooperates and coordinates dam operations with the USBR to ensure that water delivery objectives are met. Normal maintenance of the American Diversion Dam is performed during the non-irrigation season.

3.4.2 Maintenance of NRCS Dam Components

Under an agreement with EBID and Caballo Natural Resources Conservation Service District (IBM 65-356 dated December 10, 1965, and Supplement No. 1, dated February 15, 1974), the USIBWC performs maintenance of these dams. Maintenance includes the intake, outlet, and outlet channel structures, and access roads. A total of five dams are maintained by USIBWC as part of the RGCP: Broad Canyon, Crow Canyon, Green Arroyo, and Jaralosa Arroyo (two dams). The USIBWC performs mowing on the discharge channel slopes; cleans and maintains trash racks, intake structures, and outlet structures; repairs fences; and grades access roads. The USIBWC monitors the level of sediment in the dams in order to ensure that the outlet gates on the discharge structure are

set to the proper level. This maintenance allows the dams to perform effectively in reducing sediment load to the river and reducing flooding potential. Public Law 93-126; 87 Stat. 451, approved October 18, 1973, limits the USIBWC maintenance activities to \$50,000 per year.

SECTION 4 LEVEE SYSTEM MANAGEMENT

This section of the RMP describes the existing levee system, routine maintenance conducted, and flood control improvements under consideration.

4.1 SYSTEM DESCRIPTION

The RGCP flood control system was completed in 1943 to provide protection from the 100-year flood. Flood control in the RGCP relies on upstream flow regulation and the use of levees to contain flooding in areas with insufficient natural terrain elevation. The system levees extend for 57 miles along the west side of the RGCP, and 74 miles on the east side for a combined total of 131 miles. The levees, ranging in height from about 3 feet to about 18 feet, were originally built to provide 3 feet of freeboard during the design flood in most reaches. The levees have a gravel maintenance road along the top.

Flood control relies on upstream flow regulation by upstream reservoirs that include Elephant Butte Dam, completed in 1916, and Caballo Dam, completed in 1938. Caballo Reservoir has a storage capacity of 331,500 ac-ft (top of flood capacity), of which 100,000 ac-ft must be available during the months of July, August, and September for flood control. During the non-irrigation season, that capacity is used for storage and regulation of winter flows.

In addition to flow regulation by Elephant Butte and Caballo Dam, flow regulation upstream of the RGCP is provided by a series of four reservoirs constructed under the Flood Control Act of 1941: Jemez Canyon Dam (1953), Abiquiu Dam (1963), Galisteo Dam (1970), and Cochiti Dam (1975). Improved flood routing through the RGCP is a component of the URGWOM simulation model [www.spa.usace.army.mil/urgwom].

4.2 ROUTINE MAINTENANCE

Levees are inspected regularly at the beginning of each flood season and immediately after each flood event. Levee slopes are mowed to prevent growth of brush and trees that could obstruct flows, or cause root damage to the structure itself. Maintenance of the levees includes minor repairs to levees such as: filling and repairing washouts, stabilizing, shaping, and road grading and surfacing.

Levee roads, designed for passage of O&M personnel and equipment, are generally unpaved. Maintenance includes road grading and resurfacing with gravel as needed. The entire levee road system for RGCP is resurfaced within a 20-year cycle.

4.3 SYSTEM IMPROVEMENTS UNDER CONSIDERATION

4.3.1 Potential Increase in Flood Containment Capacity

A potential increase in flood containment capacity is under consideration. In 1996 the Hydrology and Hydraulics Section of the USACE Albuquerque District completed an evaluation of potential flood containment capacity of the RGCP, the Rio Grande

Canalization Improvement Program (USACE 1996). Hydrologic and hydraulic analyses of the 100-year flood were performed for the 105.4 miles of floodway between Percha Dam and American Diversion Dam. The study also included an evaluation of sedimentation in RGCP tributary basins, as well as a scour and deposition analysis.

The flood containment capacity, as evaluated in 1996 by the USACE, identified a number of potential deficiencies in the RGCP on the basis of hydraulic modeling of the 100-year flood. This report indicated that up to 60.1 additional miles of levees could require an increase in height, up to 2 feet, to meet the freeboard design criterion for protection against a 100-year flood. Those findings were re-evaluated as part of the development of the Draft EIS to include potential effects of environmental measures such as vegetation growth in the floodway.

The 1996 USACE study specified the improvements for the Canutillo area as indicated below.

East Levee at Canutillo. The proposed floodwall, beginning approximately at river mile 9.9 above American Dam and extending to river mile 11.3, is necessary due to the constricted flow area that exists; the levee-to-levee width in this reach is only 310 feet to 350 feet. This river section currently represents the hydraulic constriction in the RGCP reach where the levee-to-levee width cannot be reduced by the use of a new earthen levee section without adversely increasing the water surface elevation upstream. The recommended 7,500-foot-long floodwall would vary in height from 8 to 10 feet, without freeboard, and the structure would be located riverside and immediately adjacent to the existing east river levee provided by the railroad embankment. To accommodate local drainage, the flood wall must tie into the drainage control structures at appropriate locations. Downstream of river mile 10.8 and upstream of river mile 12.2, the levee-to-levee width expands to approximately 500 feet, allowing the floodwall to transition to an earthen levee.

West Levee at Canutillo. The west-side levee would incorporate a flood wall extension for the same constricted area (river mile 10.8 to river mile 12.2) to contain the increased water surface elevation of the 100-year flood. This increase would be the result of a reduced effective flow area with the east-side floodwall in place. The west-side flood wall would consist of a vertical wall, partially embedded in the existing levee crown, and varying in height from 8 to 10 feet. A floodwall extension is possible on the west side because, unlike the east-side levee, the west-side levee does not serve the dual purpose of railroad embankment and flood control levee. The existing levee section should be checked for through seepage and under-seepage and for embankment and foundation stability. Some methods of controlling seepage and improving embankment stability could eliminate the economic advantage of the flood wall in comparison to an earthen levee enlargement.

In areas where rebuilding of levees would be required, existing levee material would be re-engineered with clay material to meet specifications for the new levee. Additional material would be obtained from sediment removed from the active river channel as a result of maintaining channel capacity or from new borrow sites. Other sources of levee material would be from implementation of environmental measures such

as lowering the bank in the form of successively low benches to promote establishment of cottonwood/willow seedlings, and reopening of old meanders.

4.3.2 Structural Condition Improvements to the Levees

Evaluation Program

The USIBWC is evaluating the need for levee rehabilitation to address structural deficiencies. The three-step investigation entails aerial geophysical surveys, followed by surface geophysical surveys, and a geotechnical drilling program. The goals of aerial geophysical surveys are 1) to identify the regions of levee that yield questionable electrical conductivity values as related to soil composition, and 2) characterize the materials underlying the levees to identify potential areas of seepage. Resulting electrical conductivity values will then be correlated to known soil properties and characteristics, thus providing a regional representation of levee composition (i.e., sand, clay, voids).

Levee regions identified in the aerial geophysical surveys as questionable or inappropriate for flood control purposes will be re-surveyed using surface geophysics methods. Surface geophysical surveys will generate detailed resistivity/conductivity data to more accurately quantify integrity of the levee. Results of the surface geophysical survey will determine the sites that require geotechnical investigations (i.e., analysis of soil borings). Combined results of the geophysical and geotechnical drilling program will conclude where levees must be completely replaced (using new material), rehabilitated (replace some material and re-compact), or possibly even removed if economic studies (i.e. cost / benefit, risk analysis, etc.) indicate that buyout or flood easements would be feasible.

Addressing Potential Deficiencies

Correction of flood control deficiencies will be done through a program of studies and corrective measures using adaptive management. Some management techniques that have worked well in the past will continue to be applied, and new techniques will also be developed by researching demonstrated successful techniques or by experimenting with new ones. Consideration will be given to widening the cross section of existing RGCP levees. This action will strengthen levees and offset potential impacts of potential increased channel roughness and offset the effects of increased channel roughness resulting from revegetation efforts on the floodway. Implementation of actions associated with flood control rehabilitation would be planned dependent upon availability of resources including budget and manpower. The pace and extent of actions will be constrained by the availability of future funding.

- Rehabilitate existing protective levee system features to correct flood protection deficiencies (i.e. levee-strengthening, levee-raising, etc.) as determined by need for flood project rehabilitation.
- Undertake a levee stability analysis which could lead to levee replacement, reconstruction, raising, or set back to decrease the risk of flood damage.

- Inspect levees using both visual inspection and geophysical techniques for cracks and damage from either animal burrowing or decaying root systems.
- Construct a combination of new levee and floodwall in the Canutillo area, where no levee exists, to provide the community with flood protection.
- Remove dredged material deposited within the floodway from past operation and maintenance activities. This action will increase the flood carrying capacity of the floodway and therefore eliminate the need to raise levees.

SECTION 5 PROJECT SUMMARIES

Environmental measures apply to relatively long stretches of the floodway as well as site specific locations. Those measures will be implemented as individual projects whose features are summarized in this section. Five types of projects are described:

- Native vegetation planting,
- Stream bank shavedowns,
- Re-opening of former meanders,
- Modified dredging at arroyos, and
- Native grassland management.

The first four measures are presented in the form of fact sheets that summarize key features. The extent of native managed grasslands along the ROW is illustrated in foldout maps at the end of this section. Two other types of environmental measures previously classified as “linear projects” in the Draft Environmental Impact Statement -- modified grazing and voluntary conservation easements-- were not retained as projects in the RMP. Modified grazing was previously discussed in Section 2.2, and information concerning the acreage and lessee is found in Appendix D. Voluntary conservation easements, discussed in Section 6.4, is a measure incorporated into the RMP as cooperation agreements under consideration.

5.1 PROJECT LOCATIONS

Projects and their acreage are listed in Table 5.1 in geographic sequence, starting from the north end of the RGCP. River mile, the distance from American Diversion Dam, is used for project identification. As an exception, native grassland management projects are identified by the two initial letters of the River Management Unit (described in Appendix C) in which they are located. Project locations are shown in Figure 5-1 for grasslands, and Figure 5-2 for the remaining projects.

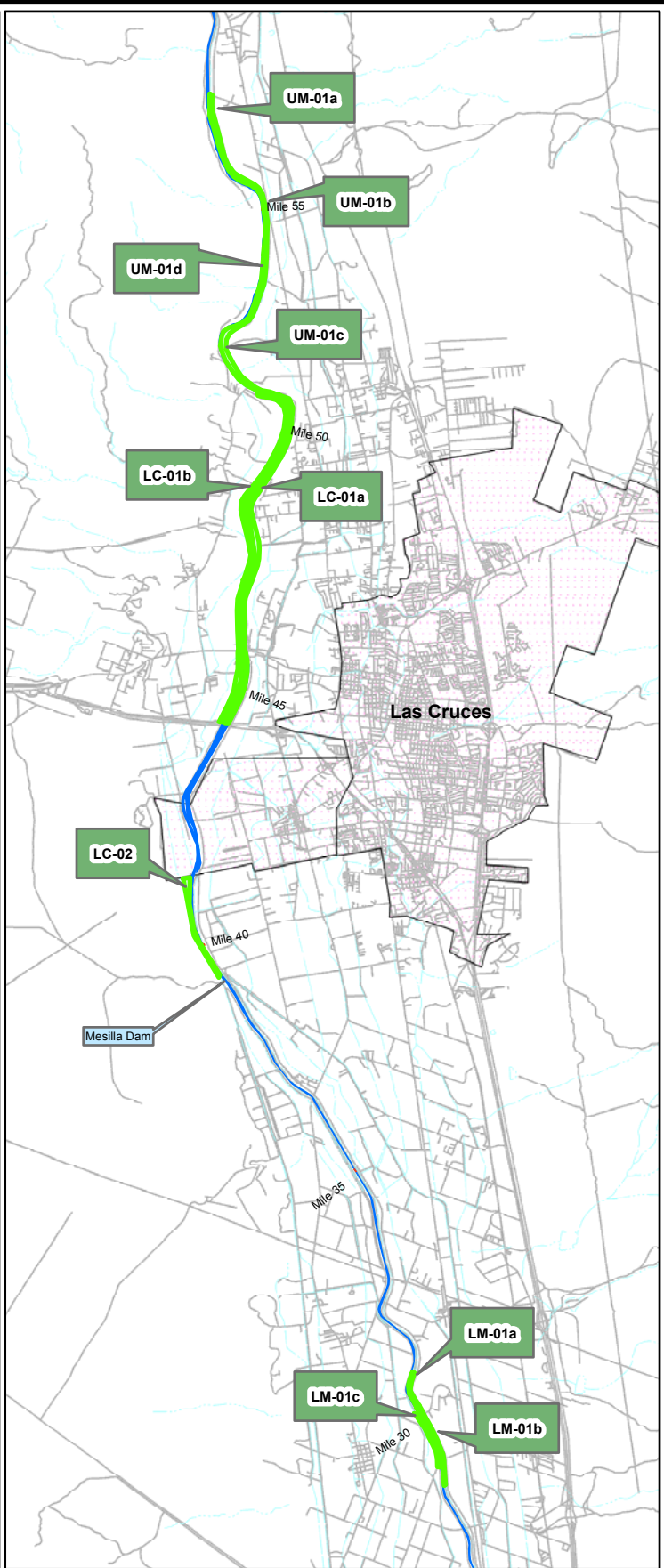
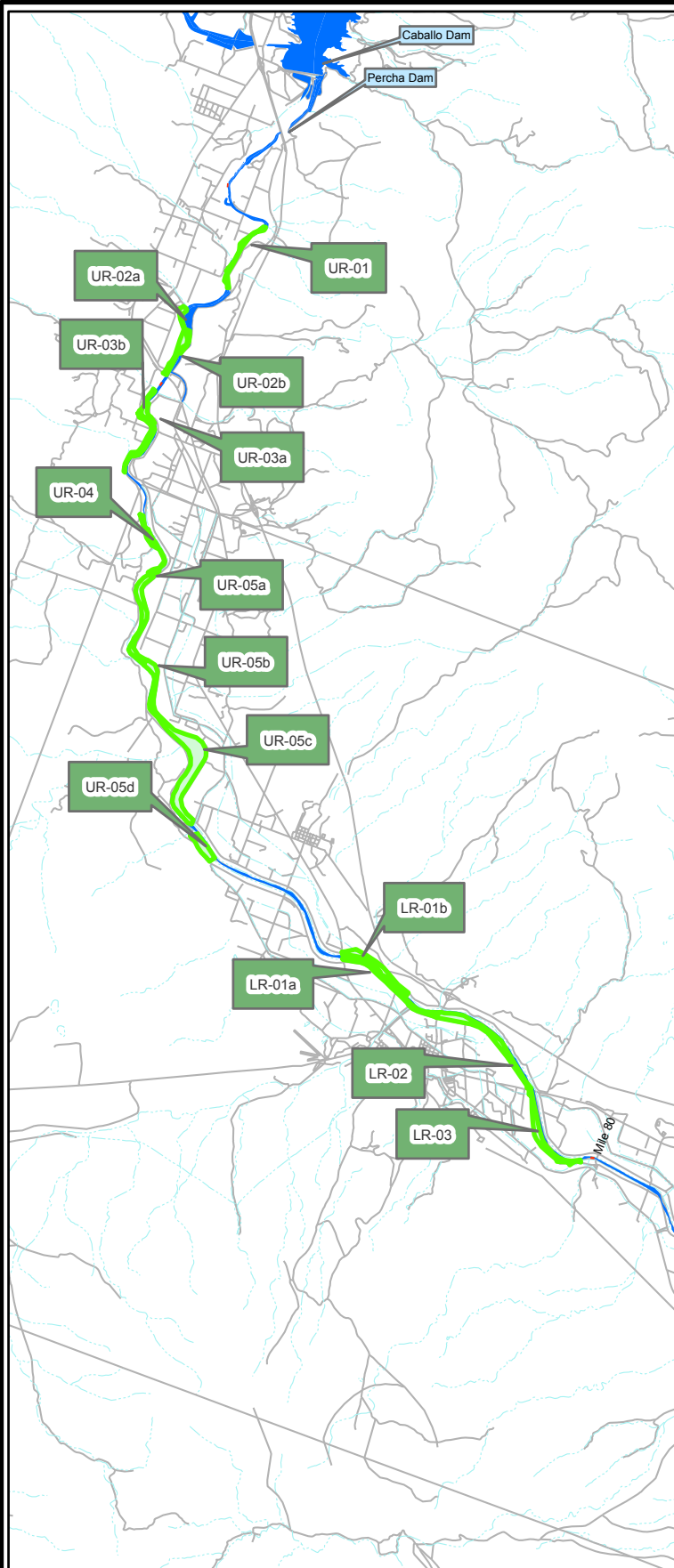
5.2 PROJECT DESCRIPTIONS

Fact sheets describe native bosque planting, stream bank shavedowns, partial meander reopening, or modified arroyo dredging at 18 individual sites. Tasks to be conducted and site development notes are presented along with project data regarding area, excavation volume, spoil area availability, and planting requirements. Potential water requirement for vegetation establishment are listed in Table 5.2. Additional information on selected sites is provided in field notes from a January 28, 2004 visit conducted by USIBWC, USACE, USFWS and Parsons representatives to help assess potential restoration opportunities and constraints (Appendix B). Native grassland projects, along with the locations of existing grazing leases and restoration project sites, are presented in two separate foldout maps in Appendix G (Rincon and Upper Mesilla Valleys, and Lower Mesilla and El Paso Valleys).

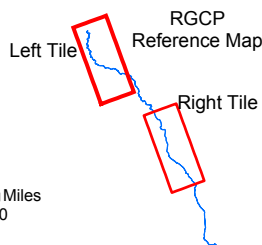
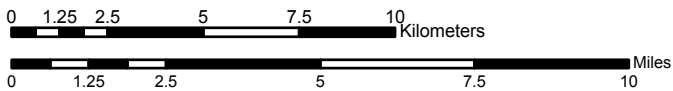
Table 5.1 Project Identification and Acreage

River Mile ID	Site Name	Native Vegetation Planting	Stream Bank Shavedowns	Modified Arroyo Dredging	Native Grassland Management
105	Oxbow Restoration	105A (6.6 acres)			
104	Tipton Arroyo	104A* (5.4 acres)	104B (3.4 acres)	104D (0.20 acres)	
103	Trujillo Arroyo		103B (26.5 acres)	103D (0.90 acres)	UR-01a (27 acres)
102	Montoya Arroyo	102A (2.8 acres)	102B (24.7 acres)	102D (0.17 acres)	
101	Holguin Arroyo	101A (6.0 acres)	101B (12.5 acres)	101D (0.16 acres)	UR-02a, b (50, 8 acres)
99	Green/Tierra Blanca Arr.	99A (5.1 acres)		99D (0.27 acres)	UR-03a (20 acres)
98	Sibley Point Bar		98B (4.1 acres)	98D (0.27 acres)	UR-03b (26 acres)
97	Jaralosa Arroyo			97D (0.44 acres)	UR-04 (32 acres)
95	Jaralosa South	95A (5.1 acres)			UR-05a (91 acres)
94	Yeso Arroyo	94A (11.5 acres)	94B (3.9 acres)	94D (0.44 acres)	UR-05b (35 acres)
92	Crow Canyon		92B (17.9 acres)		UR-05c (259 acres)
90					UR-05d (48 acres)
88					LR-01a, b (46, 72 acres)
85	Placitas Arroyo			85D (0.52 acres)	
83	Remnant Bosque	83A (16.2 acres)	83B (17.9 acres)	83D (0.30 acres)	LR-02 (102 acres)
80					LR-03 (72 acres)
78	Rincon/Reed Arroyos			78D (2.74 acres)	
76	Bignell Arroyo	76A (10.3 acres)	76B (16.3 acres)	76D (0.52 acres)	
58					UM-01a (55 acres)
54	Channel Cut	54A (19.6 acres)			UM-01b (53 acres)
53					UM-01c (47 acres)
49	Spillway No. 39	49A (15.9 acres)			UM-01d (44 acres)
48	Spillway No. 8	48A (34.6 acres)			LC-01a, b (105, 66 acres)
42	Clark Lateral	42A (15.4 acres)			LC-02 (53 acres)
41	Picacho and NMGF	41A (71.3 acres)			
30					LM-1a, b, c (20, 45, 22 acres)
Total Acreage:		223	127	6.8	

* To be considered for restoration if boundary survey confirms location is within ROW.



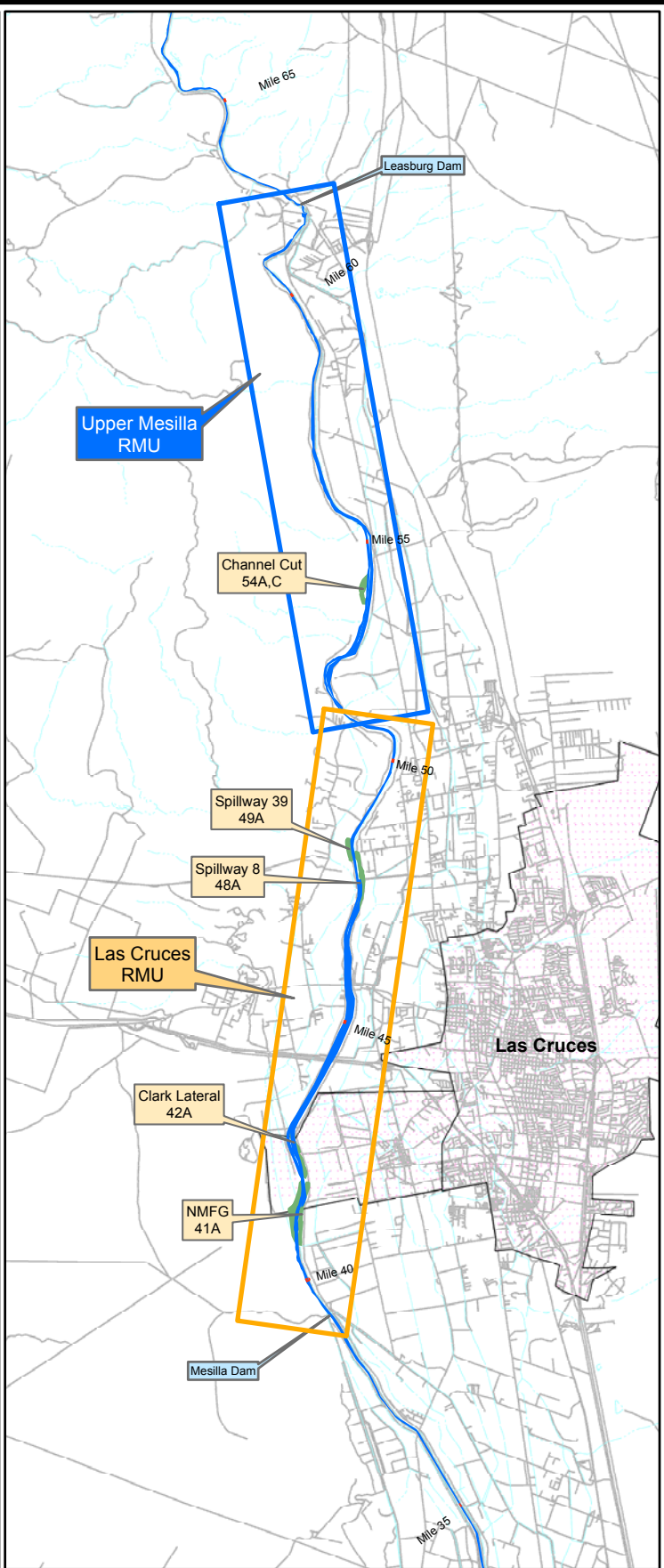
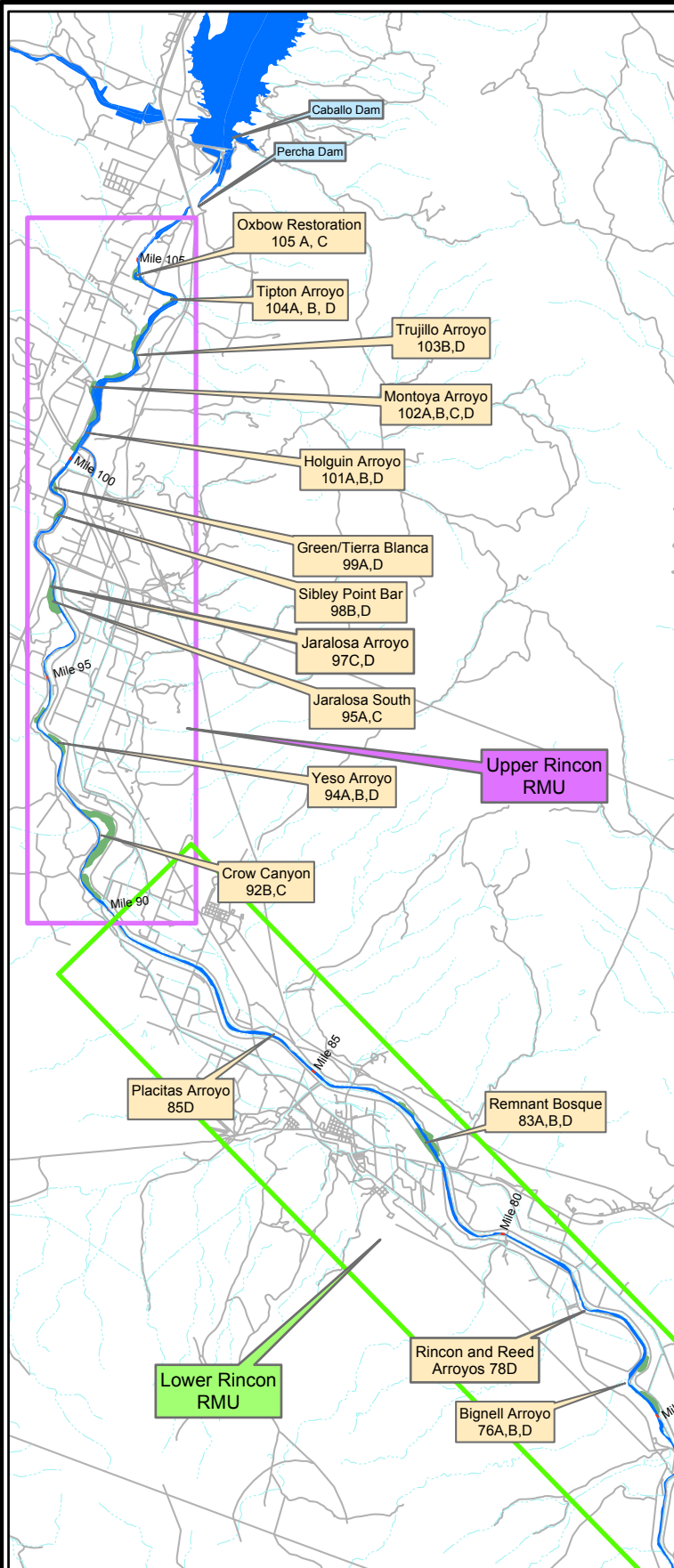
SCALE = 1 : 500,000 or 1 INCH = 41,667 FEET
 UTM Zone 13 N / NAD 83



**Figure 5-1
 Native Grassland
 Management Areas**



RGCP, 2004 River Management Plan
 United States Section,
 International Boundary Water Commission



SCALE = 1 : 500,000 or 1 INCH = 41,667 FEET
UTM Zone 13 N / NAD 83

North 30

0 1.25 2.5 5 7.5 10 Kilometers

0 1.25 2.5 5 7.5 10 Miles



Figure 5-2
Restoration Project Sites
in the Rincon and Mesilla Valleys



RGCP, 2004 River Management Plan
United States Section,
International Boundary Water Commission

**Table 5.2 Potential Water Use for Vegetation Establishment
 (Spoil Disposal Areas)**

		Required Spoils Area By Project* (Acres)			Potential Water Use** (Initial Application for Grass Development)	
River Mile	Site Name	Stream Bank Shavedowns	Modified Arroyo Dredging	Combined Area	Volume, Acre-Foot	Volume, 1000 Gallons
104	Tipton Arroyo	2.55	0.40	2.95	0.98	321
103	Trujillo Arroyo	19.88	1.80	21.68	7.23	2,355
102	Montoya Arroyo	18.53	0.34	18.87	6.29	2,050
101	Holguin Arroyo	9.38	0.32	9.70	3.23	1,054
99	Green and Tierra Blanca Arroyos	N/A	0.54	0.54	0.18	59
98	Sibley Point Bar	3.08	0.54	3.62	1.21	393
97	Jaralosa Arroyo	N/A	0.88	0.88	0.29	96
94	Yeso Arroyo	2.93	0.88	3.81	1.27	413
92	Crow Canyon	13.43	N/A	13.43	4.48	1,459
85	Placitas Arroyo	N/A	1.04	1.04	0.35	113
83	Remnant Bosque	13.43	0.60	14.03	4.68	1,524
78	Rincon/Reed Arroyos	N/A	5.48	5.48	1.83	595
76	Bignell Arroyo	12.23	1.04	13.27	4.42	1,441
	Total	95.4	13.9	109.3	36.4	11,873

* It is assumed that excavated soil and sediment from arroyos and shavedown areas would be placed on the floodway, next to the project site, at an average depth of 2 feet. This value would vary depending on the site topography.

** A total application of 4 inches was assumed for grass development in spoils placement areas: an initial 1-inch application, repeated three times every 2 weeks. No subsequent watering would be required. Pole planting areas would not be irrigated and, consequently, were excluded from estimates of water use during initial site development.

Mile 105 Oxbow Restoration

Project Manager _____

Boundary and topographic survey

Pre-design field survey _____

Detailed design _____

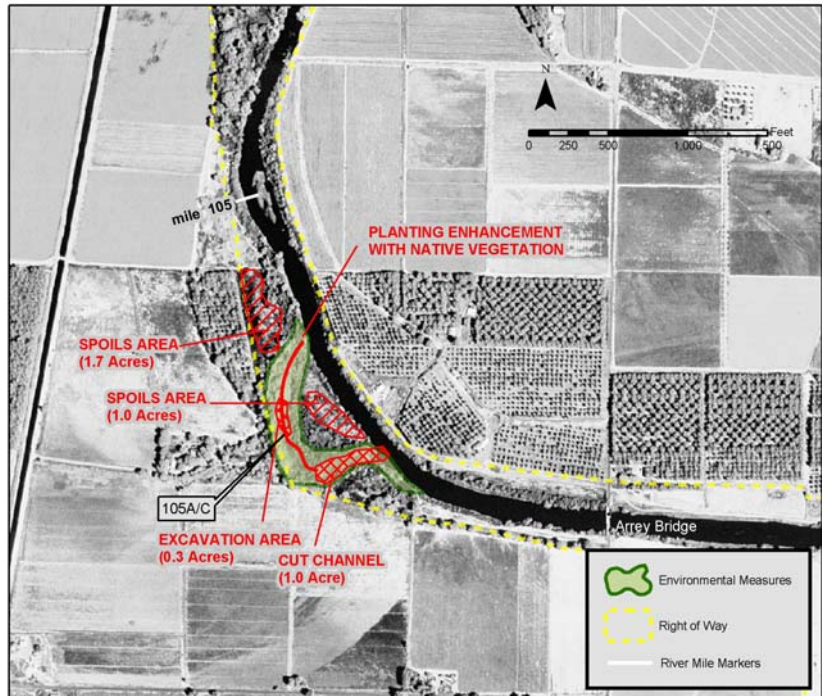
Nationwide Permit-27 _____

Storm Water Pollution Prevention
Plan (SWPPP) _____

Construction _____

Planting _____

Maintenance and Monitoring Plan



Project 105A, Planting Area

- Site 104 is well suited for pilot-scale restoration measures. During RGCP construction, the former meander was not filled but plugged on the upstream side and is now a cattail dominated wetland.
- Establish cottonwoods along the banks of wetland area and toe of former meander channel slope.
- Potentially terrace former meander channel bank to facilitate establishment of cottonwoods and provide variability of inundation regimes.

Project 105C, Partial Meander Reopening (Not included in 2004 RMP)

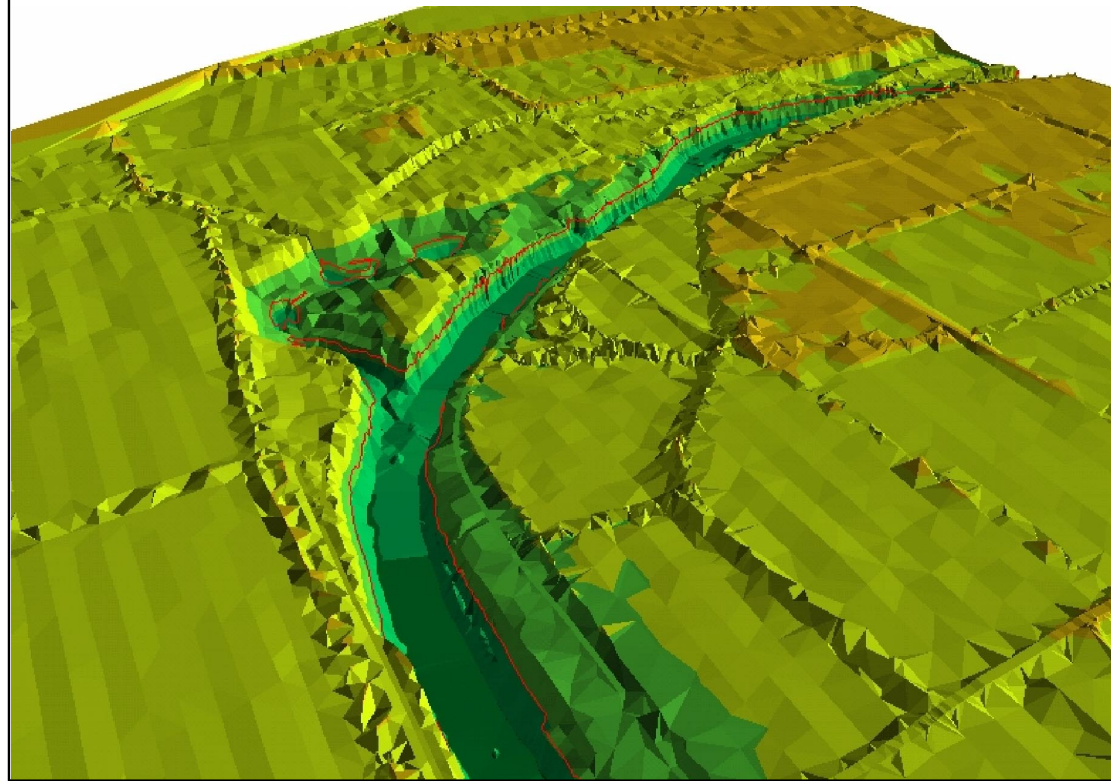
- This measure was not included in the 2004 RMP. Potential actions include the excavation of approximately 100 ft of old channel to allow backflow inundation year-round and create aquatic habitat.
- While the former meander footprint is 6.6 acres, the project area would be limited to 1.3 acres. Excavated spoils, estimated at 8,389 cubic yards for a 4-foot excavation depth, would be placed on the “island” and cleared area to the north of the former meander (2.7 acres identified as potentially available).

Project Construction Data

	Units	105A
Project area	Acres	6.6
Revegetation area (native trees)	Acres	6.6
Estimated cottonwood poles (109/ac)	Number	719

Reference Elevation for Riparian Habitat Development

Vertical Exaggeration: 8x

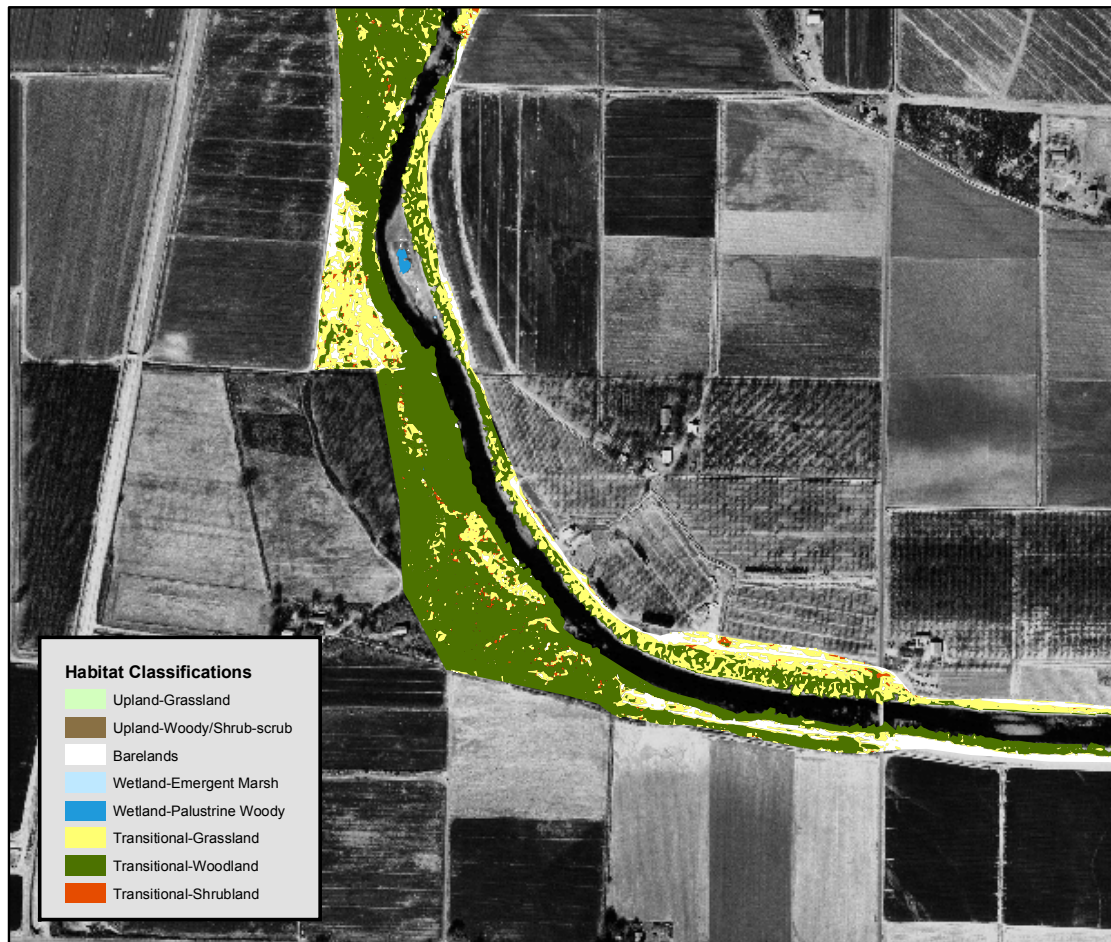


Mile 105 Oxbow Restoration

South of Percha Dam is a 6.6 ac former meander diked off during RGCP construction. This oxbow was originally the main channel of the river until the current channel was excavated. The oxbow is heavily vegetated.

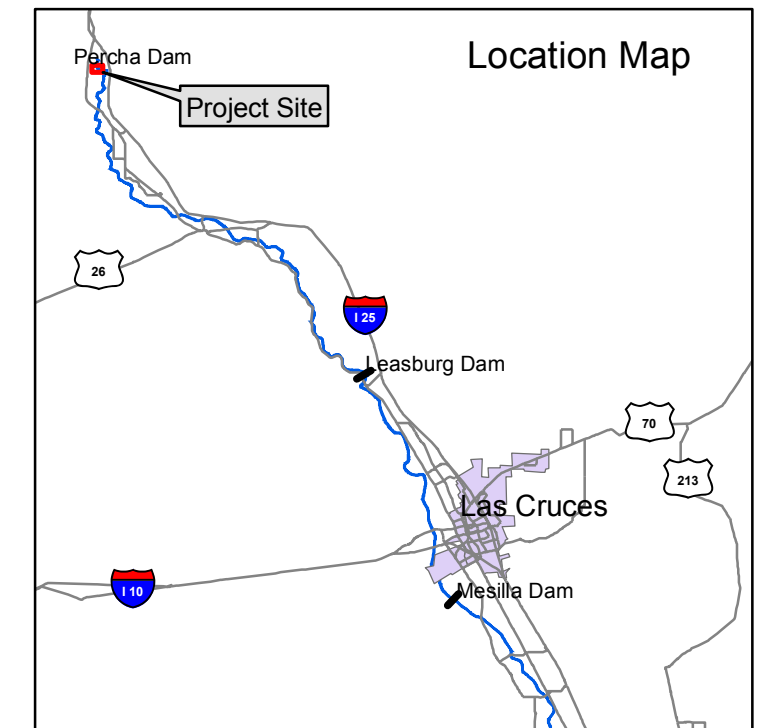
Point Project Measures	ID	#	Acres
Native Vegetation Planting/enhancement	105A	1	6.6

NOTE: Partial reopening of former meanders (measure "C") is not included in the 2004 RMP.



Habitat Classifications

Upland-Grassland
Upland-Woody/Shrub-scrub
Barelands
Wetland-Emergent Marsh
Wetland-Palustrine Woody
Transitional-Grassland
Transitional-Woodland
Transitional-Shrubland



Mile 104 Tipton Arroyo

Project Manager _____

Boundary and topographic survey

Pre-design field survey _____

Detailed design _____

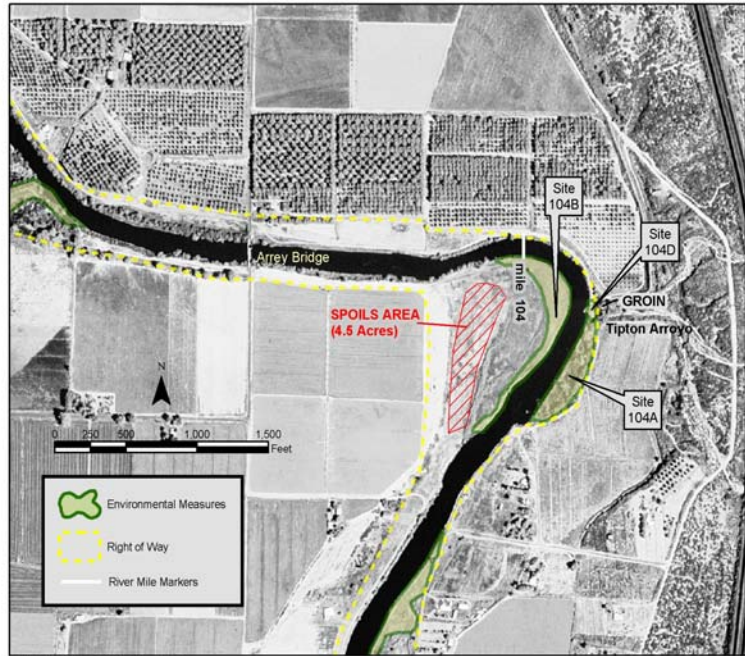
Nationwide Permit-27 _____

Storm Water Pollution Prevention
Plan (SWPPP) _____

Construction _____

Planting _____

Maintenance and Monitoring Plan



Project 104A, Planting Area (Not included in 2004 RMP)

- Low priority project to be added in the future if boundary survey confirms that the site is within ROW.

Project 104B, Shavedown

- Action is a shavedown in conjunction with a downstream backwater habitat on the west bank.
- Spoil placements areas located on west bank, adjacent to construction areas.
- Heavy equipment access via road adjacent to project area.
- SWPPP required prior to construction.
- Endangered Species Act (ESA) and Migratory Bird Treaty Act (MBTA) minimization measures required.

Project 104D, Modified Arroyo Dredging

- Low priority. Aquatic habitat creation at Tipton Arroyo is limited by adjacent access road. Excavation will require road modification.
- If excavation in channel is eliminated, no NWP-27 permit will be required for site 104.

Project Construction Data

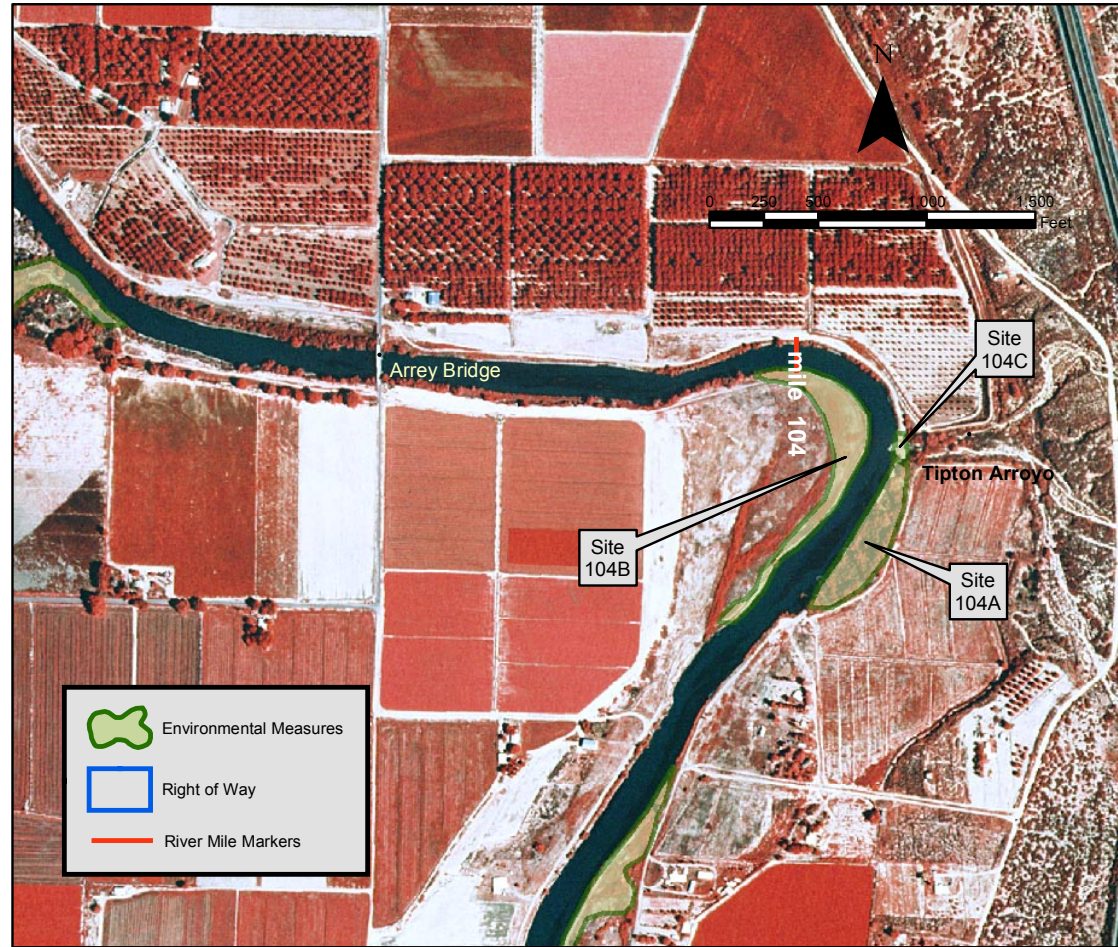
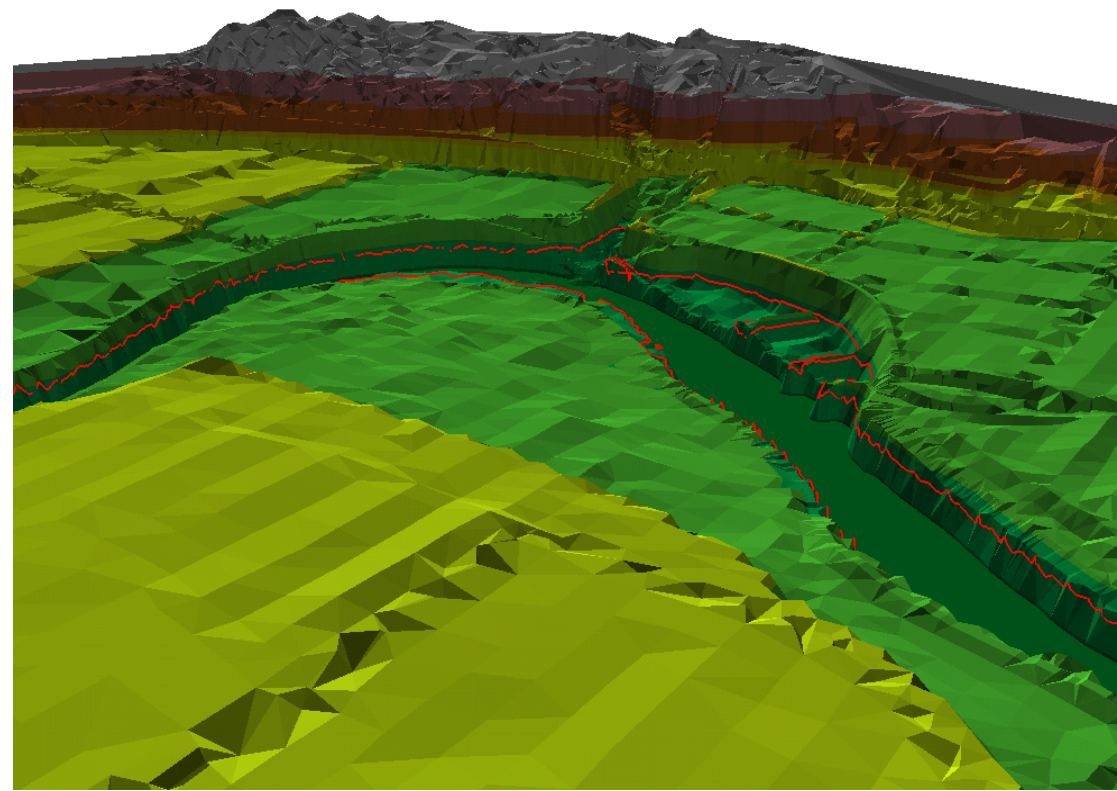
	Units	104B	104D	Site Total
Project area	Acres	3.4	0.2	3.6
Excavation volume*	Cubic yards	8,228	1,291	9,519
Required spoils area (at 2 ft. deep)**	Acres	2.55	0.40	2.95
Potentially Available Spoils Area	Acres	4.5	4.5	4.5

* Estimated excavation depth of 4 ft for arroyos and 1.5 ft for shavedowns. An area of 4.5 acres was identified as potentially available for excavated soil placement near the project area.

** All spoils and graded areas will require re-vegetation.

Reference Elevation for Riparian Habitat Development

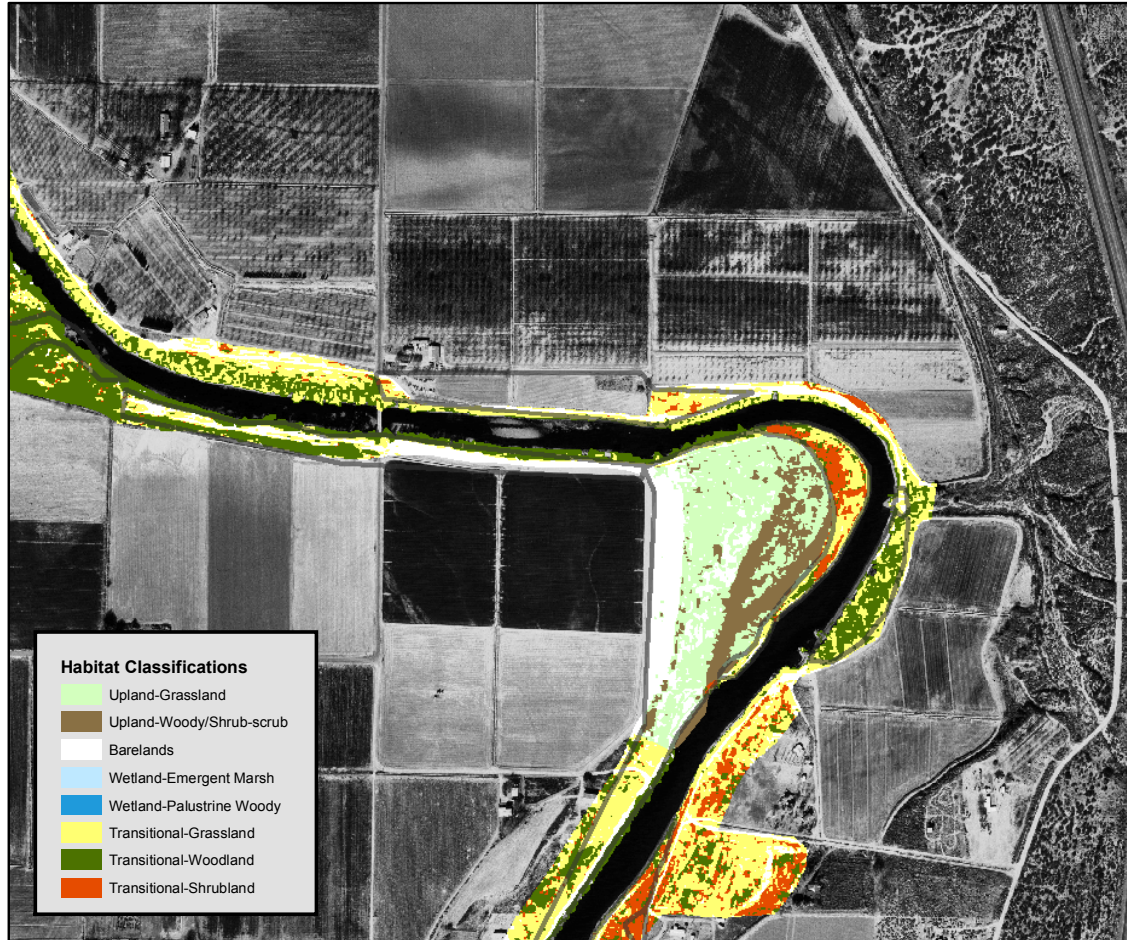
Vertical Exaggeration: 8x



Mile 104 Tipton Arroyo

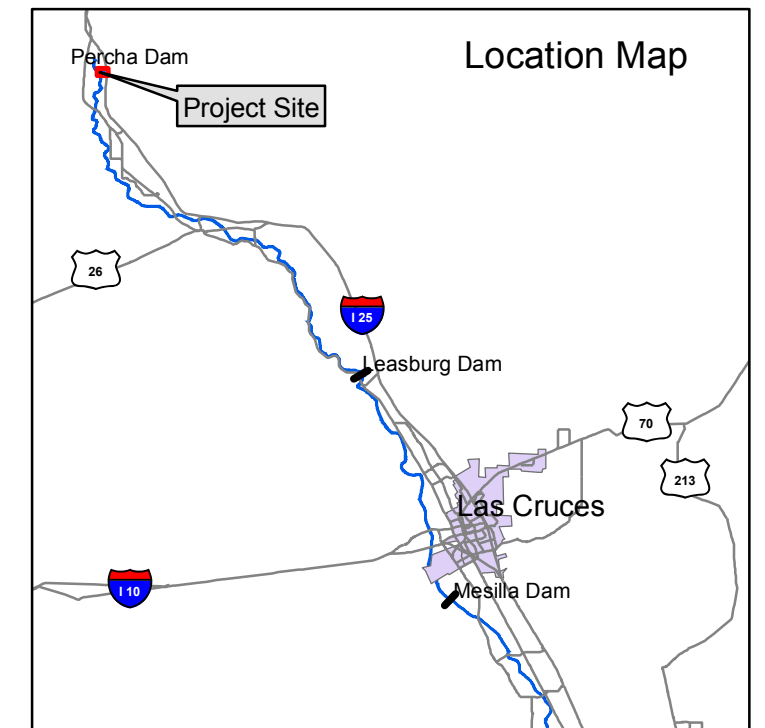
On the eastern shore, opposite a point bar, is the mouth of Tipton Arroyo. The mouth of the arroyo has been excavated to remove the “fan” of sediments entering the river. The watershed draining to Tipton Arroyo (identified as Misc.2 by USACE) encompasses 2.2 square miles with numerous drainage channels leading from uplands to the east. The channels flow under U.S. Interstate 25 and combine into Tipton Arroyo near the Rio Grande.

Point Project Measures	ID	#	Acres
Native Vegetation Planting/enhancement	104A	1	2.52
Bank shave downs*	104B	1	3.4
Modify dredging at arroyos by creating embayments	104C	1	0.2



Habitat Classifications

- Upland-Grassland
- Upland-Woody/Shrub-scrub
- Barelands
- Wetland-Emergent Marsh
- Wetland-Palustrine Woody
- Transitional-Grassland
- Transitional-Woodland
- Transitional-Shrubland



Mile 103 Trujillo Arroyo

Project Manager _____

Boundary and topographic survey

Pre-design field survey _____

Detailed design _____

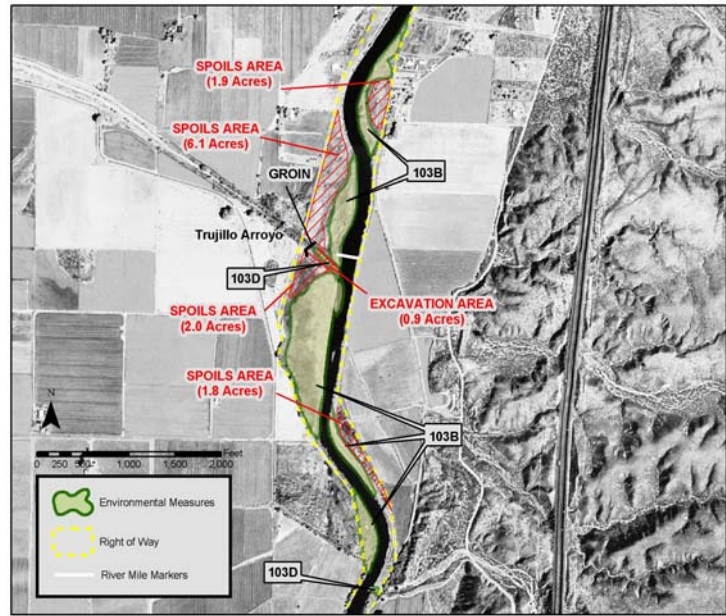
Nationwide Permit-27 _____

Storm Water Pollution Prevention
Plan (SWPPP) _____

Construction _____

Planting _____

Maintenance and Monitoring Plan



Project 103B, Shavedown

- East bank is low priority due to elevated bank.
- West bank is highest priority for site 103.
- Spoil locations are adjacent to construction locations north of Trujillo Arroyo. Some spoil material from shaveddown south of arroyo will likely need to be transported across arroyo bed to suitable locations.
- Some salt cedar removal required for west bank and arroyo margins.

Project 103D, Modified Arroyo Dredging

- Excavate arroyo mouth approximately 300 ft. back for backwater habitat and place a small groin across arroyo mouth to keep it open.
- Spoil placement locations easily accessible.
- A NWP-27 permit, Pre-construction Notification (PCN), and SWPPP will be required due to construction activities below Ordinary High Water Mark (OHM).
- Endangered Species Act (ESA) & Migratory Bird Treaty Act (MBTA) minimization measures required.

Project Construction Data

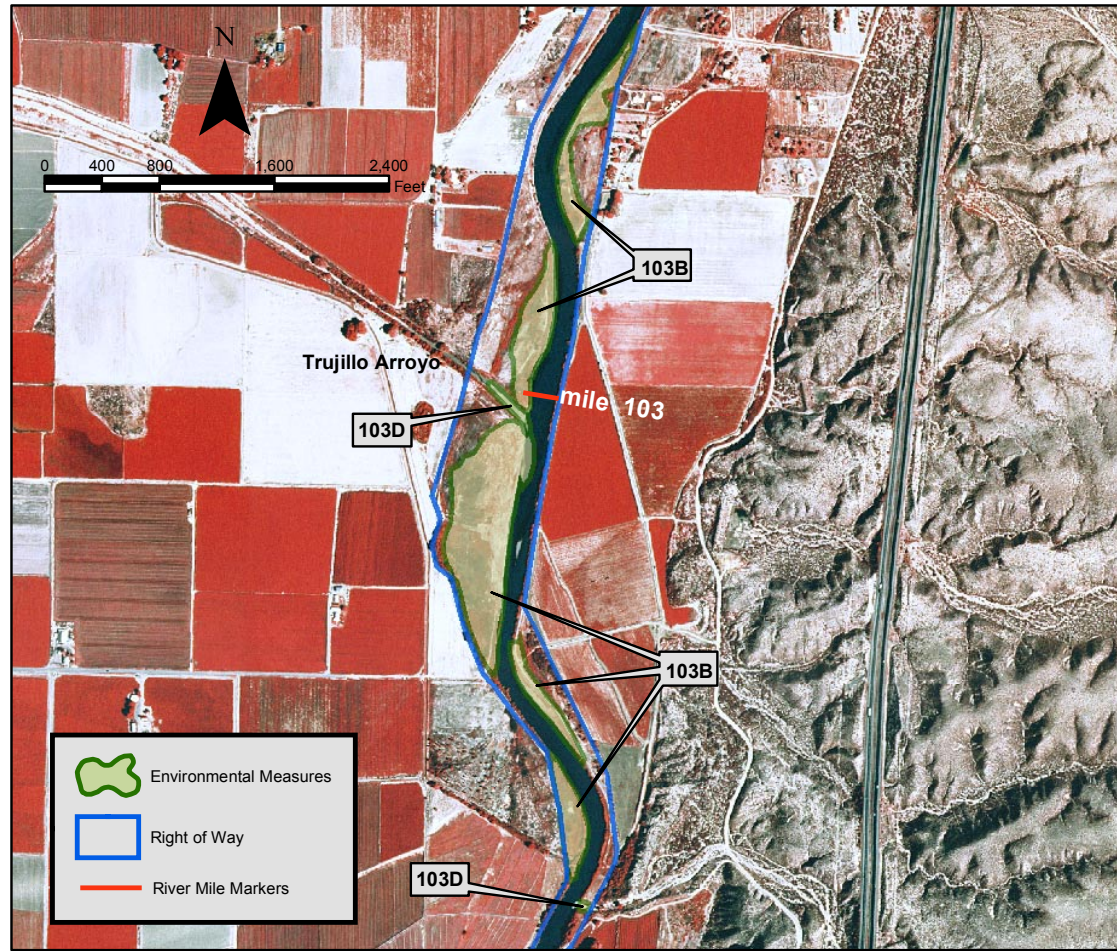
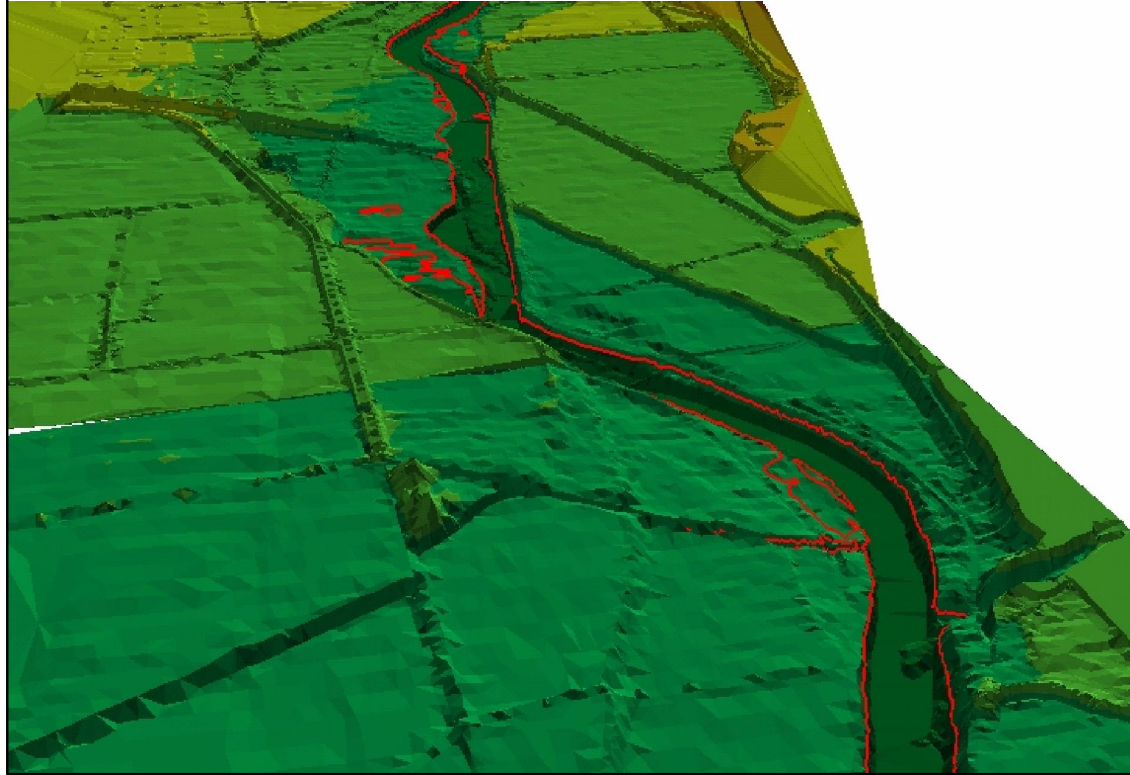
	Units	103B	103D	Site Total
Project area	Acres	26.5	0.9	27.4
Excavation volume*	Cubic yards	64,130	5,808	69,938
Required spoils area (at 2 ft. deep)**	Acres	19.9	1.8	21.7

* Estimated excavation depth of 4 ft for arroyos and 1.5 ft for shavedowns. An area of 11.8 acres was identified as potentially available for excavated soil placement near the project area.

** All spoils and graded areas will require re-vegetation.

Reference Elevation for Riparian Habitat Development

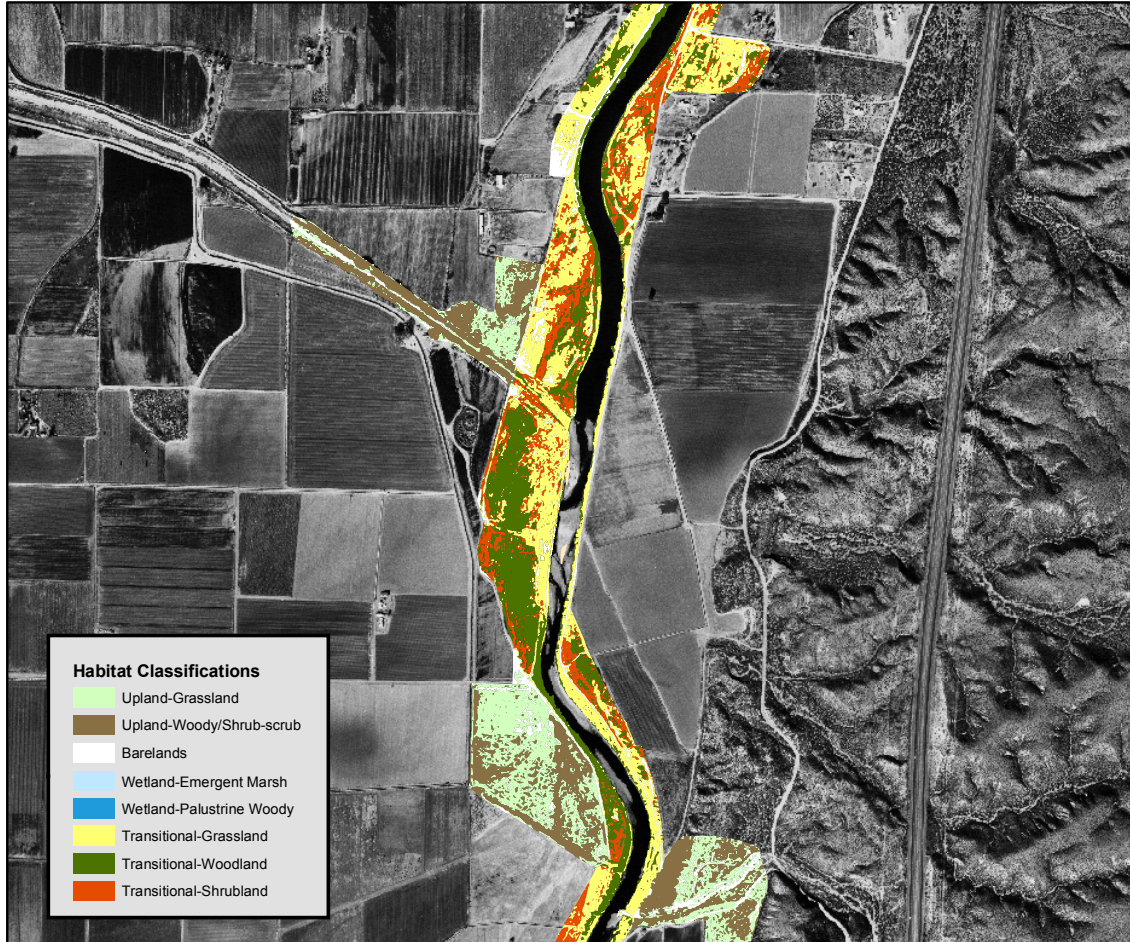
Vertical Exaggeration: 8x



Mile 103 Trujillo Arroyo

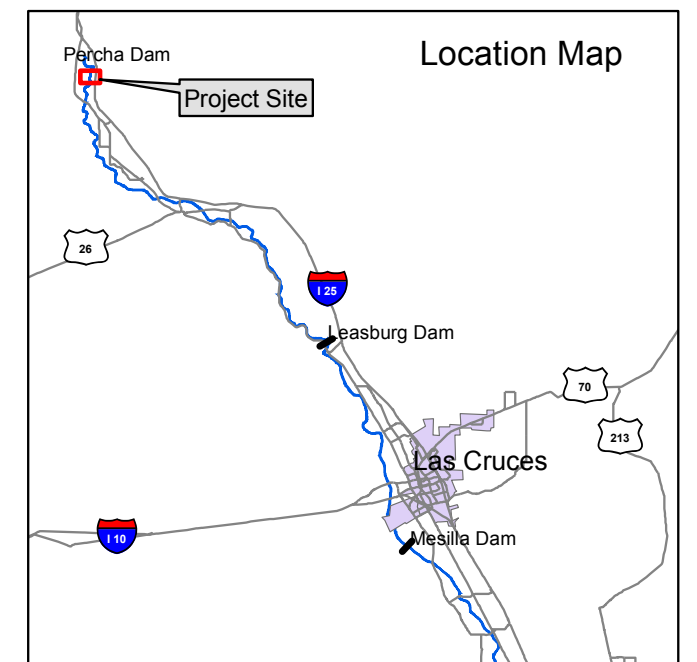
The mouth of Trujillo Arroyo is on the western bank of the river at mile 103. The channel for Nordstrom Arroyo, which is north of Trujillo Arroyo, has been diverted south to combine with Trujillo Arroyo prior to passing over the Arrey Canal Siphon and entering the floodway. Trujillo Canyon covers 52.9 square miles and extends for 29.5 miles to the west from the Rio Grande into the Black Range Mountains of the Gila National Forest.

Point Project Measures	ID	#	Acres
Bank shave downs*	103B	5	26.5
Modify dredging at arroyos by creating embayments	103D	2	0.8



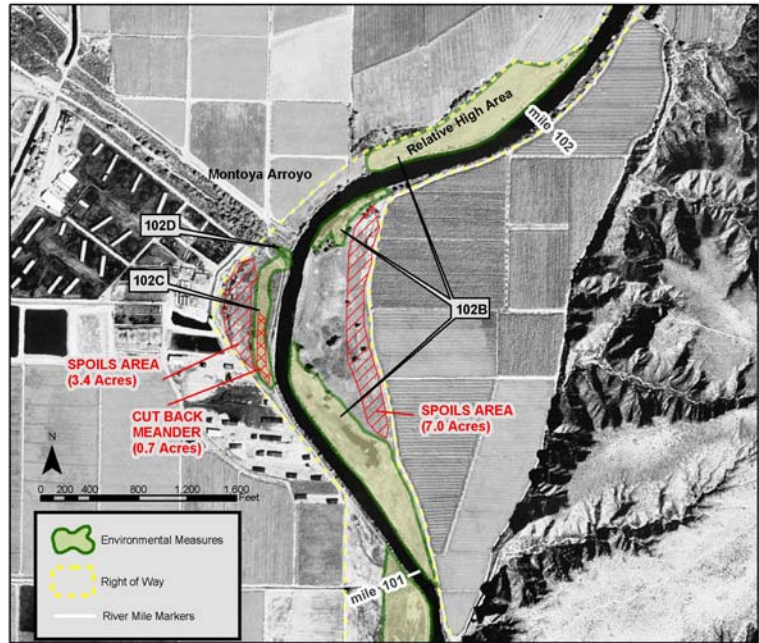
Habitat Classifications

- Upland-Grassland
- Upland-Woody/Shrub-scrub
- Barelands
- Wetland-Emergent Marsh
- Wetland-Palustrine Woody
- Transitional-Grassland
- Transitional-Woodland
- Transitional-Shrubland



Mile 102 Montoya Arroyo

Project Manager _____
 Boundary and topographic survey _____
 Pre-design field survey _____
 Detailed design _____
 Nationwide Permit-27 _____
 Storm Water Pollution Prevention Plan (SWPPP) _____
 Construction _____
 Planting _____
 Maintenance and Monitoring Plan _____



Project 102A, Planting Area

- Medium priority. Planting will not require NWP 27 permit.

Project 102B, Shavedown

- Low priority. Limited spoil placement near site and potential shavedown area is relatively high.

Project 102C, Partial Meander Reopening (Not included in 2004 RMP)

- This measure was considered low priority due to elevation and amount of spoil generated, and was not included in the 2004 RMP. The former meander footprint is 2.8 acres, and the excavation area would be limited to 0.7 acres. Excavated spoils were estimated at 1,694 cubic yards for a 4-foot excavation depth.

Project 102D, Modified Arroyo Dredging

- Mouth of the arroyo and channel will require excavation, spoil sites available on the east bank.
- Possible excavation on east bank across from mouth of arroyo to allow flooding of eastside pasture.
- Possible weir or groin location upstream of mouth of arroyo.
- A NWP-27 permit and Pre-construction Notification (PCN) will be required, as well as SWPPP.
- Endangered Species Act (ESA) & Migratory Bird Treaty Act (MBTA) minimization measures required.

Project Construction Data

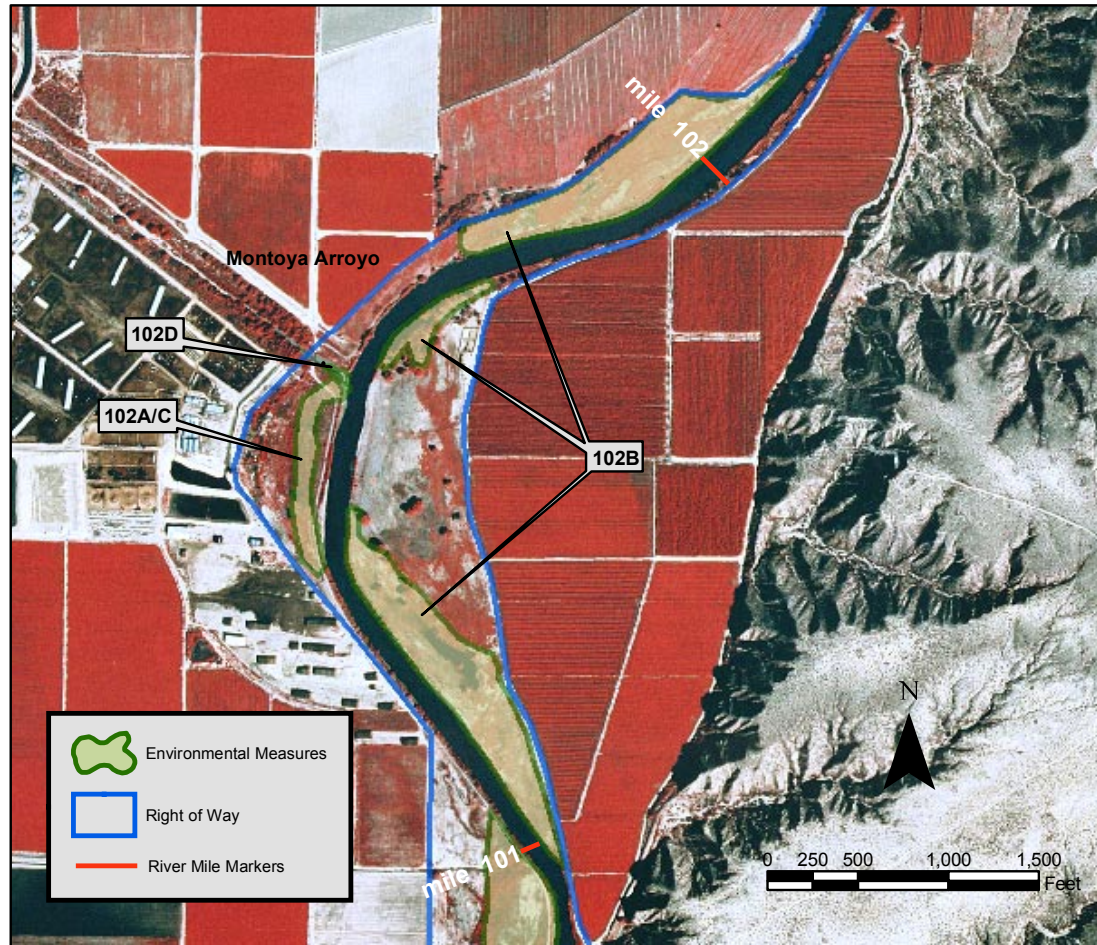
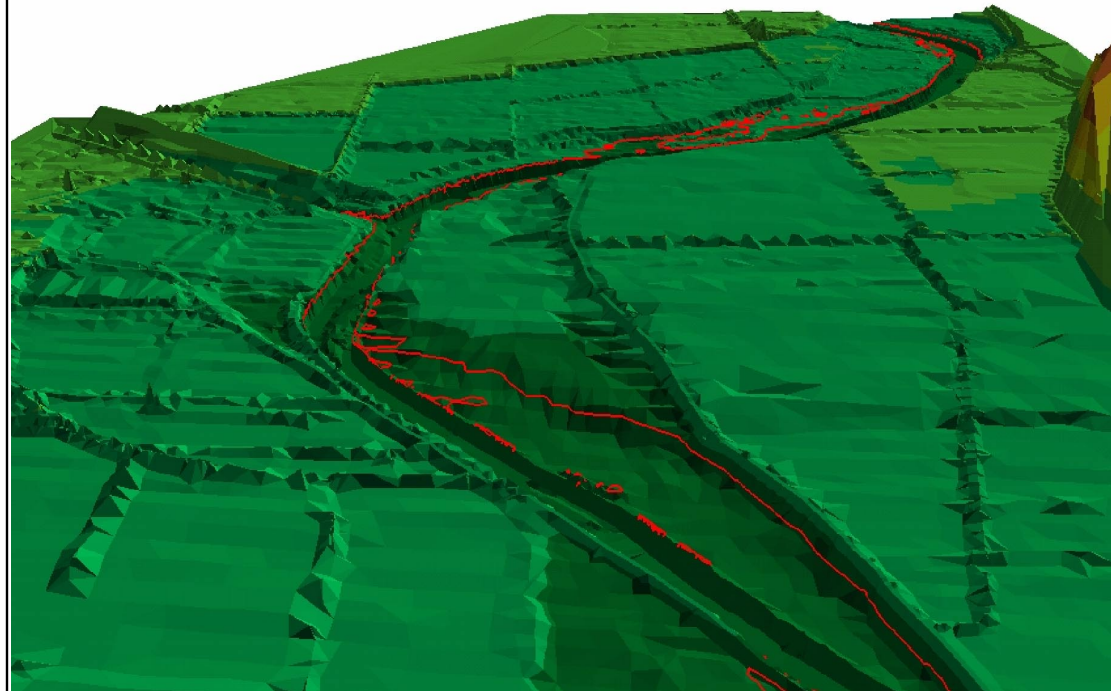
	Units	102A	102B	102D	Site Total
Project area	Acres	2.8	24.7	0.17	27.7
Excavation volume*	Cubic yards		59,774	1,097	60,871
Required spoils area (at 2 ft. deep)**	Acres		18.5	0.3	18.8
Revegetation area (native trees)	Acres	2.8			2.8
Estimated cottonwood poles (109/ac)	Number	305			305

* Estimated excavation depth of 4 ft for arroyos and 1.5 ft for shavedowns. An area of 10.4 acres was identified as potentially available for excavated soil placement near the project area.

** All spoils and graded areas will require re-vegetation.

Reference Elevation for Riparian
Habitat Development

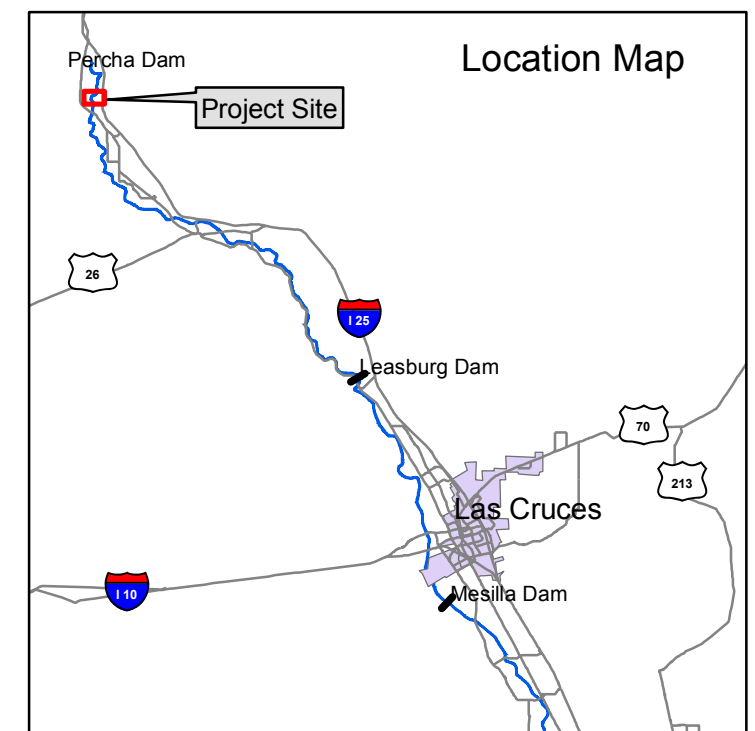
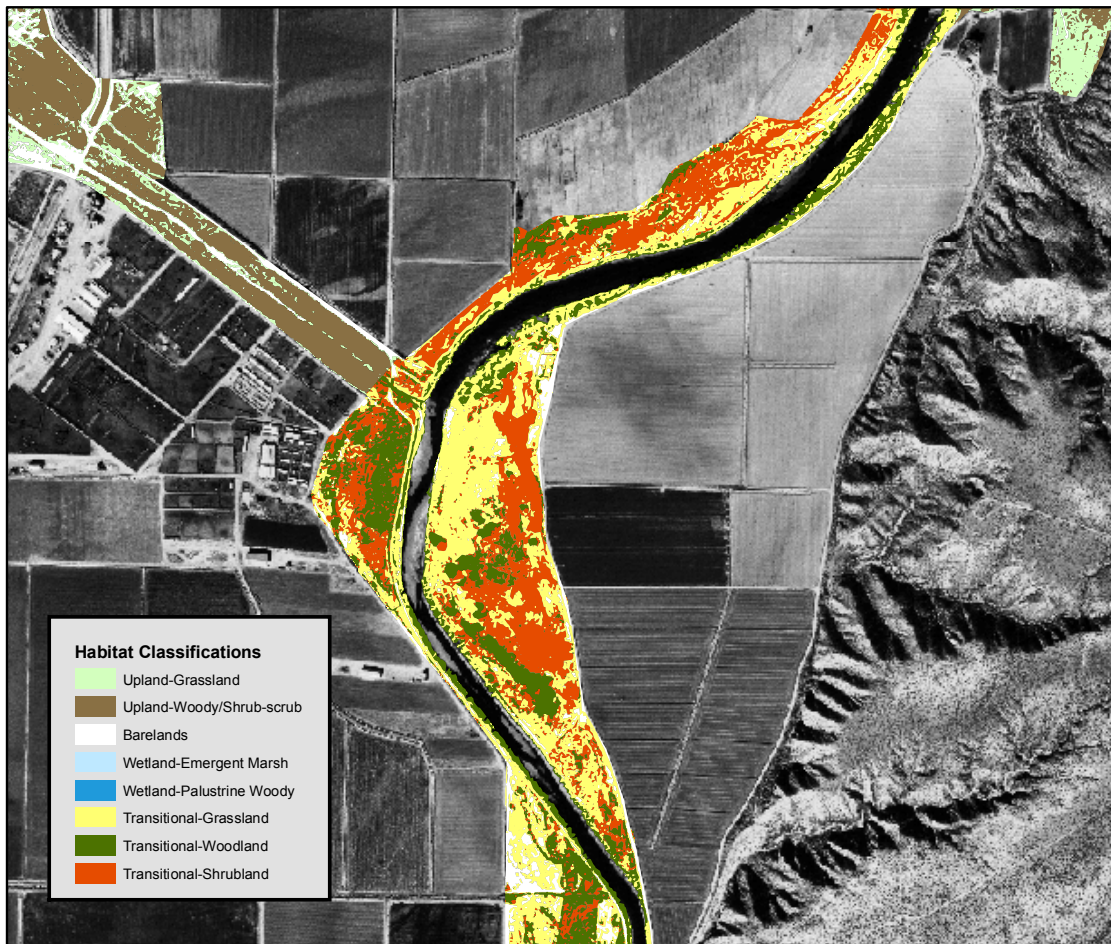
Vertical Exaggeration: 8x



Mile 102 Montoya Arroyo

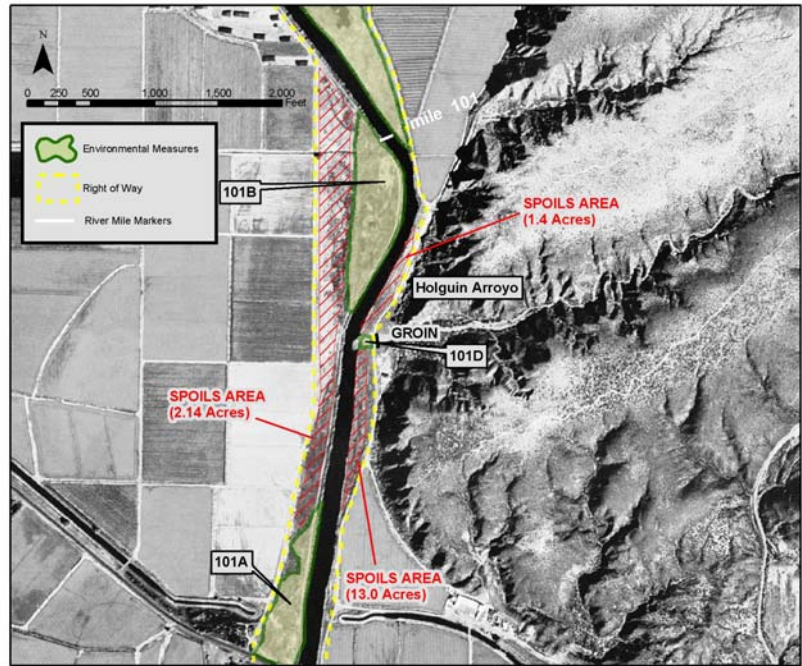
The mouth of Montoya Arroyo is on the western bank of the river at mile 101.5. The watershed covers 23 square miles and does not have a sediment control dam. The banks of the arroyo outside the ROW are heavily vegetated. This part of the ROW was originally a part of the river channel with an island separating two channels. The western channel was diked off and filled in during the RGCP construction.

Point Project Measures	ID	#	Acres
Native vegetation planting	102A	1	2.8
Bank shave downs	102B	3	24.7
Modify dredging at arroyos by creating embayments	103D	1	0.17



Mile 101 Holguin Arroyo

Project Manager _____
 Boundary and topographic survey _____
 Pre-design field survey _____
 Detailed design _____
 Nationwide Permit-27 _____
 Storm Water Pollution Prevention Plan (SWPPP) _____
 Construction _____
 Planting _____
 Maintenance and Monitoring Plan _____



Project 101A, Planting Area

- Area on west bank just upstream of Garfield Bridge has good access.

Project 101B, Shavedown

- Shave down opportunity high priority on upper west side of channel.
- East bank area down stream of arroyo is relatively high and may be unsuitable for a shavedown.
- Endangered Species (ESA) and Migratory Bird Treaty Act (MBTA) minimization measures required.

Project 101D, Modified Arroyo Dredging

- A NWP-27 permit and Pre-construction Notification (PCN) will be required, as well as SWPPP.
- Endangered Species Act (ESA) & Migratory Bird Treaty Act (MBTA) minimization measures required.
- Spoil locations are available on either side of the arroyo.

Project Construction Data

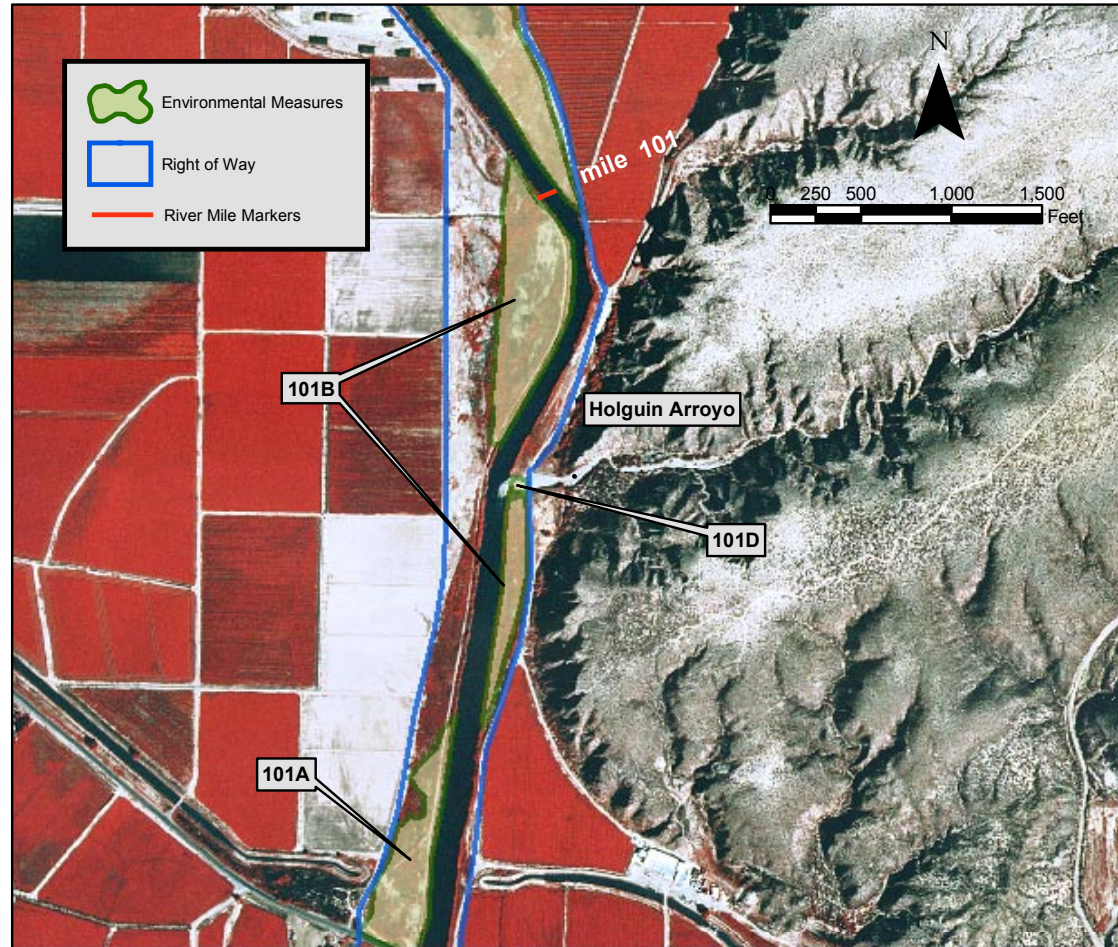
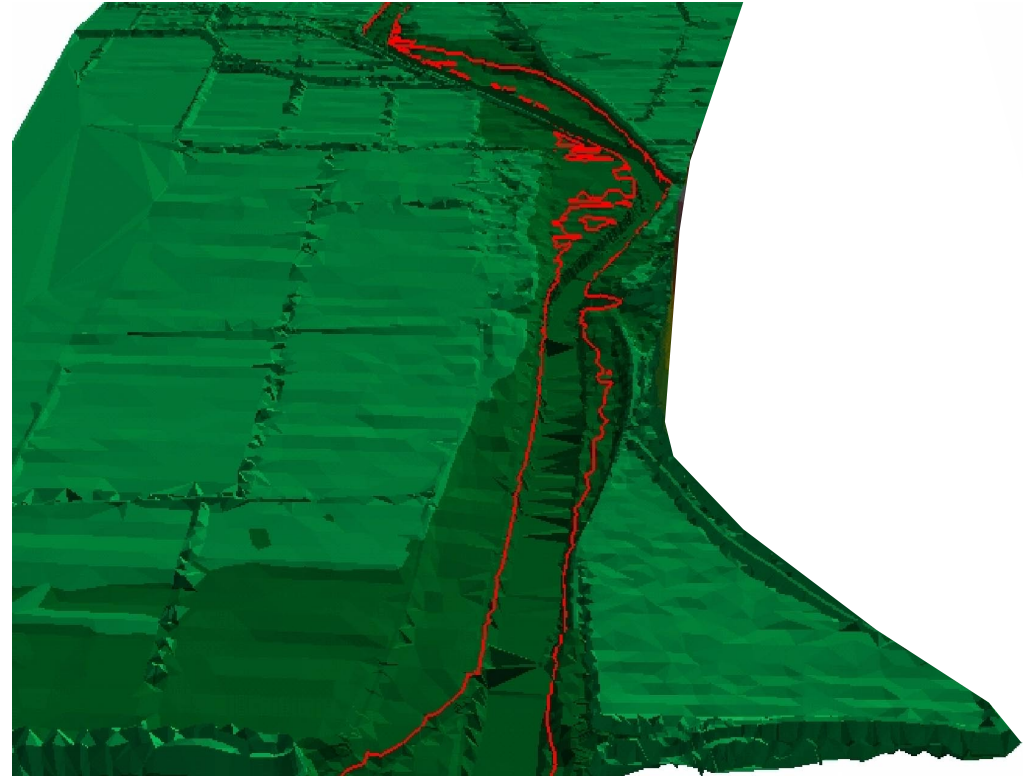
	Units	101A	101B	101D	Site Total
Project area	Acres	6.0	12.5	0.16	18.66
Excavation volume*	Cubic yards		30,250	1,032	31,282
Required spoils area (at 2 ft. deep)**	Acres		9.4	0.3	9.7
Revegetation area (native trees)	Acres	6.0			6
Estimated cottonwood poles (109/ac)	Number	654			654

* Estimated excavation depth of 4 ft for arroyos and 1.5 ft for shavedowns. An area of 16.5 acres was identified as potentially available for excavated soil placement near the project area.

** All spoils and graded areas will require re-vegetation.

Reference Elevation for Riparian Habitat Development

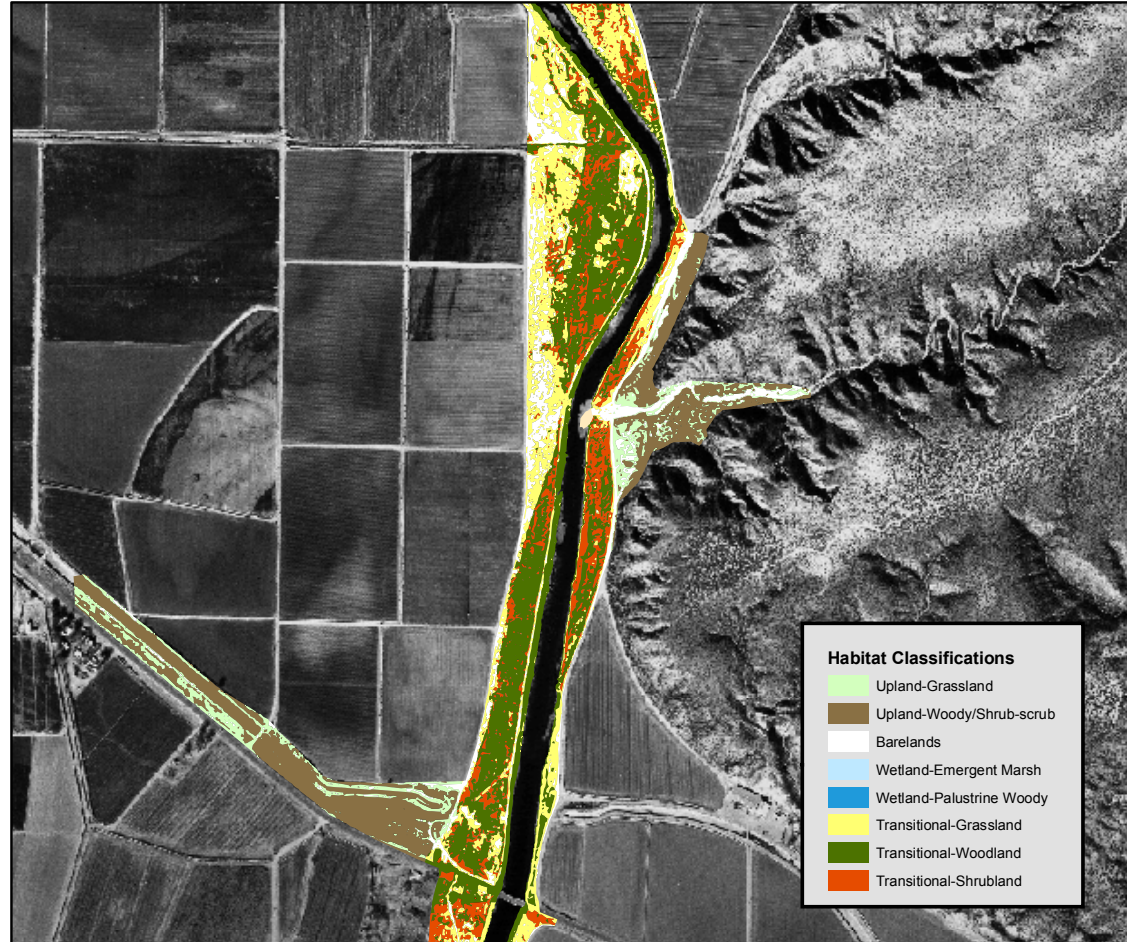
Vertical Exaggeration: 8x



Mile 101 Holguin Arroyo

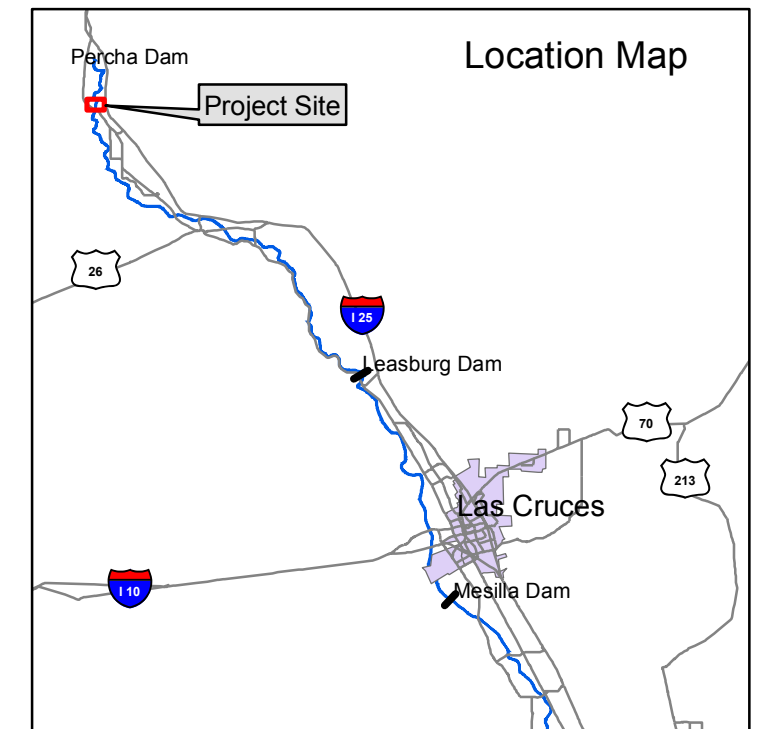
Point measures are located on the western and eastern edge of the river between Montoya and Holguin Arroyos at mile 101. Wetlands are interspersed throughout the site.

Point Project Measures	ID	#	Acres
Native vegetation planting	101A	1	6.0
Bank shave downs*	101B	2	12.5
Modify dredging at arroyos by creating embayments	101D	1	0.16



Habitat Classifications

- Upland-Grassland
- Upland-Woody/Shrub-scrub
- Barelands
- Wetland-Emergent Marsh
- Wetland-Palustrine Woody
- Transitional-Grassland
- Transitional-Woodland
- Transitional-Shrubland



Mile 99 Green and Tierra Blanca Arroyos

Project Manager _____

Boundary and topographic survey

Pre-design field survey _____

Detailed design _____

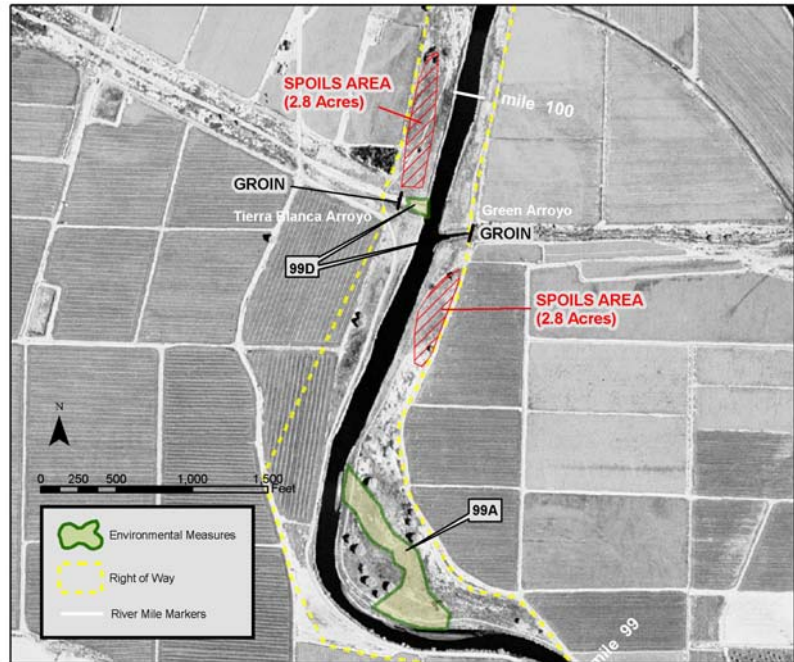
Nationwide Permit-27 _____

Storm Water Pollution Prevention
Plan (SWPPP) _____

Construction _____

Planting _____

Maintenance and Monitoring Plan



Project 99A, Planting Area

- Former meander area is high, may be difficult to plant down to groundwater.
- Downstream portion is low lying and offers good opportunity for cottonwood establishment.
- Need to check west bank ROW boundaries. There appears to be an encroachment.
- Large vortex weir across channel which has created a large deep hole below the weir and backed up sediment above it.

Project 99D, Modified Arroyo Dredging

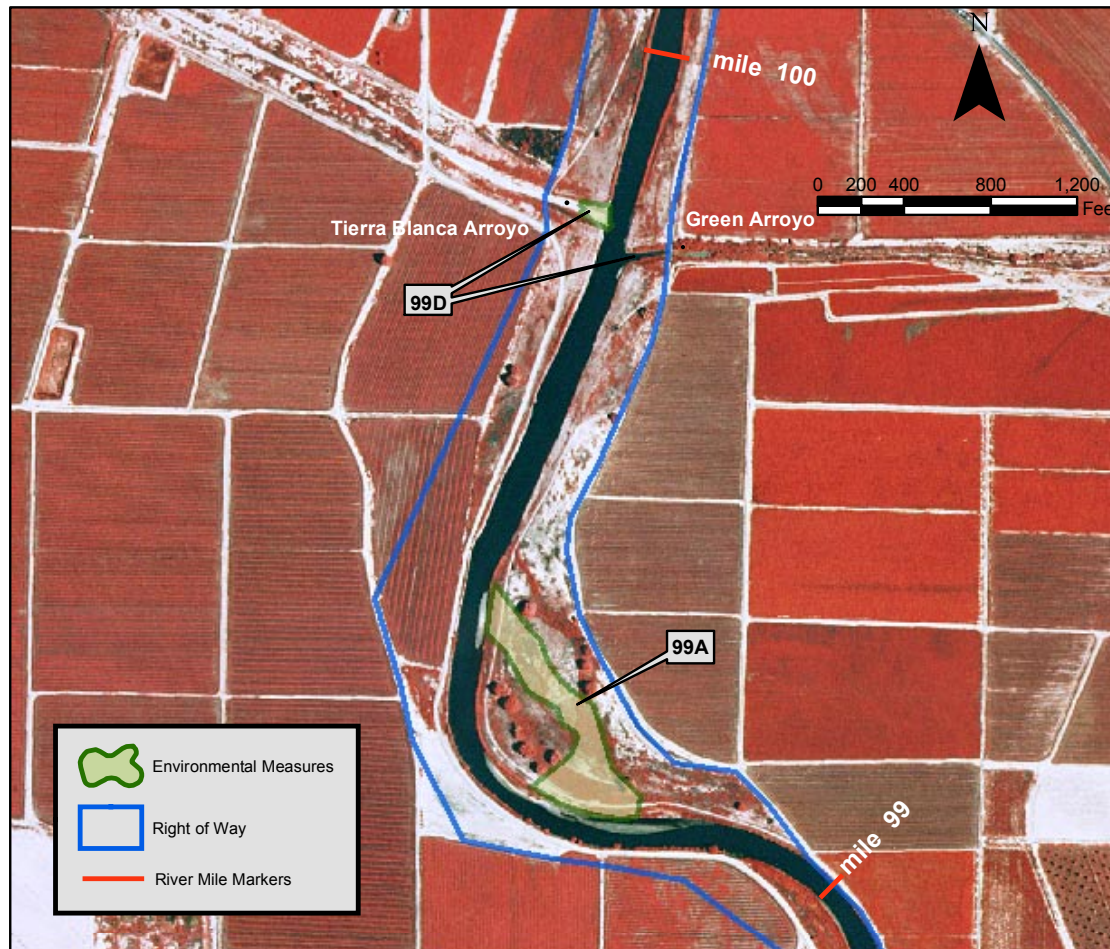
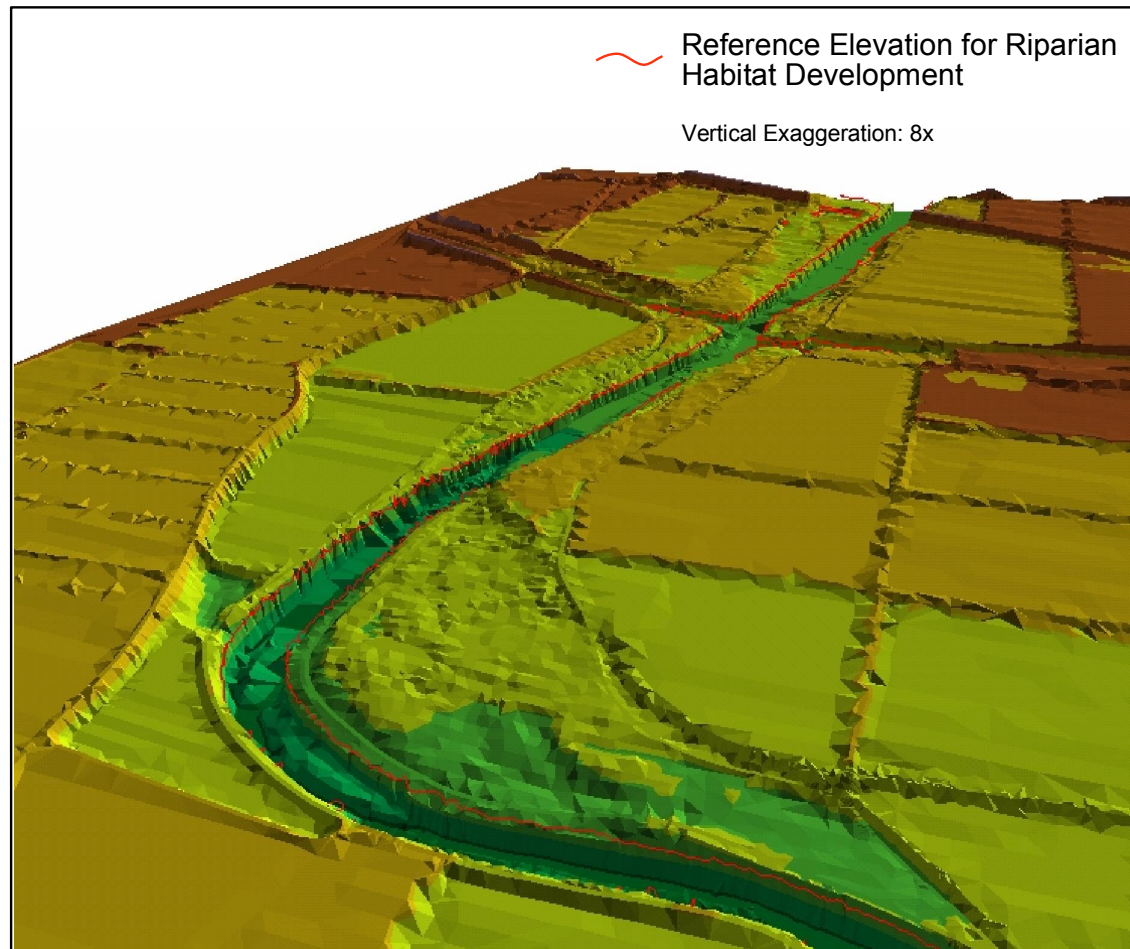
- Open the mouth at Green Arroyo and install a groin upstream in the arroyo to keep deep water habitat open.
- Plenty of area available for spoils.
- A NWP-27 permit and Pre-construction Notification (PCN) will be required, as well as SWPPP.

Project Construction Data

	Units	99A	99D	Site Total
Project area	Acres	5.05	0.27	5.32
Excavation volume*	Cubic yards		653.4	563.4
Required spoils area (at 2 ft. deep)**	Acres		0.54	0.2
Potentially Available Spoils Area	Acres			5.6
Revegetation area (native trees)	Acres	5.05		5.5
Estimated cottonwood poles (109/ac)	Number	550		550

* Estimated excavation depth of 4 ft for arroyos and 1.5 ft for shavedowns. An area of 5.6 acres was identified as potentially available for excavated soil placement near the project area.

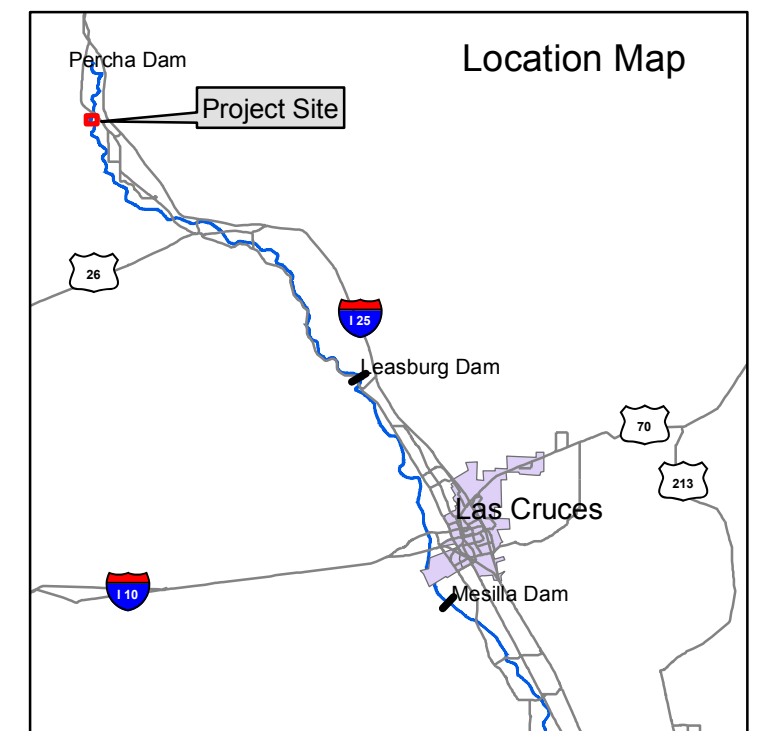
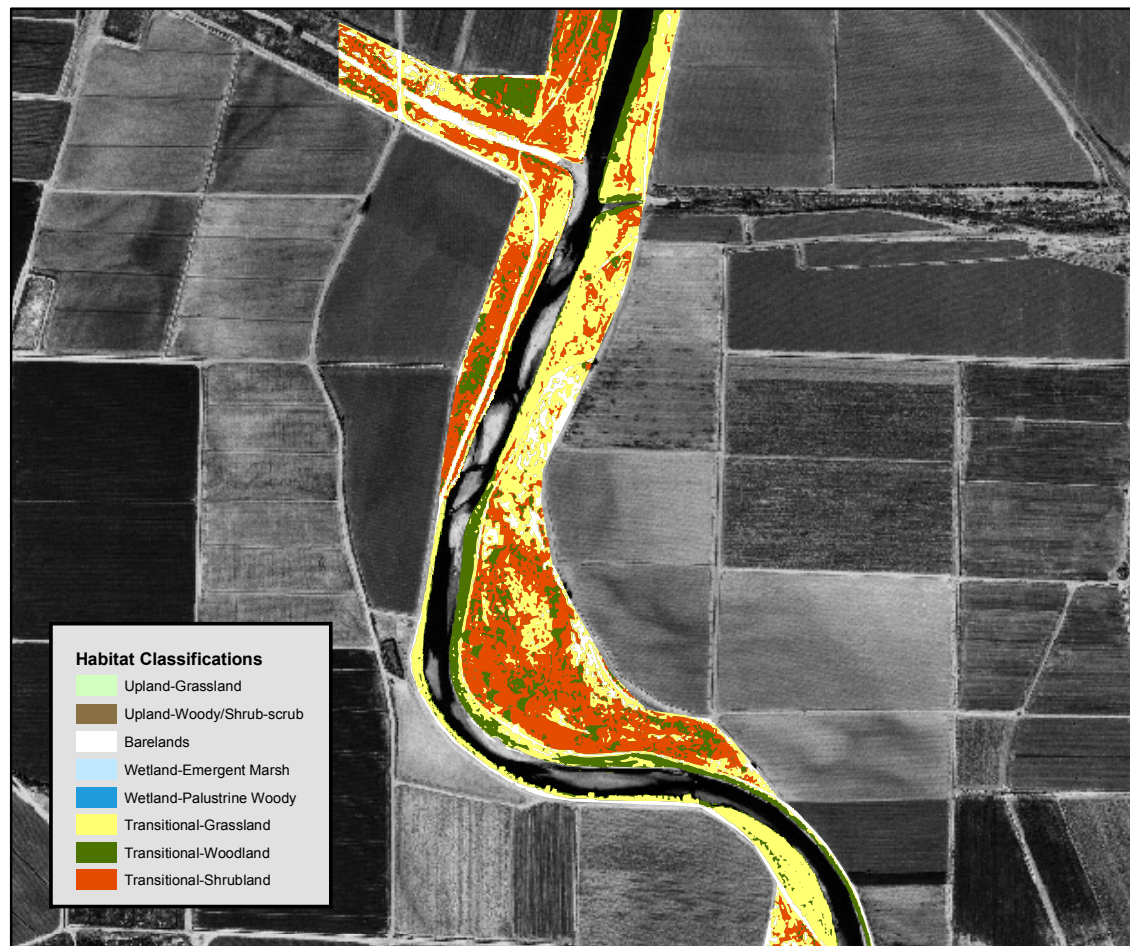
** All spoils and graded areas will require re-vegetation.



Mile 99 Green-Tierra Blanca

Tierra Blanca Arroyo enters the river on the west bank opposite Green Arroyo south of mile 100. Green Arroyo has an erosion control dam designated SCS Dam 1A and a watershed of 68.2 square miles and extending westward a distance of 30.2 miles. Tierra Blanca Arroyo deposits sediment within the river that must be periodically dredged.

Point Project Measures	ID	#	Acres
Native vegetation planting	99A	1	5.05
Modify dredging at arroyos by creating embayments	99D	2	0.27



Mile 98 Sibley Point Bar

Project Manager _____

Boundary and topographic survey

Pre-design field survey _____

Detailed design _____

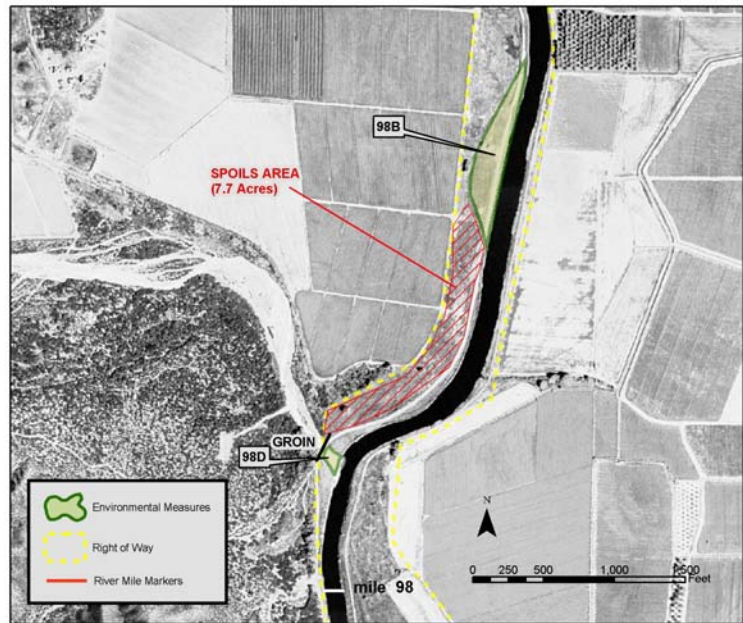
Nationwide Permit-27 _____

Storm Water Pollution Prevention
Plan (SWPPP) _____

Construction _____

Planting _____

Maintenance and Monitoring Plan



Project 98B, Shavedown

- Spoil placement located adjacent to shaveddown areas.
- SWPPP required prior to construction.
- Mitigation and minimization measures per USFWS recommendations.

Project 98D, Modified Arroyo Dredging

- Adjacent to a large area of BLM land.
- USIBWC ROW does not appear to extend west of riverbank at the meander.
- NWP-27 and Pre-construction Notification (PCN) required for work below Ordinary High Water Mark.

Project Construction Data

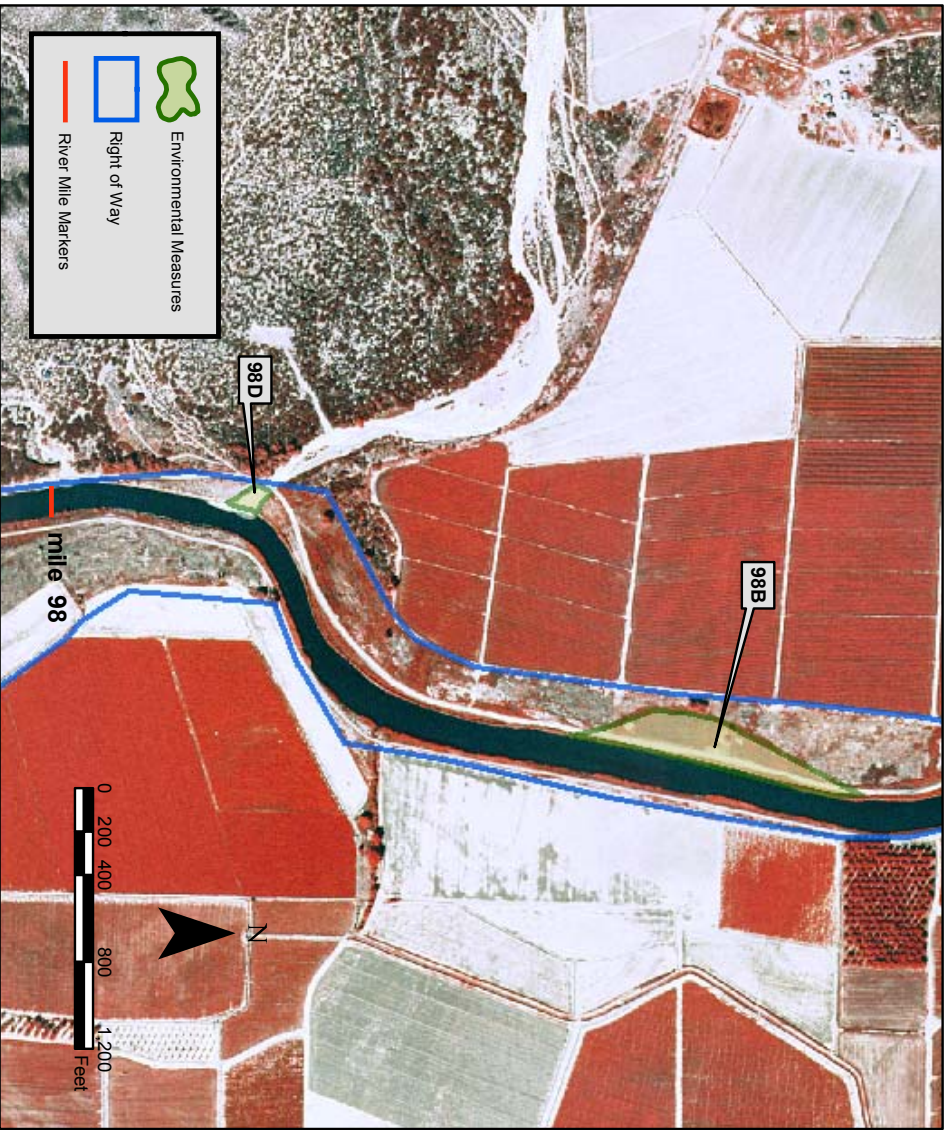
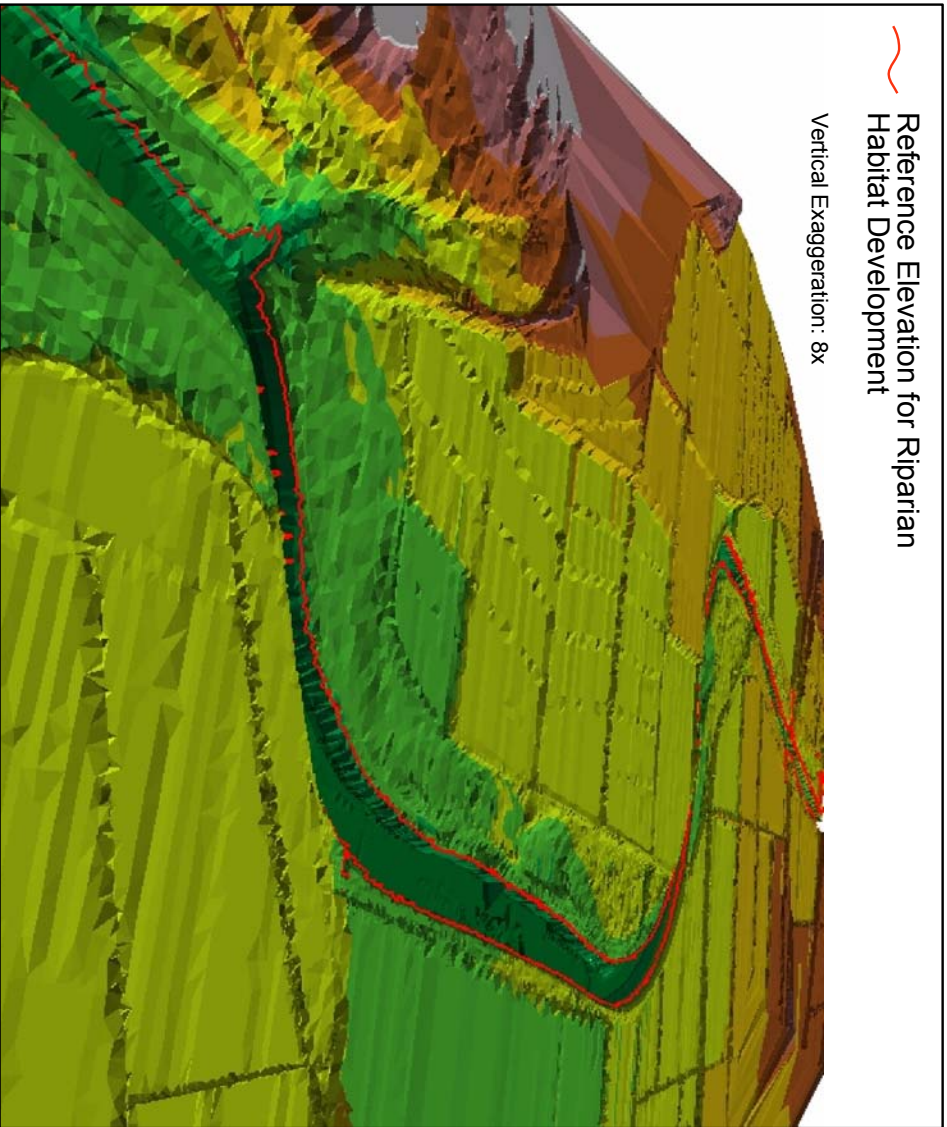
	Units	98B	98D	Site Total
Project area	Acres	4.1	0.27	4.37
Excavation volume*	Cubic yards	9,922	1,742	11,664
Required spoils area (at 2 ft. deep)**	Acres	3.1	0.5	3.6

* Estimated excavation depth of 4 ft for arroyos and 1.5 ft for shavedowns. An area of 7.7 acres was identified as potentially available for excavated soil placement near the project area..

** All spoils and graded areas will require re-vegetation.

Reference Elevation for Riparian
Habitat Development

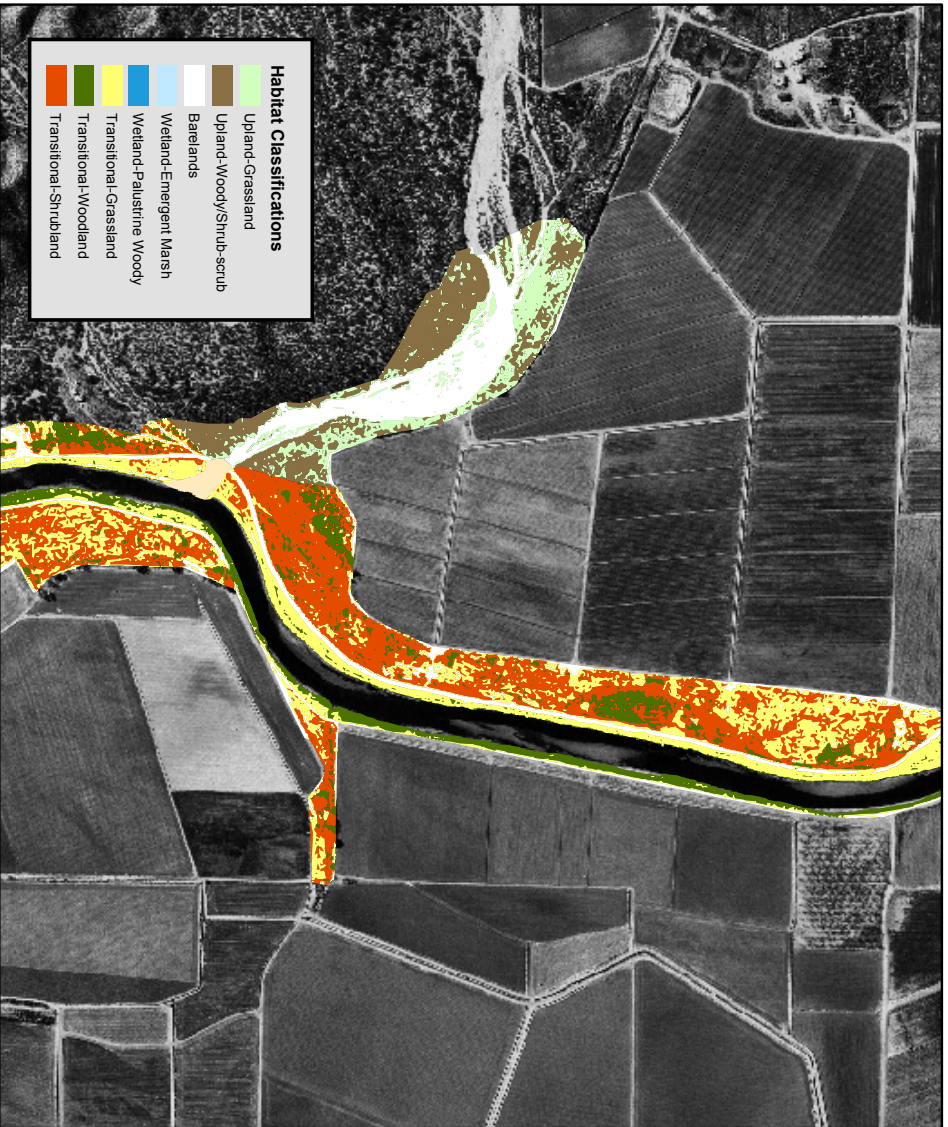
Vertical Exaggeration: 8x



Mile 98 Sibley Point Bar

Sibley Arroyo deposits sediment within the river that has been periodically dredged. The eastern side of the river supports a point bar opposite the mouth of Sibley Arroyo at mile 98.

Point Project Measures	ID	#	Acres
Bank shave downs*	98B	1	4.1
Modify dredging at arroyos by creating embayments	98D	1	0.27

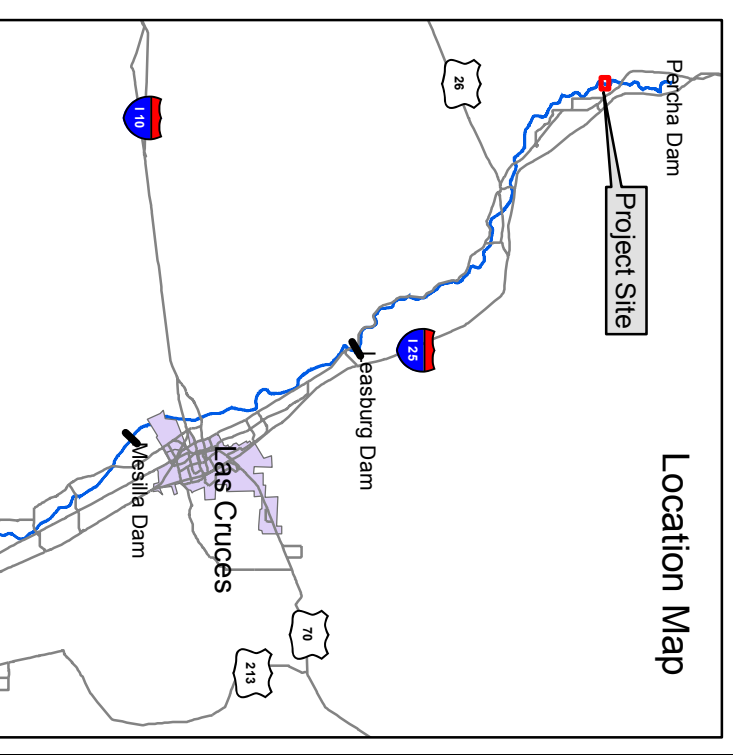


- Habitat Classifications**
- Upland-Grassland
 - Upland-Woody/Shrub-scrub
 - Barelands
 - Wetland-Emergent Marsh
 - Wetland-Palustrine Woody
 - Transitional-Grassland
 - Transitional-Woodland
 - Transitional-Strubland

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Location Map



Mile 97 Jaralosa Arroyo

Project Manager _____

Boundary and topographic survey

Pre-design field survey _____

Detailed design _____

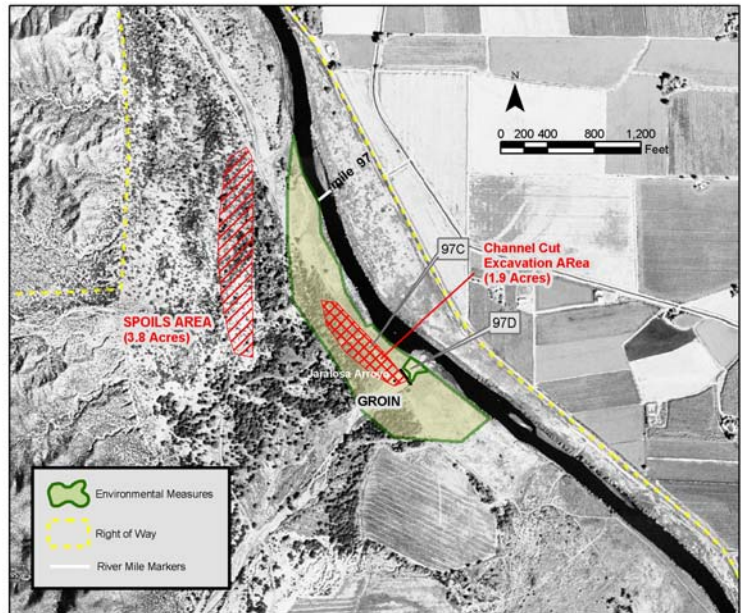
Nationwide Permit-27 _____

Storm Water Pollution Prevention
Plan (SWPPP) _____

Construction _____

Planting _____

Maintenance and Monitoring Plan



Project 97C, Partial Meander Reopening (Not included in 2004 RMP)

- This measure was considered low priority due to elevation and amount of spoil generated, and was not included in the 2004 RMP. The former meander footprint is 28 acres, and the excavation area would be limited to 1.0 acres. Excavated spoils were estimated at 2,420 cubic yards for a 4-foot excavation depth.
- Unstable margin downstream of arroyo; the process can be allowed to continue if the west bank is reinforced with armoring further into the floodway.

Project 97D (Modified Arroyo Dredging)

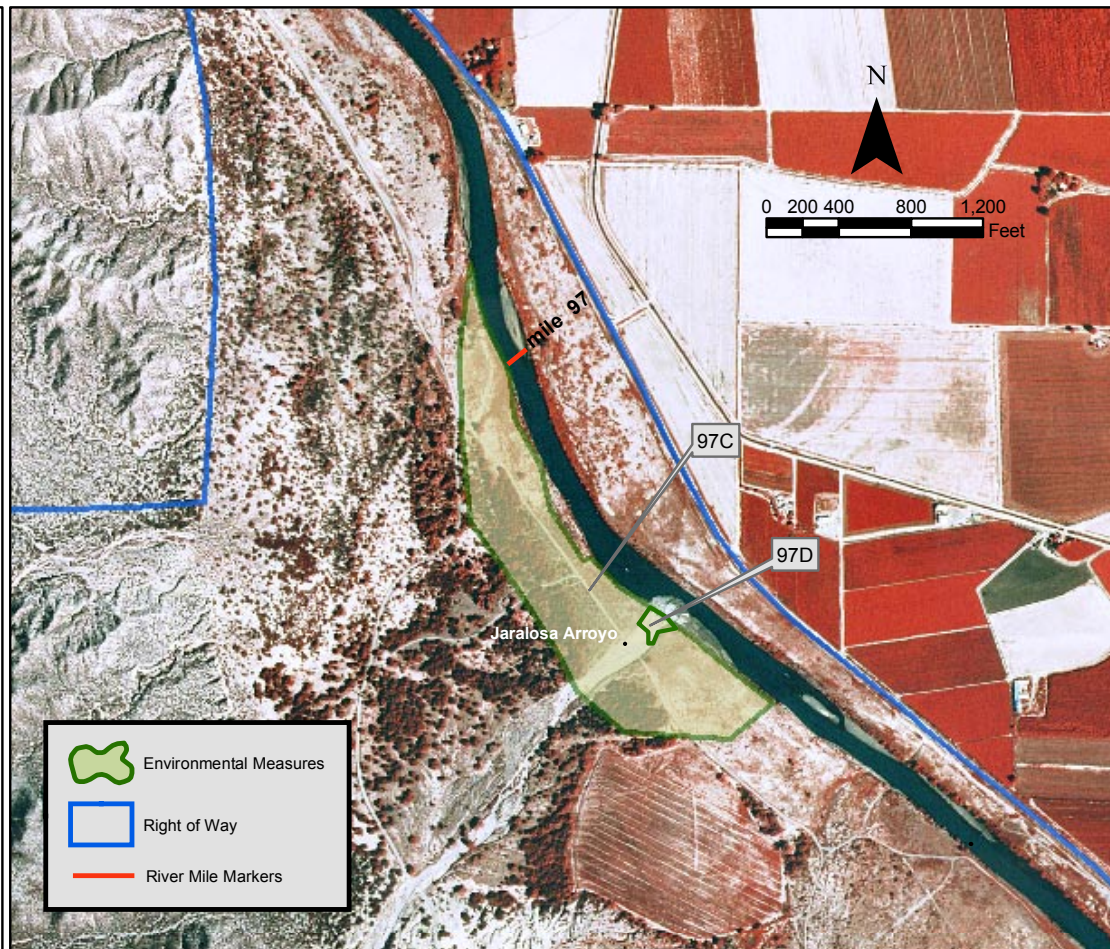
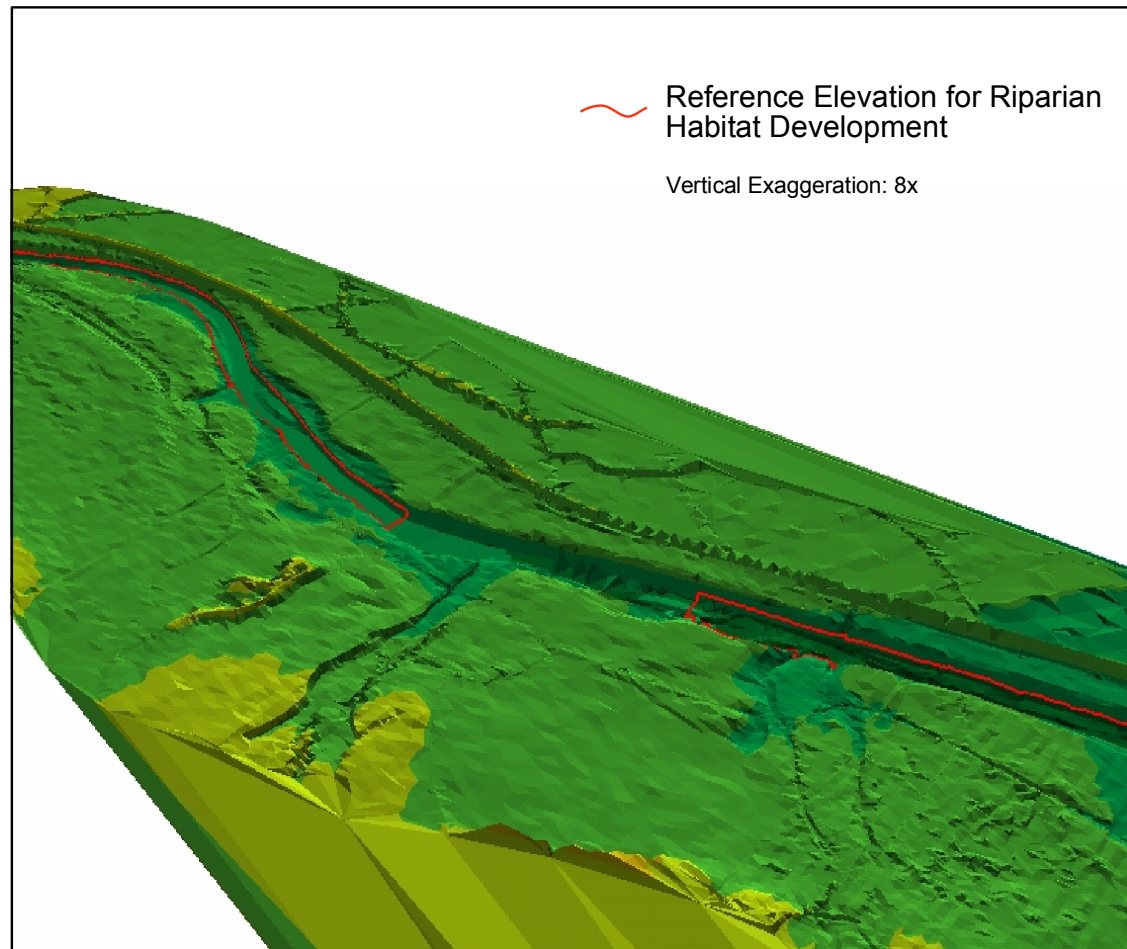
- Excavate arroyo mouth as an embayment.
- NWP-27 and Pre-construction Notification (PCN) required for work below Ordinary High Water Mark.

Project Construction Data

	Units	97D
Project area	Acres	0.44
Excavation volume*	Cubic yards	2,839
Required spoils area (at 2 ft. deep)**	Acres	0.9

* Estimated excavation depth of 4 ft for arroyos and 1.5 ft for shavedowns. An area of 4.8 acres was identified as potentially available for excavated soil placement near the project area.

** All spoils and graded areas will require re-vegetation.

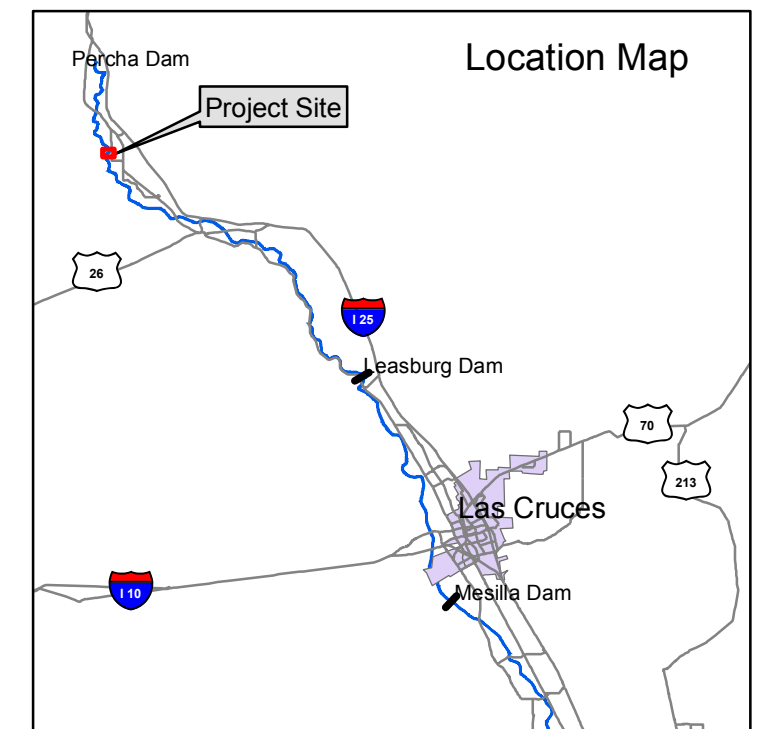
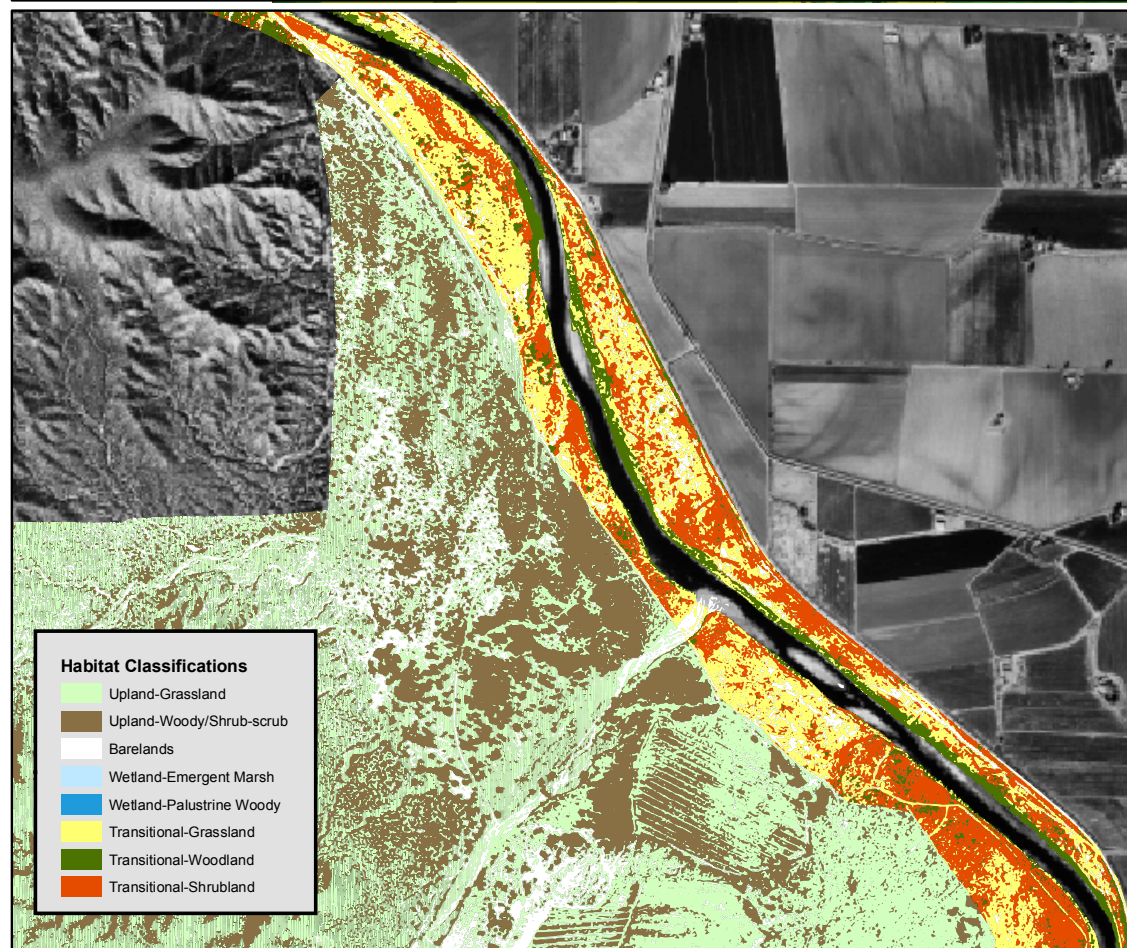


Mile 97 Jaralosa Arroyo

Jaralosa Arroyo enters the west side of the river near mile 96.5 through a channel, which diverted flow from its original route. The channel conveys the combined flow of Jaralosa Arroyo and Berrenda Creek both of which have dams. Despite the dams, the arroyo deposits sediment that creates islands in the river. Part of the ROW is leased for cultivation (approximately 60 ac). A former meander is on the west side of the river. Although the meander is outside the hydrologic floodplain, it presents a restoration opportunity (through excavation) due to ROW width.

Point Project Measures	ID	#	Acres
Modify dredging at arroyos by creating embayments	97D	1	0.44

NOTE: Partial reopening of former meanders (measure "C") is not included in the 2004 RMP.



Mile 95 Jaralosa South

Project Manager _____

Boundary and topographic survey

Pre-design field survey _____

Detailed design _____

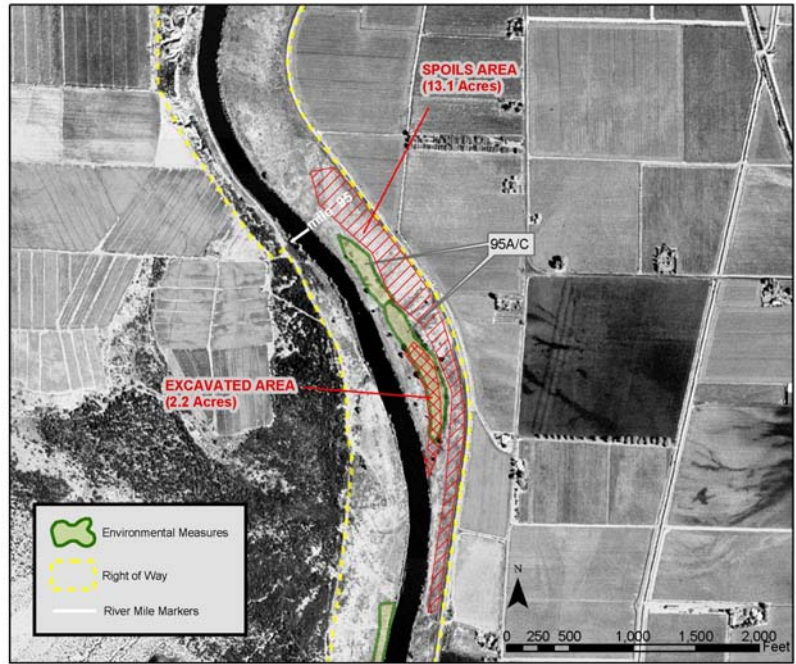
Nationwide Permit-27 _____

Storm Water Pollution Prevention
Plan (SWPPP) _____

Construction _____

Planting _____

Maintenance and Monitoring Plan



Project 95A, Planting Area

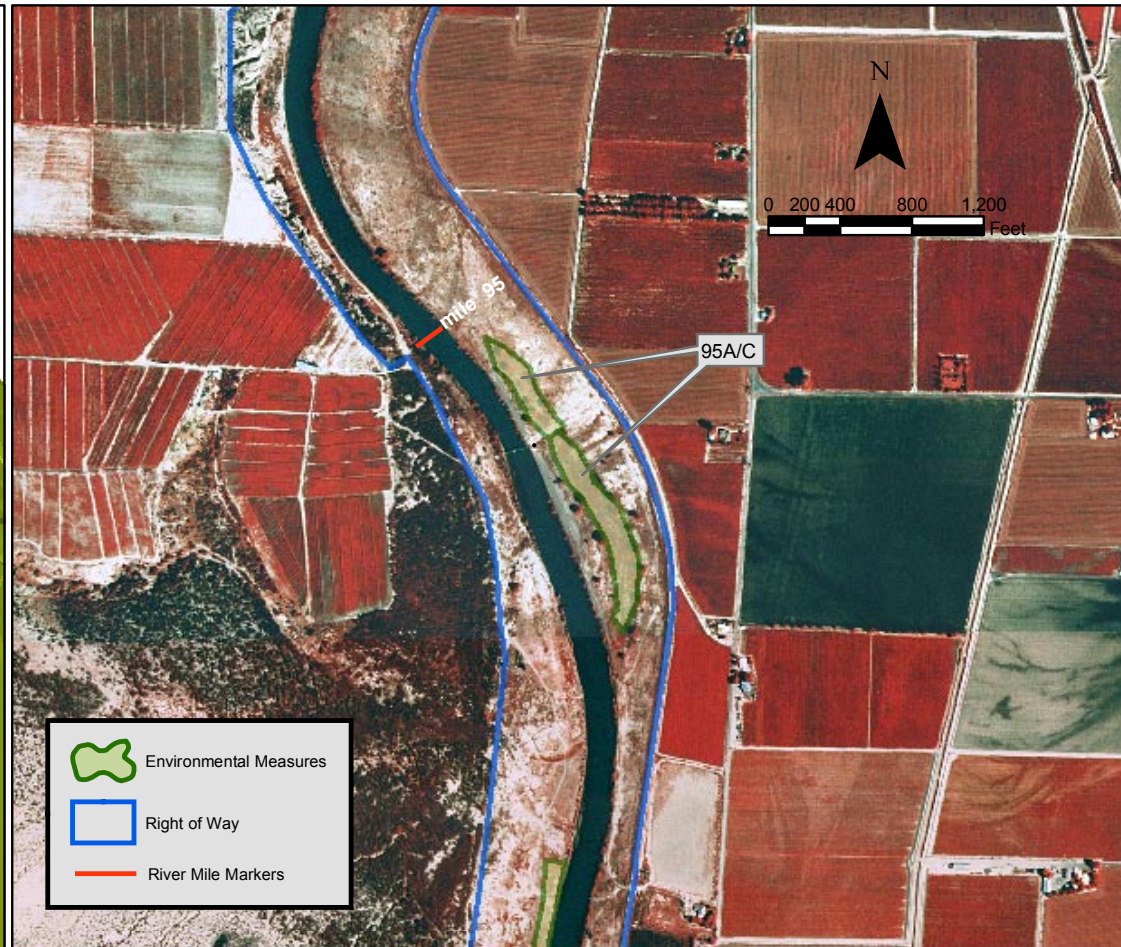
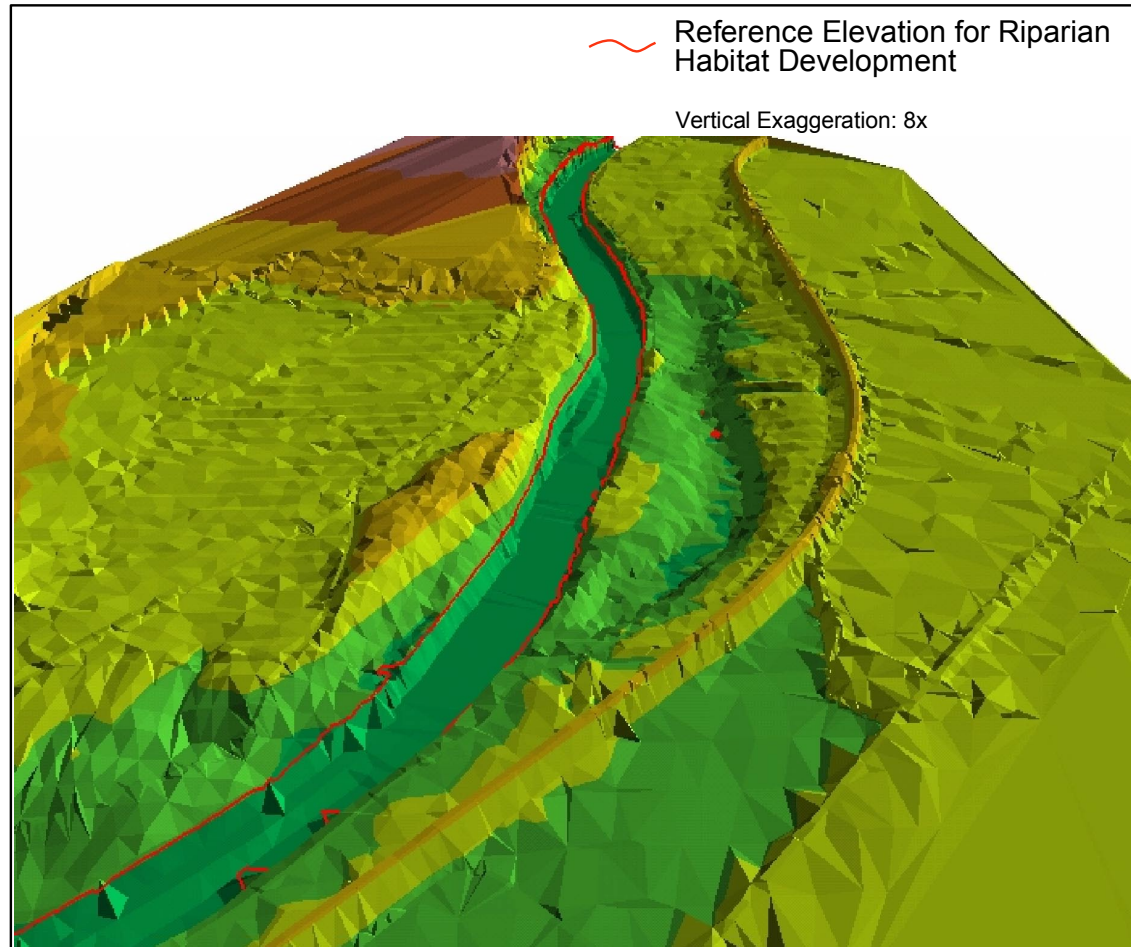
- An area of 5.1 acres (former meander footprint) will be vegetated with native plant species.

Project 95C, Partial Meander Reopening (Not included in 2004 RMP)

- This measure was considered low priority due to elevation and amount of spoil generated, and was not included in the 2004 RMP. The former meander footprint is 5.1 acres, and the excavation area would be limited to 2.2 acres. Excavated spoils were estimated at 5,324 cubic yards for a 4-foot excavation depth. An area of 13.1 acres was identified as potentially available for excavated soil placement near the project area.

Project Construction Data

	Units	95A
Project area	Acres	5.1
Revegetation area (native trees)	Acres	2.9
Estimated cottonwood poles (109/ac)	Number	316

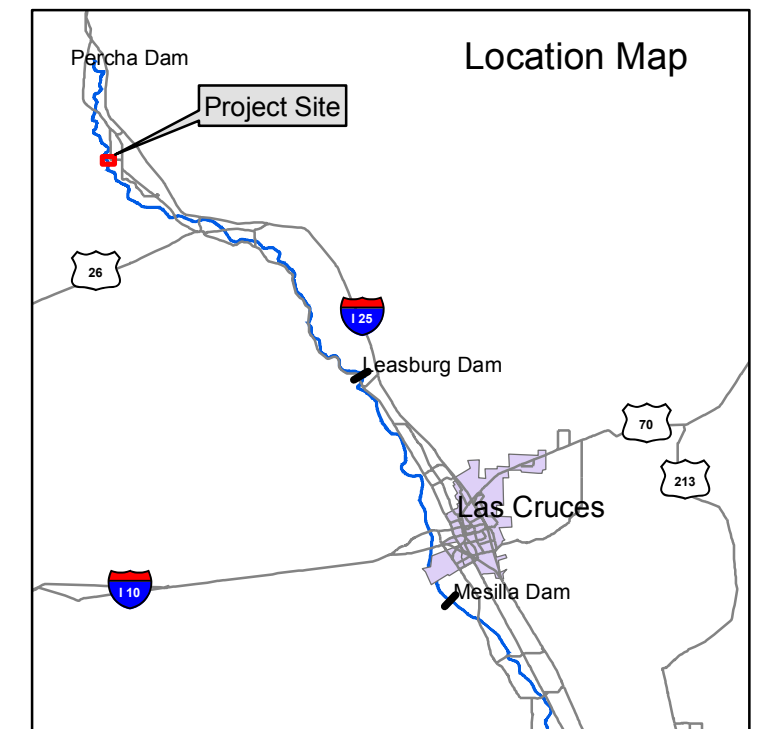
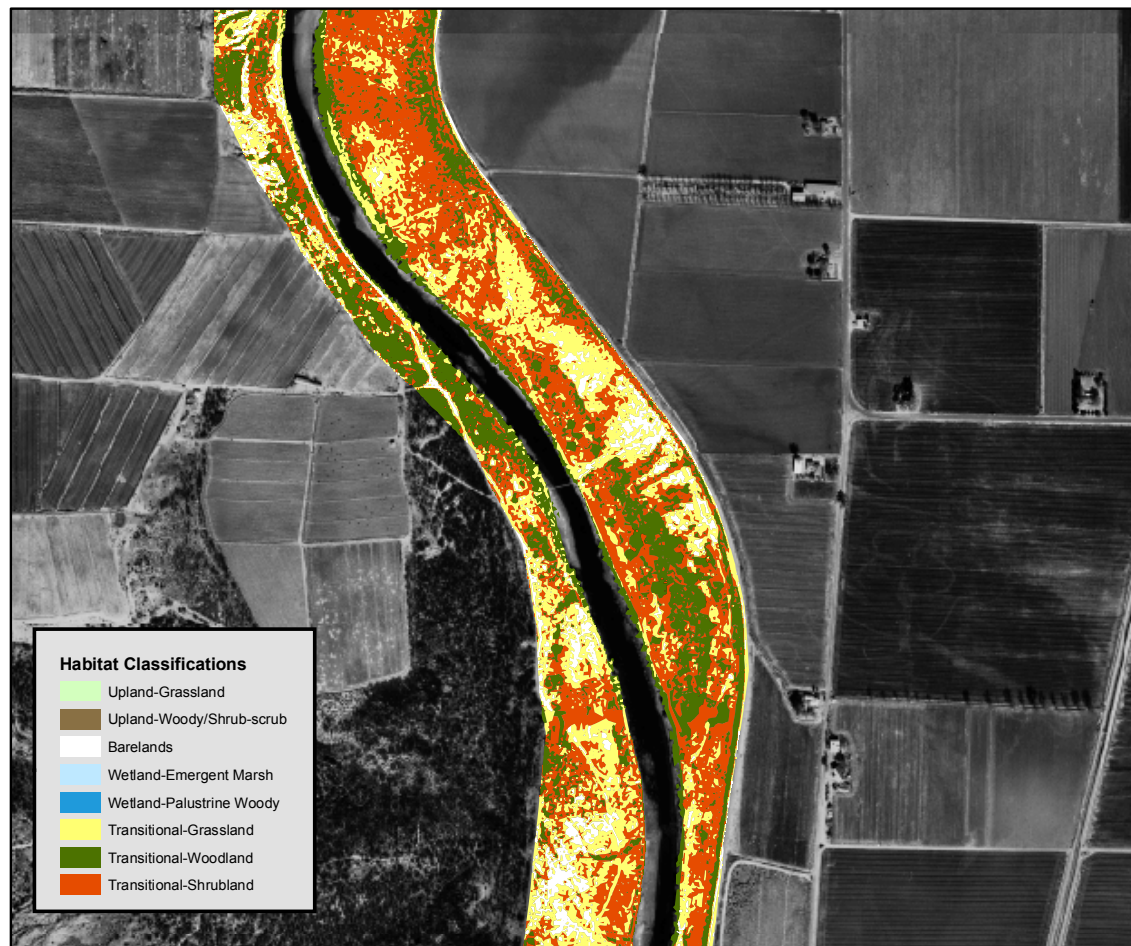


Mile 95 Jaralosa South

Jaralosa Arroyo enters the west side of the river near mile 96.5 through a channel, which diverted flow from its original route. The channel conveys the combined flow of Jaralosa Arroyo and Berrenda Creek both of which have dams. Despite the dams, the arroyo deposits sediment that creates islands in the river. A former meander is located on the east side.

Point Project Measures	ID	#	Acres
Native vegetation planting	95A	2	5.1

NOTE: Partial reopening of former meanders (measure "C") is not included in the 2004 RMP.



Mile 94 Yeso Arroyo

Project Manager _____

Boundary and topographic survey

Pre-design field survey _____

Detailed design _____

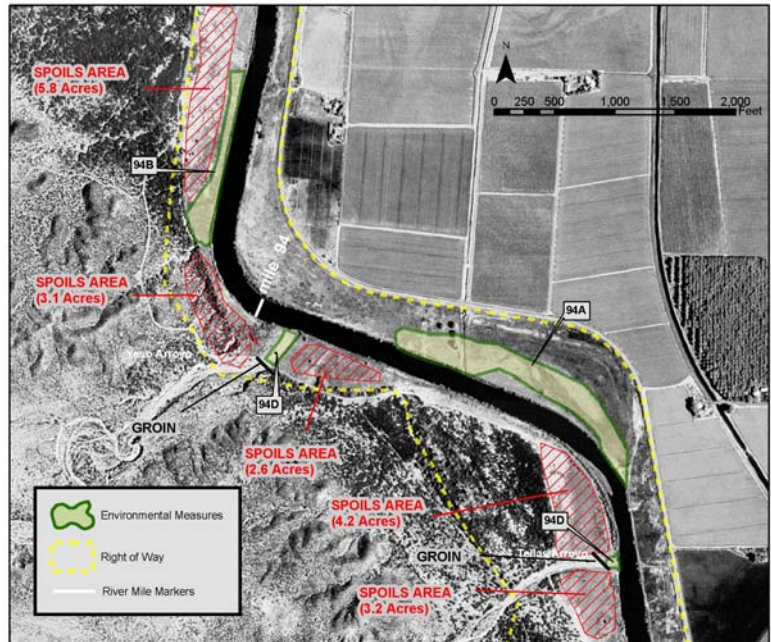
Nationwide Permit-27 _____

Storm Water Pollution Prevention
Plan (SWPPP) _____

Construction _____

Planting _____

Maintenance and Monitoring Plan



Project 94A, Planting Area

- There is a large mowed plain with some sporadic mature cottonwoods and a few juvenile cottonwoods in the plain.
- The former meander footprint area is suitable for grassland and tree planting.
- There is a possible backwater cut opportunity on the south end of the proposed meander.

Project 94B, Shavedown

- Although bank is elevated, significant spoil locations are adjacent to construction location.

Project 94D, Modified Arroyo Dredging

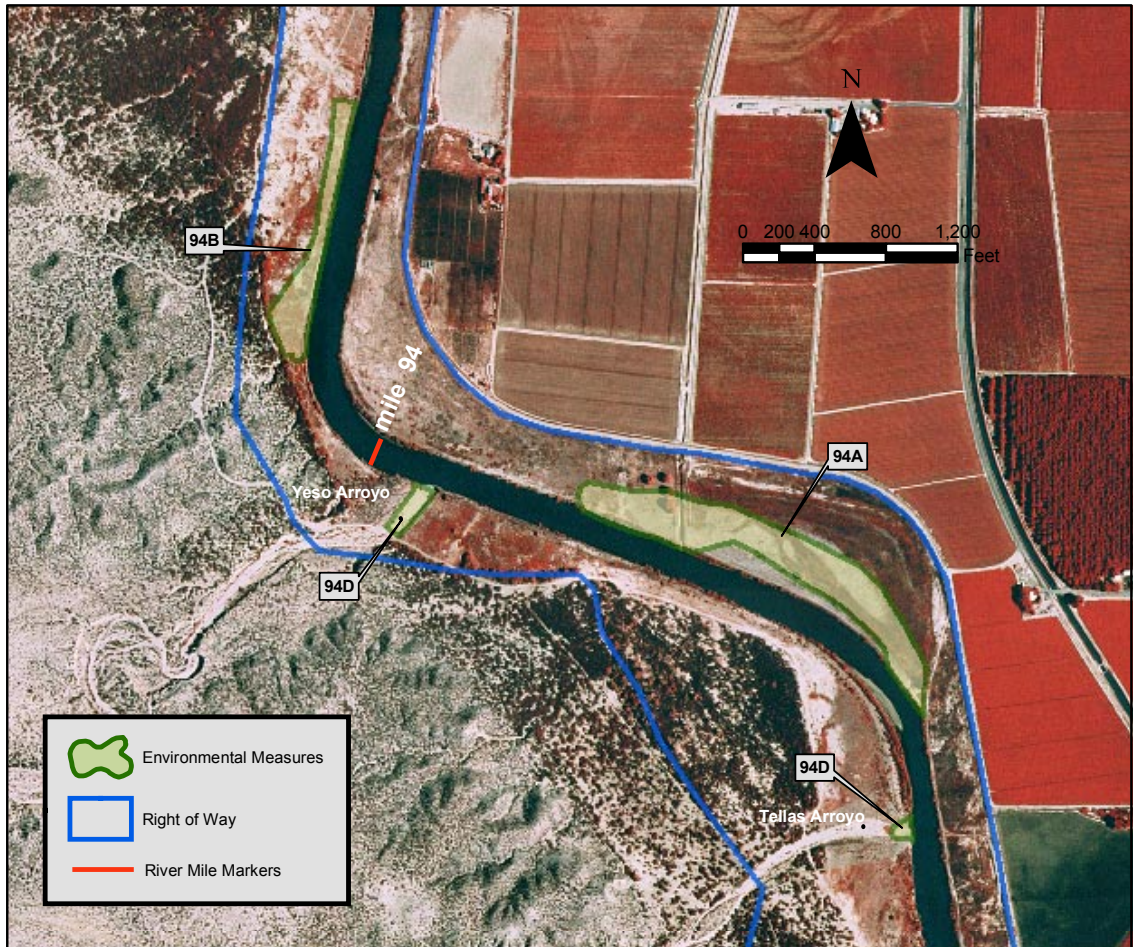
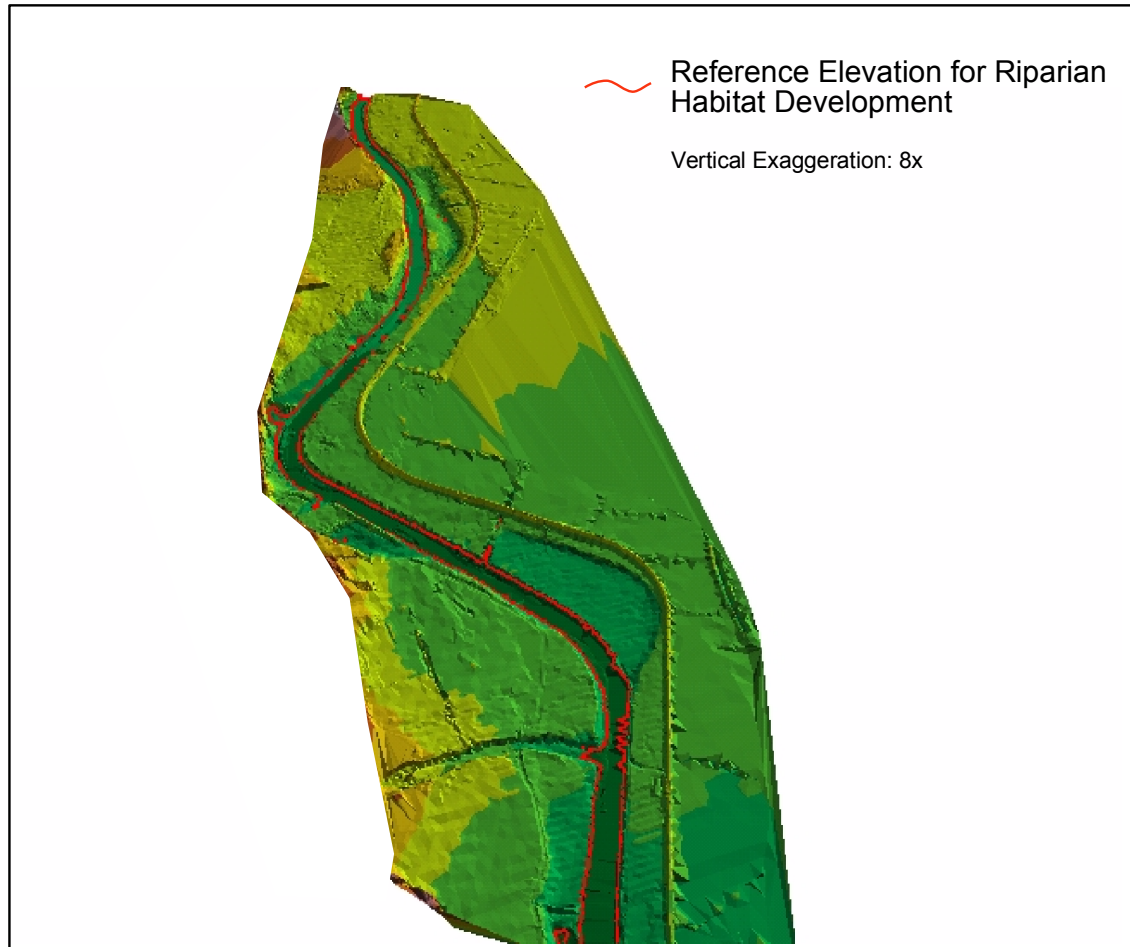
- Both arroyos discharge large amounts of sediment into the channel. Dredging the arroyo mouth and clearing channel appear to be needed.
- NWP-27 and Pre-construction Notification (PCN) required for work below Ordinary High Water Mark.

Project Construction Data

	Units	94A	94B	94D	Site Total
Project area	Acres	11.5	3.9	0.44	15.84
Excavation volume*	Cubic yards		9,438	2,840	12,278
Required spoils area (at 2 ft. deep)**	Acres		2.9	0.9	3.8
Revegetation area (native trees)	Acres	11.5			11.5
Estimated cottonwood poles (109/ac)	Number	1254			1254

* Estimated excavation depth of 4 ft for arroyos and 1.5 ft for shavedowns. An area of 18.9 acres was identified as potentially available for excavated soil placement near the project area.

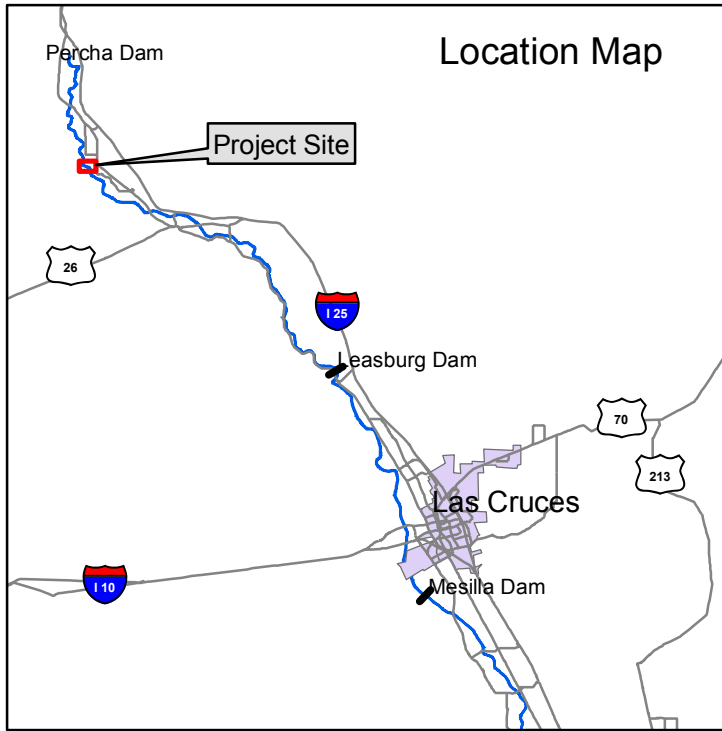
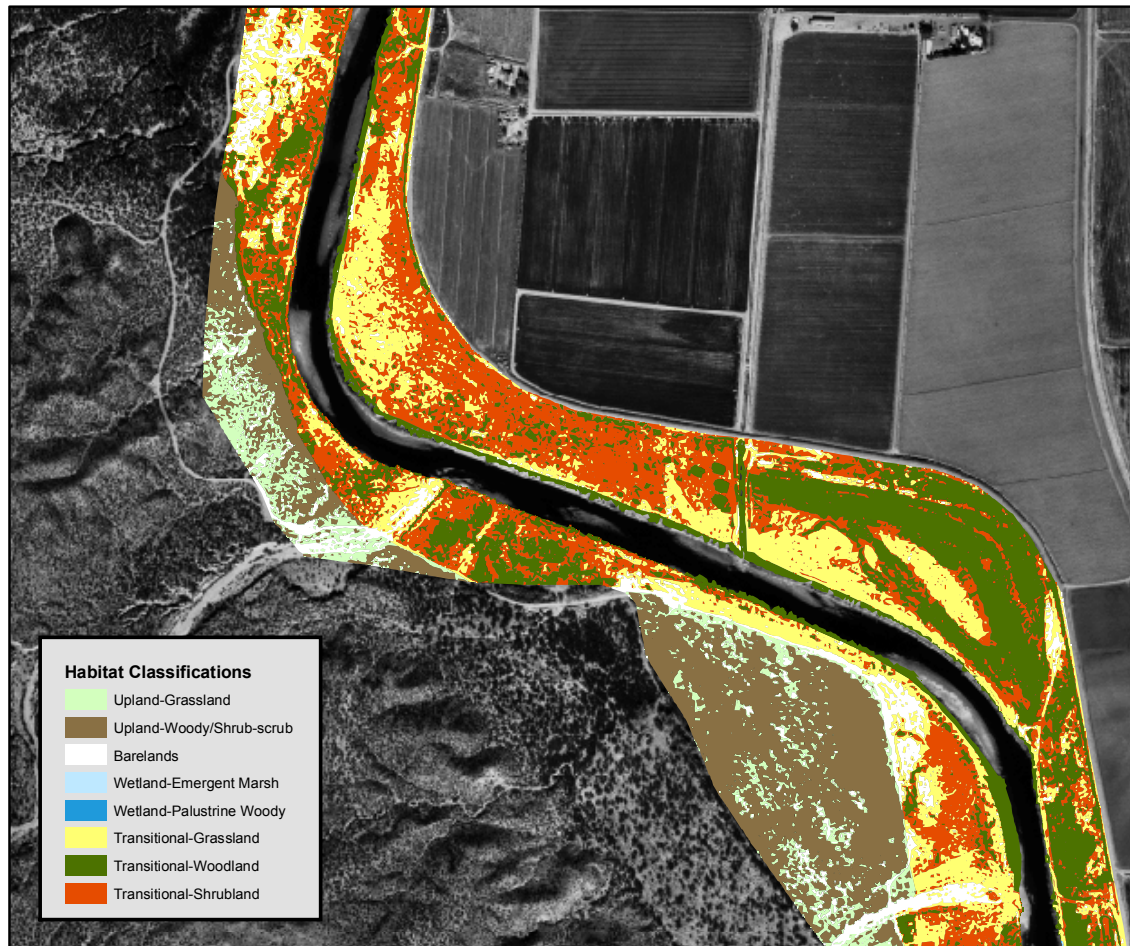
** All spoils and graded areas will require re-vegetation.



Mile 94 Yeso Arroyo

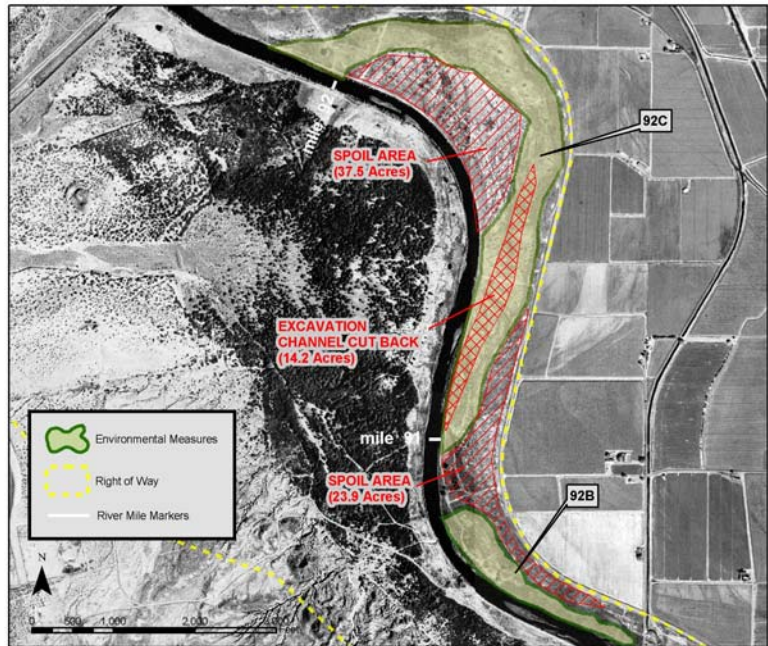
BLM lands abut the ROW to the west. A large remnant bosque is present on the western side of the river. The west bank contains mature scattered cottonwoods and understory mesquite and salt cedar. Salt cedar dominates the east bank. Yeso Arroyo has a watershed of 9.5 square miles and extends 6.1 miles to the west.

Point Project Measures	ID	#	Acres
Native vegetation planting	94A	1	11.5
Bank shave downs*	94B	1	3.9
Modify dredging at arroyos by creating embayments	94D	2	0.44



Mile 92 Crow Canyon

Project Manager _____
 Boundary and topographic survey _____
 Pre-design field survey _____
 Detailed design _____
 Nationwide Permit-27 _____
 Storm Water Pollution Prevention Plan (SWPPP) _____
 Construction _____
 Planting _____
 Maintenance and Monitoring Plan _____



Project 92B, Shavedown

- Limited spoil locations are adjacent to shavedowns.
- The site is considered a low priority due to elevated bank and limited spoil disposal capacity.
- NWP-27 and Pre-construction Notification (PCN) required for work below Ordinary High Water Mark.

Project 92C, Partial Meander Reopening (Not included in 2004 RMP)

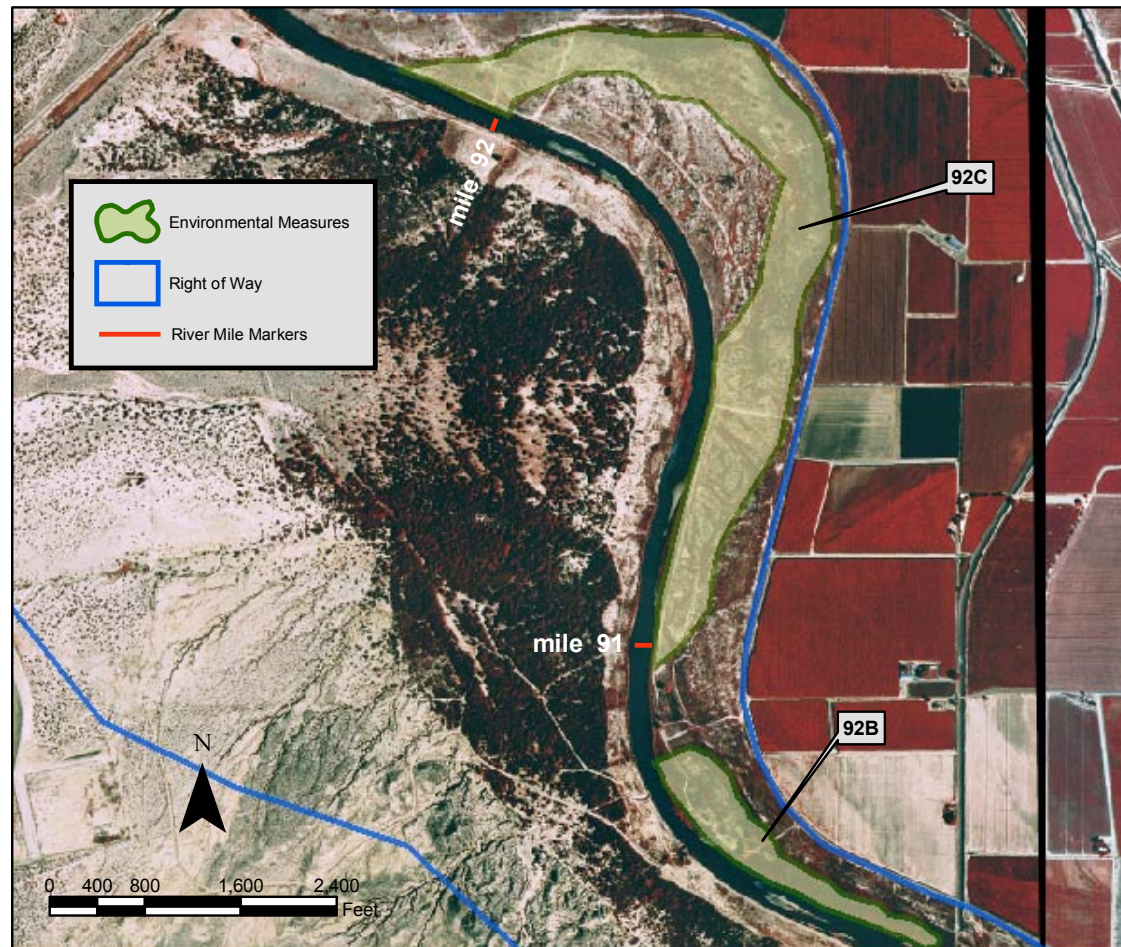
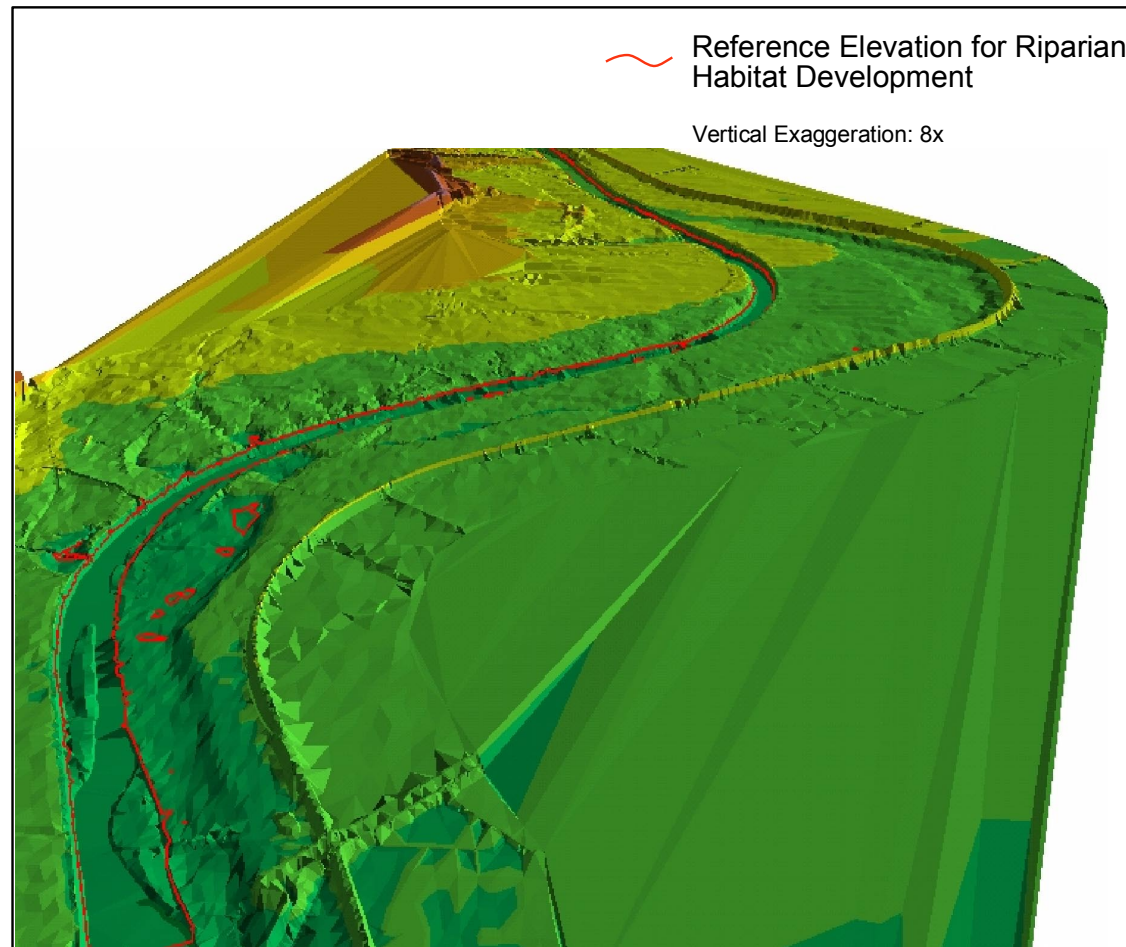
- This measure was considered low priority due to elevation and amount of spoil generated, and was not included in the 2004 RMP. The former meander footprint is 84.6 acres, and the excavation area would be limited to 14.2 acres. Excavated spoils were estimated at 34,364 cubic yards for a 4-foot excavation depth.

Project Construction Data

	Units	92B
Project area	Acres	17.9
Excavation volume*	Cubic yards	43,318
Required spoils area (at 2 ft. deep)**	Acres	13.4

* Estimated excavation depth of 4 ft for arroyos and 1.5 ft for shavedowns. An area of 61.4 acres was identified as potentially available for excavated soil placement near the project area..

** All spoils and graded areas will require re-vegetation.

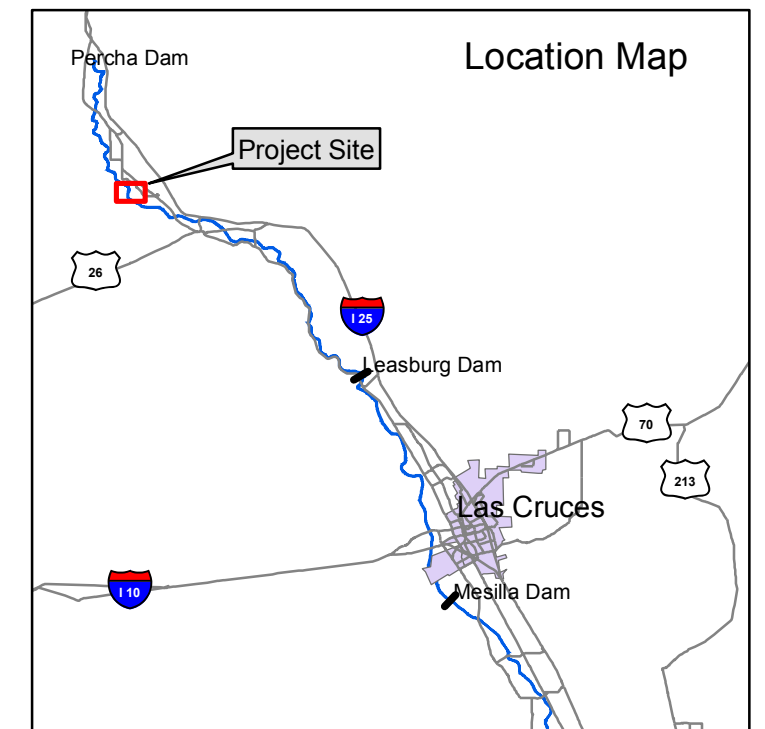
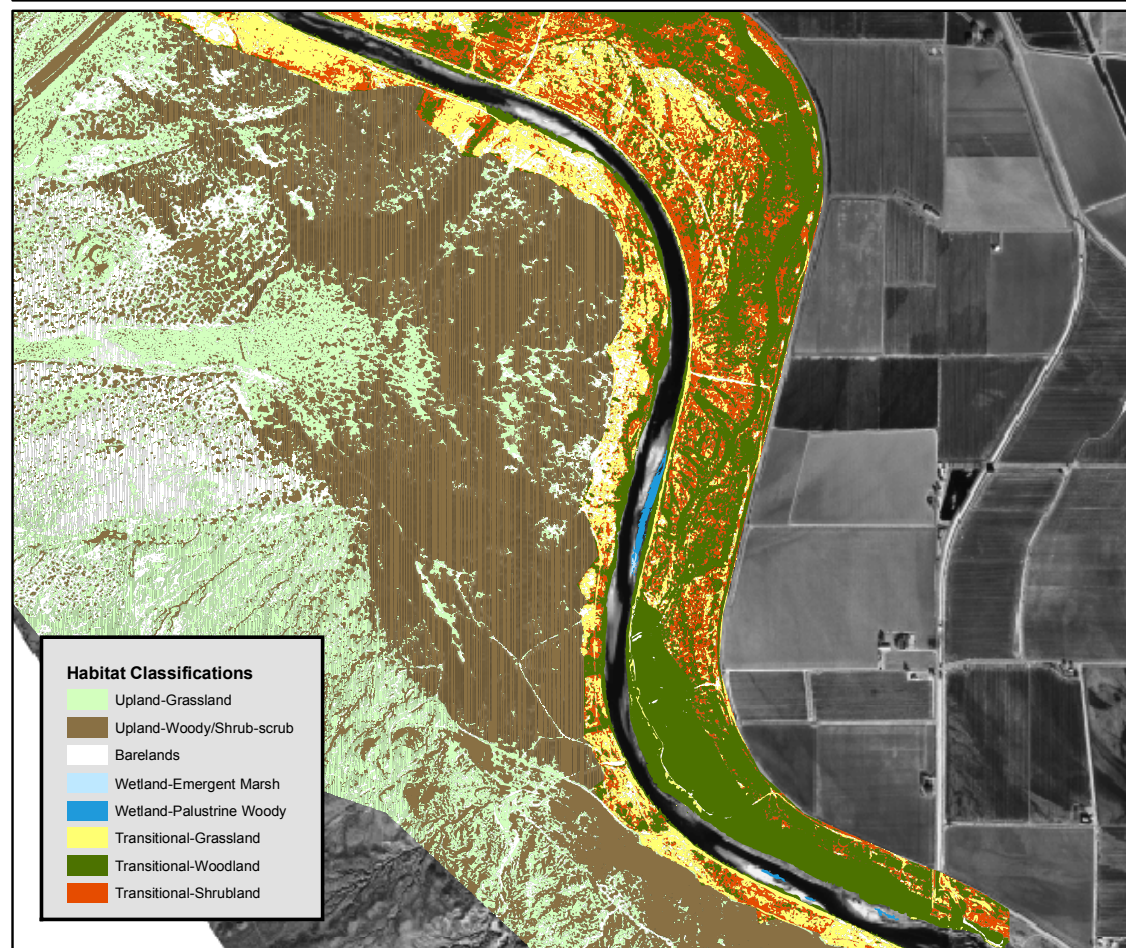


Mile 92 Crow Canyon

The majority of the bosque was cleared during RGCP construction and is now dominated by herbaceous vegetation and salt cedar. A straight, stepped channel extends from Crow Canyon dam to the west side of the river channel south of mile 93. The ROW on the west side of the river abuts land owned by BLM. A large area of ROW on the eastern side of the river is mowed but not grazed. A few mature and young cottonwoods are growing in this area. Isolated areas contain wetland vegetation indicating a high water table.

Point Project Measures	ID	#	Acres
Bank shave downs*	92B	1	17.9

NOTE: Partial reopening of meanders (measure "C") was not included in the 2004 RMP.



Mile 85 Placitas Arroyo

Project Manager _____

Boundary and topographic survey _____

Pre-design field survey _____

Detailed design _____

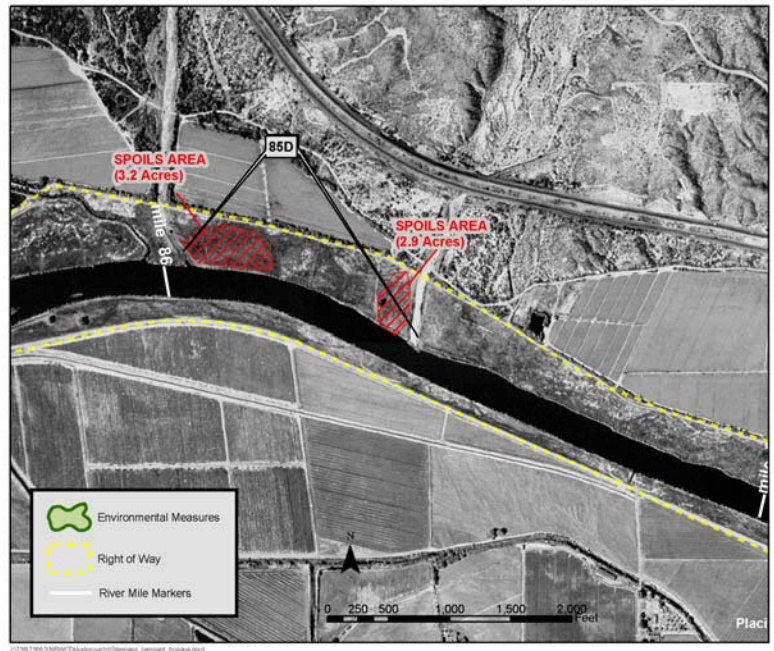
Nationwide Permit-27 _____

Storm Water Pollution Prevention Plan (SWPPP) _____

Construction _____

Planting _____

Maintenance and Monitoring Plan _____



Project 85 D, Modified Arroyo Dredging

- Placitas Arroyo enters the river, along with an unnamed arroyo, from the west, upstream of New Hatch bridge.
- Spoils areas available on either side of the river.
- NWP and Pre-construction Notification (PCN) required for work below Ordinary High Water Mark (OHM).

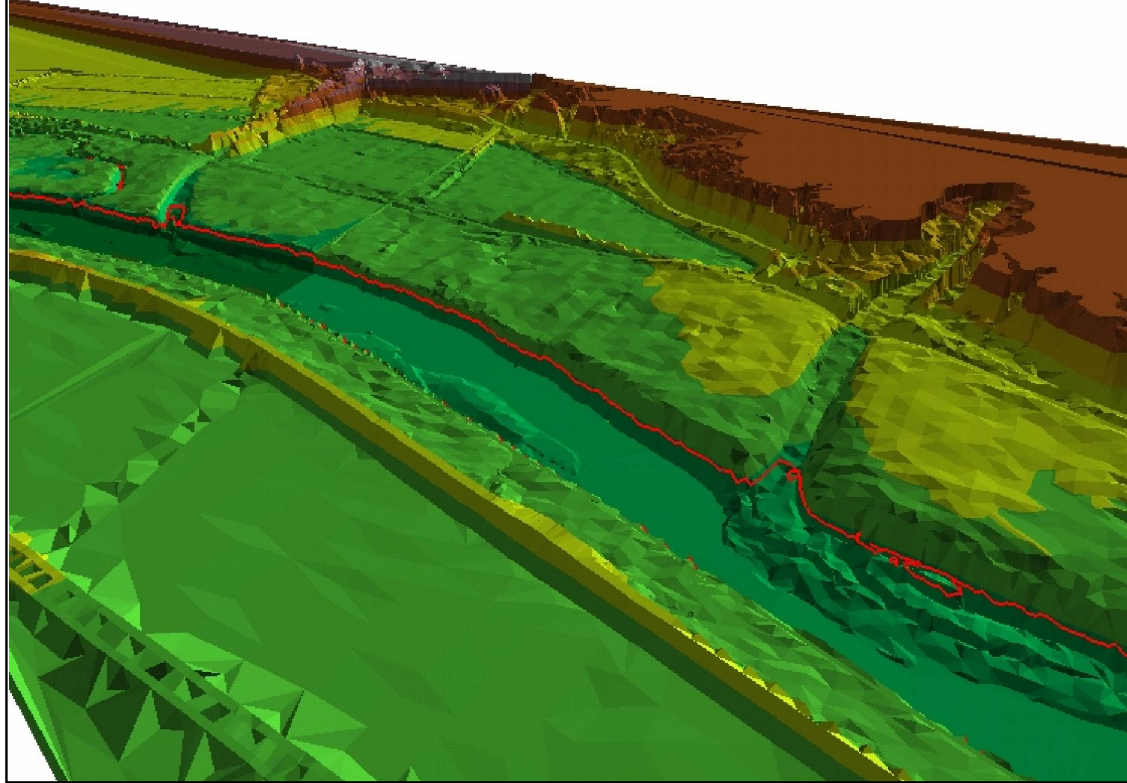
Project Construction Data

	Units	85D
Project area	Acres	0.52
Excavation volume*	Cubic yards	3,356
Required spoils area (at 2 ft. deep)**	Acres	1.1

* Estimated excavation depth of 4 ft for arroyos and 1.5 ft for shavedowns. An area of 6.2 acres was identified as potentially available for excavated soil placement near the project area.

** All spoils and graded areas will require re-vegetation.

Reference Elevation for Riparian Habitat Development
Vertical Exaggeration: 8x

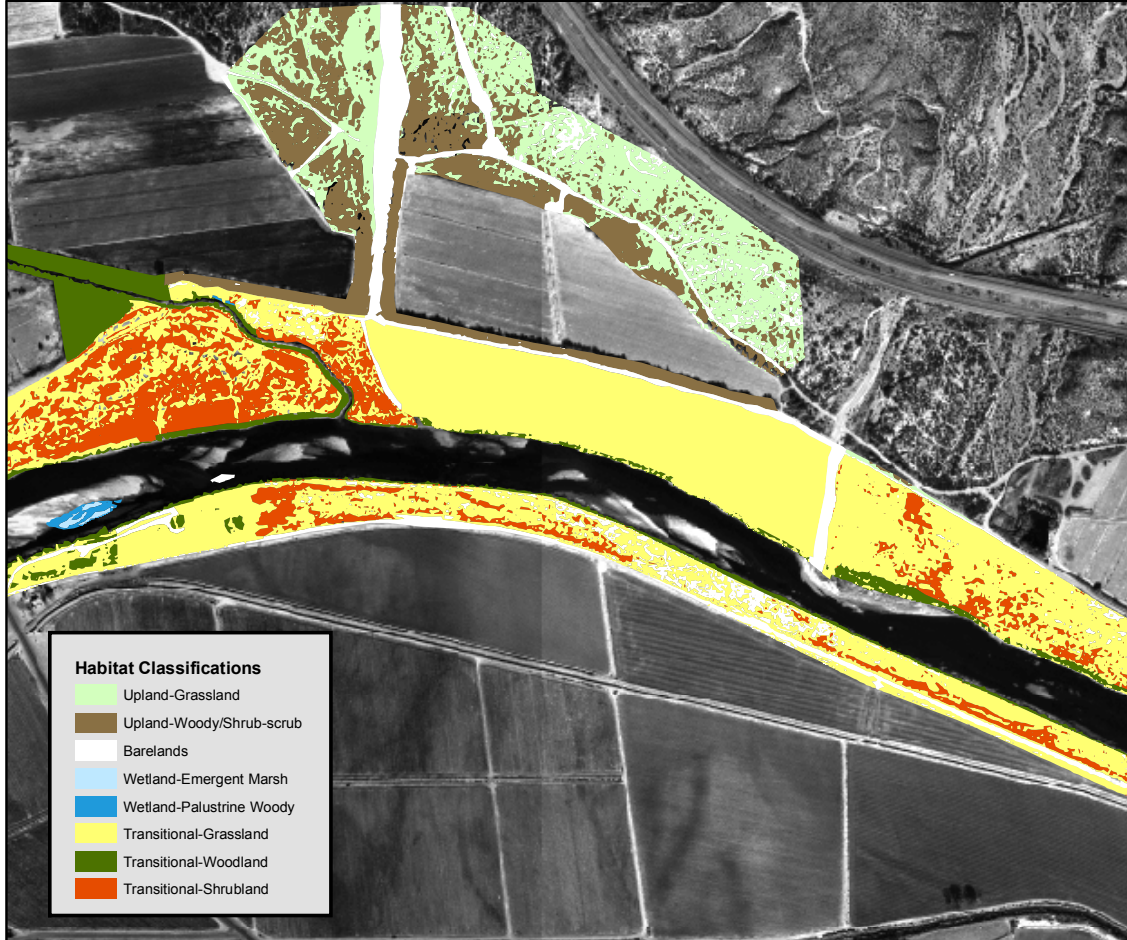


Environmental Measures
Right of Way
River Mile Markers

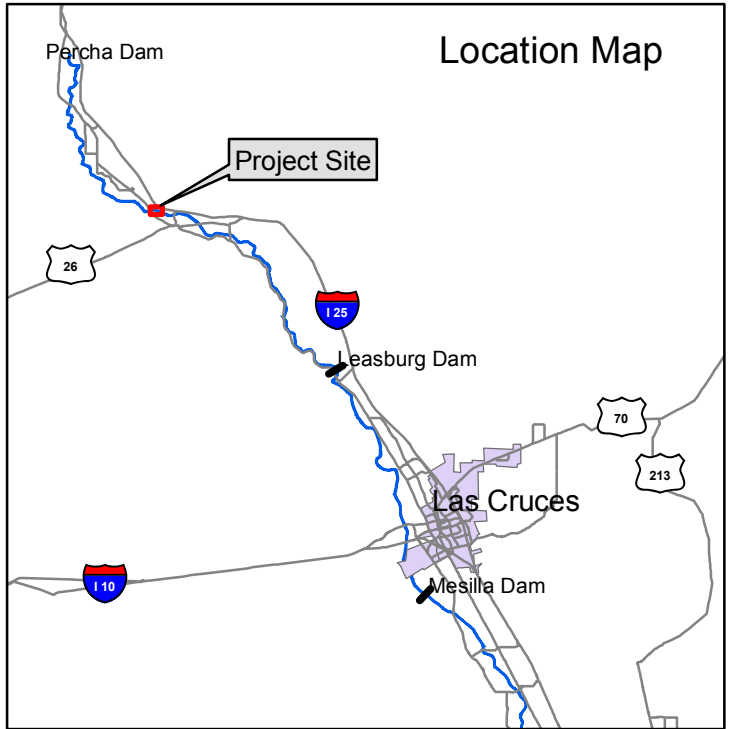
Mile 85 Placitas Arroyo

Placitas Arroyo enters the river from the west upstream from the New Hatch bridge near mile 85. Two arroyos enter the river from the east near Garfield drain and are identified for creation of embayments.

Point Project Measures	ID	#	Acres
Modify dredging at arroyos by creating embayments	85D	2	0.52

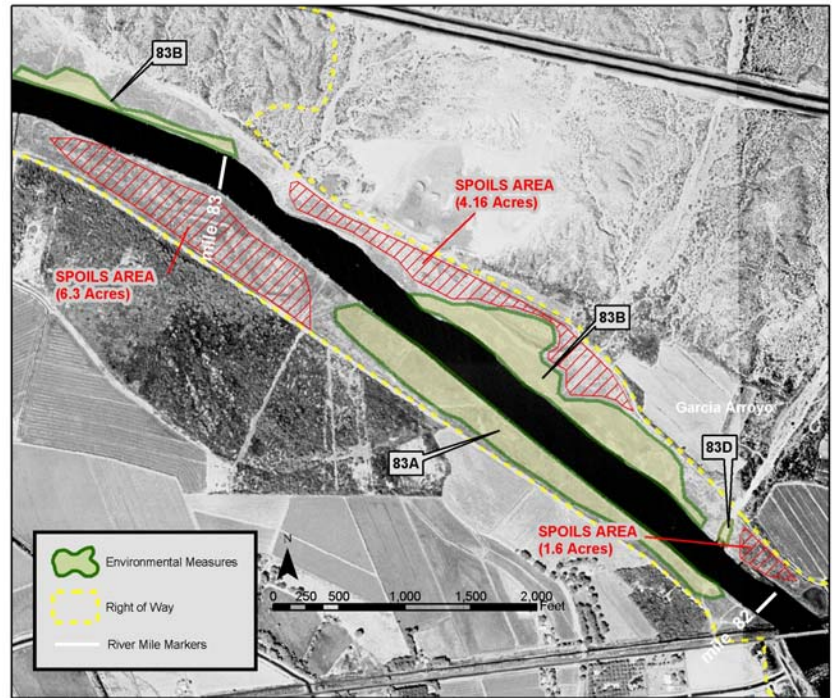


Habitat Classifications
 Upland-Grassland
 Upland-Woody/Shrub-scrub
 Barelands
 Wetland-Emergent Marsh
 Wetland-Palustrine Woody
 Transitional-Grassland
 Transitional-Woodland
 Transitional-Shrubland



Mile 83 Remnant Bosque

Project Manager _____
 Boundary and topographic survey _____
 Pre-design field survey _____
 Detailed design _____
 Nationwide Permit-27 _____
 Storm Water Pollution Prevention Plan (SWPPP) _____
 Construction _____
 Planting _____
 Maintenance and Monitoring Plan _____



Project 83A, Planting Area, and Project 83B, Shavedown

- Planting and shavedown areas are a low priority because of potential levee deficiency increase, as indicated by HEC-RAS modeling (see Table 4.2-3 of the December 2003 Draft EIS).
- Good access and good public visibility; both banks lined with salt cedar.
- Spoil locations adjacent to shavedowns. Possible wetlands located on the east bank upstream of arroyo. Delineation likely required prior to construction and spoil placement.

Project 83D, Modified Arroyo Dredging

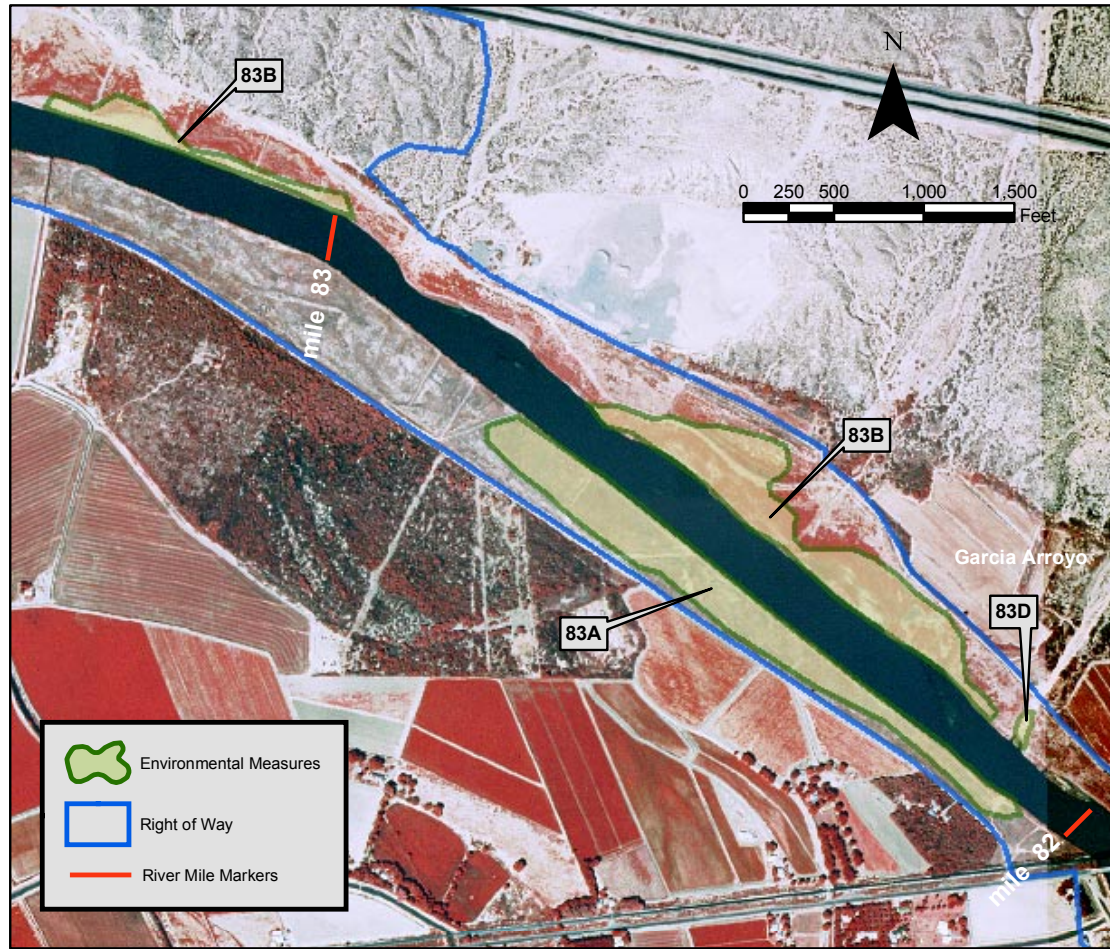
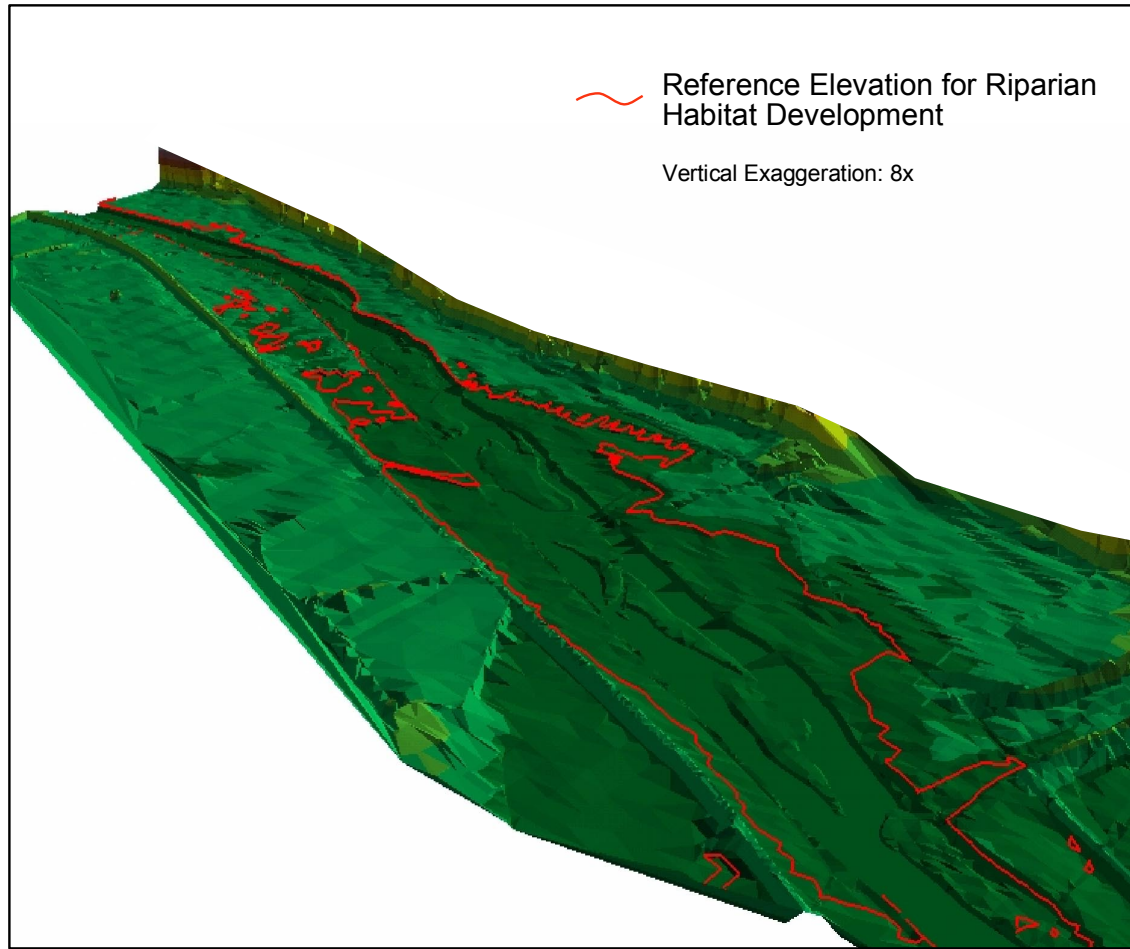
- There are low lying areas upstream of arroyo on both banks.
- Groin in place across from arroyo mouth in channel.
- NWP-27 and Pre-construction Notification (PCN) required for work below Ordinary High Water Mark.

Project Construction Data

	Units	83A	83B	83D	Site Total
Project area	Acres	16.2	17.9	0.3	34.4
Excavation volume*	Cubic yards		43,318	1,936	45,255
Required spoils area (at 2 ft. deep)**	Acres		13.4	0.6	14
Revegetation area (native trees)	Acres	16.2			16.2
Estimated cottonwood poles (109/ac)	Number	1,766			1,766

* Estimated excavation depth of 4 ft for arroyos and 1.5 ft for shavedowns. An area of 12 acres was identified as potentially available for excavated soil placement near the project area.

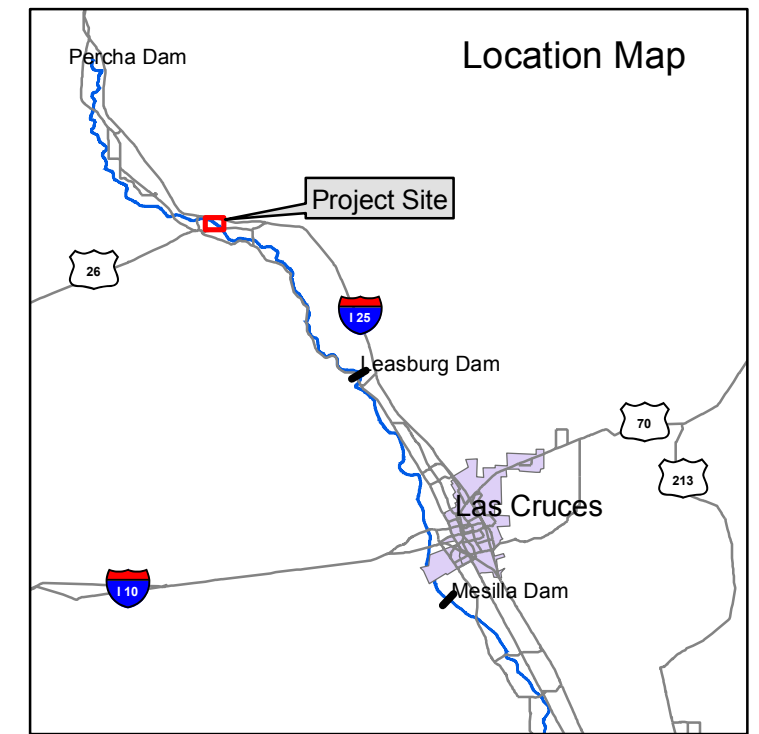
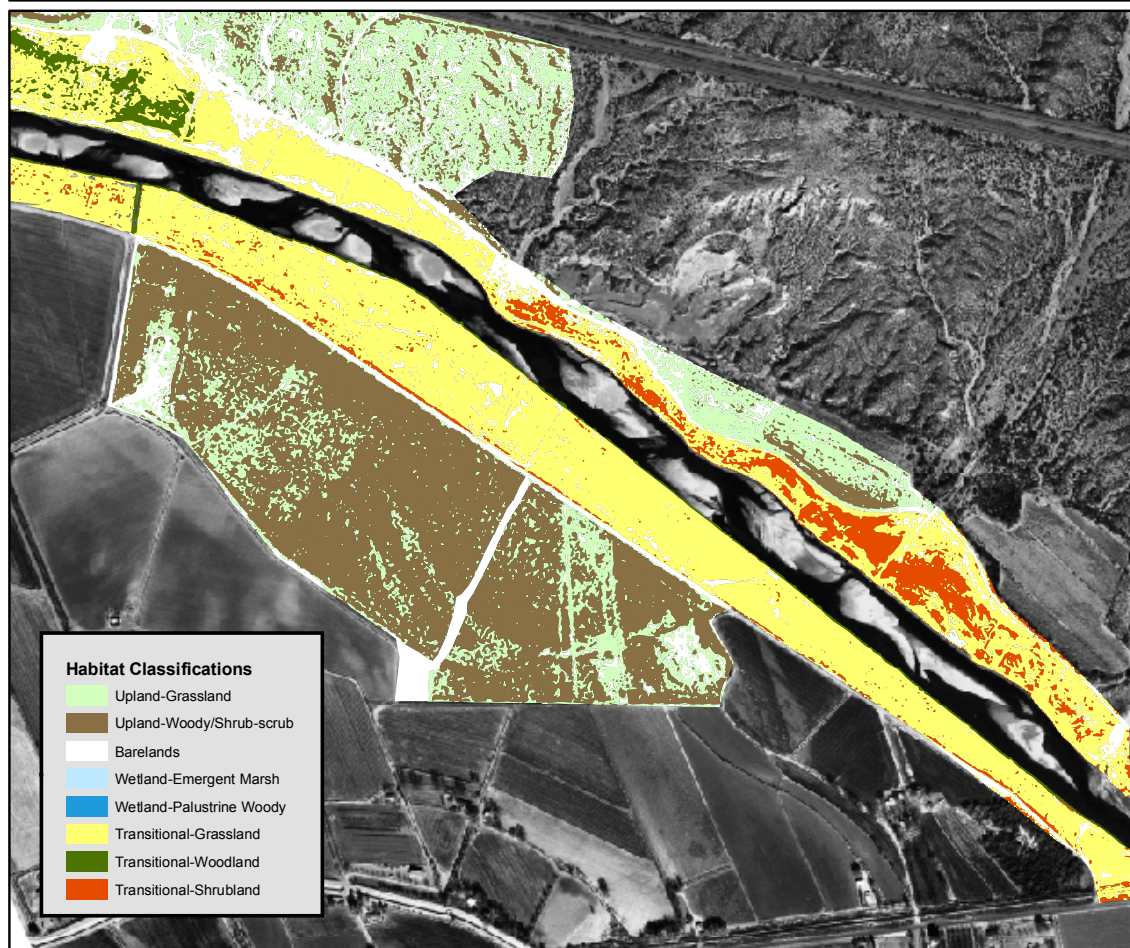
** All spoils and graded areas will require re-vegetation.



Mile 83 Remnant Bosque

The Rincon Siphon portion of the site includes Garcia Arroyo on the eastern side of the river upstream of the Rincon Siphon at mile 82. The arroyo deposits sediments in the river up stream of the bridge. The siphon is protected by a grade control dam consisting of boulders that creates a low velocity backwater to minimize erosion of the siphon bedding material. The high water elevation has created wetlands in the floodway north of the bridge.

Point Project Measures	ID	#	Acres
Native vegetation planting	83A	1	16.2
Bank shave downs*	83B	2	17.9
Modify dredging at arroyos by creating embayments	83D	1	0.3



Mile 78 Rincon and Reed Arroyos

Project Manager _____

Boundary and topographic survey

Pre-design field survey _____

Detailed design _____

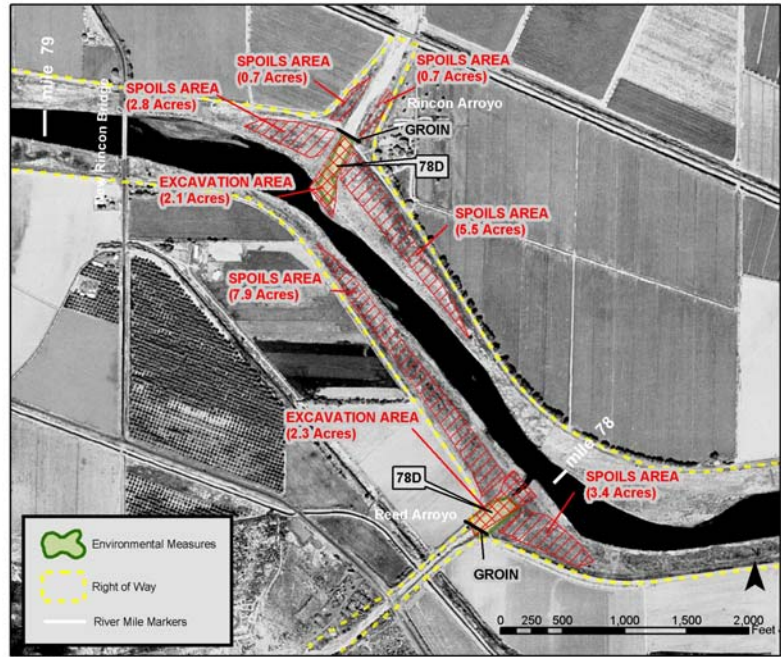
Nationwide Permit-27 _____

Storm Water Pollution Prevention Plan (SWPPP) _____

Construction _____

Planting _____

Maintenance and Monitoring Plan



Project 78 D, Modified Arroyo Dredging

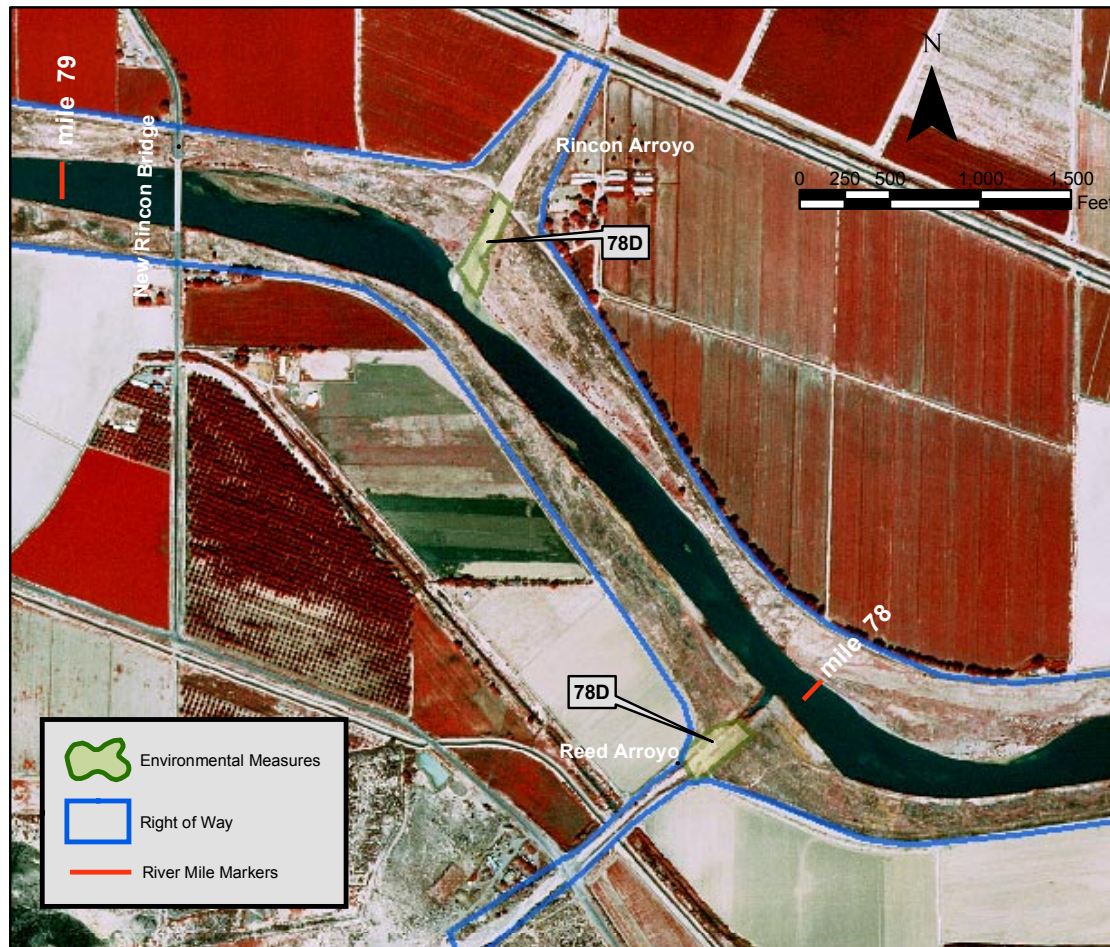
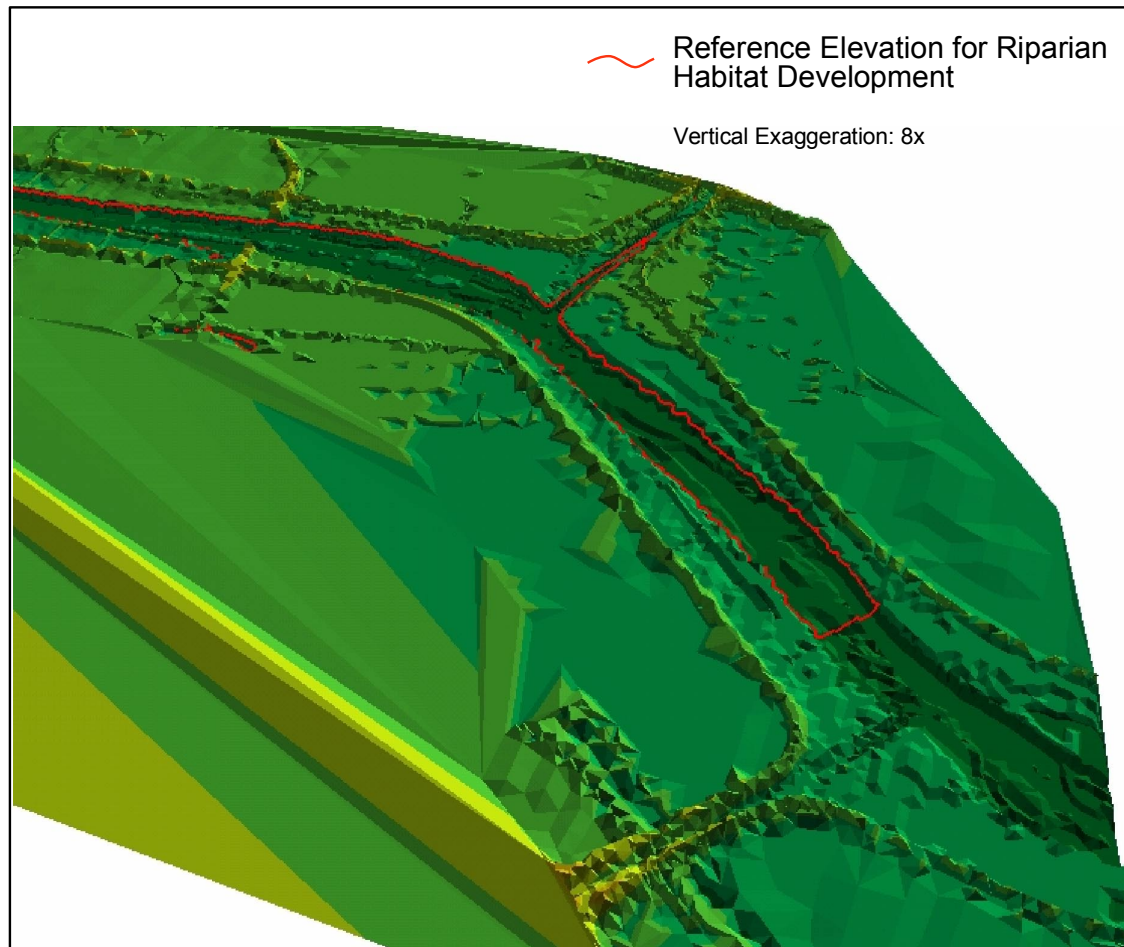
- A groin could be placed into the arroyo to limit downstream sediment deposition.
- Spoils areas available on either side of the river.
- NWP and Pre-construction Notification (PCN) required for work below Ordinary High Water Mark (OHM).

Project Construction Data

	Units	78D Rincon Arroyo	78D Reed Arroyo	Site Total
Project area	Acres	1.34	1.40	2.74
Excavation volume*	Cubic yards	7,896	9,034	16,930
Required spoils area (at 2 ft. deep)**	Acres	2.7	2.8	5.5

* Estimated excavation depth of 4 ft for arroyos and 1.5 ft for shavedowns. An area of 21 acres was identified as potentially available for excavated soil placement near the project area...

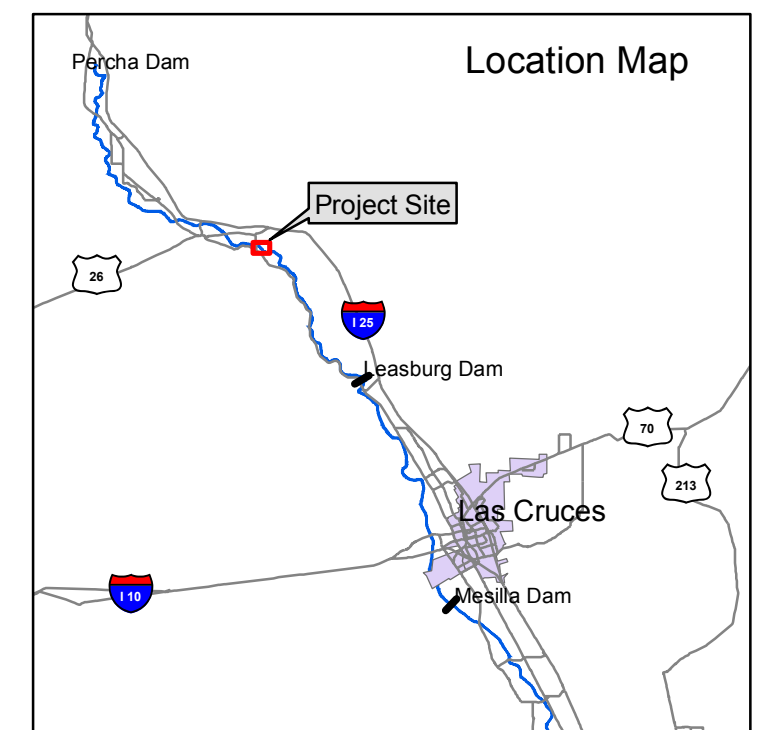
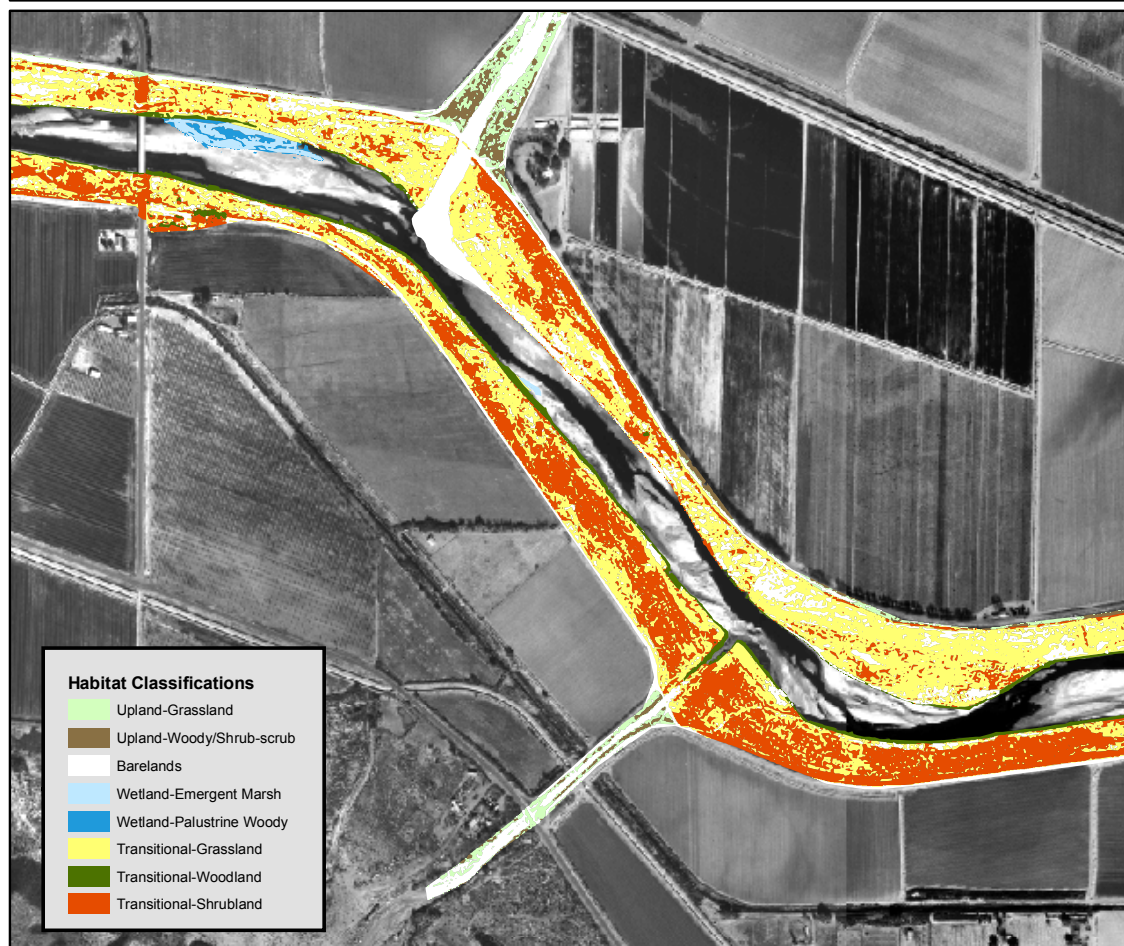
** All spoils and graded areas will require re-vegetation.



Mile 78 Rincon/Reed Arroyo

Rincon Arroyo enters the river from the north bank near mile 78.5. The Arroyo has a watershed of 124.7 square miles and extends for 30 miles to the north with numerous tributaries. This is the largest arroyo along the RGCP with no sediment control dam. An island created by the sediment deposits is heavily vegetated with willow. Reed Arroyo enters the river on the south bank at mile 78. The arroyo has a watershed of 9.6 square miles and is 6.6 miles long. No sediment control dams are located on the arroyo.

Point Project Measures	ID	#	Acres
Modify dredging at arroyos by creating embayments	78D	2	2.74



Mile 76 Bignell Arroyo

Project Manager _____

Boundary and topographic survey _____

Pre-design field survey _____

Detailed design _____

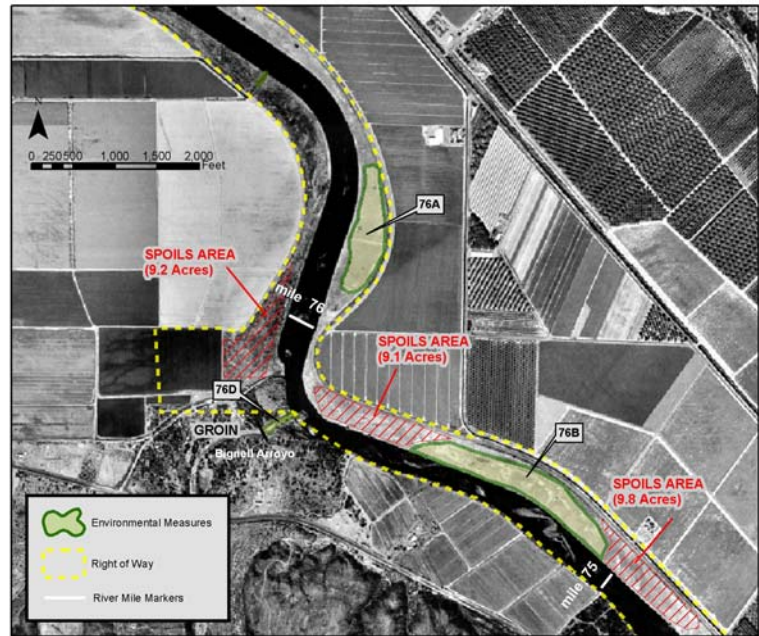
Nationwide Permit-27 _____

Storm Water Pollution Prevention Plan (SWPPP) _____

Construction _____

Planting _____

Maintenance and Monitoring Plan _____



Project 76A, Planting Area and Project 76B, Shavedown

- Planting and shavedown areas are a low priority because of potential levee deficiency increase, as indicated by HEC-RAS modeling (see Table 4.2-3 of the December 2003 Draft EIS).
- Spoil locations available adjacent to construction sites.

Project 76 D, Modified Arroyo Dredging

- In the arroyo, a groin could be placed to limit downstream sediment deposition.
- Spoil location for arroyo located on west bank
- NWP and Pre-construction Notification (PCN) required for work below Ordinary High Water Mark (OHM).

Project Construction Data

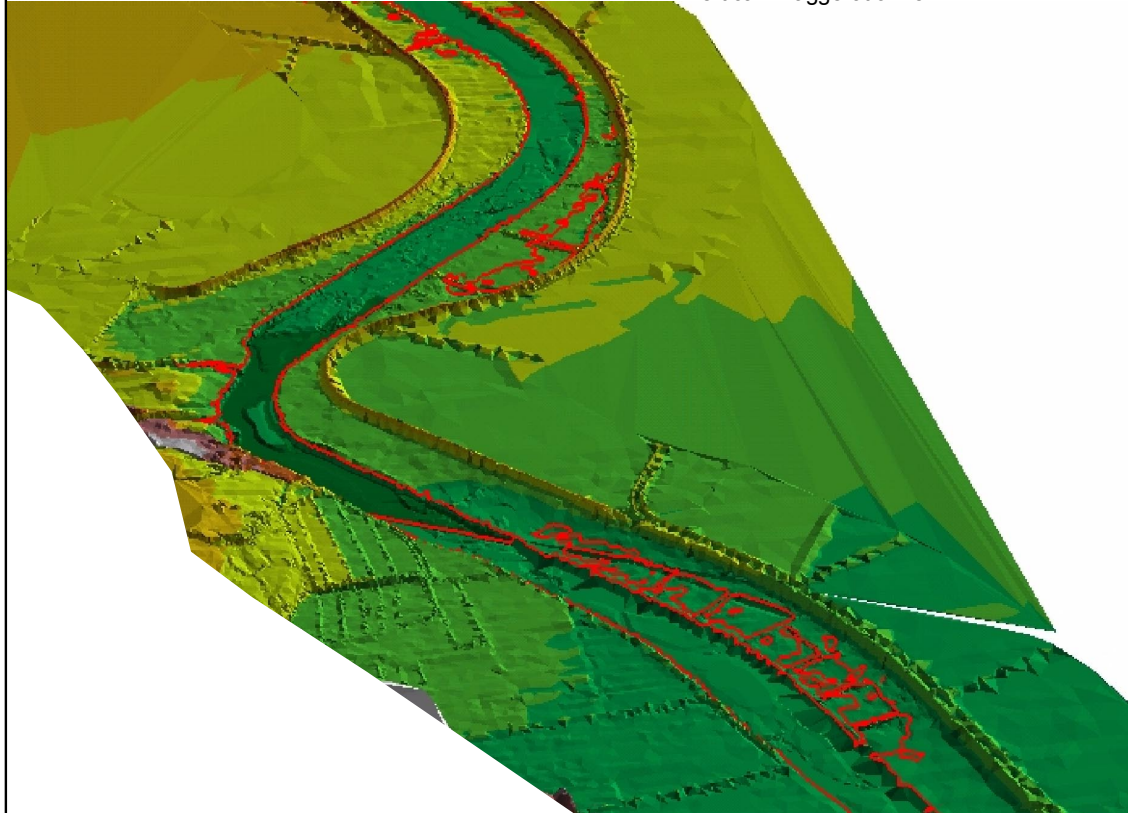
	Units	76A	76B	76D	Site Total
Project area	Acres	10.3	16.3	0.52	27.1
Excavation volume*	Cubic yards		39,446	3,356	42,802
Required spoils area (at 2 ft. deep)**	Acres		12.2	1.0	13.3
Revegetation area (native trees)	Acres	10.3			10.3
Estimated cottonwood poles (109/ac)	Number	1,123			1,123

* Estimated excavation depth of 4 ft for arroyos and 1.5 ft for shavedowns. An area of 28.1 acres was identified as potentially available for excavated soil placement near the project area..

* All spoils and graded areas will require re-vegetation.

Reference Elevation for Riparian Habitat Development

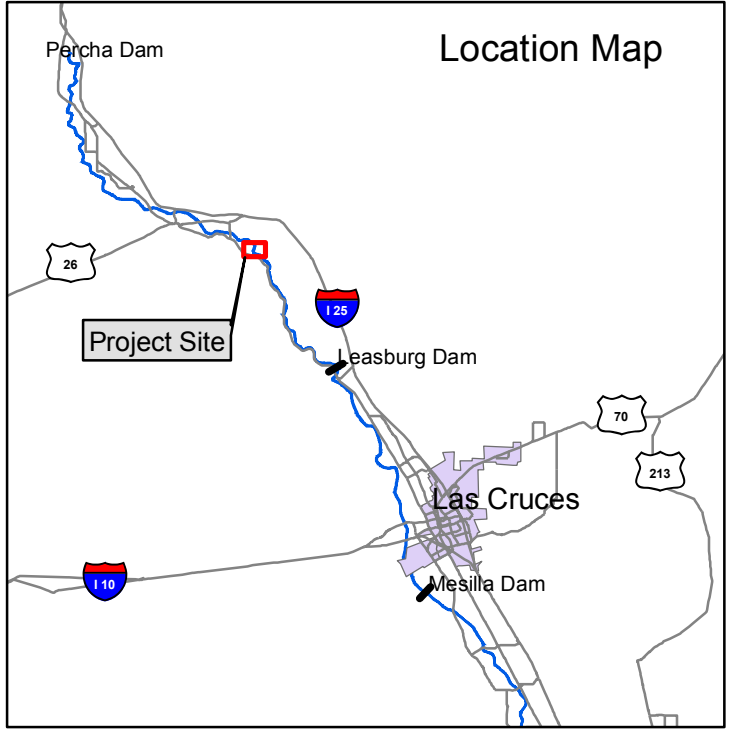
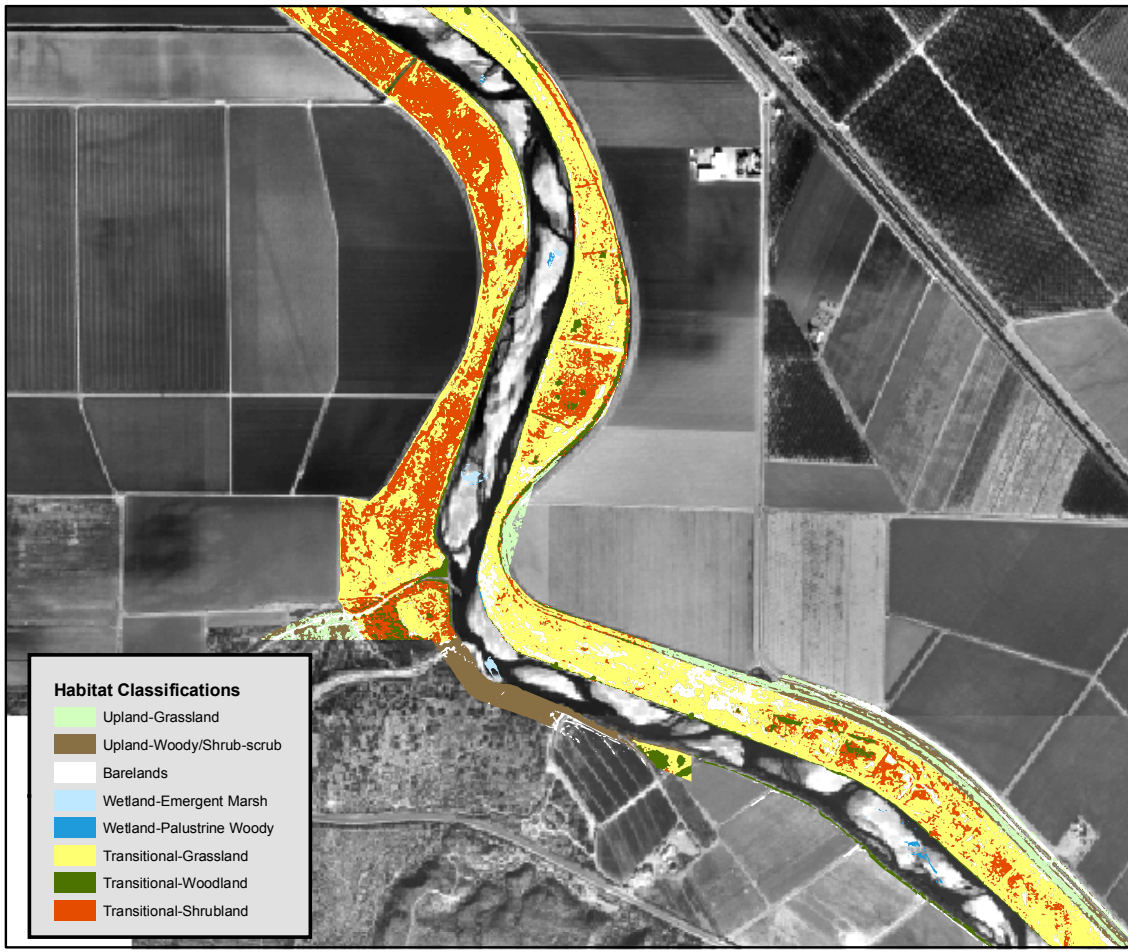
Vertical Exaggeration: 8x



Mile 76 Bignell Arroyo

Bignell Arroyo enters the river on the south bank near mile 76. The arroyo extends for 7.6 miles from the river and is not controlled by a sediment dam. Woody vegetation is found in drains and along river banks.

Point Project Measures	ID	#	Acres
Native vegetation planting	76A	1	10.3
Bank shave downs*	76B	1	16.3
Modify dredging at arroyos by creating embayments	76D	2	0.52



Mile 54 Channel Cut

Project Manager _____

Boundary and topographic survey

Pre-design field survey _____

Detailed design _____

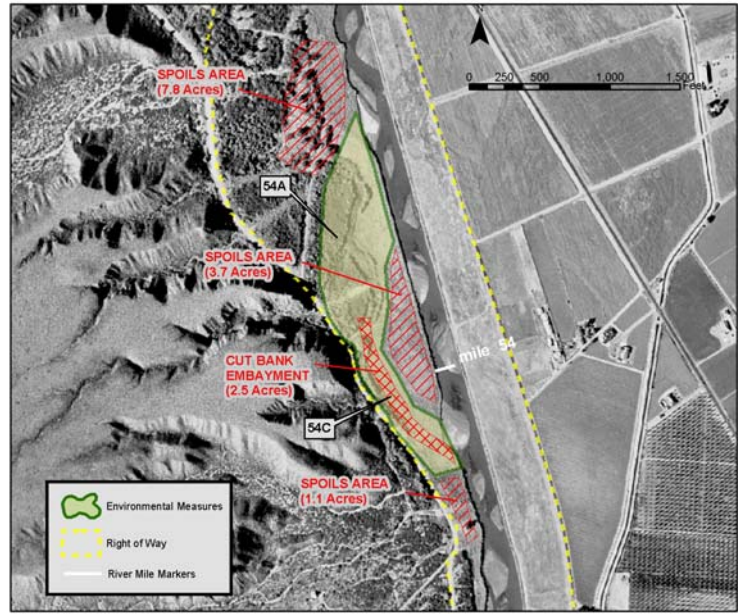
Nationwide Permit-27 _____

Storm Water Pollution Prevention
Plan (SWPPP) _____

Construction _____

Planting _____

Maintenance and Monitoring Plan



Project 54A, Planting Area

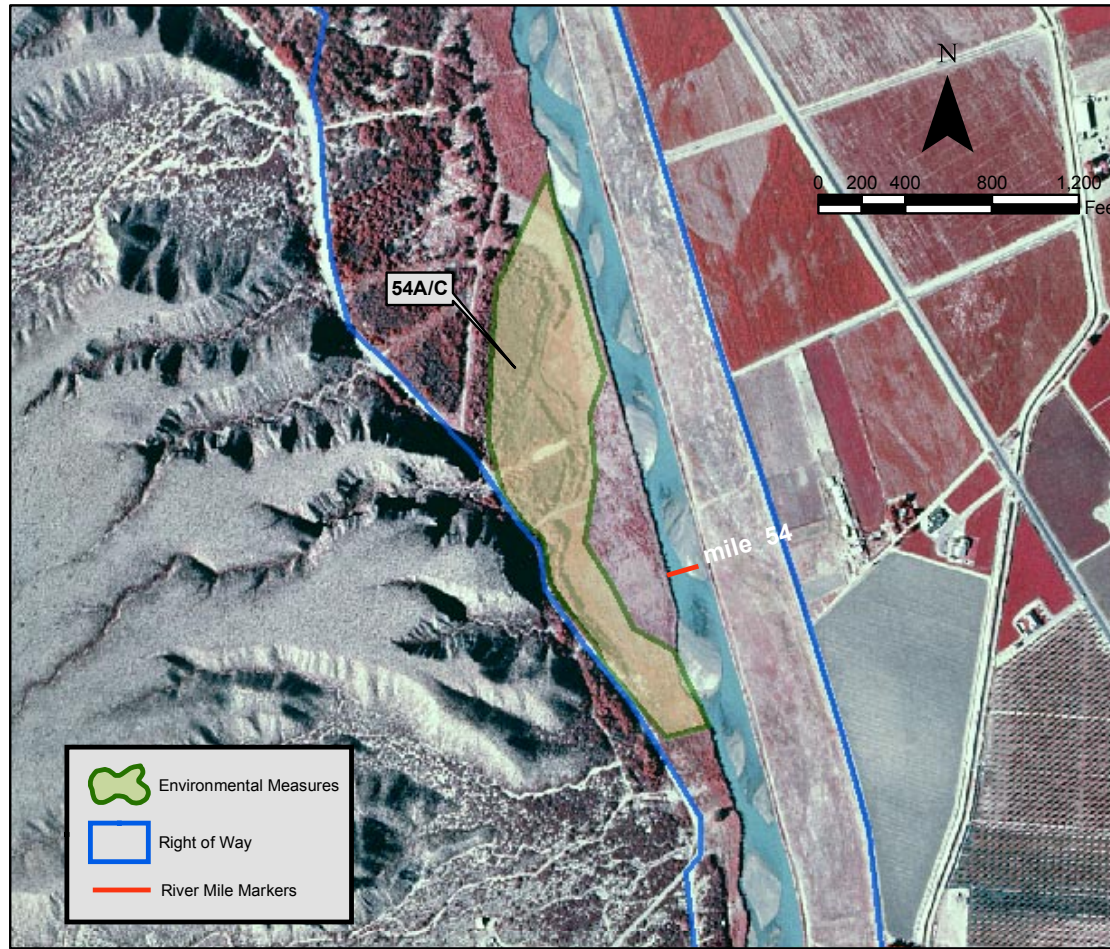
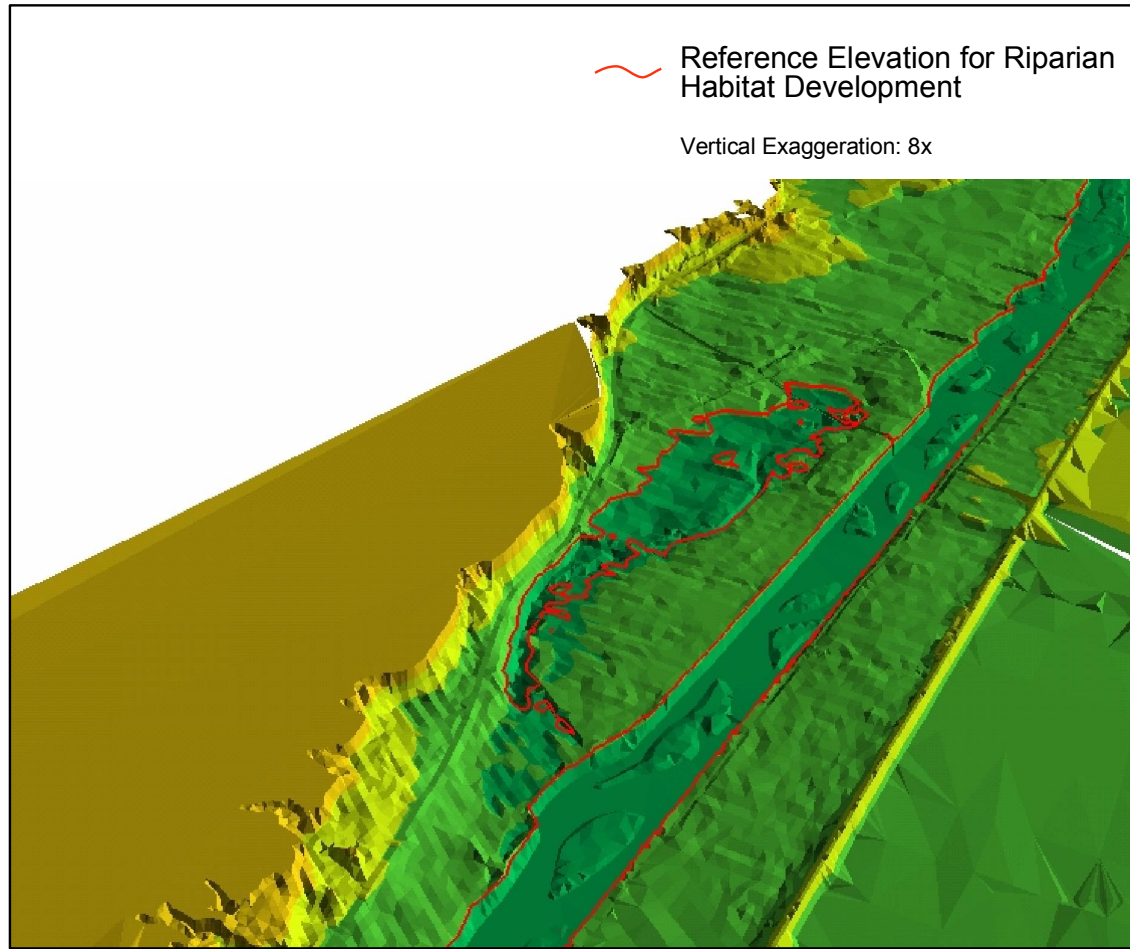
- Planting activities could expand to include potential shakedown and excavation. Although identified primarily as a planting site, considerable spoil locations are adjacent to former meander.

Project 54C, Partial Meander Reopening (Not Included in 2004 RMP)

- This measure was considered low priority due to elevation and amount of spoil generated, and was not included in the 2004 RMP. The former meander footprint is 19.6 acres, and the excavation area would be limited to 2.5 acres. Excavated spoils were estimated at 6,050 cubic yards for a 4-foot excavation depth. An area of 11.8 acres was identified as potentially available for excavated soil placement near the project area

Project Construction Data

	Units	54A
Project area	Acres	19.6
Revegetation area (native trees)	Acres	19.6
Estimated cottonwood poles (109/ac)	Number	2,136

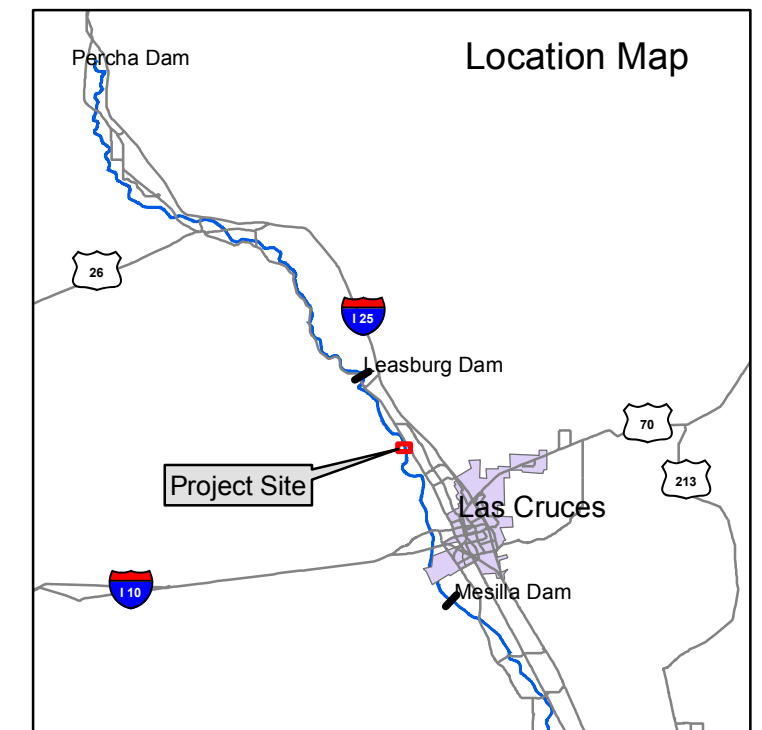
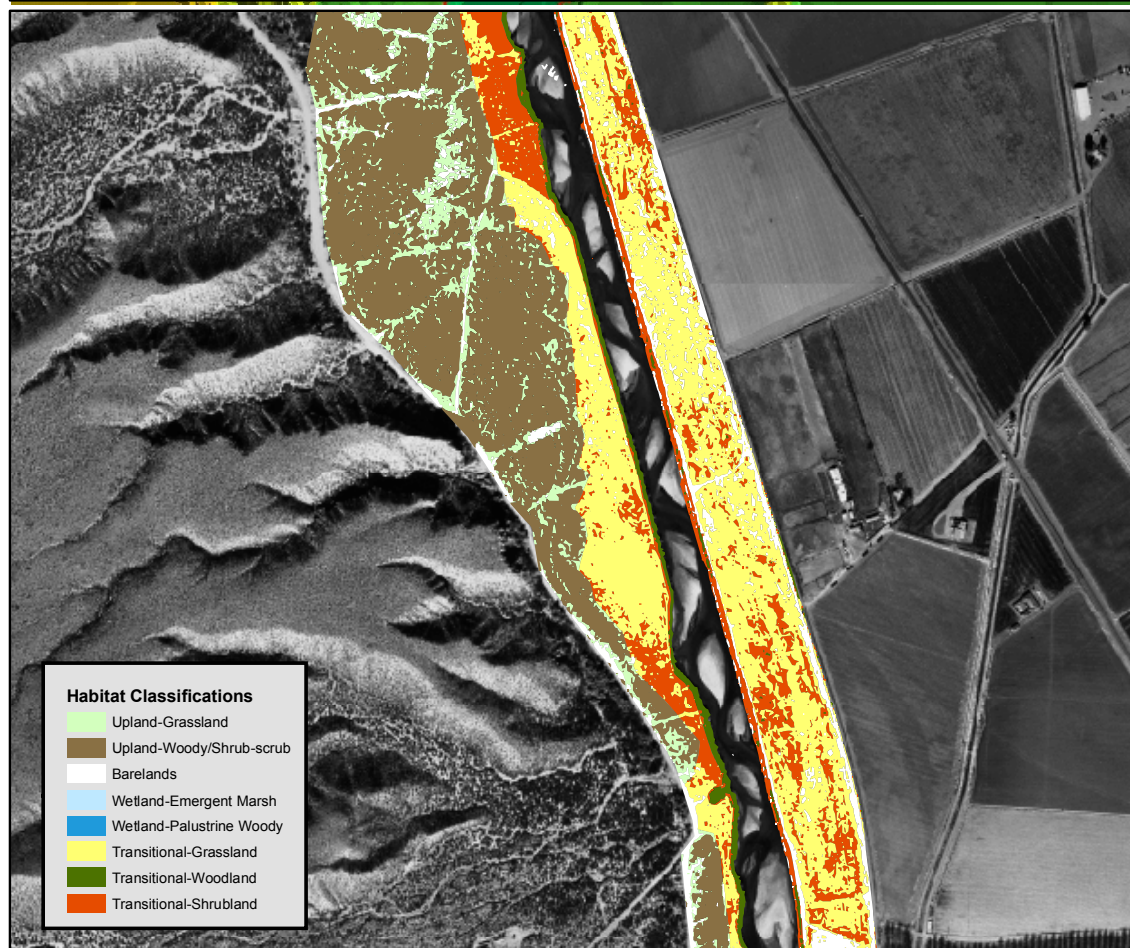


Mile 54 Channel Cut

Between mile 54 and 55, the river channel was straightened during RGCP construction. The site includes extensive ROW on each side of the river. The riparian and upland sites are mowed but provide good opportunities for riparian enhancements.

Point Project Measures	ID	#	Acres
Native vegetation planting	54A	1	19.6

NOTE: Partial reopening of meanders (measure "C") was not included in the 2004 RMP.



Miles 49 and 48 Spillways

Project Manager _____

Boundary and topographic survey

Pre-design field survey _____

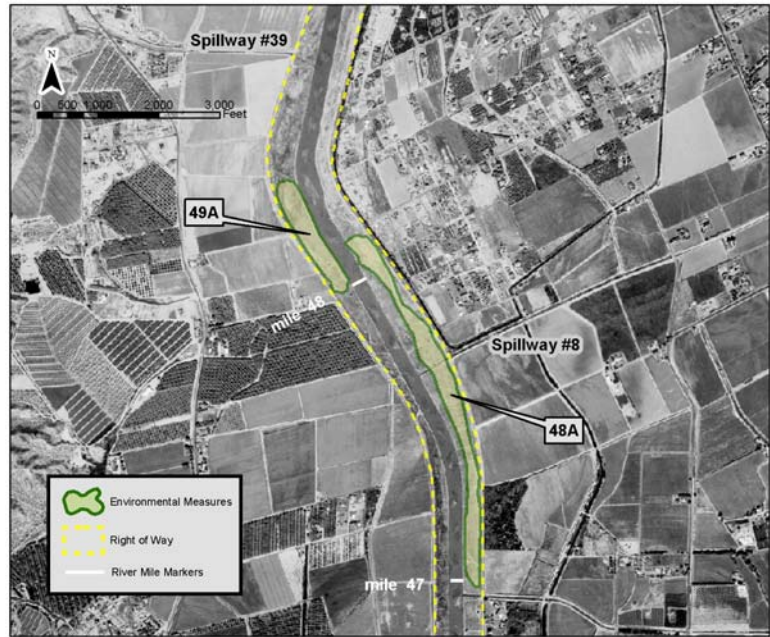
Detailed design _____

Storm Water Pollution Prevention
Plan (SWPPP) _____

Construction _____

Planting _____

Maintenance and Monitoring Plan



Projects 48A and 49A, Planting Areas

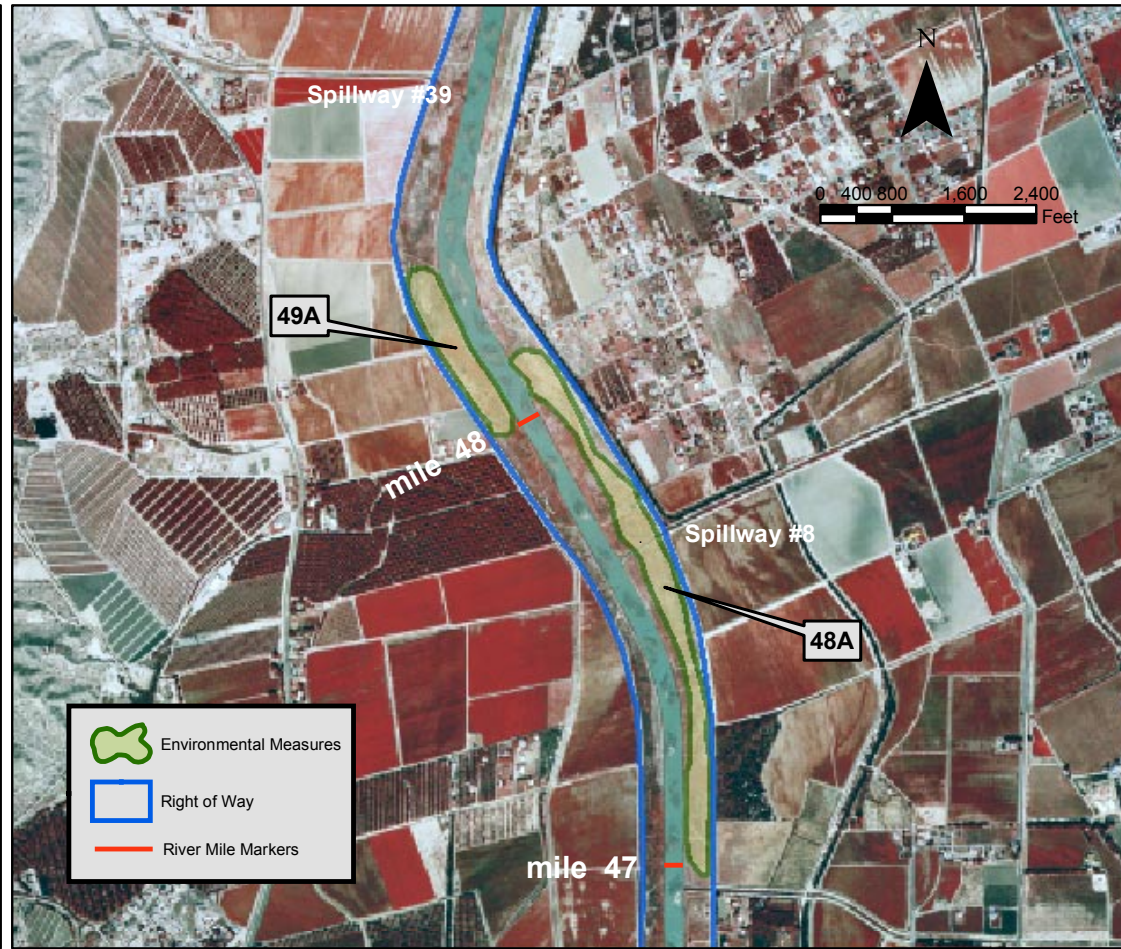
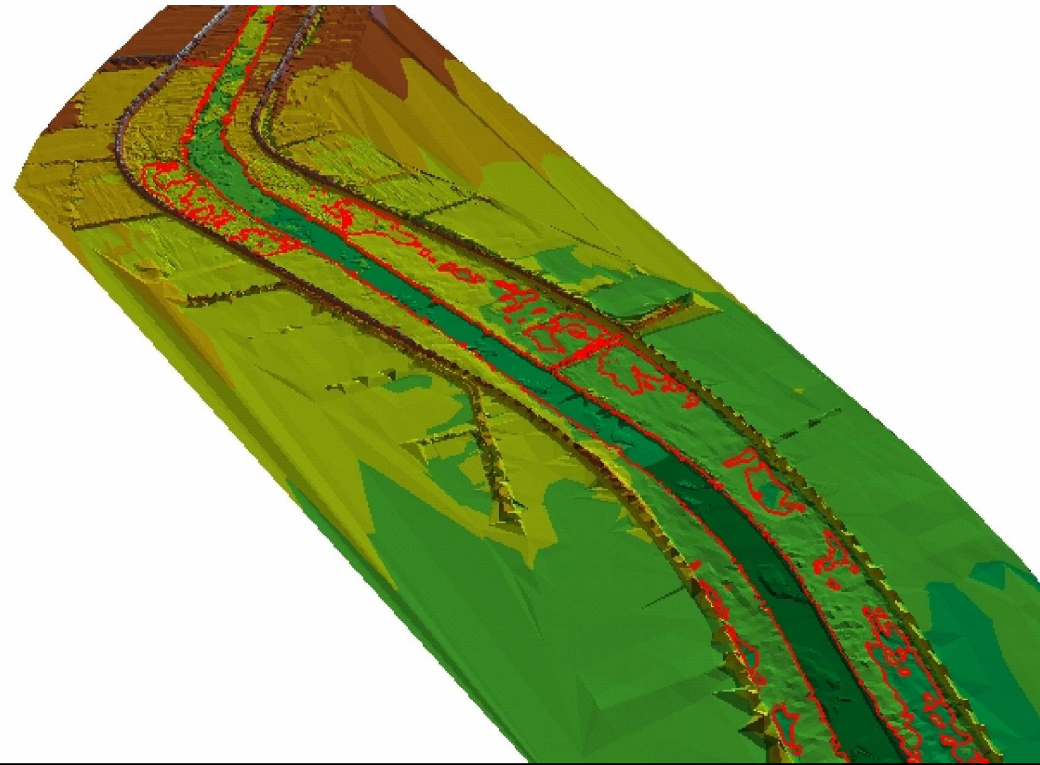
- Planting areas are a low priority because of potential levee deficiency increase, as indicated by HEC-RAS modeling (see Table 4.2-3 of the December 2003 Draft EIS).
- No NWP is required for planting sites, and sites have easy access.

Project Construction Data

	Units	48A	49A	Site Total
Project area	Acres	34.6	15.9	50.5
Revegetation area (native trees)	Acres	34.6	15.9	50.5
Estimated cottonwood poles (109/ac)	Number	3,771	1,733	5,504

Reference Elevation for Riparian Habitat Development

Vertical Exaggeration: 8x



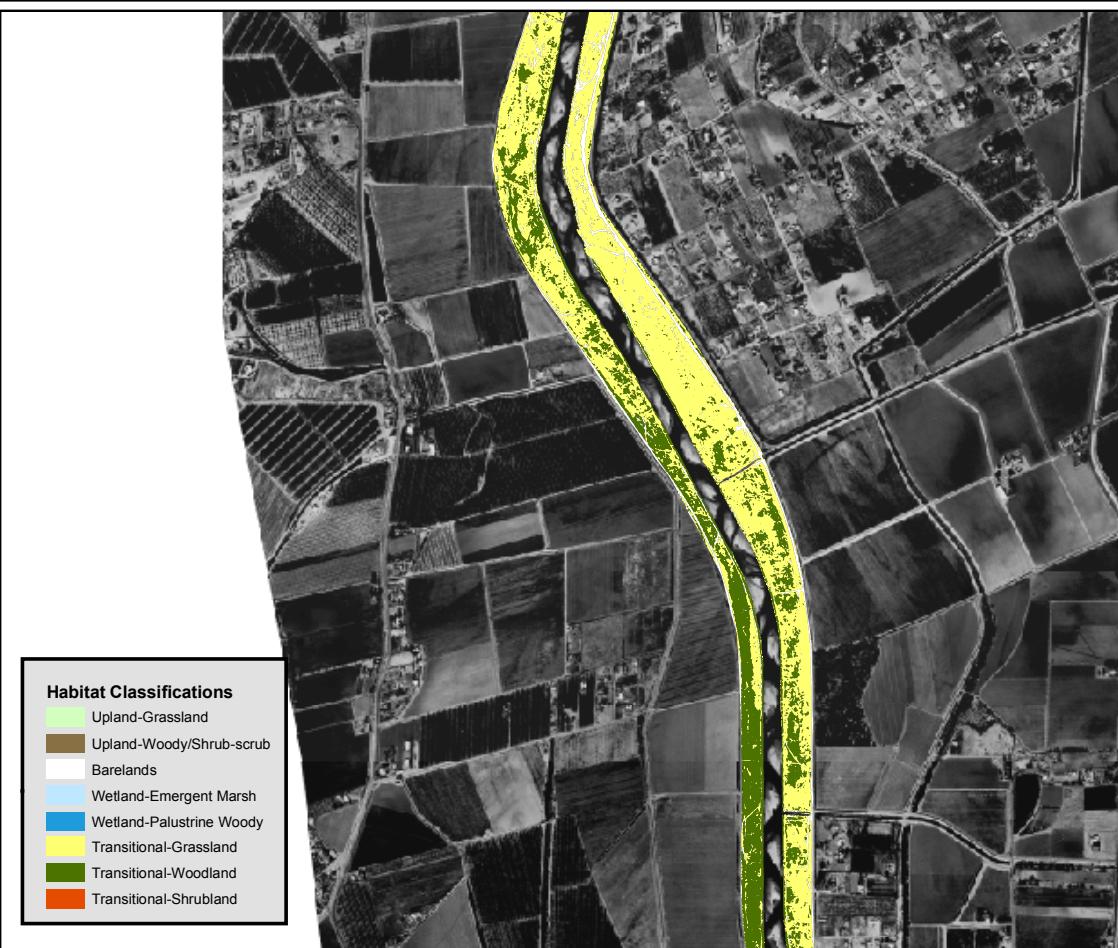
Miles 49 & 48 spillways

Spillway No. 39 flows from the Picacho Lateral to the west bank north of river near mile 48.

Point Project Measures	ID	#	Acres
Native vegetation planting	49A	1	15.9

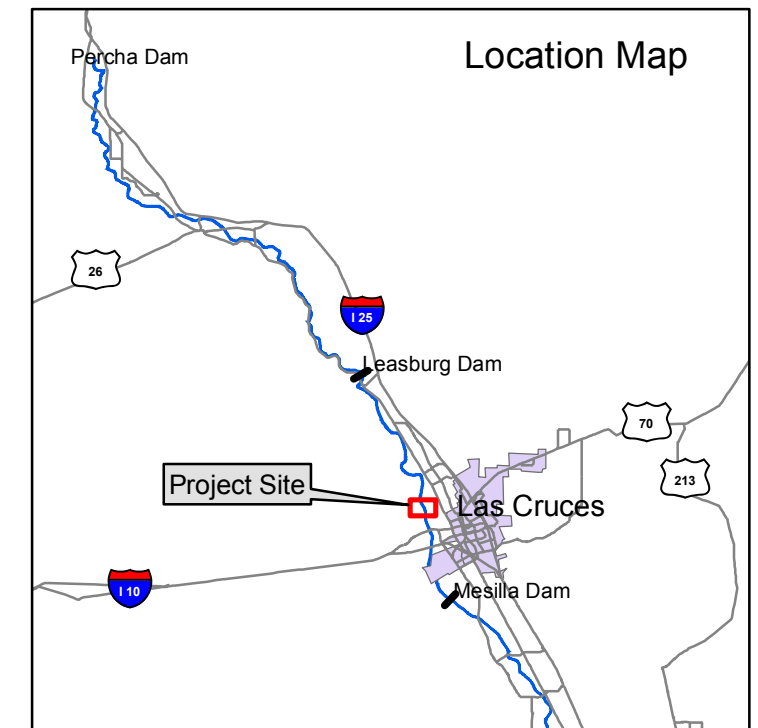
Spillway No. 8 enters the east bank of the river at mile 48.

Point Project Measures	ID	#	Acres
Native vegetation planting	48A	1	34.6



Habitat Classifications

Upland-Grassland
Upland-Woody/Shrub-scrub
Barelands
Wetland-Emergent Marsh
Wetland-Palustrine Woody
Transitional-Grassland
Transitional-Woodland
Transitional-Shrubland



Mile 42 Clark Lateral

Project Manager _____

Boundary and topographic survey

Pre-design field survey _____

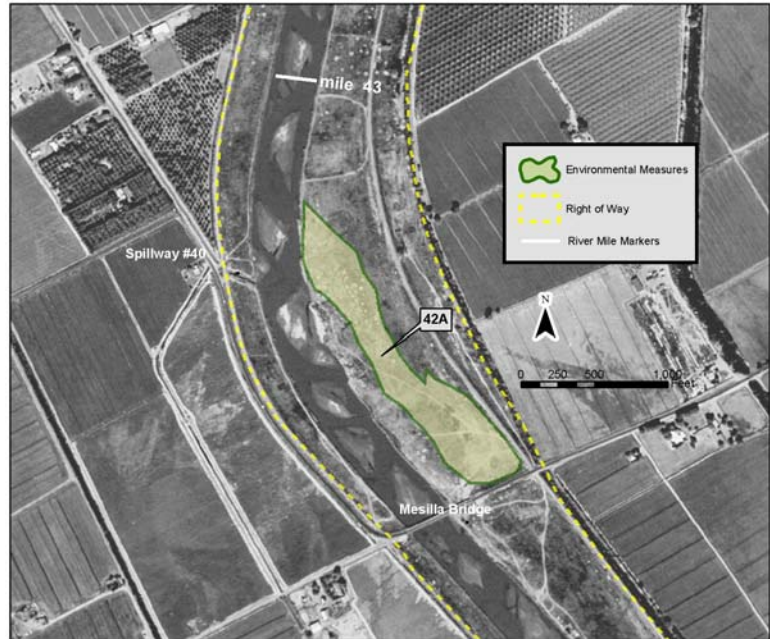
Detailed design _____

Storm Water Pollution Prevention
Plan (SWPPP) _____

Construction _____

Planting _____

Maintenance and Monitoring Plan



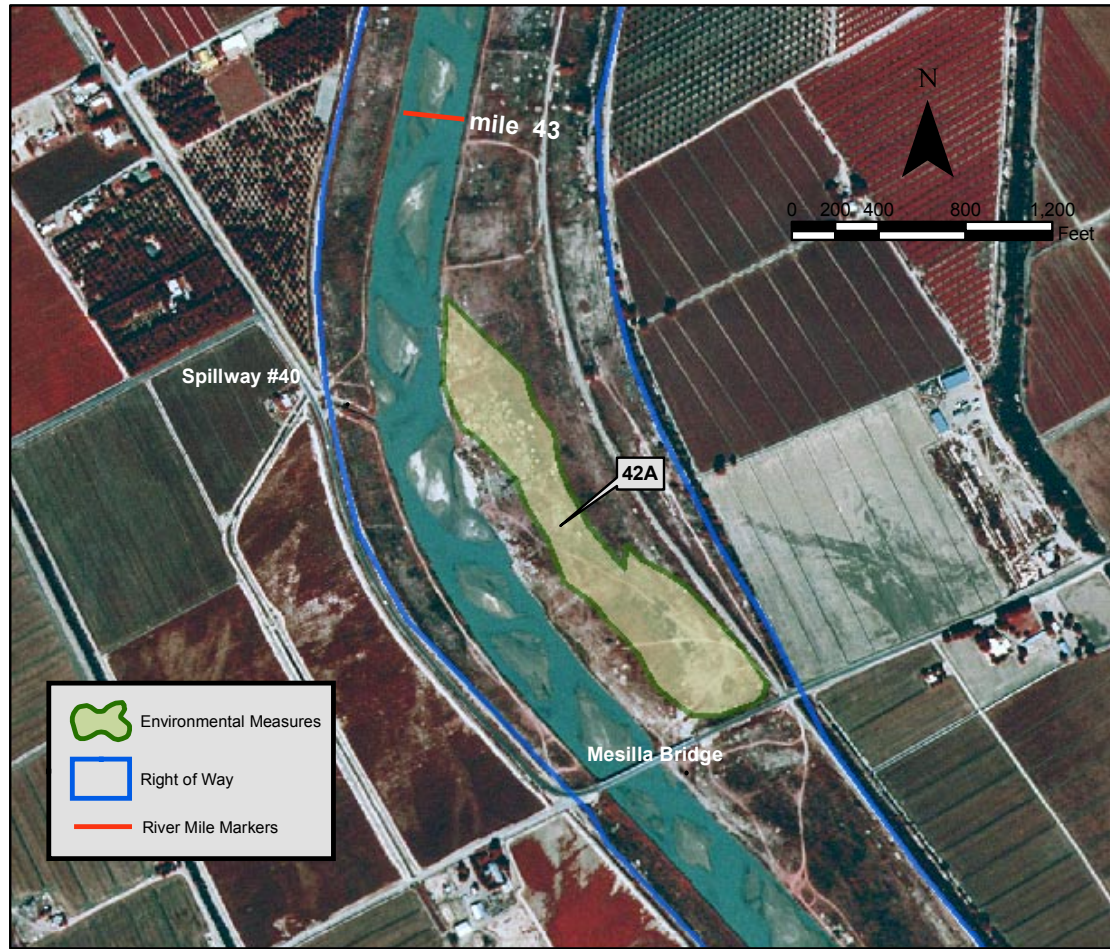
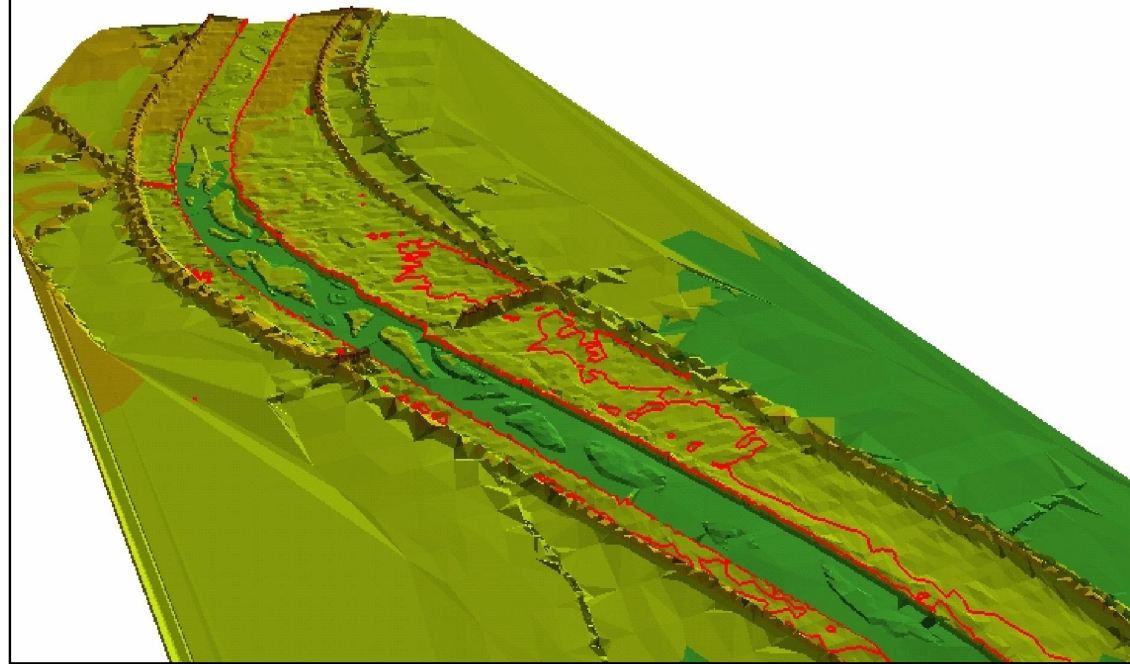
Project 42A, Planting Areas




- Planting sites are considered high priority because no NWP-27 is required, and sites are accessible.

Project Construction Data

	Units	42A
Project area	Acres	15.4
Revegetation area (native trees)	Acres	15.4
Estimated cottonwood poles (109/ac)	Number	1,679

Reference Elevation for Riparian Habitat Development
Vertical Exaggeration: 8x



-  Environmental Measures
-  Right of Way
-  River Mile Markers









Mile 42 Clark Lateral

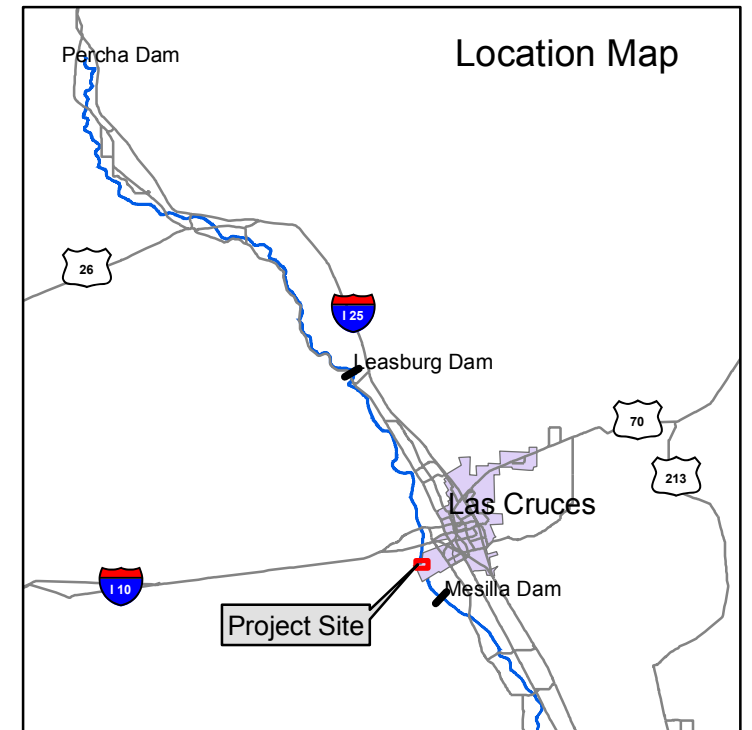
The ROW extends past the levee to the Clark Lateral on the east side of the river at mile 42. Grass and shrubs dominate the area due to mowing although some mature acacia and cottonwoods are present at the south end.

Point Project Measures	ID	#	Acres
Native vegetation planting	42A	1	15.4



Habitat Classifications

-  Upland-Grassland
-  Upland-Woody/Shrub-scrub
-  Barelands
-  Wetland-Emergent Marsh
-  Wetland-Palustrine Woody
-  Transitional-Grassland
-  Transitional-Woodland
-  Transitional-Shrubland



Mile 41 Picacho and NMGF

Project Manager _____

Boundary and topographic survey

Pre-design field survey _____

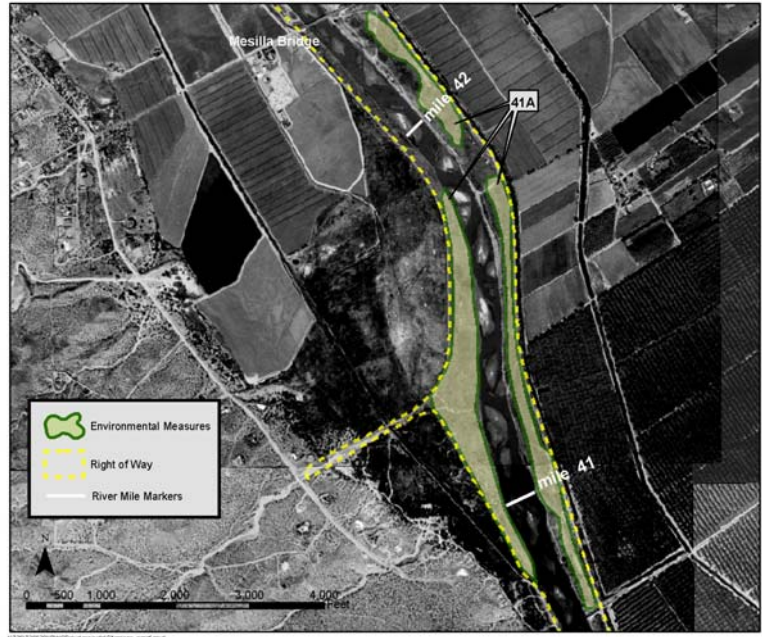
Detailed design _____

Storm Water Pollution Prevention
Plan (SWPPP) _____

Construction _____

Planting _____

Maintenance and Monitoring Plan

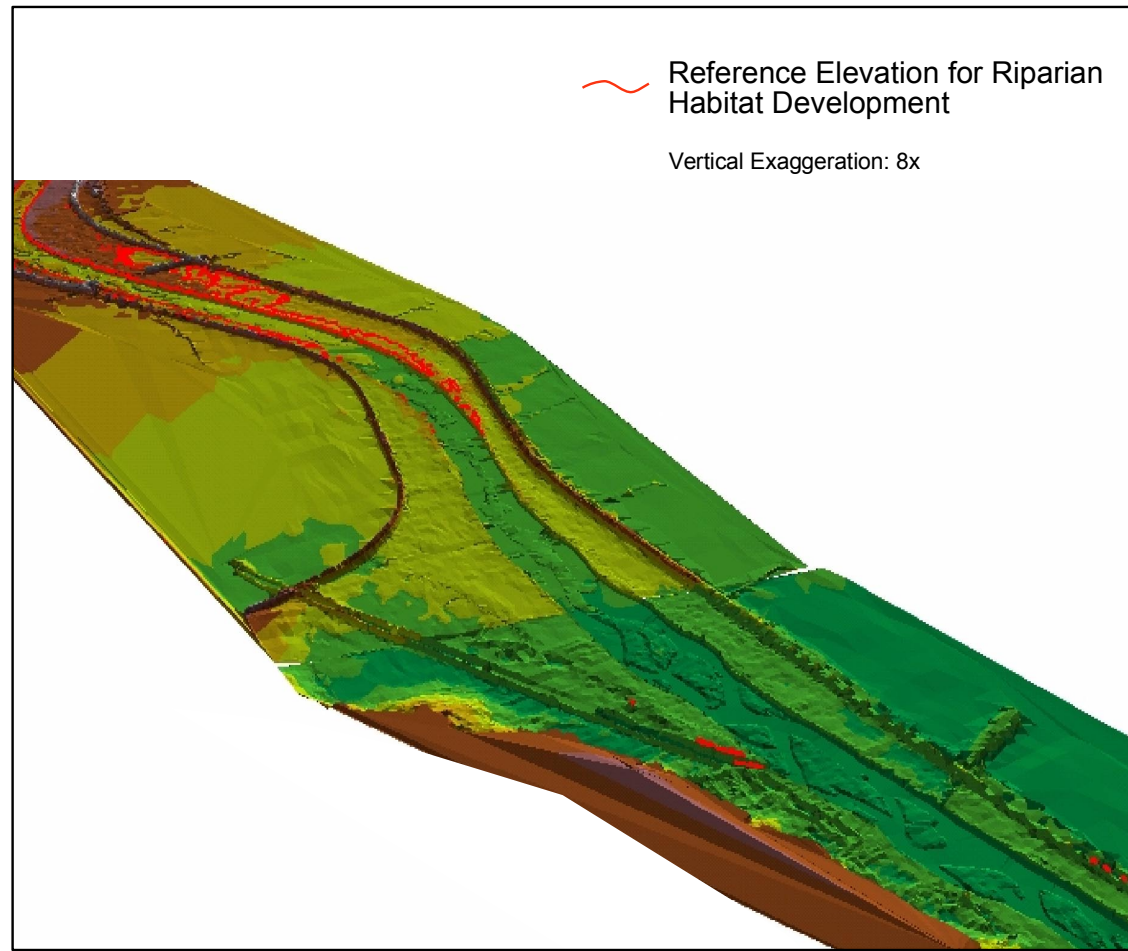


Project 41A, Planting Areas

- High priority because the planting area is adjacent to a restoration site is under development adjacent to the west ROW boundary.
- The river has started to form meanders within its current channel.
- Large area upstream of meander for spoils.
- West bank is low and offers the possibility for shavedowns.
- No NWP is required.

Project Construction Data

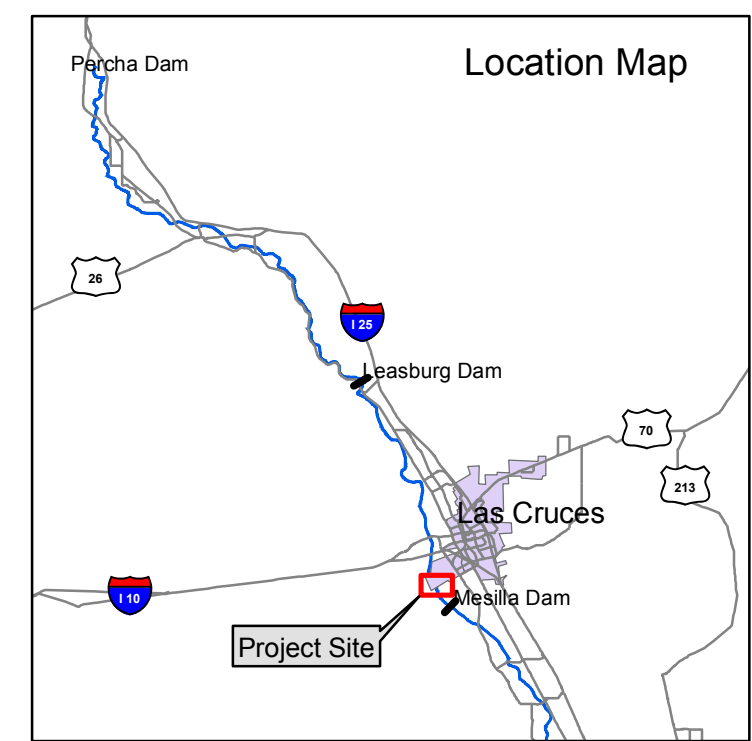
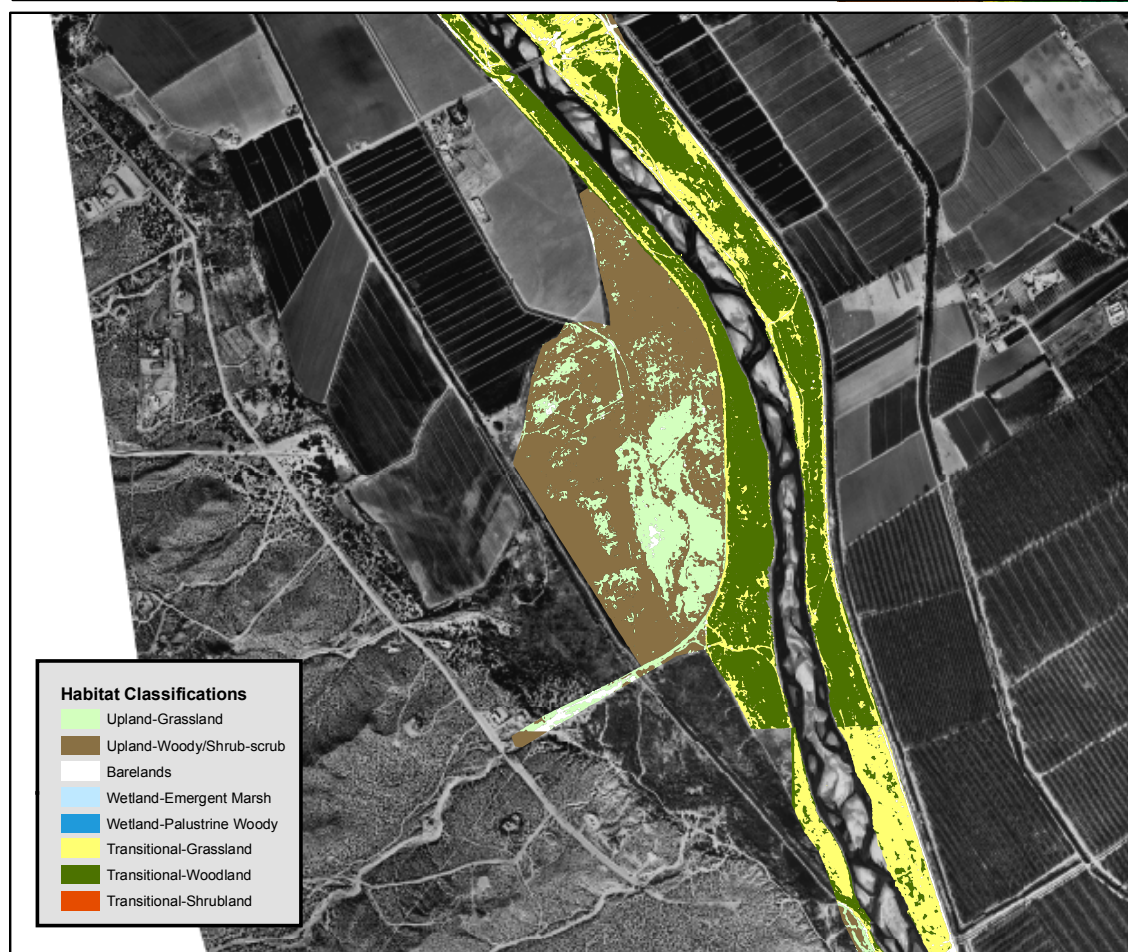
	Units	41A
Project area	Acres	71.3
Revegetation area (native trees)	Acres	71.3
Estimated cottonwood poles (109/ac)	Number	7,772



Mile 41 Picacho and NMGF

A privately-owned tract of land on the west side of the river near mile 41.5 has been identified by SWEC as the potential site of a Bosque Park. The presence of an old channel through the tract is evident from vegetation and from historical maps. Undeveloped land south of this tract, owned by New Mexico Game and Fish, is a project planned for bosque enhancement (Picacho Wetlands Project).

Point Project Measures	ID	#	Acres
Native vegetation planting	41A	3	71.3



SECTION 6 IMPLEMENTATION PROGRAM

This chapter of the RMP describes the implementation schedule and approach for environmental measures, permitting requirements associated with restoration project construction, lease management (grazing and recreational) and various cooperative agreements that the USIBWC will initiate in order to execute the RMP.

6.1 IMPLEMENTATION SCHEDULE

A 20-year timeline was adopted for implementation of projects. The timeline was divided into three phases:

Phase 1. During this 5-year phase, implementation plans will be developed and funded, agreements will be reached for interagency cooperation and water use, and selected projects will be tested at a pilot scale. Project performance will be monitored to determine their success, water use, and need for modification, and to conduct an environmental benefit versus investment analysis.

Phase 2. During this 5-year phase, priority projects will be implemented, as determined by the potential cost and environmental benefit. Project prioritization will be conducted according to an adaptive management approach discussed in Section 6.2.

Phase 3. Remaining projects with a lower priority will be implemented over a 10-year period following Phase 2.

Following Phase 3, environmental measures will be maintained in the long run and, to the extent possible, expanded to sustain the riparian corridor and ensure functionality of aquatic habitat diversification projects. A project timetable is presented in Table 6.1.

6.2 ADAPTIVE MANAGEMENT

The use of adaptive management is anticipated in implementing the river management plan for the RGCP. Adaptive management is a science-based decision process that will lead to better management through a systematic process of prediction, application, monitoring, feedback, and improvement.

The adaptive management scheme lays out specific, measurable goals to be achieved but allows for continuing evaluation and adjustment to cope with unexpected results or changing conditions. The adaptive management approach also allows for development of new management techniques through experimentation. An adaptive management strategy has been adopted because of the following factors:

- The large scale and resources needed for ecosystem restoration and habitat improvements,
- Implementation of measures would occur over an extended period of time, and
- Uncertainties in projecting hydrologic, geomorphic, and ecosystem responses, and those associated with weather, stream flow, and future channel morphology.

Table 6.1 Project Implementation

River Mile ID	Site Name	Native Vegetation Planting	Stream Bank Shavedowns	Modify Dredging at Arroyos	Native Grassland Management
105	Oxbow Restoration	105A (6.6 acres)			
104	Tipton Arroyo	104A* (5.4 acres)	104B (3.4 acres)	104D (0.20 acres)	
103	Trujillo Arroyo		103B (26.5 acres)	103D (0.90 acres)	UR-01a (27 acres)
102	Montoya Arroyo	102A (2.8 acres)	102B (24.7 acres)	102D (0.17 acres)	
101	Holguin Arroyo	101A (6.0 acres)	101B (12.5 acres)	101D (0.16 acres)	UR-02a, b (50, 8 acres)
99	Green/Tierra Blanca Arroyos	99A (5.1 acres)		99D (0.27 acres)	UR-03a (20 acres)
98	Sibley Point Bar		98B (4.1 acres)	98D (0.27 acres)	UR-03b (26 acres)
97	Jaralosa Arroyo			97D (0.44 acres)	UR-04 (32 acres)
95	Jaralosa South	95A (5.1 acres)			UR-05a (91 acres)
94	Yeso Arroyo	94A (11.5 acres)	94B (3.9 acres)	94D (0.44 acres)	UR-05b (35 acres)
92	Crow Canyon		92B (17.9 acres)		UR-05c (259 acres)
90					UR-05d (48 acres)
88					LR-01a, b (46, 72 acres)
85	Placitas Arroyo			85D (0.52 acres)	
83	Remnant Bosque	83A (16.2 acres)	83B (17.9 acres)	83D (0.30 acres)	LR-02 (102 acres)
80					LR-03 (72 acres)
78	Rincon/Reed Arroyos			78D (2.74 acres)	
76	Bignell Arroyo	76A (10.3 acres)	76B (16.3 acres)	76D (0.52 acres)	
58					UM-01a (55 acres)
54	Channel Cut	54A (19.6 acres)			UM-01b (53 acres)
53					UM-01c (47 acres)
49	Spillway No. 39	49A (15.9 acres)			UM-01d (44 acres)
48	Spillway No. 8	48A (34.6 acres)			LC-01a, b (105, 66 acres)
42	Clark Lateral	42A (15.4 acres)			LC-02 (53 acres)
41	Picacho and NMGF	41A (71.3 acres)			
30					LM-1a, b, c (20, 45, 22 acres)

PHASE 1

PHASE 2

PHASE 3

The adaptive management would be implemented through coordination with the Paso del Norte Watershed Council established by the New Mexico-Texas Water Commission. The Council, established to oversee implementation of enhancements for the El Paso-Las Cruces Regional Sustainable Water Project, would serve in an advisory capacity regarding selection, planning, and implementation of environmental measures. The Paso del Norte Watershed Council would also recommend policies for cooperation and sharing information concerning planning and management activities of other projects potentially affecting the operation and management of the RGCP. Membership to the Council is open to all municipalities, water agencies, researchers, educators, businesses, volunteer organizations, and concerned citizens.

Technical guidance for future project needs and actions will be provided by an External Advisory Committee (See, subsection 7.3.1 for proposed member composition) to obtain impartial, scientifically informed evaluations, and that a long-term monitoring and evaluation program would be established. The program would document changes in river flow regime, groundwater depth, vegetation communities, and other predetermined aspects of the biological diversity of designated restoration and control sites.

6.3 PERMIT REQUIREMENTS

Construction activities that are within navigable waters or will result in fill, dredged material, or sediment (erosion) entering the river requires one or more federal permits. The USACE requires the USIBWC to obtain a Clean Water Act (CWA) Section 404 permit for work below the ordinary high water mark (OHM). The OHM for the RGCP was defined in 2004 by the USACE El Paso Field Office as the bank vegetation line created by the annual irrigation flow. The USEPA requires the USIBWC to obtain a Storm Water Permit for Construction Activities disturbing 1-acre or more of land. The objective of both permits is to limit the quantity of material entering the river, such as sediment from erosion.

6.3.1 CWA Section 404 Permits

The USACE has 32 Nationwide Permits (NWP) that are used to permit typical construction activities. These NWPs also contain applicable Rivers and Harbor Act Section 10 and CWA Section 401 State Water Quality Certification permit conditions.

The USACE has indicated permit NWP-27 may be appropriate for the RGCP environmental measures. A copy of NWP-27 Summary is located in Appendix A.

Procedures for Obtaining a NWP-27

The USIBWC staff will perform the following steps to obtain proper permit authorization.

- Call the El Paso field office of the USACE (915-568-1359) located at Fort Bliss when a river restoration project has been authorized.
- Download from the USACE Albuquerque District website and review the most recent NWP-27 Summary and permit guidance (<http://www.spa.usace.army.mil>).

- Survey site and produce boundary and topographic map.
- Perform a pre-design field survey and revegetation assessment to identify areas where the various river management modifications are sustainable without frequent maintenance (less than annual).
- Develop a scaled site map. The site map will identify both permanent and temporary areas of construction. These areas include vehicle access points, spoils disposal areas, erosion control and wetland areas. See ENG Form 4345 (permit application form) for more details.
- Prepare NWP preconstruction notice (PCN). The PCN consists of a letter, a completed application form (ENG Form 4345), and maps.

Project Notification Letter

The PCN letter should provide the following information:

- Name, address, and telephone number of USIBWC contact.
- The location of the project (description and map).
- The purpose of, and need for, the project.
- Description of project and adverse environmental impacts identified in the Draft EIS.

ENG Form 4345

The application for a Department of Army Permit uses ENG (Engineering) Form 4345. New Mexico Environment Department has a joint application with the DOA that specifically addresses water quality concerns in New Mexico. A copy of the joint application form and instruction follows the NWP-27 Summary in this appendix. Form 4345 contains 2 pages of forms and 2 pages of instructions. Most of the instructions are straightforward. Some need additional explanation.

Blocks 8 – 11, Authorized Agent. These blocks allow a permittee to assign representation of the USIBWC to another person or entity. Insert NA (not applicable) in blocks 8-11.

Blocks 18 and 19, Project Activities and Purpose. Insert “Refer to PCN letter for this information”.

Blocks 20 -22 Dredged or Fill Material to be Discharged. It is not anticipated that any fill will be disposed in the river. Nevertheless, earlier coordination with the USACE El Paso Field Office should address how to respond to this information request.

Block 24, Adjoining Property Owner. Typically, distance from construction is considered on whether to list an adjacent property owner. The USACE El Paso Field Office should be consulted before filling out this part of the application.

Blocks 26 and 27, Water Quality Impacts. Obtaining coverage under USEPA Region 6 Construction General Permit (CGP) for Storm Water Discharges satisfies these requirements. Procedures for obtaining a CGP are located in subsection 6.3.3.

Location and Site Maps

The location map identifies the project area in reference to easily identifiable landmarks, such as highway intersections. The scaled site map described above should also be included with the PCN letter. Both maps need to be on 8.5" x 11" paper. The USIBWC will include the regular plan size site map and a miniaturized 8.5" x 11" version of the site map with the PCN.

6.3.2 Permit NWP-31

NWP-31, which applies to "*Maintenance of Existing Flood Control Facilities*" will be evaluated for use as an all encompassing RGCP maintenance permit as opposed to seeking individual dredging project by project USACE permits. This NWP requires obtaining the details of the original flood and/or irrigation flow conveying design and any original river cross-sections. The design parameters and cross-section form the maintenance baseline. The purpose of the maintenance baseline is to maintain the original flow carrying capacity of the man-made canal. A copy of NWP-31 is in Appendix A.

6.3.3 USEPA Construction Storm Water General Permit

The USEPA requires the USIBWC to obtain a Construction Storm Water General Permit (CGP) for construction jobs (non-maintenance) that will disturb 1-acre or more of land with some exceptions for small construction jobs. The July 1, 2003 CGP, which expires on July 1, 2008, is located at <http://cfpub2.epa.gov/npdes/stormwater/cgp.cfm>. A new form will be required for construction projects that start after the 2008 permit expiration date.

The USEPA will waive the CGP for small construction job, less than 5 acres, during certain parts of the year in New Mexico. The waiver is contingent, among others, on a calculated Erosivity Index (EI). The EPA sponsored the development of an approximation of the EI on the Texas A&M University website: <http://ei.tamu.edu/index.html>. As an example, for a small construction job starting October 1, 2004 and ending in August 1, 2005 on the Rio Grande in Sierra County, the Erosivity Index is approximately 3.27. The waiver requires submittal of the Erosivity Index calculations, so the website is not official for permitting purposes.

Appendix D of the CGP and USEPA Storm Water Phase II Fact Sheet 3.1 (Appendix A) are to be used to calculate the EI for submission of the waiver. According to Figure 1 of this Fact Sheet, the EI Zone from Caballo Dam to the Texas border is 72. Table 1, page 11, Row 72 indicates construction performed between September 16 through July 31 corresponds to an EI of 3.9, which is less than 5. Therefore, for construction projects less than 5 acres and occurring between September 16 through July 31, a construction rainfall erosivity waiver will be requested. As of March 8, 2004, a Low Erosivity Waiver Form was not available. If EPA does create a form, it will be

noticed (either directly, by public notice, or by making information available in <http://www.epa.gov/npdes/stormwater/cgp>).

If the USIBWC is eligible for a waiver based on low erosivity potential, provide the following information in a letter requesting a waiver from permitting requirements:

- Name, address and telephone number of the construction site operators;
- Name (or other identifier), address, county or similar governmental subdivision, and latitude/longitude of the construction project or site;
- Estimated construction start and completion (i.e., final stabilization) dates, and total acreage (to the nearest quarter acre) to be disturbed;
- The rainfall erosivity factor calculation that applies to the active construction phase at your project site; and
- A statement, signed and dated by an authorized USIBWC representative as provided in the Construction General Permit (CGP Appendix G, Subsection 11) that certifies that the construction activity will take place during a period when the value of the rainfall erosivity factor is less than five.

For construction projects above 1 acre that do not qualify for a waiver and projects greater than 5 acres, a CGP will be obtained. The CGP requires the development of a Storm Water Pollution Prevention Plan (SWPPP).

The CGP describes in detail the required contents of the SWPPP. Obtain the most current CGP and develop the document according to the instructions. The SWPPP is typically developed during the design phase since the design must incorporate many of the requirements of the CGP.

After the SWPPP, a Notice of Intent to comply with the CGP will be filed electronically with the USEPA. The NOI may be filed electronically at the following website: <http://cfpub.epa.gov/npdes/stormwater/enoi.cfm>. The CGP authorizes construction to begin 7-days after acknowledgement of receipt of the NOI.

Requirements of the CGP may be terminated after construction and final stabilization are complete. A definition of "Final Stabilization" is in the permit and is required only of areas that are not otherwise covered by some sort of structure. All other disturbed areas must be finally stabilized by either vegetative or non-vegetative practices, except disturbed areas on lands that will be returned to an agricultural use such as cropland, rangeland, or silviculture need only be returned to the preexisting agricultural use condition (e.g., tilled land, grass rangeland, agricultural buffer strip, etc.). Perennial vegetation could include grasses, ground covers, trees, shrubs, etc. Vegetative final stabilization only requires getting to 70 percent of the "natural" vegetative cover in that part of the country. If the natural cover is only 50 percent, you only have to get back to 35 percent cover (70 percent of 50 percent). Non-vegetative stabilization could include rip-rap, gravel, gabions, mulch etc. Long term semi-permanent erosion control practices combined with seeds that would establish vegetative stabilization (e.g., properly secured seed impregnated erosion control mats, etc.) could also be used as "final stabilization." To qualify as "long-term," the erosion control practice must be selected, designed, and

installed so as to provide at least three years of erosion control (USEPA Storm Water frequently asked questions).

EPA believes where the environmental threat is low (i.e., in arid and semi-arid climates), "final stabilization" can also include techniques that employ re-vegetation combined with other stabilization measures. "Other stabilization measures" in this context include what are known as "temporary degradable rolled erosion control products," a.k.a., "erosion control blankets" (ECBs) along with an appropriate seed base. With proper selection (degradability, application, siting, etc), design, and installation, ECBs can be very effective in preventing the detachment and transportation of soil until they naturally degrade and vegetation has assumed this function. Therefore, upon proper selection, design, and installation of the combination ECB-seed technique in arid or semi-arid areas, a permittee can be considered to have achieved final stabilization and can terminate permit coverage. If longer than 3 years (i.e., three growing seasons) is required to establish the 70 percent of natural vegetative cover, this technique cannot be used or cited for fulfillment of permit termination requirements prior to actual establishment of vegetative cover (USEPA Storm Water frequently asked questions).

To terminate CGP coverage, complete a Notice of Termination (NOT) form and mail to the USEPA Storm Water Notice Processing Center listed in the CGP. The NOT form is located at the back of the CGP and at the following website http://cfpub.epa.gov/npdes/stormwater/application_coverage.cfm.

6.4 COOPERATION AGREEMENTS

Cooperation agreements were identified as a strategy for water acquisition and for acquisition and management of conservation easements.

6.4.1 Water Acquisition

Because the USIBWC does not have any water rights within the RGCP, water rights acquisition in cooperation with EBID and EPCWID#1 becomes a critical element in the viability and long-term sustainability of several environmental measures. Any third-party water conversion contracts would need USBR approval pursuant to the 1920 Sale of Water for Miscellaneous Purposes Act.

The USIBWC will support initiatives from environmental organizations and farming communities to develop a regulatory and cooperation framework for use of water in environmental measures. A detailed analysis of potential USBR Rio Grande Project water use for river restoration was recently completed by the World Wildlife Fund (King and Maitland 2003; the study is available online at the following address <http://cagesun.nmsu.edu/~jpkking/wwf/reportdownload.htm>). The study evaluated current water uses and options for collaboration between the agricultural community and environmental water users.

Two strategies under consideration for water rights acquisition are financing on-farm water conservation programs within irrigation districts, and water banking.

Financing On-Farm Water Conservation Programs

Support of water conservation by financing on-farm water conservation programs was identified as a viable strategy to secure water for use in environmental measures. On farm application efficiency for individual districts have been recently reported in the 50 to 82 percent range for EBID, and 50 to 75 percent range for EPCWID#1 (King and Maitland 2003). Supporting water conservation would not only be consistent with ongoing programs and stated interests of the irrigation districts, but would also facilitate seeking funds from high-priority state and federal programs. Such conservation programs would focus on financing on-farm irrigation system improvements that represent a substantial investment for individual farmers.

Water Banking

Water banking is a water management strategy that speeds up the temporary transfer of water from those willing to lease it to those willing to pay to use it. Farmers and other water rights holders can deposit some or all of their allotted water into a “water bank” where users pay the going market rate to borrow it for a limited period of time. The lessor retains ownership of the water rights, and rights placed in the bank cannot be forfeited for non-use.

6.4.2 Easement Acquisition and Management

Flood easements, as well as conservation easements, could be incorporated in the future as part of the RMP. Flood easements, while their acquisition is not anticipated in the short-term, could be acquired in the future by the USIBWC as part of a revised flood control strategy. Easements would add flood protection beyond that already provided by a levee system that has been in place for over 60 years. Under these conditions flood easements would cover areas without recurrent flooding and in relatively elevated terrain with little potential for riparian corridor development.

Conservation easements outside the ROW would provide connectivity with undeveloped areas and provide a buffer to riparian vegetation. These objectives do not fall within the Congress-mandated mission for the RGCP and, thus, they would not be operated under USIBWC jurisdiction. Easement acquisition and management would be done through cooperative agreements with other agencies with natural resources management capabilities and funding, and environmental organizations placing high priority on habitat conservation by land acquisition. Cooperative agreements could include USFWS, USACE, USBR, NRCS, National Park Service, New Mexico Department of Game and Fish (NMDGF), New Mexico State Parks Department, and Texas Parks and Wildlife Department, county/local conservation/recreational agencies, and organizations such as the Nature Conservancy. Available programs include the National Parks Service Land and Conservation Fund, the USACE Continuing Authorities Program (Sections 206 and 1135, ecosystem restoration), and NRCS programs for conservation reserves, wetlands reserves, wildlife habitat incentives, and environmental quality incentives.

SECTION 7

GUIDELINES FOR PROJECT DEVELOPMENT

This section provides general guidelines for completing the projects described in Section 5. Each project will have distinct phases (Subsection 7.1) subdivided into distinct tasks (Subsection 7.2). Guidelines for a monitoring plan are described in Subsection 7.3.

7.1 PROJECT PHASES

Most projects will have at least four phases:

- Pre-design,
- Design,
- Construction, and
- Post-construction erosion control.

7.1.1 Pre-Design Phase

There are a number of activities that need to be performed before construction can start. The USIBWC will notify the El Paso field office of the USACE located at Fort Bliss when a project has been authorized that requires a permit. See Section 6. Since many of these projects will be excavating material below the ordinary high water mark (OHWM), a Nationwide Permit 27 (NWP-27) will be needed. Having the USACE involved at the beginning of the project will help in permitting process.

Prior to design, each site will need a boundary and topographic survey to develop a topographic map of the site. A pre-design field survey and revegetation assessment will identify areas of each restoration efforts and establish the restoration baseline. A scaled site map can then be developed. The site map should identify both permanent and temporary areas of construction. These areas include access points as well as spoils disposal areas.

Once the site map is completed, a NWP-27 preconstruction notice should be developed and submitted to the USACE if required. Authorization to construct under a NWP typically takes less than 30-days. Appendix A contains procedures for completing a NWP-27 preconstruction notice.

7.1.2 Design Phase

After the site map is developed, engineers can develop design drawings and specifications. The design drawings will identify the construction access point, cut and fill estimations, erosion control procedures, and provide scaled drawing of restoration and spoils disposal areas. Specifications will identify native plant species and contain the procedures for planting and irrigating.

Following the final design completion, and no less than 2 days prior to construction, a Storm Water Pollution Prevention Plan (SWPPP) and a Notice of Intent

(NOI) to follow the National Pollutant Discharge Elimination System (NPDES) General Permit should be submitted to EPA Region 6 and the New Mexico Environment Department. See Section 6.3.3 and Appendix A for details on permit submittal.

7.1.3 Construction Phase

Description of tasks in the construction phase are outside the scope of this RMP. Mitigation measures to be implemented during construction and application of vegetation treatments, such as salt cedar control, are listed by resource area in Appendix F.

7.1.4 Post Construction Erosion Control Phase

Many of the projects will require post-construction maintenance and monitoring. A Monitoring Plan will need to be prepared to detail the post-construction maintenance such as, watering and emergent exotic vegetation control as well as vegetation establishment surveys, monitoring schedule and reporting requirements (Subsection 7.3).

7.2 TASK DESCRIPTIONS

7.2.1 Summary

Each project is composed of various tasks. Table 7.1 identifies each major task associated with each project type.

7.2.2 Project Task Criteria

The following provides details concerning the implementation of each task.

Project Permits

Section 6 and Appendix A contain the procedures and forms to be used to obtain the required permit. A USACE permit is required if construction or maintenance occurs below the OHWM. A Region 6 Storm Water Permit is required for construction projects that disturb 1 acre or more of land.

Aerial / GIS Assessment

Aerial photography and GIS will be used to prescreen point project sites for vegetation and potential wetlands and will help determine site access and look at possible conflicts with adjacent landowners.

Field Survey

A survey crew will be sent to each project to obtain project boundary and topographic data including the location and elevation of the ordinary high water mark (OHWM). Description of the OHWM and an example photograph is in Appendix A.

Table 7.1 Project / Task Matrix

Project Tasks	Project Type				
	Native Grasslands	Grazing Regimes	Modified Arroyo Dredging	Bank Shave-downs	Native Tree Planting
USACE Nationwide Permit			√	√	√
Aerial/GIS survey	√	√	√	√	√
Field survey	√	√	√	√	√
Fencing	√	√	√		√
Alternate water source	√	√			
Site access	√	√	√	√	√
Equipment staging			√	√	√
Spoils placement			√	√	√
Storm water pollution prevention plan (SWPPP)			√	√	√
Excavation			√	√	√
Mowing	√	√			
Hand clearing	√	√			
Herbicide application	√	√			
Controlled burns	√				
Soil preparation	√	√			√
Seeding	√	√	√	√	√
Planting		√			
Fertilization	√	√			√
Temporary watering	√	√			
Monitoring	√	√	√	√	√

The USIBWC staff will meet with the survey crew at the site to establish the project boundaries and identify the OHWM. The survey crew will provide a scaled project area topographic map, the square-feet within the project area, and an electronic copy of the data that is compatible with USIBWC CAD or GIS software. This information will be used to develop the site map.

Some areas where excavation will occur may include or be adjacent to wetlands. A wetlands evaluation will be necessary to determine the extent of wetlands in the area, and its relation to the designed excavation. If wetlands were thought to be adjacent to the restoration site, a wetland delineation will be performed at the site using standard USACE wetland delineation procedures. Wetland and vegetation characterization will begin with a GIS assessment of the site using available aerial photography. Areas likely to be considered wetlands will be noted, as well as other vegetation characteristics such as: density of salt cedar, species structure and physiognomic characteristics of the surrounding terrain. The vegetation characteristics assessment will be used as a baseline from which to measure the effectiveness of environmental measures.

Fencing

Fencing is used as a means of protecting the restoration efforts along river banks from damage caused by livestock and wildlife. It should be used for changes in grazing regimes and after pole planting and seeding native grasses.

Alternative Livestock Water Source Development

Because fencing prevents livestock from drinking from the river, it may be necessary to provide an alternative water source such as a windmill well and trough.

Site Access

It may be necessary to acquire site access through private or public lands for heavy equipment. These arrangements need to be made in the design phase of any point project.

Equipment Staging

If construction is required for an extended time, the design and SWPPP must identify a secure location to unload/load and store the heavy equipment. These arrangements need to be made in the design phase of any point project.

Spoils Placement

Excavated soil will need to be placed in an upland area within the boundary of USIBWC property. Spoils may not be used on the levee. If no area near the project site is available, trucking spoils to a suitable location may be required and will need to be accounted for in the design.

Storm Water Pollution Prevention Plan

Prior to any excavation or placement of soils, sedimentation controls must be in place before any work begins. If the excavated area exceeds 1 acre, a Storm Water Pollution Prevention Plan will be required. See Section 6 and Appendix A.

Excavation

Excavation will be required for re-opening meanders, arroyo embayments, bank and shavedowns. The topographic data developed during the site survey will be used to determine the quantity of spoils. Grading will be necessary for bank shavedowns to achieve the correct final elevation.

Mowing

Mowing is performed over much of the project area for salt cedar and other exotic vegetation control. Mowing should occur before the field survey.

Hand Removal

Hand removal of salt cedar and other exotic vegetation control is performed in areas that are too near the water for heavy equipment. It is performed with chainsaws, machetes and axes. The vegetation removed will need to be moved and staged for decay (which can create beneficial habitat for fauna) or burned if area is limited.

Herbicide Application

Herbicides are applied in conjunction with hand removal to prevent regrowth. Garlon-4 (triclopyr) or a similar product is applied to the stump with a paint brush or handheld sprayer immediately after cutting. This method is only effective when vegetation is active growing, generally April thru October.

Controlled Burns

Control of exotic grasses over large areas with controlled burns is an option. It is much more cost effective than aerial application of herbicides and prepares the soil for seeding native grasses.

Soil Preparation

Soil testing is required prior to soil preparation. Soil samples will be collected 15 inches below the surface and 15 inches above the water table in a grid pattern over the project area to determine salinity (electrical conductivity) and soil texture. Soil preparation consists of clearing invasive vegetation, grading, disking, salinity management and fertilization.

Seeding

Seeding native grasses will be performed with seed drills over large areas or broadcast seeding over smaller areas. Straw will be used to cover the seeded area for germination. Watering will likely be required to establish the native seeds.

Native grass seeds including: Salt grass; Little bluestem; and Black gramma. Native trees will be Cottonwood, Goodings willow and Coyote willow. Native grass seed and plant producers and distributors can be acquired from the NRCS website (<http://plant-materials.nrcs.usda.gov/technical/websites/source.html>).

Planting

A groundwater prism will be developed using historic groundwater elevation and flow rate data and field measurements to determine the required planting elevations of poles. Installation of groundwater monitoring wells and piezometers may be required to determine baseline groundwater elevations. The groundwater elevations will need to be monitored for a minimum of one year (under normal flow conditions) to determine the variation of groundwater elevations in the project area. These groundwater wells should be monitored throughout the restoration program period to measure changes in the water table and help evaluate the effectiveness of the environmental measures.

Cottonwood and Black willow poles will be planted in a grid pattern of holes approximately 20' apart and 6' deep. Sapling poles may be cut from existing stands of trees found in the area. Poles will be approximately 10' long and have a butt diameter of 2-3". A bobcat with a hole auger attachment has been shown to be the most effective method of planting pole cuttings. Chicken wire is used around the base of the saplings to prevent girding by beavers. Pole planting survival rate has been approximately 60 percent. Failed pole plantings will be replaced on a site-rotation basis.

Fertilization / Root Stimulation

Compost or fertilizer will be placed in the hole created by the auger prior to pole planting. Backfill soil will contain sufficient quantity of clay to wick groundwater. Root stimulant will be applied to poles ends before placing them in the holes and backfilling.

Temporary Watering

A watering truck or purchase of river water and irrigation system will be required to water the seeded area weekly until the native grasses planted are established. It is estimated approximately 2 acre-feet of water will be needed to establish vegetation that can survive (see Appendix H for technical support documentation). Tree poles planted may require watering during the first year as well.

Monitoring

Biweekly monitoring will be performed for spot foliar application of herbicide to salt cedar. Additional watering may be required and will be determined during the biweekly assessments. Photo-documentation of the point project sites will be performed, in digital format, to be used in evaluating the performance of environmental measures.

7.3 MONITORING PLAN

Monitoring will be required after environmental measures have been performed to determine if the measure is performing as desired and maintenance is required for some of the measures to ensure the effectiveness of the measure at each site. When time, money and materials are being spent, results are expected. Only monitoring the performance of the environmental measure will provide the quality assurance and quality control to provide reliable determination of the measure performance.

7.3.1 Plan Preparation

A monitoring plan will be prepared during the design portion of each project. It will be prepared in coordination with the External Advisory Committee which may include all municipalities, water agencies, researchers, educators, businesses, volunteer organizations, and concerned citizens. It is envisioned that monitoring of the restoration projects could be performed by volunteers and researchers interested in these efforts.

The baseline data collected during the initial site and vegetation surveys will be compared to the results from the scheduled monitoring and maintenance activities to determine environmental measure effectiveness. Monitoring data will be used in the planning the implementation of future point projects. If a measure isn't working to improve habitat as implemented, modifications to the environmental measure should be employed to improve the measure until it performs as expected.

The monitoring plan will state the desired restoration goals and objectives, such as increased native riparian vegetation, reduce sedimentation, or improve wildlife and aquatic habitat.

7.3.2 Plan Components

Monitoring Guidelines - Monitoring guidelines document the baseline condition, and establish the restoration criteria to be measured; guidelines also indicate how criteria will be measured and milestones between the base and restored condition.

Monitoring Schedule – The monitoring schedule determines how often restoration criteria are measured.

GPS/GIS Mapping – Global positioning systems (GPS) are used to locate areas where baseline and monitoring information is collected. The GPS locational data are entered into GIS mapping software and criteria measurements are entered into database software and related to the GIS locational data. This method will allow the monitoring information to be viewed spatially and help to provide a better interpretation of the data collected.

Project Monitoring Reports – The monitoring data reports are prepared as data becomes available and presented to the External Advisory Committee.

APPENDIX A
USACE AND USEPA PERMITTING PROCEDURES

MEMORANDUM

To: Douglas Echlin, Environmental Protection Specialist, US IBWC

From: Stephen W. Manning, P.E.

Date: March 17, 2004

Subject: January 28, 2004 Visit to the RGCP

The USIBWC and Parsons met with Jim Mace of the USACE, El Paso Field office and John Branstetter of the US Fish and Wildlife Service, Albuquerque Office on January 28, 2004. The purpose of the meeting was to visit some of the point project sites to discuss the restoration alternatives and permitting needs. Mr. Mace stated that work below the Ordinary High Water Mark (OHM) would need to be authorized by a Clean Water Act Section 404 and/or Rivers and Harbors Act Section 10 permit. One permit can cover the entire requirements of Sections 404 and 10.

According to 33 CFR 328 – Definition of Waters of the U.S., Subsection 3(e) “*The term ordinary high water mark means that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.*”

Mr. Mace indicated the edge of the vegetation line created by the irrigation flow was the OHM. The photograph on the next page provides a good example of this vegetation line.

Any work below this vegetation line will need to be permitted. Mr. Mace agreed that the restoration work and canal maintenance work performed in the area at the same time could be permitted under a Nationwide Permit 27 (NWP-27). Procedures for obtaining a NWP-27 are discussed in the next subsection.

We also discussed permitting options for routine maintenance within the canal. Parsons suggested NWP-31, which applies to “*Maintenance of Existing Flood Control Facilities*”. This NWP requires details of the original flood and/or irrigation flow conveying design or river cross-sections. The design parameters and cross-section form the maintenance baseline. The purpose of the maintenance baseline is to maintain the original flow carrying capacity of the manmade canal. Although work to obtain a NWP-31 is outside the scope of this river management plan, obtaining a NWP-31 may be more cost effective than applying for individual permit one job at a time. Parsons recommends consideration of applying for a NWP-31.

Ordinary High Water Mark



NATIONWIDE PERMIT 27

NWP-27 authorizes stream and wetland activities such as the creation of riparian areas and wetlands and enhancement of stream and open waters of the U.S., provided there are no net loss of wetlands. A copy of NWP-27 Summary is located in this appendix.

Activities authorized by this NWP include the removal of accumulated sediments; the installation, removal, and maintenance of small water control structures, dikes, and berms; the installation of current deflectors; the enhancement, restoration, or creation of riffle and pool stream structure; the placement of in-stream habitat structures; modifications of the stream bed and/or banks to restore or create stream meanders; the backfilling of artificial channels and drainage ditches; the removal of existing drainage structures; the construction of small nesting islands; the construction of open water areas; activities needed to reestablish vegetation, including plowing or discing for seed bed preparation and the planting of appropriate wetland species; mechanized land clearing to remove non-native invasive, exotic or nuisance vegetation; and other related activities. Planting of non-native vegetation is prohibited.

NWP-27 contains 27 general conditions that are common to all nationwide permits. Most of these conditions are general knowledge, such as don't disturb any endangered species or block traffic to navigation. Below is a list of all the general conditions with a brief description. For a complete description of all the conditions, see the copy of NWP-27 Summary at the end of this appendix.

Note that Item 13.(b)(4) in the NWP-27 Summary does not require delineation of wetlands under NWP-27. Additionally, Item 13.(b)(8) only applies to actual restoration of previously identified riparian habitats and wetlands. The projects described in this RMP are actually creating new habitat, although the projects are referred to as restoration, generally speaking, in the DEIS.

General Condition	Brief Description
1	Only minimal adverse affects on navigation is allowed.
2	Structures maintained to ensure public safety.
3	Soil erosion and sediment controls required. <i>[See Section 2 of this appendix]</i>
4	Allow for aquatic life movement.
5	Minimize soil disturbance by equipment in wetlands.
6	Regional and case-by-case conditions may apply.
7	Work cannot adversely affect Wild and Scenic River designation.
8	Tribal rights are applicable.
9	Water Quality <i>[See Section 2 of this appendix]</i>
10	Coastal Zone Management regulation apply where applicable.
11	Cannot jeopardize continued existence of endangered or threatened species.
12	Cannot adversely impact historic properties.
13	Notification requirements <i>[See the Preconstruction Notice subsection]</i>
14	Certification of completion of work must be submitted to USACE.
15	Use of multiple NWP prohibited unless disturbed acreage limits are met.
16	Work cannot negatively affect water supply intakes.
17	Work in concentrated shellfish populations prohibited.
18	Fill cannot contain unsuitable materials (e.g., cars, trash) or toxic materials.
19	Compensatory mitigation requirements. <i>[Not required for NWP-27]</i>
20	Avoid spawning areas in spawning season.
21	Maintain preconstruction downstream flow conditions.
22	Adverse effects from impoundments prohibited.
23	Avoid waterfowl breeding areas.
24	Removal of temporary fill required at completion of work.
25	Designated Critical Resource Waters <i>[Does not apply to RGCP]</i>
26	Fills within 100-year floodplain <i>[No FEMA floodplain map is available for the RGCP]</i>
27	Construction period <i>[see Preconstruction Notice subsection]</i>

OTHER CONDITIONS

This appendix contains a copy of conditions specific to New Mexico. See *ISSUANCE OF STATEWIDE REGIONAL CONDITIONS TO THE NATIONWIDE PERMIT PROGRAM IN THE STATE OF NEW MEXICO* in this appendix.



**U.S. Army Corps
of Engineers**
Albuquerque District

Nationwide Permit Summary

No. 27, STREAM AND WETLAND RESTORATION ACTIVITIES (NWP Final Notice, 67 FR 2082, para. 27)

Activities in waters of the US associated with the restoration of former waters, the enhancement of degraded tidal and non-tidal wetlands and riparian areas, the creation of tidal and non-tidal wetlands and riparian areas, and the restoration and enhancement of non-tidal streams and non-tidal open water areas as follows:

(a) The activity is conducted on:

(1) Non-Federal public lands and private lands, in accordance with the terms and conditions of a binding wetland enhancement, restoration, or creation agreement between the landowner and the U.S. Fish and Wildlife Service (FWS) or the Natural Resources Conservation Service (NRCS), the National Marine Fisheries Service, the National Ocean Service, or voluntary wetland restoration, enhancement, and creation actions documented by the NRCS pursuant to NRCS regulations; or

(2) Reclaimed surface coal mine lands, in accordance with a Surface Mining Control and Reclamation Act permit issued by the OSM or the applicable state agency (the future reversion does not apply to streams or wetlands created, restored, or enhanced as mitigation for the mining impacts, nor naturally due to hydrologic or topographic features, nor for a mitigation bank); or

(3) Any other public, private or tribal lands;

(b) Notification: For activities on any public or private land that are not described by paragraphs (a)(1) or (a)(2) above, the permittee must notify the District Engineer in accordance with General Condition 13; and

(c) Planting of only native species should occur on the site.

Activities authorized by this NWP include, to the extent that a Corps permit is required, but are not limited to: the removal of accumulated sediments; the installation, removal, and maintenance of small water control structures, dikes, and berms; the installation of current deflectors; the enhancement, restoration, or creation of riffle and pool stream structure; the placement of in-stream habitat structures; modifications of the stream bed and/or banks to restore or create stream meanders; the backfilling of artificial channels and drainage ditches; the removal of existing drainage structures; the construction of small nesting islands; the construction of

open water areas; the construction of oyster habitat over unvegetated bottom in tidal waters; activities needed to reestablish vegetation, including plowing or discing for seed bed preparation and the planting of appropriate wetland species; mechanized land clearing to remove non-native invasive, exotic or nuisance vegetation; and other related activities.

This NWP does not authorize the conversion of a stream to another aquatic use, such as the creation of an impoundment for waterfowl habitat. This NWP does not authorize stream channelization. This NWP does not authorize the conversion of natural wetlands to another aquatic use, such as creation of waterfowl impoundments where a forested wetland previously existed. However, this NWP authorizes the relocation of non-tidal waters, including non-tidal wetlands, on the project site provided there are net gains in aquatic resource functions and values. For example, this NWP may authorize the creation of an open water impoundment in a non-tidal emergent wetland, provided the non-tidal emergent wetland is replaced by creating that wetland type on the project site. This NWP does not authorize the relocation of tidal waters or the conversion of tidal waters, including tidal wetlands, to other aquatic uses, such as the conversion of tidal wetlands into open water impoundments.

Reversion. For enhancement, restoration, and creation projects conducted under paragraphs (a)(3), this NWP does not authorize any future discharge of dredged or fill material associated with the reversion of the area to its prior condition. In such cases a separate permit would be required for any reversion. For restoration, enhancement, and creation projects conducted under paragraphs (a)(1) and (a)(2), this NWP also authorizes any future discharge of dredged or fill material associated with the reversion of the area to its documented prior condition and use (i.e., prior to the restoration, enhancement, or creation activities). The reversion must occur within five years after expiration of a limited term wetland restoration or creation agreement or permit, even if the discharge occurs after this NWP expires. This NWP also authorizes the reversion of wetlands that were restored, enhanced, or created on prior-converted cropland that has not been abandoned, in accordance with a binding agreement between the landowner and NRCS or FWS (even though the restoration, enhancement, or creation activity did not require a Section 404 permit). The five-year reversion limit does not apply to agreements without time limits reached under paragraph (a)(1). The prior condition will be documented in the original agreement or permit, and the determination of return to prior conditions will be made by the Federal agency or appropriate state agency executing the agreement or permit. Before any reversion activity the permittee or the appropriate Federal or state agency must notify the District Engineer and include the documentation of the prior condition. Once an area has reverted to its prior physical condition, it will be subject to whatever the Corps Regulatory requirements will be at that future date. (Sections 10 and 404)

Note: Compensatory mitigation is not required for activities authorized by this NWP, provided the authorized work results in a net increase in aquatic resource functions and values in the project area. This NWP can be used to authorize compensatory mitigation projects, including mitigation banks, provided the permittee notifies the District Engineer in accordance with General Condition 13, and the project includes compensatory mitigation for impacts to waters of the US caused by the authorized work. However, this NWP does not authorize the reversion of an area used for a compensatory mitigation project to its prior condition. NWP 27 can be used to authorize impacts at a mitigation bank, but only in circumstances where it has been approved under the Interagency Federal Mitigation Bank Guidelines.

NATIONWIDE PERMIT GENERAL CONDITIONS

The following General Conditions must be followed in order for any authorization by an NWP to be valid:

1. **Navigation.** No activity may cause more than a minimal adverse effect on navigation.
2. **Proper Maintenance.** Any structure or fill authorized shall be properly maintained, including maintenance to ensure public safety.
3. **Soil Erosion and Sediment Controls.** Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow.
4. **Aquatic Life Movements.** No activity may substantially disrupt the necessary life-cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. Culverts placed in streams must be installed to maintain low flow conditions.
5. **Equipment.** Heavy equipment working in wetlands must be placed on mats, or other measures must be taken to minimize soil disturbance.
6. **Regional and Case-By-Case Conditions.** The activity must comply with any regional conditions that may have been added by the Division Engineer (see 33 CFR 330.4(e)) and with any case specific conditions added by the Corps or by the state or tribe in its Section 401 Water Quality Certification

and Coastal Zone Management Act consistency determination. **Note: Statewide Regional Conditions have been added for activities within the states of Colorado, New Mexico, and Texas.**

7. **Wild and Scenic Rivers.** No activity may occur in a component of the National Wild and Scenic River System; or in a river officially designated by Congress as a "study river" for possible inclusion in the system, while the river is in an official study status; unless the appropriate Federal agency, with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation, or study status. Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency in the area (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service).

8. **Tribal Rights.** No activity or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.

9. **Water Quality.** (a) In certain states and tribal lands an individual 401 Water Quality Certification must be obtained or waived (See 33 CFR 330.4(c)).

(b) For NWPs 12, 14, 17, 18, 32, 39, 40, 42, 43, and 44, where the state or tribal 401 certification (either generically or individually) does not require or approve water quality management measures, the permittee must provide water quality management measures that will ensure that the authorized work does not result in more than minimal degradation of water quality (or the Corps determines that compliance with state or local standards, where applicable, will ensure no more than minimal adverse effect on water quality). An important component of water quality management includes stormwater management that minimizes degradation of the downstream aquatic system, including water quality (refer to General Condition 21 for stormwater management requirements). Another important component of water quality management is the establishment and maintenance of vegetated buffers next to open waters, including streams (refer to General Condition 19 for vegetated buffer requirements for the NWPs).

This condition is only applicable to projects that have the potential to affect water quality. While appropriate measures must be taken, in most cases it is not necessary to conduct detailed studies to identify such measures or to require monitoring.

10. **Coastal Zone Management.** In certain states, an individual state coastal zone management consistency concurrence must be obtained or

waived (see 33 CFR 330.4(d)).

11. Endangered Species. (a) No activity is authorized under any NWP which is likely to jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act (ESA), or which will destroy or adversely modify the critical habitat of such species. Non-federal permittees shall notify the District Engineer if any listed species or designated critical habitat might be affected or is in the vicinity of the project, or is located in the designated critical habitat and shall not begin work on the activity until notified by the District Engineer that the requirements of the ESA have been satisfied and that the activity is authorized. For activities that may affect Federally-listed endangered or threatened species or designated critical habitat, the notification must include the name(s) of the endangered or threatened species that may be affected by the proposed work or that utilize the designated critical habitat that may be affected by the proposed work. As a result of formal or informal consultation with the FWS or NMFS the District Engineer may add species-specific regional endangered species conditions to the NWPs.

(b) Authorization of an activity by a NWP does not authorize the "take" of a threatened or endangered species as defined under the ESA. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with "incidental take" provisions, etc.) from the USFWS or the NMFS, both lethal and non-lethal "takes" of protected species are in violation of the ESA. Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the USFWS and NMFS or their world wide web pages at <http://www.fws.gov/r9endspp/endspp.html> and http://www.nmfs.noaa.gov/prot_res/overview/es.html respectively.

12. Historic Properties. No activity which may affect historic properties listed, or eligible for listing, in the National Register of Historic Places is authorized, until the District Engineer has complied with the provisions of 33 CFR part 325, Appendix C. The prospective permittee must notify the District Engineer if the authorized activity may affect any historic properties listed, determined to be eligible, or which the prospective permittee has reason to believe may be eligible for listing on the National Register of Historic Places, and shall not begin the activity until notified by the District Engineer that the requirements of the National Historic Preservation Act have been satisfied and that the activity is authorized. Information on the location and existence of historic resources can be obtained from the State Historic Preservation Office and the National Register of Historic Places (see 33 CFR 330.4(g)). For activities that may affect historic properties listed in, or eligible for listing in, the National Register of Historic Places, the

notification must state which historic property may be affected by the proposed work or include a vicinity map indicating the location of the historic property.

13. Notification.

(a) Timing; where required by the terms of the NWP, the prospective permittee must notify the District Engineer with a preconstruction notification (PCN) as early as possible. The District Engineer must determine if the notification is complete within 30 days of the date of receipt and can request additional information necessary to make the PCN complete only once. However, if the prospective permittee does not provide all of the requested information, then the District Engineer will notify the prospective permittee that the notification is still incomplete and the PCN review process will not commence until all of the requested information has been received by the District Engineer. The prospective permittee shall not begin the activity:

(1) Until notified in writing by the District Engineer that the activity may proceed under the NWP with any special conditions imposed by the District or Division Engineer; or

(2) If notified in writing by the District or Division Engineer that an Individual Permit is required; or

(3) Unless 45 days have passed from the District Engineer's receipt of the complete notification and the prospective permittee has not received written notice from the District or Division Engineer. Subsequently, the permittee's right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2).

(b) Contents of Notification: The notification must be in writing and include the following information:

(1) Name, address and telephone numbers of the prospective permittee;

(2) Location of the proposed project;

(3) Brief description of the proposed project; the project's purpose; direct and indirect adverse environmental effects the project would cause; any other NWP(s), Regional General Permit(s), or Individual Permit(s) used or intended to be used to authorize any part of the proposed project or any related activity. Sketches should be provided when necessary to show that the activity complies with the terms of the NWP (Sketches usually clarify the project and when provided result in a quicker decision.);

(4) For NWPs 7, 12, 14, 18, 21, 34, 38, 39, 40, 41, 42, and 43, the PCN must also include a delineation of affected special aquatic sites, including wetlands, vegetated shallows (e.g., submerged aquatic vegetation, seagrass beds), and riffle and pool complexes (see paragraph 13(f));

(5) For NWP 7 (Outfall Structures and Maintenance), the PCN must include information regarding the original design capacities and

configurations of those areas of the facility where maintenance dredging or excavation is proposed;

(6) For NWP 14 (Linear Transportation Projects), the PCN must include a compensatory mitigation proposal to offset permanent losses of waters of the US and a statement describing how temporary losses of waters of the US will be minimized to the maximum extent practicable;

(7) For NWP 21 (Surface Coal Mining Activities), the PCN must include an Office of Surface Mining (OSM) or state-approved mitigation plan, if applicable. To be authorized by this NWP, the District Engineer must determine that the activity complies with the terms and conditions of the NWP and that the adverse environmental effects are minimal both individually and cumulatively and must notify the project sponsor of this determination in writing;

(8) For NWP 27 (Stream and Wetland Restoration Activities), the PCN must include documentation of the prior condition of the site that will be reverted by the permittee;

(9) For NWP 29 (Single-Family Housing), the PCN must also include:

(i) Any past use of this NWP by the Individual Permittee and/or the permittee's spouse;

(ii) A statement that the single-family housing activity is for a personal residence of the permittee;

(iii) A description of the entire parcel, including its size, and a delineation of wetlands. For the purpose of this NWP, parcels of land measuring 1/4-acre or less will not require a formal on-site delineation. However, the applicant shall provide an indication of where the wetlands are and the amount of wetlands that exists on the property. For parcels greater than 1/4-acre in size, formal wetland delineation must be prepared in accordance with the current method required by the Corps. (See paragraph 13(f));

(iv) A written description of all land (including, if available, legal descriptions) owned by the prospective permittee and/or the prospective permittee's spouse, within a one mile radius of the parcel, in any form of ownership (including any land owned as a partner, corporation, joint tenant, co-tenant, or as a tenant-by-the-entirety) and any land on which a purchase and sale agreement or other contract for sale or purchase has been executed;

(10) For NWP 31 (Maintenance of Existing Flood Control Facilities), the prospective permittee must either notify the District Engineer with a PCN prior to each maintenance activity or submit a five year (or less) maintenance plan. In addition, the PCN must include all of the following:

(i) Sufficient baseline information identifying the approved channel depths and configurations and existing facilities. Minor deviations are authorized, provided the approved flood control protection or drainage is not increased;

(ii) A delineation of any affected special aquatic sites, including wetlands; and,

(iii) Location of the dredged material disposal site;

(11) For NWP 33 (Temporary Construction, Access, and Dewatering), the PCN must also include a restoration plan of reasonable measures to avoid and minimize adverse effects to aquatic resources;

(12) For NWPs 39, 43 and 44, the PCN must also include a written statement to the District Engineer explaining how avoidance and minimization for losses of waters of the US were achieved on the project site;

(13) For NWP 39 and NWP 42, the PCN must include a compensatory mitigation proposal to offset losses of waters of the US or justification explaining why compensatory mitigation should not be required. For discharges that cause the loss of greater than 300 linear feet of an intermittent stream bed, to be authorized, the District Engineer must determine that the activity complies with the other terms and conditions of the NWP, determine adverse environmental effects are minimal both individually and cumulatively, and waive the limitation on stream impacts in writing before the permittee may proceed;

(14) For NWP 40 (Agricultural Activities), the PCN must include a compensatory mitigation proposal to offset losses of waters of the US. This NWP does not authorize the relocation of greater than 300 linear-feet of existing serviceable drainage ditches constructed in non-tidal streams unless, for drainage ditches constructed in intermittent non-tidal streams, the District Engineer waives this criterion in writing, and the District Engineer has determined that the project complies with all terms and conditions of this NWP, and that any adverse impacts of the project on the aquatic environment are minimal, both individually and cumulatively;

(15) For NWP 43 (Stormwater Management Facilities), the PCN must include, for the construction of new stormwater management facilities, a maintenance plan (in accordance with state and local requirements, if applicable) and a compensatory mitigation proposal to offset losses of waters of the US. For discharges that cause the loss of greater than 300 linear feet of an intermittent stream bed, to be authorized, the District Engineer must determine that the activity complies with the other terms and conditions of the NWP, determine adverse environmental effects are minimal both individually and cumulatively, and waive the limitation on stream impacts in writing before the permittee may proceed;

(16) For NWP 44 (Mining Activities), the PCN must include a description of all waters of the US adversely affected by the project, a description of measures taken to minimize adverse effects to waters of the US, a description of measures taken to comply with the criteria of the NWP, and a reclamation plan (for all aggregate mining activities in isolated waters and non-tidal wetlands adjacent to headwaters and any hard rock/mineral

mining activities);

(17) For activities that may adversely affect Federally-listed endangered or threatened species, the PCN must include the name(s) of those endangered or threatened species that may be affected by the proposed work or utilize the designated critical habitat that may be affected by the proposed work; and

(18) For activities that may affect historic properties listed in, or eligible for listing in, the National Register of Historic Places, the PCN must state which historic property may be affected by the proposed work or include a vicinity map indicating the location of the historic property.

(c) Form of Notification: The standard Individual Permit application form (Form ENG 4345) may be used as the notification but must clearly indicate that it is a PCN and must include all of the information required in (b) (1)-(18) of General Condition 13. A letter containing the requisite information may also be used.

(d) District Engineer's Decision: In reviewing the PCN for the proposed activity, the District Engineer will determine whether the activity authorized by the NWP will result in more than minimal individual or cumulative adverse environmental effects or may be contrary to the public interest. The prospective permittee may submit a proposed mitigation plan with the PCN to expedite the process. The District Engineer will consider any proposed compensatory mitigation the applicant has included in the proposal in determining whether the net adverse environmental effects to the aquatic environment of the proposed work are minimal. If the District Engineer determines that the activity complies with the terms and conditions of the NWP and that the adverse effects on the aquatic environment are minimal, after considering mitigation, the District Engineer will notify the permittee and include any conditions the District Engineer deems necessary. The District Engineer must approve any compensatory mitigation proposal before the permittee commences work. If the prospective permittee is required to submit a compensatory mitigation proposal with the PCN, the proposal may be either conceptual or detailed. If the prospective permittee elects to submit a compensatory mitigation plan with the PCN, the District Engineer will expeditiously review the proposed compensatory mitigation plan. The District Engineer must review the plan within 45 days of receiving a complete PCN and determine whether the conceptual or specific proposed mitigation would ensure no more than minimal adverse effects on the aquatic environment. If the net adverse effects of the project on the aquatic environment (after consideration of the compensatory mitigation proposal) are determined by the District Engineer to be minimal, the District Engineer will provide a timely written response to the applicant. The response will state that the project can proceed under the terms and conditions of the NWP.

If the District Engineer determines that the adverse effects of the

proposed work are more than minimal, then the District Engineer will notify the applicant either: (1) That the project does not qualify for authorization under the NWP and instruct the applicant on the procedures to seek authorization under an Individual Permit; (2) that the project is authorized under the NWP subject to the applicant's submission of a mitigation proposal that would reduce the adverse effects on the aquatic environment to the minimal level; or (3) that the project is authorized under the NWP with specific modifications or conditions. Where the District Engineer determines that mitigation is required to ensure no more than minimal adverse effects occur to the aquatic environment, the activity will be authorized within the 45-day PCN period. The authorization will include the necessary conceptual or specific mitigation or a requirement that the applicant submit a mitigation proposal that would reduce the adverse effects on the aquatic environment to the minimal level. When conceptual mitigation is included, or a mitigation plan is required under item (2) above, no work in waters of the US will occur until the District Engineer has approved a specific mitigation plan.

(e) Agency Coordination: The District Engineer will consider any comments from Federal and state agencies concerning the proposed activity's compliance with the terms and conditions of the NWPs and the need for mitigation to reduce the project's adverse environmental effects to a minimal level.

For activities requiring notification to the District Engineer that result in the loss of greater than 1/2-acre of waters of the US, the District Engineer will provide immediately (e.g., via facsimile transmission, overnight mail, or other expeditious manner) a copy to the appropriate Federal or state offices (USFWS, state natural resource or water quality agency, EPA, State Historic Preservation Officer (SHPO), and, if appropriate, the NMFS). With the exception of NWP 37, these agencies will then have 10 calendar days from the date the material is transmitted to telephone or fax the District Engineer notice that they intend to provide substantive, site-specific comments. If so contacted by an agency, the District Engineer will wait an additional 15 calendar days before making a decision on the notification. The District Engineer will fully consider agency comments received within the specified time frame, but will provide no response to the resource agency, except as provided below. The District Engineer will indicate in the administrative record associated with each notification that the resource agencies' concerns were considered. As required by section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act, the District Engineer will provide a response to NMFS within 30 days of receipt of any Essential Fish Habitat conservation recommendations. Applicants are encouraged to provide the Corps multiple copies of notifications to expedite agency notification.

(f) Wetland Delineations: Wetland delineations must be prepared in

accordance with the current method required by the Corps (For NWP 29 see paragraph (b)(9)(iii) for parcels less than (1/4-acre in size). The permittee may ask the Corps to delineate the special aquatic site. There may be some delay if the Corps does the delineation. Furthermore, the 45-day period will not start until the wetland delineation has been completed and submitted to the Corps, where appropriate.

14. Compliance Certification. Every permittee who has received NWP verification from the Corps will submit a signed certification regarding the completed work and any required mitigation. The certification will be forwarded by the Corps with the authorization letter and will include:

(a) A statement that the authorized work was done in accordance with the Corps authorization, including any general or specific conditions;

(b) A statement that any required mitigation was completed in accordance with the permit conditions; and

(c) The signature of the permittee certifying the completion of the work and mitigation.

15. Use of Multiple Nationwide Permits. The use of more than one NWP for a single and complete project is prohibited, except when the acreage loss of waters of the US authorized by the NWPs does not exceed the acreage limit of the NWP with the highest specified acreage limit (e.g. if a road crossing over tidal waters is constructed under NWP 14, with associated bank stabilization authorized by NWP 13, the maximum acreage loss of waters of the US for the total project cannot exceed 1/3-acre).

16. Water Supply Intakes. No activity, including structures and work in navigable waters of the US or discharges of dredged or fill material, may occur in the proximity of a public water supply intake except where the activity is for repair of the public water supply intake structures or adjacent bank stabilization.

17. Shellfish Beds. No activity, including structures and work in navigable waters of the US or discharges of dredged or fill material, may occur in areas of concentrated shellfish populations, unless the activity is directly related to a shellfish harvesting activity authorized by NWP 4.

18. Suitable Material. No activity, including structures and work in navigable waters of the US or discharges of dredged or fill material, may consist of unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.) and material used for construction or discharged must be free from toxic pollutants in toxic amounts (see section 307 of the CWA).

19. Mitigation. The District Engineer will consider the factors discussed

below when determining the acceptability of appropriate and practicable mitigation necessary to offset adverse effects on the aquatic environment that are more than minimal.

(a) The project must be designed and constructed to avoid and minimize adverse effects to waters of the US to the maximum extent practicable at the project site (i.e., on site).

(b) Mitigation in all its forms (avoiding, minimizing, rectifying, reducing or compensating) will be required to the extent necessary to ensure that the adverse effects to the aquatic environment are minimal.

(c) Compensatory mitigation at a minimum one-for-one ratio will be required for all wetland impacts requiring a PCN, unless the District Engineer determines in writing that some other form of mitigation would be more environmentally appropriate and provides a project-specific waiver of this requirement. Consistent with National policy, the District Engineer will establish a preference for restoration of wetlands as compensatory mitigation, with preservation used only in exceptional circumstances.

(d) Compensatory mitigation (i.e., replacement or substitution of aquatic resources for those impacted) will not be used to increase the acreage losses allowed by the acreage limits of some of the NWPs. For example, 1/4-acre of wetlands cannot be created to change a 3/4-acre loss of wetlands to a 1/2-acre loss associated with NWP 39 verification. However, 1/2-acre of created wetlands can be used to reduce the impacts of a 1/2-acre loss of wetlands to the minimum impact level in order to meet the minimal impact requirement associated with NWPs.

(e) To be practicable, the mitigation must be available and capable of being done considering costs, existing technology, and logistics in light of the overall project purposes. Examples of mitigation that may be appropriate and practicable include, but are not limited to: reducing the size of the project; establishing and maintaining wetland or upland vegetated buffers to protect open waters such as streams; and replacing losses of aquatic resource functions and values by creating, restoring, enhancing, or preserving similar functions and values, preferably in the same watershed.

(f) Compensatory mitigation plans for projects in or near streams or other open waters will normally include a requirement for the establishment, maintenance, and legal protection (e.g., easements, deed restrictions) of vegetated buffers to open waters. In many cases, vegetated buffers will be the only compensatory mitigation required. Vegetated buffers should consist of native species. The width of the vegetated buffers required will address documented water quality or aquatic habitat loss concerns. Normally, the vegetated buffer will be 25 to 50 feet wide on each side of the stream, but the District Engineers may require slightly wider vegetated buffers to address documented water quality or habitat loss concerns. Where both wetlands and open waters exist on the project site, the Corps will determine the appropriate compensatory mitigation (e.g., stream buffers or wetlands

compensation) based on what is best for the aquatic environment on a watershed basis. In cases where vegetated buffers are determined to be the most appropriate form of compensatory mitigation, the District Engineer may waive or reduce the requirement to provide wetland compensatory mitigation for wetland impacts.

(g) Compensatory mitigation proposals submitted with the "notification" may be either conceptual or detailed. If conceptual plans are approved under the verification, then the Corps will condition the verification to require detailed plans be submitted and approved by the Corps prior to construction of the authorized activity in waters of the US.

(h) Permittees may propose the use of mitigation banks, in-lieu fee arrangements or separate activity-specific compensatory mitigation. In all cases that require compensatory mitigation, the mitigation provisions will specify the party responsible for accomplishing and/or complying with the mitigation plan.

20. Spawning Areas. Activities, including structures and work in navigable waters of the US or discharges of dredged or fill material, in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., excavate, fill, or smother downstream by substantial turbidity) of an important spawning area are not authorized.

21. Management of Water Flows. To the maximum extent practicable, the activity must be designed to maintain preconstruction downstream flow conditions (e.g., location, capacity, and flow rates). Furthermore, the activity must not permanently restrict or impede the passage of normal or expected high flows (unless the primary purpose of the fill is to impound waters) and the structure or discharge of dredged or fill material must withstand expected high flows. The activity must, to the maximum extent practicable, provide for retaining excess flows from the site, provide for maintaining surface flow rates from the site similar to preconstruction conditions, and provide for not increasing water flows from the project site, relocating water, or redirecting water flow beyond preconstruction conditions. Stream channelizing will be reduced to the minimal amount necessary, and the activity must, to the maximum extent practicable, reduce adverse effects such as flooding or erosion downstream and upstream of the project site, unless the activity is part of a larger system designed to manage water flows. In most cases, it will not be a requirement to conduct detailed studies and monitoring of water flow.

This condition is only applicable to projects that have the potential to affect waterflows. While appropriate measures must be taken, it is not necessary to conduct detailed studies to identify such measures or require monitoring to ensure their effectiveness. Normally, the Corps will defer to

state and local authorities regarding management of water flow.

22. Adverse Effects From Impoundments. If the activity creates an impoundment of water, adverse effects to the aquatic system due to the acceleration of the passage of water, and/or the restricting its flow shall be minimized to the maximum extent practicable. This includes structures and work in navigable waters of the US, or discharges of dredged or fill material.

23. Waterfowl Breeding Areas. Activities, including structures and work in navigable waters of the US or discharges of dredged or fill material, into breeding areas for migratory waterfowl must be avoided to the maximum extent practicable.

24. Removal of Temporary Fills. Any temporary fills must be removed in their entirety and the affected areas returned to their preexisting elevation.

25. Designated Critical Resource Waters. Critical resource waters include, NOAA-designated marine sanctuaries, National Estuarine Research Reserves, National Wild and Scenic Rivers, critical habitat for Federally listed threatened and endangered species, coral reefs, state natural heritage sites, and outstanding national resource waters or other waters officially designated by a state as having particular environmental or ecological significance and identified by the District Engineer after notice and opportunity for public comment. The District Engineer may also designate additional critical resource waters after notice and opportunity for comment.

(a) Except as noted below, discharges of dredged or fill material into waters of the US are not authorized by NWP's 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, and 44 for any activity within, or directly affecting, critical resource waters, including wetlands adjacent to such waters. Discharges of dredged or fill materials into waters of the US may be authorized by the above NWP's in National Wild and Scenic Rivers if the activity complies with General Condition 7. Further, such discharges may be authorized in designated critical habitat for Federally listed threatened or endangered species if the activity complies with General Condition 11 and the USFWS or the NMFS has concurred in a determination of compliance with this condition.

(b) For NWP's 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, and 38, notification is required in accordance with General Condition 13, for any activity proposed in the designated critical resource waters including wetlands adjacent to those waters. The District Engineer may authorize activities under these NWP's only after it is determined that the impacts to the critical resource waters will be no more than minimal.

26. Fills Within 100-Year Floodplains. For purposes of this General Condition, 100-year floodplains will be identified through the existing Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Maps or FEMA-approved local floodplain maps.

(a) Discharges in Floodplain; Below Headwaters. Discharges of dredged or fill material into waters of the US within the mapped 100-year floodplain, below headwaters (i.e. five cfs), resulting in permanent above-grade fills, are not authorized by NWP's 39, 40, 42, 43, and 44.

(b) Discharges in Floodway; Above Headwaters. Discharges of dredged or fill material into waters of the US within the FEMA or locally mapped floodway, resulting in permanent above-grade fills, are not authorized by NWP's 39, 40, 42, and 44.

(c) The permittee must comply with any applicable FEMA-approved state or local floodplain management requirements.

27. Construction Period. For activities that have not been verified by the Corps and the project was commenced or under contract to commence by the expiration date of the NWP (or modification or revocation date), the work must be completed within 12-months after such date (including any modification that affects the project).

For activities that have been verified and the project was commenced or under contract to commence within the verification period, the work must be completed by the date determined by the Corps.

For projects that have been verified by the Corps, an extension of a Corps approved completion date maybe requested. This request must be submitted at least one month before the previously approved completion date.

FURTHER INFORMATION

1. District Engineers have authority to determine if an activity complies with the terms and conditions of an NWP.
2. NWP's do not obviate the need to obtain other Federal, state, or local permits, approvals, or authorizations required by law.
3. NWP's do not grant any property rights or exclusive privileges.
4. NWP's do not authorize any injury to the property or rights of others.
5. NWP's do not authorize interference with any existing or proposed Federal project.

DEFINITIONS

Best Management Practices (BMPs): BMPs are policies, practices, procedures, or structures implemented to mitigate the adverse environmental effects on surface water quality resulting from development.

BMPs are categorized as structural or non-structural. A BMP policy may affect the limits on a development.

Compensatory Mitigation: For purposes of Section 10/404, compensatory mitigation is the restoration, creation, enhancement, or in exceptional circumstances, preservation of wetlands and/or other aquatic resources for the purpose of compensating for unavoidable adverse impacts which remain after all appropriate and practicable avoidance and minimization has been achieved.

Creation: The establishment of a wetland or other aquatic resource where one did not formerly exist.

Enhancement: Activities conducted in existing wetlands or other aquatic resources that increase one or more aquatic functions.

Ephemeral Stream: An ephemeral stream has flowing water only during and for a short duration after, precipitation events in a typical year. Ephemeral stream beds are located above the water table year-round. Groundwater is not a source of water for the stream. Runoff from rainfall is the primary source of water for stream flow.

Farm Tract: A unit of contiguous land under one ownership that is operated as a farm or part of a farm.

Flood Fringe: That portion of the 100-year floodplain outside of the floodway (often referred to as "floodway fringe").

Floodway: The area regulated by Federal, state, or local requirements to provide for the discharge of the base flood so the cumulative increase in water surface elevation is no more than a designated amount (not to exceed one foot as set by the National Flood Insurance Program) within the 100-year floodplain.

Independent Utility: A test to determine what constitutes a single and complete project in the Corps regulatory program. A project is considered to have independent utility if it would be constructed absent the construction of other projects in the project area. Portions of a multi-phase project that depend upon other phases of the project do not have independent utility. Phases of a project that would be constructed even if the other phases were not built can be considered as separate single and complete projects with independent utility.

Intermittent Stream: An intermittent stream has flowing water during certain times of the year, when groundwater provides water for stream flow. During dry periods, intermittent streams may not have flowing water. Runoff from rainfall is a supplemental source of water for stream flow.

Loss of Waters of the US: Waters of the US that include the filled area and other waters that are permanently adversely affected by flooding, excavation, or drainage because of the regulated activity. Permanent adverse effects include permanent above-grade, at-grade, or below-grade fills that change an aquatic area to dry land, increase the bottom elevation of a waterbody, or change the use of a waterbody. The acreage of loss of

waters of the US is the threshold measurement of the impact to existing waters for determining whether a project may qualify for an NWP; it is not a net threshold that is calculated after considering compensatory mitigation that may be used to offset losses of aquatic functions and values. The loss of stream bed includes the linear feet of stream bed that is filled or excavated. Impacts to ephemeral streams are not included in the linear foot measurement of loss of stream bed for the purpose of determining compliance with the linear foot limits of NWPs 39, 40, 42, and 43. Waters of the US temporarily filled, flooded, excavated, or drained, but restored to preconstruction contours and elevations after construction, are not included in the measurement of loss of waters of the US.

Non-tidal Wetland: A non-tidal wetland is a wetland (i.e., a water of the US) that is not subject to the ebb and flow of tidal waters. The definition of a wetland can be found at 33 CFR 328.3(b). Non-tidal wetlands contiguous to tidal waters are located landward of the high tide line (i.e., spring high tide line).

Open Water: An area that, during a year with normal patterns of precipitation, has standing or flowing water for sufficient duration to establish an ordinary high water mark. Aquatic vegetation within the area of standing or flowing water is either non-emergent, sparse, or absent. Vegetated shallows are considered to be open waters. The term "open water" includes rivers, streams, lakes, and ponds. For the purposes of the NWPs, this term does not include ephemeral waters.

Perennial Stream: A perennial stream has flowing water year-round during a typical year. The water table is located above the stream bed for most of the year. Groundwater is the primary source of water for stream flow. Runoff from rainfall is a supplemental source of water for stream flow.

Permanent Above-grade Fill: A discharge of dredged or fill material into waters of the US, including wetlands, that results in a substantial increase in ground elevation and permanently converts part or all of the waterbody to dry land. Structural fills authorized by NWPs 3, 25, 36, etc. are not included.

Preservation: The protection of ecologically important wetlands or other aquatic resources in perpetuity through the implementation of appropriate legal and physical mechanisms. Preservation may include protection of upland areas adjacent to wetlands as necessary to ensure protection and/or enhancement of the overall aquatic ecosystem.

Restoration: Re-establishment of wetland and/or other aquatic resource characteristics and function(s) at a site where they have ceased to exist, or exist in a substantially degraded state.

Riffle and Pool Complex: Riffle and pool complexes are special aquatic sites under the 404(b)(1) Guidelines. Riffle and pool complexes sometimes characterize steep gradient sections of streams. Such stream sections are recognizable by their hydraulic characteristics. The rapid movement of

water over a coarse substrate in riffles results in a rough flow, a turbulent surface, and high dissolved oxygen levels in the water. Pools are deeper areas associated with riffles. A slower stream velocity, a streaming flow, a smooth surface, and a finer substrate characterize pools.

Single and Complete Project: The term "single and complete project" is defined at 33 CFR 330.2(i) as the total project proposed or accomplished by one owner/developer or partnership or other association of owners/developers (see definition of independent utility). For linear projects, the "single and complete project" (i.e., a single and complete crossing) will apply to each crossing of a separate water of the US (i.e., a single waterbody) at that location. An exception is for linear projects crossing a single waterbody several times at separate and distant locations: each crossing is considered a single and complete project. However, individual channels in a braided stream or river, or individual arms of a large, irregularly shaped wetland or lake, etc., are not separate waterbodies.

Stormwater Management: Stormwater management is the mechanism for controlling stormwater runoff for the purposes of reducing downstream erosion, water quality degradation, and flooding and mitigating the adverse effects of changes in land use on the aquatic environment.

Stormwater Management Facilities: Stormwater management facilities are those facilities, including but not limited to, stormwater retention and detention ponds and BMPs, which retain water for a period of time to control runoff and/or improve the quality (i.e., by reducing the concentration of nutrients, sediments, hazardous substances and other pollutants) of stormwater runoff.

Stream Bed: The substrate of the stream channel between the ordinary high water marks. The substrate may be bedrock or inorganic particles that range in size from clay to boulders. Wetlands contiguous to the stream bed, but outside of the ordinary high water marks, are not considered part of the stream bed.

Stream Channelization: The manipulation of a stream channel to increase the rate of water flow through the stream channel. Manipulation may include deepening, widening, straightening, armoring, or other activities that change the stream cross-section or other aspects of stream channel geometry to increase the rate of water flow through the stream channel. A channelized stream remains a water of the US, despite the modifications to increase the rate of water flow.

Tidal Wetland: A tidal wetland is a wetland (i.e., water of the US) that is inundated by tidal waters. The definitions of a wetland and tidal waters can be found at 33 CFR 328.3(b) and 33 CFR 328.3(f), respectively. Tidal waters rise and fall in a predictable and measurable rhythm or cycle due to the gravitational pulls of the moon and sun. Tidal waters end where the rise and fall of the water surface can no longer be practically measured in a predictable rhythm due to masking by other waters, wind, or other effects.

Tidal wetlands are located channelward of the high tide line (i.e., spring high tide line) and are inundated by tidal waters two times per lunar month, during spring high tides.

Vegetated Buffer: A vegetated upland or wetland area next to rivers, streams, lakes, or other open waters which separates the open water from developed areas, including agricultural land. Vegetated buffers provide a variety of aquatic habitat functions and values (e.g., aquatic habitat for fish and other aquatic organisms, moderation of water temperature changes, and detritus for aquatic food webs) and help improve or maintain local water quality. A vegetated buffer can be established by maintaining an existing vegetated area or planting native trees, shrubs, and herbaceous plants on land next to open-waters. Mowed lawns are not considered vegetated buffers because they provide little or no aquatic habitat functions and values. The establishment and maintenance of vegetated buffers is a method of compensatory mitigation that can be used in conjunction with the restoration, creation, enhancement, or preservation of aquatic habitats to ensure that activities authorized by NWP's result in minimal adverse effects to the aquatic environment. (See General Condition 19.)

Vegetated Shallows: Vegetated shallows are special aquatic sites under the 404(b)(1) Guidelines. They are areas that are permanently inundated and under normal circumstances have rooted aquatic vegetation, such as seagrasses in marine and estuarine systems and a variety of vascular rooted plants in freshwater systems.

Waterbody: A waterbody is any area that in a normal year has water flowing or standing above ground to the extent that evidence of an ordinary high water mark is established. Wetlands contiguous to the waterbody are considered part of the waterbody.

ADDITIONAL INFORMATION

For additional information concerning the nationwide permits or for a written determination regarding a specific project, please contact the office below:

In New Mexico:

Chief, Regulatory Branch
Albuquerque District, US Army Corps of Engineers
4101 Jefferson Plaza, N.E.
Albuquerque, NM 87109-3435
Telephone: (505) 342-3283
E-Mail: cespa-od-r@usace.army.mil

In Southeastern Colorado:

Southern Colorado Regulatory Office
720 North Main Street, Room 205

Pueblo, Colorado 81003-3046
Telephone: (719) 543-9459

In Southern New Mexico and Western Texas:

El Paso Regulatory Office
P.O. Box 6096
Ft. Bliss, Texas 79906-0096
Telephone: (915) 568-1359

In Northwestern New Mexico:

Durango Regulatory Office
278 Sawyer Drive, Suite #1
Durango, Colorado 81303-7955
Telephone: (970) 375-9452

Information about the U.S. Army Corps of Engineers regulatory program, including nationwide permits, may also be accessed on our Internet page: <http://www.spa.usace.army.mil/reg/>

This nationwide permit is effective March 18, 2002, and expires on March 19, 2007, unless sooner modified, suspended, or revoked.

Summary Version: March 18, 2002

**Instructions for Preparing a
Joint Application for The Department of Army Permit and New Mexico Water Quality Certification**

Blocks 1 through 4. To be completed by Corps of Engineers

Block 5. Applicant's Name. Enter the name of the responsible party or parties. If the responsible party is an agency, company, corporation or other organization, indicate the responsible officer and title. If more than one party is associated with the application, please attach a sheet with the necessary information marked **Block 5**.

Block 6. Address of Applicant. Please provide the full address of the party or parties responsible for the application. If more space is needed, attach an extra sheet of paper marked **Block 6**.

Block 7. Applicant's Telephone Number(s). Please provide the number where you can usually be reached during normal business hours.

Block 8 through 11. To be completed if you choose to have an agent.

Block 8. Authorized Agent's Name and Title. Indicate name of individual or agency, designated by you, to represent you in this process. An agent can be an attorney, builder, contractor, engineer or any other person or organization. Note: An agent is not required.

Block 9 and 10. Agent's Address and Telephone number. Please provide the complete mailing address of the agent, along with the telephone number where he/she can be reached during normal business hours.

Block 11. Statement of Authorization. To be completed by applicant if an agent is to be employed.

Block 12. Proposed Project Name or Title. Please provide name identifying the proposed project (i.e., Landmark Plaza, Burned Hills Subdivision or Edsall Commercial Center).

Block 13. Name of Waterbody. Please provide the name of any stream, lake, marsh or other waterway to be directly impacted by the activity. If it is a minor (no name) stream, identify the waterbody the minor stream enters.

Block 14. Proposed Project Street Address. If the proposed project is located at a site having a street address (not a box number), please enter here.

Block 15. Location of Proposed Project. Enter the county and state where the proposed project is located. If more space is required, please attach a sheet with the necessary information marked **Block 15**.

Block 16. Other Location Descriptions. If available, provide the Section, Township and Range of the site and/or the latitude and longitude. You may also provide description of the proposed project location, such as lot numbers, tract numbers or you may choose to locate the proposed project site from a known point (such as the right descending bank of Smith Creek, one mile down from the Highway 14 bridge). If a large river or stream, include the river mile of the proposed project site if known.

Block 17. Directions to the Site. Provide directions to the site from a known location or landmark. Include highway and street numbers as well as names. Also provide distances from known locations and any other information that would assist in locating the site.

Block 18. Nature of Activity. Describe the overall activity or project. Give appropriate dimensions of structures such as wingwalls, dikes (identify the materials to be used in construction, as well as the methods by which the work is to be done), or excavations (length, width, and height). Indicate whether discharge of dredged or fill material is involved. Also, identify any structure to be constructed on a fill, piles or float supported platforms.

The written descriptions and illustrations are an important part of the application. Please describe, in detail, what you wish to do. If more space is needed, attach an extra sheet of paper marked **Block 18**.

Block 19. Proposed project Purpose. Describe the purpose and need for the proposed project. What will it be used for and why? Also include a brief description of any related activities to be developed as the result of the proposed project. Give the approximate dates you plan to be both begin and complete all work.

Block 20. Project Duration. Indicate project start date and completion date.

Block 21. Reasons for Discharge. If the activity involves the discharge of dredged and/or fill material into a wetland or other waterbody, including the temporary placement of material, explain the specific purpose of the placement of the material (such as erosion control).

Block 22. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards. Describe the material to be

discharged and amount of each material to be discharged within Corps jurisdiction. Please be sure this description will agree with your illustrations. Discharge material includes: rock, sand, clay, concrete, etc.

Block 23. Surface Areas of Wetlands or Other Waters Filled. Describe the area to be filled at each location. Specifically identify the surface areas, or part thereof, to be filled. Also include the means by which the discharge is to be done (backhoe, dragline, etc.). Of dredged material is to be discharged on an upland site, identify the site and the steps to be taken (if necessary) to prevent runoff from the dredged material back into a waterbody. If more space is needed, attach an extra sheet of paper marked **Block 23**.

Block 24. Is any Portion of the Work Already Complete? Provide any background on any part of the proposed project already completed. Describe the area already developed, structures completed, any dredge or fill material already discharged, type of material, volume in cubic yards, acres filled, if a wetland or other waterbody (in acres or square feet). If the work was done under an existing Corps permit, identify the authorization if possible.

Block 25. Names and Addresses of Adjoining Property Owners, Lessees, etc., Whose Property Adjoins the Project Site. List complete names and full mailing addresses of the adjacent property owners (public and private) lessees, etc. whose property adjoins the waterbody or aquatic site where the work is being proposed so that they may be notified of the proposed activity (usually by public notice). If more space is needed, attach an extra sheet of paper marked **Block 25**.

Information regarding adjacent landowners is usually available through the office of the tax assessor in the county of counties where the project is to be developed.

Block 26. Describe any adverse water quality impacts. Any work conducted in Waters of the United States can degrade water quality. For example, any earthmoving activities conducted in the presence of running water can cause an increase in turbidity. Turbidity is a measurement of the amount of suspended material in water. This material settles out downstream and can degrade fish and invertebrate habitat. Other contaminants include, but are not limited to, oil, grease, or hydraulic fluid.

Please provide, with as much detail as possible, potential impacts and their expected time duration.

Block 27. Describe methods to be used to prevent water quality impacts. All watercourses in the State have water quality standards which must be maintained at all times. You must design your project so that water quality will be protected. The most effective way to prevent water quality impacts is through the use of Best Management Practices (BMPs). All BMPs should be designed to prevent sediment, oil, grease, and other pollutants from entering the water.

In your application, include plans, specifications, and designs detailing the BMPs you will use.

Block 28. Information about Approvals or Denials by Other Agencies. You may need the approval of other Federal, state or local agencies for your project. Identify any applications you have submitted and the status, if any (approved or denied) of each application. You need not have obtained all other permits before applying for a Corps permit.

Block 29. Signature of Applicant or Agent. The application must be signed by the owner or other authorized party (agent). This signature shall be an affirmation that the party applying for the permit possesses the requisite property rights to undertake the activity applied for (including compliance with special conditions, mitigation, etc.).

DRAWINGS AND ILLUSTRATIONS

General Information.

Three types of illustrations are needed to properly depict the work to be undertaken. These illustrations or drawings are identified as a **Vicinity Map**, a **Plan View**, or a **Typical Cross-Section Map**. Identify each illustration with a figure or attachment number.

Please submit one original, or good quality copy, of all drawings on 8 ½ x 11 inch plain white paper (tracing paper or film may be substituted). Use the fewest number of sheets necessary for your drawings or illustrations.

Each illustration should identify the project, the applicant, and the type of illustration (vicinity map, plan view or cross-section). **While illustrations need not be professional (many small, private project illustrations are prepared by hand), they should be clear, accurate and contain all necessary information.**

Public reporting burden for this collection of information is estimated to average 5 hours per response, including the time for reviewing instructions, searching existing data sources gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters Service Directorate of Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302; and to the Office of Management and Budget, Paperwork Reduction Project (-710-0003), Washington, DC 20503. Please **DO NOT RETURN** your form to either of those addresses. Completed applications must be submitted to the District Engineer having jurisdiction over the location of the proposed activity.

PRIVACY ACT STATEMENT

Authority: 33 USC 401, Section 10; 1413, Section 404, Principal Purpose: These laws require permits authorizing activities in, or affecting, navigable waters of the United States, the discharge of dredged or fill material into waters of the United States, and the transportation of dredged material for the purpose of dumping it into ocean waters. Routing Uses: Information provided on this form will be used in evaluating the application for a permit. Disclosure: Disclosure of requested information is voluntary. If information is not provided, however, the permit application cannot be processed nor can a permit be issued.

One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETED
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(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME	8. AUTHORIZED AGENT'S NAME AND TITLE (an agent is not required)
6. APPLICANT'S ADDRESS	9. AGENT'S ADDRESS
7. APPLICANT'S PHONE NOS. W/AREA CODE a. Residence b. Business	10. AGENT'S PHONE NOS. W/AREA CODE a. Residence b. Business

11. **STATEMENT OF AUTHORIZATION**
 I hereby authorize, _____ To act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

APPLICANT'S SIGNATURE	DATE
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NAME, LOCATION AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions)	
13. NAME OF WATERBODY, IF KNOWN (if applicable)	14. PROJECT STREET ADDRESS (if applicable)
15. LOCATION PROJECT <div style="display: flex; justify-content: space-around;"> _____ COUNTY _____ _____ STATE _____ </div>	

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions)

17. DIRECTIONS TO THE SITE

18. Nature of Activity (Description of project, include all features)

19. Project Purpose (Describe the reason or purpose of the project, see instructions)

USE BLOCKS 20-23 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Project Schedule

Start Date _____ End Date _____

21. Reason(s) for Discharge

22. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards

23. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)

24. Is Any Portion of the Work Already Complete? Yes _____ No _____ IF YES, DESCRIBE THE COMPLETED WORK

25. Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody (if more than can be entered here, please attach a supplemental list).

26. Describe any adverse water quality impacts that may result from the proposed activity such as increased turbidity or erosion. How long will such impacts occur?

27. Describe methods to be used to prevent water quality impacts which could interfere with attainment of State designated fishery, recreation, irrigation, water supply or other uses.

28. List of Other Certifications or Approvals/Denials Received from other Federal, State or Local Agencies for Work Described in This Application.

AGENCY	TYPE APPROVAL*	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED
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*Would include but is not restricted to zoning, building and flood plain permits.

29. Application is hereby made for a permit or permits to authorize the work described in this application. I certify that the information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

SIGNATURE OF APPLICANT

DATE

SIGNATURE OF AGENT

DATE

The application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than \$10,000 or imprisoned not more than five years or both.

**ISSUANCE OF STATEWIDE REGIONAL CONDITIONS
TO THE NATIONWIDE PERMIT PROGRAM IN THE STATE OF
NEW MEXICO**

Summary of Proposed Project: The following regional conditions to the nationwide permits in New Mexico have been approved. This action was undertaken in accordance with the authority of Section 404 of the Clean Water Act and Title 33, Code of Federal Regulations, Part 330.5(c).

Introduction: On January 15, 2002, the U.S. Army Corps of Engineers (Corps) published its final notice of issuance of the Nationwide Permits (NWP) in the Federal Register (67 FR 2019 et seq). The NWP became effective on March 18, 2002. Anyone wishing to obtain a full text copy of the NWP via the Internet, may do so through the Government Printing Office (GPO) at http://www.access.gpo.gov/su_docs/. The Albuquerque District will publish summaries of the NWP with approved regional conditions at <http://www.spa.usace.army.mil/reg/>.

On September 18, 2001, the Albuquerque District Engineer, proposed to use discretionary authority to modify certain NWP by adding statewide regional conditions. On April 15, 2002 the South Pacific Division Engineer approved the regional conditions. Activities which have commenced or are under contract to commence in reliance upon a nationwide permit which has been modified or revoked will remain authorized provided the activity is complete by April 15, 2003. Permittees who believe they qualify for grandfathering may contact the appropriate Corps of Engineers, Regulatory Office for additional information

Approved Regional Conditions Applicable to Specific Nationwide Permits within the State of New Mexico:

a. Nationwide Permit No. 12 Utility Line Discharges. In New Mexico, utility activities crossing waterways wider than 200 feet require notification of the District Engineer in accordance with General Condition 13 (Notification).

b. Nationwide Permit No. 13 Bank Stabilization: In New Mexico, bank stabilization activities necessary for erosion prevention in streams that average less than 20 feet in width (measured between the ordinary high water marks) are limited to the placement of no more than 1/4 cubic yard of material per running foot below the plane of the ordinary high water mark. Activities greater than 1/4 cubic yard per running foot may be authorized if the permittee notifies the District Engineer in accordance with General Condition 13 (Notification) and the Corps determines adverse environmental effects are minimal.

c. Nationwide Permit No. 14 Linear Transportation Crossings: In perennial waterways in New Mexico, culverts shall be designed to provide for fish passage. Culverts shall be designed and installed so that water flow shall be at least 0.8 feet deep (if practicable), the maximum hydraulic drop in the culvert shall not exceed 0.8 ft, and the maximum velocity shall not exceed 4.0 fps for culverts less than 100 feet long, 3.0 fps for culverts 100-200 feet long, and 2.0 fps for culverts longer than 200 feet. These flow criteria must be satisfied at least 90 percent of the time during the migration of the target species and age class.

d. Nationwide Permit No. 27 Stream and Wetland Restoration Activities. In New Mexico, restoration or enhancement projects that incorporate the use of rip-rap, channelization, or levees may be authorized only after the permittee notifies the District Engineer in accordance with General Condition 13 (Notification) and the Corps determines the adverse environmental effects are minimal.

e. Nationwide Permit No. 39 Residential, Commercial, and Institutional Developments. In New Mexico, this permit does not authorize channelization or relocation of any intermittent or perennial water course regardless of size or rate of flow.

f. Nationwide Permit No. 44 Mining Activities. This nationwide permit is **revoked** within the state of New Mexico.

Regional Conditions Applicable to All Nationwide Permits within the State of New Mexico

g. Activities Involving Fills in Perennial Waters or Wetlands Larger Than 1/2 Acre. In New Mexico, any activity that involves filling in perennial waters or wetlands larger than 1/10 acre, may be authorized only after the permittee notifies the District Engineer in accordance with General Condition 13 (Notification); and any activity that exceeds 1/2 acre of fills to the waters shall **not** be authorized by any NWP.

h. Springs. Within the State of New Mexico all NWPs are revoked within 100 feet of the water source of natural springs. A spring source is defined as any location where ground water emanated from a point in the ground. For purposes of this regional condition, springs do not include seeps or other discharges which do not have a defined channel.

i. Temporary Water Diversion. In New Mexico, flowing water shall be temporarily diverted away from the work area with non-erodible materials to reduce erosion, turbidity increases, and sedimentation. Affected area and duration of temporary water diversions shall be minimized to the extent practical. Suggested methods include, but are not limited to, the use of water bladders, sand bags, boards, or concrete barriers. After construction, the water will be returned to the original channel. Projects totally dewatering more than 100 linear feet of stream channel shall not be authorized by nationwide permit. Projects that temporarily divert flow from up to 100 linear feet of stream channel to one side of a channel, without totally dewatering the channel may be authorized without notification, provided the nationwide permit does not otherwise require notification. Any activity that involves the temporary diversion of the stream flow outside the previously existing channel may require notification of the District Engineer in accordance with General Condition 13 (Notification). Such notification will include a mitigation plan to compensate for any impacts to aquatic resource. Where practicable, the temporary diversion of waters shall be accomplished in accordance with best management practices included in the fact sheet entitled "Temporary Stream Diversion Procedures."

j. Non-Water Dependent Activities. In New Mexico, no NWP shall authorize an action in special aquatic sites, including wetlands, whose principal activity is not water dependent; unless the District Engineer has been notified in accordance with General Condition 13 (Notification).

k. Pre-Construction Notifications (PCNs). In New Mexico, PCNs requiring external notification shall also be sent to the appropriate city, county, or tribal agency for their comments. For those activities authorized by NWP No. 4, 13, 27, and 30 that require notification to the District Engineer (DE), the DE will notify the New Mexico Department of Game and Fish and other appropriate agencies.

l. Soil Erosion and Sediment Controls. In New Mexico, General Condition 3 (Soil Erosion and Sediment Controls) is amended by adding the following: Areas with exposed soil and fills during and following construction will be revegetated and protected from erosion by features designed to retain sediment on site when practical. All control measures must be properly selected and installed in accordance with good engineering practices and manufacturers specifications. Sediment control measures shall be maintained in good working order. Sediment

Control devices shall be inspected after significant storm events and repaired as necessary to restore sediment control capabilities. Sediment shall be removed from sediment traps (silt fences, sediment basins, etc) when the design capacity has been reduced by 50 percent. Permanent stabilization measures shall be initiated as soon as practicable (but in no case over 14 days after construction activity in that portion of the project ceased).

m. Pollution Controls. In New Mexico, any poured concrete will be contained in forms and/or placed behind/in cofferdams to prevent discharge into the watercourse. Use appropriate measures to prevent wastewater from concrete batching, vehicle wash-down, or aggregate processing from entering the waterway.

n. Equipment Inspection. In New Mexico, heavy equipment used in the project area will be inspected daily for leaks. No leaking equipment may be used in or within 100 feet of any water of the U.S. including wetlands.

o. Fuel and Petrochemicals. To prevent introduction of petrochemicals into waters of New Mexico, fuel, oil, hydraulic fluid, lubricants and other petrochemicals stored within the floodplain must have an impervious secondary containment system to prevent spills. The permittee shall contain and remove any petrochemical spills, including contaminated soil, and dispose of these materials at an approved upland site. Refueling of equipment must not take place within 100 feet of any water of the U.S., including wetlands.

p. Vegetation Removal and Mitigation. In New Mexico, when appropriate and technically feasible, mitigation and/or compensation will be required to offset loss in functions of woody riparian or wetland vegetation. Woody riparian or wetland vegetation will not be removed before submitting a mitigation plan to the Corps, except where required to place permanent structures. Replace any woody riparian or wetland vegetation unavoidably lost at 2:1 ratio, insuring survival. Measures to prevent damage by beavers, wildlife, or livestock may be necessary until trees are established. Required revegetation plantings shall include only native plants adapted to the site, which, after initial/seedling supplemental care period has terminated, thrive at the project site with no supplemental water or treatment. Plantings shall be monitored for at least two growing seasons. If, after two growing seasons, the survival rate of woody vegetation plantings is below 80%, additional plantings shall be required to insure the overall survival rate is at least 80 percent.

q. Aquatic Life Movements. In New Mexico, General Condition 4 (Aquatic Life Movements) is amended to require that all activities that would impede aquatic life movement or migration including those construction activities whose purpose is to impound water, will require efficient fish passage structures except when the structure is specifically designed to prevent such movement (barriers to prevent upstream movement of non-native fish to protect native fish species).

r. New Mexico State Threatened and Endangered Species. General Condition 11 (Endangered Species) is amended by adding the following: In New Mexico, any activity that occurs in habitat occupied by a New Mexico state threatened or endangered species identified under the authority of the New Mexico Wildlife Conservation Act (NMSA 17-2-37 through 17-2-46, 1978) or which is listed under the Federal Endangered Species Act, is not authorized by a nationwide permit prior to notification of the District Engineer in accordance with General Condition 13 (Notification) and consultation with the New Mexico Department of Game and Fish. (See also Regional Condition "u", Designated Critical Resource Waters in New Mexico).

s. Important Spawning Areas. To comply with General Condition No. 20, Spawning Areas, nationwide permit activities in New Mexico are not authorized without notification if such activities would: (a) destroy important spawning areas; (b) be conducted in spawning habitats during spawning seasons for trout and Kokonee salmon (spawning for rainbow and cutthroat trout

is from March 15 through July 15, and for brown and brook trout and Kokonee salmon is from September 1 through November 30). For any nationwide permit activities occurring in these waters during spawning seasons, the permittee must notify the District Engineer in accordance with General Condition 13 (Notification), who will notify the appropriate agency before the activity is permitted.

Important spawning areas are defined as those waters that have been designated as High Quality Cold Water Fisheries (HQCWF) by the New Mexico State Environment Department, Surface Water Quality Bureau (SWQB). The SWQB defines a HQCWF as "a perennial stream reach in a minimally disturbed condition which has considerable aesthetic value and a superior coldwater fishery habitat. A stream reach so categorized must have water quality, stream bed characteristics, and other attributes of habitat sufficient to protect and maintain a propagating coldwater fishery (i.e., a population of reproducing salmonids)." A listing of all HQCWF can be found in the New Mexico Standards for Interstate and Intrastate Streams, 20 NMAC 6.1, effective January 23, 1995.

t. Gradient. General Condition 21 (Management of Water Flows) is amended by amending the first sentence to read: In New Mexico, projects that will result in changes to local stream gradient, streambed elevation, direction, velocity of streamflow, or cause any significant changes in channel size, shape and streambank habitat (unless the project specifically designed to restore previously degraded and unstable streams) require notification to the DE in accordance with General Condition 13, (Notification).

u. Designated Critical Resource Waters in New Mexico. In New Mexico, a list of designated Critical Resource Waters has been published in accordance with General Condition 25 (Designated Critical Resource Waters). This list will be published on the Albuquerque District Regulatory home page and will be attached to nationwide permit summaries distributed to the public. A copy is attached (see Enclosure 1).

ADDITIONAL INFORMATION

The following provides additional information regarding minimization of impacts and compliance with existing General Conditions:

a. Permittees are reminded of General Condition Number 18 which prohibits the use of unsuitable material. Organic debris, building waste, asphalt, car bodies and junk materials are **not** suitable fill material. Also, General Condition Number 3 requires appropriate erosion and sediment controls (i.e., all fills must be properly stabilized to prevent erosion and siltation into water and/or wetlands.) Streambed material or other small aggregate material placed alone for bank stabilization will not meet General Condition Number 3.

b. Permittees are encouraged to mitigate project impacts prior to or concurrent with project construction. This issue continues to be a concern and the Corps prefers at this time to request that NWP notification submittals explicitly address prior to or concurrent mitigation or the reasons why mitigation cannot occur prior to or concurrent with project construction.

Water Quality Certification Information: Section 401 water quality certification for NWP's in the Albuquerque District has been variously issued, waived, denied, or conditioned by water quality certifying agencies. Information on the status of water quality certifications in New Mexico is published on the Albuquerque District web page at <http://www.spa.usace.army.mil/reg/>. Review the list to determine the status of water quality certification for the type of NWP and area of use. This list is a summary of information received from the certifying agencies; the specific requirements are available in each agency's water quality certification. You must obtain any required individual water quality certification from the appropriate water quality certification

authority for your project area prior to construction under the specified nationwide permit.

Raymond G. Midkiff
Lieutenant Colonel, EN
District Engineer

Enclosure 1.

Designated Critical Resource Waters in New Mexico

In New Mexico, the following list of designated Critical Resource Waters is published in accordance with General Condition 25 (Designated Critical Resource Waters). See General Condition 25 of the nationwide permits for restrictions of nationwide permit use.

Critical Herp Habitat

Critical Herp habitat is defined as that habitat which is known to be occupied by state threatened and endangered reptiles and amphibians that are not listed as threatened and endangered under the Federal Endangered Species Act.

All perennial reaches of the Gila River, the San Francisco River and Mule Creek. These waters are native habitat for the Narrowhead garter snake (*Thamnophis rufipunctatus*) and the Mexican garter snake (*Thamnophis eques*).

Critical Invertebrate Habitat

Critical invertebrate habitat is defined as that habitat which is known to be occupied by state threatened and endangered invertebrates that are not listed as threatened and endangered under the Federal Endangered Species Act.

Blue Spring and the associated springbrook riparian corridor, Eddy County, NM. Blue Spring is the primary hydrologic source for perennial reaches of the Black River. Blue Spring provides aquatic habitat for the endemic Pecos springsnail (*Pyrgulopsis pecosensis*), and the land snail, *Vertigo ovata*.

Willow Spring, "Willow Spring Ranch" (formerly Cienega Ranch), Socorro Co., NM. Native habitat for the endemic Chupadera springsnail (*Pyrgulopsis chupadera*).

Torreon Spring, Pound Ranch, Socorro Co., NM. Native habitat for the endemic New Mexico springsnail (*Pyrgulopsis neomexicana*).

Ojo Caliente-Warm Spring wetland complex, Socorro Co., NM. Native habitat for the endemic Alamosa springsnail (*Tryonia alamosae*).

Sedillo Spring, Socorro Co., NM. Native habitat for the Socorro isopod.

Canadian River drainage, including perennial tributaries (Conchas River, Trementina Creek, Ute River), Conchas Lake, and Ute Reservoir. Habitat for the paper pondshell mussel (*Utterbackia imbecillis*).

All perennial reaches of the Black River, Eddy county. Native habitat for the only population of the Texas hornshell (*Popenaias popei*) in New Mexico.

Critical Fish Habitat

Critical fish habitat is defined as that habitat which is known to be occupied by state threatened and endangered fish that are not listed as threatened and endangered under the Federal Endangered Species Act.

Gila chub (*Gila intermedia*).

Mule Creek (a San Francisco River tributary) and
Turkey Creek (a Gila River tributary)

Roundtail chub (*Gila robusti*).

Gila River: New Mexico reaches of the Upper East Fork of the Gila River, the Lower Middle fork of the Gila River and the lower most West Fork of the Gila River.

San Juan River Drainage: New Mexico reaches of the
Mancos River,

La Plata River,
Florida River and
Animas River

Arkansas River speckled chub (*Macrhybopsis aestivalis tetranemus*)
South Canadian River, downstream of Ute dam to the Texas/New Mexico border.

Suckermouth minnow (*Phenacobius mirabilis*)
South Canadian and
Dry Cimarron River

Southern redbelly dace (*Phoxinus erythrogaster*)
Headwaters of the Mora River,
including Coyote Creek and
tributaries to Black Lake

Zuni bluehead sucker (*Catostomus discobolus yarrowi*)
Rio Nutria upstream of the mouth of Nutria Box Canyon near the eastern boundary of the Zuni
Indian Reservation and the Agua Remora.

Blue Sucker (*Cycleptus elongatus*)
Pecos River, downstream from Brantley Dam to the Texas - New Mexico border and the lower
reaches of the Black River

Gray Redhorse (*Moxostoma congestum*)
Pecos River, from Carlsbad downstream to the New Mexico - Texas border and the lower
reaches of the Black River.

Mexican tetra (*Astyanas mexicanus*)
Pecos River and associated floodplain habitats from Bitter Lake National Wildlife Refuge
downstream to the New Mexico - Texas border, the
Black River and
Delaware River

White Sands pupfish (*Cyprinidon tularosa*)
All perennial aquatic habitat within the U. S. Army White Sands Missile Range and the Holloman
Air Force Base.

Pecos pupfish (*Cyprinidon pecosensis*)
Pecos River and associated floodplain habitats from Bitter Lake National Wildlife Refuge
downstream to near Malaga Bend
Gypsum sinkholes, isolated oxbows and artificial impoundments on Bitter Lake National Wildlife
Refuge and habitats associated with Bottomless Lakes State Park.

Bigscale Logperch (*Percina macrolepida*)
Pecos River between Santa Rosa and Fort Sumner Reservoir,
the lower Pecos River near Brantley Reservoir and the
Black River

Greenthroat darter (*Etheostoma lepidum*)
Bitter Creek and gravel-bottomed ponds on Bitter Lake National Wildlife Refuge,
Cottonwood Creek, Blue Spring and Rattlesnake Springs in Carlsbad Caverns National Park

SPECIAL TROUT WATERS

Special trout waters are managed to provide anglers with the opportunity to experience a superior high quality fishing. These waters have reduced bag limits or are catch and release. Accordingly, they need to be protected during construction activities permitted under CWA Sec. 404. No activities are authorized under any NWP for activities occurring these waters without PCN to the appropriate state agencies.

Pecos River Drainage

Pecos River from 1/2 mile above the confluence of the Mora and Pecos, upstream 1-1/2 miles to 1/4 mile above Cowles Bridge

Pecos River in the Pecos Wilderness above Pecos Falls

Doctor Creek from 1/4 mile above its confluence with Holy Ghost Creek, upstream to its headwaters

Jacks Creek from the waterfalls located 1/4 mile downstream from NM Hwy 63 crossing, upstream to its headwaters

Rio Valdez in the Pecos Wilderness from 1/4 mile below Smith Cabin, upstream to its headwaters

Jemez River Drainage

Rio Cebolla from the Seven Springs Day Use Area upstream to its headwaters

Rio Guadalupe from Porter Landing Bridge 1.3 miles downstream to Llano Loco Spring

San Antonio River from the Baca Location boundary downstream 2 miles.

San Juan River Drainage

San Juan River from Navajo Dam downstream 3-3/4 miles to east side of Section 16.

Rio Costilla Drainage

Valle Vidal - all streams in the Valle Vidal including Shuree Lakes

Rio Costilla from the Valle Vidal Boundary 2.4 miles downstream to Latir Creek

Chama River Drainage

All waters within the Sargent Wildlife Area including Nabor Creek and Nabor Lake, Rio Chama, Rio Chamita and Sexto Creek Chama River 2.9 miles within the Rio Chama Wildlife and Fishing Area

Chama River from Abiquiu Dam downstream 7 miles to the U.S. bridge at Abiquiu

Upper Rio Grande Drainage and its tributaries

Rio Grande from Colorado line downstream to the Taos Junction Bridge

Red River from the confluence of Goose Creek for 1 mile upstream as posted

Red River from 1/2 mile below walking bridge at the Red River State Hatchery downstream to confluence with the Rio Grande

Rio De Los Pinos from USFS Roads 284 & 87A, 2-1/2 miles upstream to private land

Rio Pueblo between the bridge at Mile Marker 55 on State Hwy 518 upstream 1 mile to Canon Tio Maes Trailhead, as posted

Lower Rio Grande from Elephant Butte Dam downstream to Caballo Lake including Caballo Lake

Cimarron River from east end of Tolby Campground downstream 1.4 miles to first U.S. 64 bridge

Rio Las Animas within the Gila National Forest, Black Ranger District

Gilita Creek from the Gila Wilderness downstream 5 miles to Snow Creek

Rio Ruidoso along U. S. 70 in Ruidoso Downs from Merriam Drive downstream 0.7 miles

CRITICAL DESIGNATED RESOURCE AREAS FOR RIO GRANDE CUTTHROAT

For any NWP activities occurring in waters where Rio Grande cutthroats occur, the permittee must notify the Corps in accordance with the Notification general condition, who will provide PCN for review, to the appropriate agency before the activity is permitted. All locations where Rio Grande cutthroat populations are known to occur are:

CANADIAN DRAINAGE

Colfax County

American Creek
Clear Creek
Leandro Creek
Middle Ponil Creek
Ricardo Creek
South Ponil Creek

Mora County

Luna Creek (Near Mora)
Mccrystal Creek
Murphy Creek
Santiago Creek

PECOS DRAINAGE

Mora County

Jarosa Creek (Below Pecos Falls)
Pecos River (Above the falls)
Rio Valdez
Rito Azul (Rito de Las Chimayosos)
Rito De Los Chimayosos
Rito Del Padre
Rito Maestas (Rio del Padre)

San Miguel County

Cave Creek
Dalton Creek
Doctor Creek
Indian Creek
Macho Creek
Jacks Creek

RIO GRANDE DRAINAGE

Rio Arriba County

American Creek (Jemez)
Canjillon Creek
Canones Creek (Jemez)
Cecilia Creek (Rio Gallina Basin)
Chihuahueros Creek (Jemez Mts)
Clear Creek (Jemez)
El Rito Creek

El Rito Creek Upper (Fifteen Springs)
Jaroso Creek (El Rito)
Nabor Creek (Sergent Wildlife Area)
Polvadera Creek (Canones Creek)
Resumidero Creek & Oso Creek (San Pedro Parks)
Rio de La Cebolla (Rio Quemado-Truchas)
Rio De Las Vacas (Perchas, Anastacio)

Rio De Truchas (Rio Quemado)
Rio Del Oso (Chama)
Rio Nutrias (Tres Piedras)
Rio Puerco West
Rio Santa Barbara (east fork)
Rio Santa Barbara (middle fork)
Rio Santa Barbara (West Fork)
Rio Tusas - little Tusas
Rio Tusas-lower
Rio Tusas-upper
Rito Cafe
Rito De Las Perchas
Tanques Creek (Tres Piedras)
Tio Grande (Tres Piedras)
Willow Creek (Jicarilla)-restored-1998

Sandoval County

Cochiti Creek watershed
Peralta Creek
La Jara Creek (Rio Puerco)
Rio Cebolla
Rito de las Palomas (Jemez)
Rito de Los Pinos (Jemez)

Santa Fe County

Rio Capulin
Rio Frijoles Creek
Rio Nambe

Sierra County

Rio Las Animas, including the Holden Prong and Murphy Place

Taos County

Red River Drainage
Bitter Creek
Cabresto Creek
Cabresto Creek (Lake Fork)
Columbine Creek (Deer, Placier, Willow)
Sawmill Creek (Red River)

Valle Vidal Drainage

Rio Costilla
Comanche Creek
Fernandez Creek (Comanche)
Little Costilla Creek (Comanche)
Powderhouse Creek

Chuckwagon Creek (Comanche)
Vidal Creek (Comanche)

Hondo Drainage

Gavilan Canyon Creek (Rio Hondo de Taos)
Italianos Creek (Rio Hondo de Taos)
Rio Hondo -South Fork (Wheeler Peak)
Yerba Creek (Rio Hondo de Taos)

Rio Grande Del Rancho Drainage

Fowler Creek (Rio Grande Del Rancho)
Saloz Creek (Rio Grande del Rancho)
Jaroso Creek/ Saloz (Rio Grande del Rancho)
Rio Chiquito (Rio Grande del Rancho)

Rio Pueblo Drainage

Agua Piedra (Rio Pueblo)
Alamitos Creek (Rio Pueblo)
Frijoles Creek (Rito de la Olla)
Indian Canyon (Penasco)
Agua Caliente (Pilar)
La Cueva Creek
Osha Creek
Palociento Creek
Rito de la Olla (Pot Creek)
Rito de la Presa
Rito del Medio (Questa/El Rito)
Rito Primero
San Cristobal Creek
Sardinas (near la Pressa)
Tienditas Creek (Valle Escondito)
West Latir Creek

TULAROSA DRAINAGE

Otero County

Indian Creek (Three Rivers)

APPENDIX B
JANUARY 28, 2004 FIELD TRIP REPORT

APPENDIX B

Field Visit Site Notes

January 24, 2004

Participants:

Doug Echlin and Richard Galindo, USIBWC; James Mace, USACE, El Paso Field Office; John Branstetter, USFWS, Albuquerque Field Services Office; R.C. Wooten, Carlos Victoria, Steve Manning, James Hinson, Chris Ryon, Parsons, Austin Office.

Mile 105 Oxbow Restoration

The 6.6 ac former meander was diked off during RGCP construction by plugging the upstream end using earth, with wire fence reinforcement. This oxbow was not backfilled during RGCP construction. The oxbow is currently vegetated with a cattail wetland.

This site is planned for re-vegetation and creating an open water area for fish habitat. The ROW north of the restoration site could be connected with nature trails to the adjacent Percha Dam State Park to provide public use and visibility of the restoration project.

Excavating a small open water area in the downstream mouth of the former meander would provide backwater habitat for fish during high irrigation flows. A channel from the mouth would be cut back into the meander to the approximate middle of the former meander where a second excavation will be made for a second deep water habitat. The channel would continue beyond the second excavation to the approximate end of current cattail wetland.

Two areas adjacent to the excavation sites can be used for spoils placement (see Fact Sheets in Section 5). One is located north of the former meander, and another on the “island” between the meander and the current streambed (Photo 1). Both potential spoils areas are relatively clear of foliage and too high above the water table to be practical for cottonwood pole planting.



Photo 1: View of a potential open area from the south bank of the downstream end of the former meander. The meander “island” is located toward the background.

Cattails cover nearly 90 percent of the meander bed (Photo 2). Salt cedar control and native revegetation need to be performed. The oxbow area was burned in approximately 2003, denuding large salt cedar trees present. The previous burning will facilitate removal of the remaining plants. Salt cedar growth has restarted from the root balls of the burned plants. Chipped salt cedar may be placed on higher elevations of the spoils disposal areas to prevent erosion after construction.



Photo 2: View of the cattails from the west side of the former meander “island.”

Mile 104 Tipton Arroyo

This site was selected for a bank shavedown and backwater habitat (Photo 3). Downstream from the arroyo, in the east bank, an area previously identified for bosque enhancement, is fenced off (Project 104A). The property deeds need to be checked prior to project design.



Photo 3. West bank view showing a low-elevation point bar suitable for an extensive shavedown. In the background, there is a large open area for disposal of excavated material.

The east bank access road along the river crosses Tipton Arroyo very close to the mouth (Photo 4). The narrow ROW and need to cut across the road gives this site a low priority for development. An open water area may be created for fish habitat at the downstream end of Site 104B.



Photo 4. Mouth of Tipton Arroyo on the eastern shore, opposite the point bar.

Mile 103 Trujillo Arroyo

The mouth of the arroyo is located on the west bank (Photo 5). It includes Nordstrom Arroyo which was diverted south and combined with Trujillo Arroyo prior to entering the floodway.



Photo 5. View of sediment accumulation at Trujillo Arroyo, a potential challenge to maintaining restoration efforts.

On the west bank, south of the arroyo, the arroyo channel could be partially modified to spill over into the shavedown area (Photo 6). Flood protection for adjacent farms is a key consideration. The area is large enough to provide a spoils disposal area. Salt cedar control will be needed in this area and along the arroyo.



Photo 6. View of potential shavedown and open water areas on the west bank south the arroyo.

Mile 102 Montoya Arroyo

The mouth of Montoya Arroyo is located on the west bank (Photo 7). This ROW section was originally part of the streambed, with an island separating two channels. The western channel was diked off and filled in during the RGCP construction. The upstream west bank (Project 105B) appears to be too high above the river for a shaveddown area, and it might be more suitable for pole planting for revegetation.



Photo 7. View of sediment accumulation at the Montoya Arroyo. Existing riprap protection on the east bank is shown in the foreground.

The banks of the arroyo outside the ROW are heavily vegetated. The arroyo banks could be modified to allow periodic flooding of adjacent ROW lands on the south side.



Photo 8. View downstream and across from the Montoya Arroyo showing a potential spoils disposal area on the east bank.

Salt cedar growth is abundant on both stream banks. On the east bank, a cut to provide access could be made upstream of the riprap area.

The downstream portion of east bank is of lower elevation providing a good opportunity for a shaveddown and vegetation restoration, as well as spoils placement (Photo 8). The east side also has a number of large cottonwoods and a depression with a thick stand of saltgrass.

Mile 101 Holguin Arroyo

The arroyo has significant sediment deposition (Photo 9). Restoration measures have been identified for both banks between Montoya and Holguin Arroyos. upstream of the Garfield Bridge. Wetlands are interspersed throughout the site. The west bank opposite the Holguin Arroyo appears to be a good area for sediment disposal.



Photo 9. Holguin Arroyo downstream view showing significant sediment accumulation. A fence had been installed to water livestock.

Site 101A, selected for revegetation and pole planting, is located on the southern west bank, just upstream of the Garfield Bridge. The site has easy access by road on the west side of the river and public visibility from the bridge.

Site 101B, selected for a shaveddown, is large enough for spoil disposal on the far west side. The east bank is relatively elevated. Both banks have large salt cedar stands that need to be controlled or replaced with native vegetation.

Mile 99 Green and Tierra Blanca Arroyos

Both arroyos enter the river directly opposite to each other, Green Arroyo from the east bank and Tierra Blanca Arroyo slightly upstream, from the west bank (Photo 10).



Photo 10. View of Green Arroyo (foreground) and Tierra Blanca Arroyo (background).

Site 99D on the east bank provides an excellent opportunity to excavate an open water area into Green Arroyo as an upstream dam controls sediment discharge from the arroyo basin. The open water area could extend across the wide floodway all the way to the ROW boundary. To assist in keeping the open water deep a rock groin could be installed up into the arroyo. Spoils could be disposed downstream from the arroyos on either side of the ROW.

The Tierra Blanca Arroyo, without a control dam, discharges a more significant amount of sediment than Green Arroyo. For this reason it is less suitable for excavating and maintaining an open water area. As an option, the area could be developed into a natural shavedown-type habitat if the arroyo were allowed to overtop its south bank and occasionally flood the adjacent land with sediment-laden water. An additional groin could be installed just upstream of the two arroyos to reduce sediment accumulation in that immediate area.



Photo 11. View of existing vortex weir showing scoured area downstream.

A vortex weir was installed in 1998 as a mitigation measure for dredging activities (Photo 11). During irrigation flows, water depth on the downstream side could approach 6 feet. Extensive algae growth was present downstream from a dairy farm. A USEPA Confined Animal Feeding Operation permit is likely needed to control nutrients from entering the river. The permit specifies use of terraces and the amount of land required for manure application.

The former meander at Site 99A is too high relative to the river because it has been used extensively for backfilling since RGCP construction. Large cottonwoods remain along the former meander's path.

Mile 98 Sibley Arroyo

Sibley Arroyo enters the RGCP from the west bank. At this location the west bank is low and suitable for a shavedown. A point bar has formed opposite to the mouth of Sibley Arroyo on the east bank (Photo 12).

The area adjacent to the arroyo and the river is at a low elevation and could be flooded periodically if the arroyo mouth was modified. There is land availability to deposit sediment on the adjacent banks.



Photo 12. Sibley Arroyo point bar.

At Site 99B, upstream of the arroyo, bank elevation is low. A dirt road that passes through the site near the water's edge would need to be re-routed further up the bank. Sediment disposal areas are located in the immediate site vicinity.

Mile 97 Jaralosa Arroyo

Jaralosa Arroyo, whose original flow was diverted during RGCP construction, enters the west side of the river through a channel that conveys the combined flow of Jaralosa Arroyo and Berrenda Creek. Both creeks have sediment control dams. Part of the ROW is leased for cultivation (approximately 60 ac).

At the mouth of the Jaralosa Arroyo, Site 97D, a deep-water embayment could be developed by dredging and placing a groin or vortex weir upstream from the mouth. Dredged sediment could be deposited on the adjacent land (Photo 13).

A former meander on the west side of the river appears to be mostly outside the hydrologic floodplain. Backwater habitat could be created by excavation in the downstream end of the former meander. Between the arroyo and the meander there is an area that may be suitable for a shavedown. This site is surrounded by an extensive ROW that makes it a likely candidate for a Phase I pilot project.



Photo 13. Mouth of the Jaralosa Arroyo.

Downstream from the arroyo the steep west bank is eroding (Photo 14), a process that could be partially allowed given the extensive ROW and adjacent BLM lands. Armoring is likely needed to control the extent of the receding stream bank.



Photo 14. Unstable segment along the west bank, downstream from Jaralosa Arroyo.

Mile 92 Crow Canyon

The majority of the bosque was cleared during RGCP construction and is now dominated by herbaceous vegetation and salt cedar (Photo 15). A large area of ROW on the eastern side of the river is mowed but not grazed. A few mature and young cottonwoods are growing in this area. Isolated areas contain wetland vegetation indicating a high water table.



Photo 15: Crow Canyon, riparian salt grass with emerging salt cedar.

Mile 83 Remnant Bosque

The Rincon Siphon portion of the site includes Garcia Arroyo on the eastern side of the river upstream of the Rincon Siphon at mile 82. The arroyo deposits sediments in the river up stream of the bridge. The high water elevation has created wetlands in the floodway north of the bridge.

Site 83A on the west side of the river contains a thick cover of salt grass and salt cedar. Removal of salt cedar and pole planting appear to be the main restoration measures for this site. The river at this site contains a lot of sediment (Photo 16).



Photo 16: Sediment deposition at Garcia Arroyo.

Site 83B is proposed shavedowns. A spoils disposal area is near by. The banks are low lying relative to the river and should not require a lot of excavation. Salt cedar is developing in this area (Photo 17). There is a wetland on the west bank upstream of the arroyo, which should be avoided.



Photo 17: Developing salt cedar at Garcia Arroyo.

Miles 49 & 48 Spillways

Salt cedar removal, pole planting, and revegetation are proposed for these sites. Both are vegetated with salt cedar and native grasses (Photo 18). The ground water table is probably shallow and should allow natural revegetation following salt cedar removal. Pole planting is also recommended.



Photo 18: Downstream of Picacho Spillway

APPENDIX C

RIVER MANAGEMENT UNIT DESCRIPTIONS

UPPER RINCON RMU

Description- The RMU is a 16.5-mile stretch of river located south of Percha Dam. This is the least populated segment of the river, with large tracts of ROW lands and adjacent BLM lands on the east and west sides of the river and includes more than 2,830 acres inside the right of way (ROW).

Structures - There are no constructed levees north of the Doña Ana County line. A 7-mile long levee on the east side extends from Doña Ana County line south to the end of the RMU boundary. Armor (rip-rap) is present to varying degrees along the channel. Eight aquatic in-stream mitigation sites are present. Structures include the Arrey and Garfield Bridges.

Land Use - The Upper Rincon above Doña Ana County line is currently managed by USIBWC as a no-mow zone. The RMU is bounded on the east and west sides by agricultural lands within upper portion. On the leveed portion (lower 9.5 mile area) the east side levee separates contiguous agricultural lands with the west side dominated extensively by BLM tracts. USIBWC uplands right of way is leased for grazing.

Hydrology -The highest flow rates of the Canalization Project are found below Percha Dam during water delivery periods. The RMU contains 7 tributaries; Trujillo Arroyo, Montoya Arroyo, Tierra Blanca Arroyo, Sibley Arroyo, Green Arroyo, Berrenda Creek, Jaralosa Arroyo, Cuervo Arroyo, and McLeod Draw.

Erosion and Sedimentation - Sedimentation occurs at the mouths of the arroyos. This tends to divert the river flow against the opposite bank, which is subject to erosion if not armored. Erosion may also occur on the same bank but downstream from the arroyo as the flow deflects back across the river.

Vegetation - Remnant riparian vegetation exists in pockets adjacent to arroyo confluence concentrated in the northern end of the RMU adjacent to Percha Dam State Park. Fringes of vegetation are established in many mowed areas providing bank stabilization.

Channel Processes - The riverbanks are generally elevated above the water surface by 5 to 10 feet. Significant sedimentation occurs in this reach due to contributions from large arroyo watersheds. This material has been periodically removed for water conveyance purposes. Sediment disposal outside of the ROW has historically been an issue due to the lack of available space.

Corridor and ROW Dimension - The width of the USIBWC ROW varies from 250 feet to about 1,250 feet until Jaralosa Arroyo where extensive uplands are included within the ROW. A second large upland tract is located within the Crow Canyon Arroyo on the west side of the river.

Potential - The RMU includes old meanders within the ROW, which were cut off by canalization during construction. Large amounts of area are contained within the ROW's large floodway, while numerous arroyos provide potential for numerous site-specific

restoration measures. Seasonal peak flows have a potential to inundate over 200 acres of floodway.

LOWER RINCON RMU

Description – The RMU is an 18-mile stretch dominated by agricultural (primarily row crops) on either side of the river. The RMU is considered marginal for restoration due to potential levee deficiencies, water delivery structures and extensive amount of private lands. The RMU includes more than 598 acres of potential enhancement sites inside the ROW and 256 acres outside the ROW.

Structures – Rincon Siphon, Hatch Siphon, and 31 miles of levees characterize the RMU. Five mitigation sites are present in the RMU. The RMU includes Salem, Hatch (US 85 and NM 26), Atchison, Topeka and Santa Fe Railroad, Hatch-Rincon (NM 140 and HWY 154), and new Rincon Bridge.

Land Use – The entire RMU is mowed. Agriculture dominates the landscape with a few areas changing into the BLM tracts. Narrow bands of agriculture separate BLM tracks from the ROW along the unleveed lower west side. Angostura Arroyo provides some connectivity between uplands, arroyo habitat and the river corridor.

Hydrology – The RMU contains seven contributing arroyos: Placitas Arroyo, Spring Canyon, Ralph Arroyo, Rincon Arroyo, Angostura Arroyo, Reed Arroyo and Bignell Arroyo. Extensive flooding of agriculture lands is possible along the southerly unleveed west bank, unleveed west bank north of Rincon bridge, and in the east side of Garfield Drain.

Erosion and Sedimentation – The arroyos contribute extensive amounts of sediment into the river. Integrity of the siphons due to erosion is a major concern.

Vegetation - Remnant riparian vegetation exists on private lands adjacent to the ROW. The majority of the ROW is dominated by upland and riparian herbaceous communities. Mowing has suppressed the majority of salt cedar from dominating the entire area between the channel and levee. A diversity of vegetation can be found along the Angostura Arroyo, Reed Arroyo and Bignell Arroyo.

Channel Processes – There appears to be little modification in channel sinuosity since project construction. No bends or meanders appear to have been straightened during construction.

Corridor Dimension – The width of the ROW varies from about 300 feet to 800 feet. The ROW becomes significantly wider at the confluence of the Angostura Arroyo and extends from the corridor at Reed Arroyo and Bignell Arroyo.

Potential - The Lower Rincon has riparian and aquatic enhancement opportunities for improving the riparian corridor between the Upper Rincon and Seldon Canyon and connecting upland habitat with the riparian corridor. Seasonal peak flows have the potential to inundate over 300 acres of floodway.

SELDON CANYON RMU

Description - The Seldon Canyon RMU is a 9-mile section bounded by Seldon Canyon ending at Leasburg Dam State Park. The RMU is currently managed as a no-mow zone. The RMU is adjacent to southwestern willow flycatcher habitat on private property. The very limited ROW restricts options outside of the channel proper, and as a result, restoration options although listed as a potential goal are largely limited.

Structures – Tonuco Bridge is the only listed structure.

Land Use – Extensive undeveloped lands (BLM, New Mexico State University and private) buttress the river corridor. Considerable topographic relief has restricted agriculture conversion of the area. The RMU is managed as a no-mow zone.

Hydrology – The RMU contains 3 major arroyos, Broad Canyon, Foster Canyon and Faulkner Canyon.

Erosion and Sedimentation – Sedimentation at Leasburg Dam has widened the river and created extensive islands even at high flows. The process of sediment accumulation followed by vegetation of islands is readily apparent north and west of Leasburg Dam.

Vegetation - Extensive and mature salt cedar woodlands are found along the Broad Canyon confluence with the river. The majority of non-uplands property is privately held.

Channel Processes - Increasing elevation changes through the canyon result in high flow rates. Increased flows in conjunction with channel blockage can present potential flood management problems north of the canyon.

Corridor Dimension – The river corridor ranges between 300 feet and 1500 feet in width. The riparian zone is clearly visible in aerial photographs by the sharp contrast between salt cedar dominated communities and upland shrub scrub areas.

Potential - The USIBWC has a limited ROW within the canyon; extensive private lands are adjacent to the river. There is possible habitat for southwestern willow flycatcher located adjacent to the floodway.

UPPER MESILLA RMU

Description - The Upper Mesilla RMU is a 12-mile stretch extending from Leasburg Dam State Park to the outskirts of Las Cruces at Shalem Colony Bridge. Levees on the east side and extensive BLM holdings on the west define the RMU. Sites include a total of 214 acres within the ROW and 56 acres of potential acquisitions.

Structures – The east side of the river has over 9-miles of maintained levees. Structures include Leasburg Bridge.

Land Use – The entire east side of the river is in agriculture. Extensive pecan orchards dominate the agricultural areas.

Hydrology – Other than upstream water flows, the RMU is influenced by Apache Canyon and two spillways (identified as Spillway 2 and Spillway 2A).

Erosion and Sedimentation – Water velocities are less than in the northern RMU, having been reduced through attenuation and water diversions at Leasburg Dam. The RMU begins a significant departure from previous RMUs which contain numerous arroyos contributing sediment.

Vegetation - The majority of the east ROW is dominated by upland and riparian herbaceous communities. Mowing has suppressed the majority of salt cedar from dominating the entire area between the channel and levee. Vegetation on the west side ROW has been grazed and appears to be partially mowed along the level flood plain. Several large dense salt cedar bosques are found on the west side with mature and declining cottonwoods found within the bosques. There is little indication of cottonwood re-growth. Pole plantings have been attempted on the east side near spillway Spillway 2A and across the river from a channel cut site.

Channel Processes - The major modification of channel sinuosity is a 0.8 mile meander straightened during project construction.

Corridor Dimension - The river corridor ranges between 800 feet and 1500 feet in width.

Potential – The most significant attribute of the RMU is the uninterrupted connectivity between BLM lands and the west side of the river corridor. In addition, hydraulic analyses (HEC-RAS modeling) showed no potential deficiencies in the east side levees. This provides restoration opportunities for a previous channel cut (0.8 miles in length) on the west side. In addition, modifying grazing practices along with salt cedar control on the west side could improve wildlife habitat and terrestrial/riverine boundary. Interagency agreements concerning grazing along the west side would be required. West side ROW provides a unique opportunity to improve the river corridor and uplands connectivity by altering to a large extent grazing and mowing. The west side of the river contains several remnant bosques, mostly dominated by salt cedar but with occasional mature cottonwoods and cottonwood snags.

LAS CRUCES RMU

Description- Urbanization and heightened need for flood control are the major issues. The RMU begins at Shalem Colony Bridge and extends south for 15 miles to Mesilla Dam. The Las Cruces RMU includes both developed and agricultural lands.

Structures – Over 18 miles of levees bound the east and west sides of the river. Bridges include Shalem, Picacho (U.S. 70, 80 and 180), and IH 10.

Land Use – Land use is composed of an urbanized/agricultural matrix. The levees are used as recreational areas (e.g. access and parking for fishing jogging, nature walks, etc). The upper 5 miles of the RMU are managed as a no-mow zone.

Hydrology – Box Canyon is the primary arroyo entering the river. Spillways 4, 6 and 10 provide some opportunities for enhancement.

Vegetation – The majority of the ROW is dominated by upland and riparian herbaceous communities. Mowing has suppressed the majority of salt cedar from dominating the entire area between the channel and levee.

Channel Processes – A 0.6-mile meander was straightened on the east side north of Spillway 39.

Corridor Dimension - The river corridor ranges between 700 feet and 1100 feet in width.

Potential - Las Cruces RMU provides significant opportunities for managing in a multiple-use manner. Despite urbanization constraints, considerable improvements in the form of recreation areas and selective habitat are possible. Local agency cooperation is required to fully realize potential. Emphasis is on enhancing and creating habitat associated with spillways and connecting sites within the current no-mow zone. Further mowing reduction and green zone management should include salt cedar control.

LOWER MESILLA RMU

Description – The Lower Mesilla Valley begins at Mesilla Dam and extends south 19 miles to New Anthony Road. The Lower Mesilla RMU is dominated by agriculture on both sides of the river. The northern portion of the RMU is characterized by extensive pecan orchards and the southern portions are primarily cropped.

Structures – Levees bound both sides of the RMU with the exception of a 2-mile stretch located on the west side of the river, north of Mesilla Dam. Bridges include Mesilla, Santo Tomas (NM 28), Mesquite (NM 228), Vado, Berino and Old Anthony Bridge.

Land Use – Evidence of overgrazing was observed in several locations within the floodway. A golf course (Anthony Country Club) is located in the floodway. Mowing occurs up to the river bank in several locations.

Hydrology – Several spillways feed into the river (Spillway 104 through Spillway 115). The water level during irrigation flow is at times less than 1 foot below the incised bank. This is in contrast to water levels in many parts of the northern project area where water levels were observed to be several feet below the bank even at high flows.

Vegetation - The majority of the ROW is dominated by upland and riparian herbaceous communities. Mowing has suppressed the majority of salt cedar from dominating the entire area between the channel and levee.

Channel Processes - Seven old channels cut off by the canalization are located mostly outside the ROW.

Corridor Dimension – The corridor is virtually uniform in width, averaging 650 feet. There is remarkably little variability throughout the RMU in overall dimensions.

Potential - With the exception of a NMGF site, opportunities are restricted. Due to private landowner involvement and adjacent state property, the NMGF site presents an opportunity for restoration of bosque and wetlands.

EL PASO RMU

Description – The RMU begins at New Anthony Road and extends south 20 miles to American Dam. Urbanization and flood control problems are the major issue.

Structures – Levees bound both sides of the river with the exception of a 4.5 mile length on the west side of the river beginning at Anapra Bridge progressing northward. Flood protection is afforded by natural relief along this section.

Land Use – Land use is primarily urbanized with a mix of agricultural in the northern section of the RMU. As in the Las Cruces RMU, many of the areas are used as recreational areas. Several bridges in the RMU include, New Anthony, Vinton, Canutillo, Borderland, Artcraft, County Club, Anapra, and Brick Plant.

Hydrology – Several spillways (Spillway 116 through Spillway 128) provide some opportunities for enhancement.

Vegetation - The majority of the ROW is dominated by upland and riparian herbaceous communities. Mowing has suppressed the majority of salt cedar from dominating the entire area between the channel and levee

Channel Processes - Some of the most extensive changes to the river have occurred in the El Paso area. The Vinton cutoff, completed several decades before the Canalization Project, significantly straightened the river. The old meander, approximately 3.5 miles in length, is mostly situated on Public Utilities Board land.

Corridor Dimension – The channel is similar in dimension to that of the Lower Mesilla Valley rarely exceeding 800 feet in width.

Potential - El Paso provides significant opportunities for multiple management. Overriding flood control concerns limit actions which could aggravate flooding. Urbanization adjacent to levees reduces future flood control options to raising levees rather than using levee setbacks. Despite urbanization constraints, considerable improvements in the form of recreation areas are possible. Local agency cooperation is required to fully realize potential. Selective mowing over the years has allowed limited natural regeneration of cottonwood stands.

APPENDIX D

GRAZING MANAGEMENT GUIDELINES

GRAZING MITIGATION MEASURES

Grazing Leases are currently regulated according to the USIBWC Directive Volume III, Chapter 501 dated March 13, 2002. The procedures set forth in this Directive are clear and adequate for the issuance, denial, renewal, corrective action and/or cancellation of leasing contracts. Leased property is included in Table D-1 below.

According to the Directive, “The USIBWC management staff will make efforts each budget cycle to plan for and ensure the adequate assignment of resources and personnel for the monitoring of contractual agreements made with regard to USIBWC real property to include the physical inspection of property subject to such agreements.” Active management of leased property is further prescribed in the policies and procedures in Chapter 501 attachments A, B, C and D. Attachments A, B and C are Notices and Rules and Regulations in the Federal Register and Attachment D is the USEPA document “Background for NEPA Reviewers: Grazing on Federal Lands”.

Possible degradation and mitigation measures are shown below “Background for NEPA Reviewers: Grazing on Federal Lands”.

“Active management using these variables may increase forage, as well as improve habitat. The following grazing mitigation measures are deemed appropriate by the U. S. Bureau of Land Management for mitigating the potential impacts caused by grazing activities.

- Active management of livestock grazing allotments typically includes consideration of the following variables indifferent combinations:
 1. grazing frequency, including complete rest;
 2. livestock stocking rates;
 3. livestock distribution;
 4. season and timing of forage use;
 5. livestock kind and class;
 6. control of wildlife herd size and conflicts;
 7. forage utilization and;
 8. rehabilitation.
- Avoid high intensity, long duration grazing. The level of utilization must allow for regrowth of vegetation in order to maintain the productive capacity of the pasture.
- Encourage a greater level of control over the numbers of livestock and wildlife and time spent on each allotment.

- Encourage a great level of oversight on allotments: more frequent assessment of utilization levels and quicker response to move livestock when utilization levels are attained may keep the area from being overgrazed.
- Separate riparian zone from other pastures and develop separate management plans, and if necessary, exclude livestock from riparian (or upland) areas until the desired level of recovery is attained.
- Fence or prevent direct access to stream in riparian area to reduce trampling, damage of vegetation and the associated channel modification problems (may be costly to maintain, however).
- Use permanent enclosures in areas of high risk or extreme sensitivity where the likelihood of damage is high and the potential for restoration is low.
- Control livestock and wildlife grazing in areas predisposed to damage during periods of high sensitivity (adequate management plans).
- Use planned grazing systems to maintain plant vigor and desired species composition.
- Intensive practiced (reseeding, weed control) may be necessary for extremely degraded pastures.
- Late season grazing should occur after the growth of warm season species has peaked and seeds have been produced.
- Know dynamics of plant species within an allotment and their capacity for regrowth.
- Evaluate type of livestock grazed and grazing intensity based on predicted impact to wildlife.
- Periodic minor ground shaping may be necessary to encourage dispersed flow and prevent concentrated flow of runoff.
- Plant compatible native trees or shrubs, to reduce runoff, establish roots and provide shade.
- Monitor progress of vegetation growth, bank and channel stability, and overall vitality of rangeland and riparian areas. Seasonal photographs may aid in this effort.
- Stabilize stream banks against erosion, although natural vegetative cover is preferred, artificial means of stabilization such as rubble, concrete or riprap may be necessary.
- Consider use of “in-stream” structures such as gabions, small rock dams, debris catchers, individual boulder placement, rock jetties, or silt log drops, to stabilize stream channels against excessive incision and/or widening.
- Plan period of rest from grazing to stabilize stream.

- Consider changes in land use allocations, especially in or adjacent to degraded areas.
- Retain flexibility in allotment permits to account for special circumstances, such as excluding livestock during drought periods or other special circumstances, if necessary.
- Monitoring of rangelands is an important activity that will provide opportunity to identify and mitigate impacts. Conduct follow-up monitoring of range trends including conditions and utilizations. Alter actions based on monitoring data.”

These included guidelines along with the rest of the above referenced USIBWC Directive provides the Grazing Guidelines for the River Management Plan. Active management of leased property is the desired intent of the Directive. Implementation of the Directive will adequately protect the property currently leased.

It is within the mandates of the Directive to require mitigation measures to be performed by the lessees to the property if proper environmental stewardship is not practiced and the property is negatively impacted. Therefore a vegetation survey should be performed on all properties leased for grazing purposes.

Included in this Appendix D is the NCRS Pasture Condition Score Sheet to be used by the property inspector to assess the leased property for plant communities, soil and water resource stability and productivity and identify treatment needs for improvement

**Table D-1
RGCP Rincon Valley Lease Summary
(Updated to April 2004)**

TRACT	NAME & ADDRESS	CONTRACT	BEG/END	ACRES
CR-01	S.P. RUTHERFORD & JIMMY LYTLE P.O. BOX 3 SALEM, NM 87941	IBM 00-13	01/01/00 12/31/04	180.0
CR-02A	LOYAD E. ANDERSON STAR ROUTE, BOX 31-A RINCON, NM 87940	IBM 98-18	01/01/03 12/31/08	3.0
CR-03	TOMMY S. BICKLE P.O. BOX 750 HATCH, NM 87937	IBM 98-16	03/10/03 03/09/08	50.0
CR-04B	TOMMY S. BICKLE P.O. BOX 750 HATCH, NM 87937	IBM 00-31	08/13/00 08/12/05	26.0
CR-05A	WILLIAM N. CASTLE P.O. BOX 355 HATCH, NM 87937	IBM 99-19	05/01/99 04/30/04	65.0
CR-05A1	JUAN F. GARCIA STAR ROUTE, BOX 5 HATCH, NM 87937	IBM 98-09	01/01/03 12/31/08	14.5
CR-05B2	WILLIAM N. CASTLE P.O. BOX 355 HATCH, NM 87937	IBM 99-26	05/06/99 05/05/04	30.0
CR-12A	TONY GONZALES, JR. BOX 61 GARFIELD, NM 87936	IBM 98-28	10/01/03 09/30/08	119.0
CR-12C	SAMUEL GONZALES BOX 61 GARFIELD, NM 87936	IBM 99-31	08/01/99 07/31/04	608.0
CR-12D	ERROL GONZALES BOX 61 GARFIELD, NM 87936	IBM 96-44	08/16/01 08/15/06	404.0
CR-13A	ERROL GONZALES BOX 61 GARFIELD, NM 87936	IBM 96-44	08/16/01 08/15/06	40.7
CR-14A	ERLINDA APODACA 604 DON MIGUEL LAS CRUCES, NM 88005	IBM 00-32	09/01/00 08/31/05	47.5
CR-14B	ERLINDA APODACA 604 DON MIGUEL LAS CRUCES, NM 88005	IBM 00-32	09/01/00 08/31/05	26.0
CR-14D	TONY GONZALES, JR. BOX 61 GARFIELD, NM 87936	IBM 98-10	01/01/03 12/31/08	87.0
CR-15	JOE B. MILLARD BOX 24 ARREY, NM 87930	IBM 98-27	09/27/03 09/26/08	16.0
CR-16A,B,C,E,&F	DAVID & ROBERT HOLGUIN P.O. BOX 40 GARFIELD, NM 87936	IBM 00-21	03/25/00 03/24/05	4.6
CR-17B	DAVID HOLGUIN P.O. BOX 40 GARFIELD, NM 87936	IBM 99-24	03/15/04 03/14/09	7.2

TRACT	NAME & ADDRESS	CONTRACT	BEG/END	ACRES
CR-17C	DAVID HOLGUIN P.O. BOX 40 GARFIELD, NM 87936	IBM 99-24	03/15/04 03/14/09	5.4
CR-19	A.R. OGAZ BOX 202 GARFIELD, NM 87936	IBM 00-25	04/15/00 04/14/05	8.0
CR-20	B.W. LUCHINI 1413 LEES DRIVE LAS CRUCES, NM 88001-4466	IBM 98-11	01/01/03 12/31/08	5.8
CR-21	DAVID HOLGUIN P.O. BOX 40 GARFIELD, NM 87936	IBM 00-10	03/01/00 02/28/05	31.0
CR-25	DALE FOLKMAN 6705 BRIGHT VIEW ROAD LAS CRUCES, NM 88005	IBM 00-11	02/01/00 01/31/05	12.4
CR-27	FRANK A. HEGWER 113 EAGLE DRIVE ALAMOGORDO, NM 83310	IBM 98-15	02/07/03 02/06/08	4.4
CR-30	ADRIAN OGAZ RURAL ROUTE 54 GARFIELD, NM 87936	IBM 96-45	09/01/01 08/31/06	19.3

**Table D-2
 Mesilla Valley Lease Summary
 (Updated to April 2004)**

TRACT	NAME & ADDRESS	CONTRACT	BEG/END	ACRES
CM-07A	MIGUEL & OSCAR HERNANDEZ ROUTE 1, BOX 636 WESTSIDE DRIVE ANTHONY, NM 88021	IBM 98-05	12/01/02 11/30/07	80.0
CM-10B-A	MR. & MRS. DAN C. JOHNSON P.O. BOX 118 BERINO, NM 88024	IBM 00-30	09/01/00 08/31/05	73.0
CM-11A	F & K FARMS c/o Dosar Investment Company 4855 N. MESA ST., SUITE 120 EL PASO, TX 79912	IBM 98-32	11/01/03 10/31/08	0.60
CM-17	JAMES E. KNIGHT c/o John M. Fowler College of Agri & Home Econ. MSC3169 NMSU P.O. BOX 30003 LAS CRUCES, NM 88003	IBM 99-18	02/01/04 01/31/09	45.8
CM-19A	CITY OF MESILLA P.O. BOX 10 MESILLA, NM 88046	IBM 93-28	04/15/94 04/14/2019	66.0
CM-20	CITY OF MESILLA P.O. BOX 10 MESILLA, NM 88046	IBM 93-28	04/15/94 04/14/2019	66.0
CM-19B	JIMMY HARRIS P.O. BOX 338 MESILLA, NM 88046	IBM 99-06	12/01/03 11/30/08	4.0
CM-24	TOM G. DUVAL 5406 ROCKY ACRES TRAIL LAS CRUCES, NM 88005	IBM 00-15	02/27/00 02/26/05	232.0

TRACT	NAME & ADDRESS	CONTRACT	BEG/END	ACRES
CM-24A	TOM G. DUVAL 5414 ROCKY ACRES TERRACE LAS CRUCES, NM 88005	IBM 00-18	03/10/00 03/09/05	10.0
CM-24B	FRANCES M. BURKE & MARY BURKE WHEELER P.O. BOX 281 FAIRACRES, NM 88033	IBM 00-16	03/01/00 02/28/05	23.0
CM-26A-H&K	GENE & ANN CASSIDY 2771 CROWN POINT COURT LAS CRUCES, NM 88011	IBM 00-29	05/01/00 04/30/05	266.8
CM-27A-2	FORT SELDEN, INC. P.O. BOX 2636 ANTHONY, NM 88021	IBM 97-03	12/01/01 11/30/06	9.35
CM 27A-3	MAX JOHNSON 822 FORT SELDEN ROAD LAS CRUCES, NM 88005	IBM 97-04	12/01/01 11/30/06	6.61
CM-27C	TED H. HORNER 11563 N. HIGHWAY 85 LAS CRUCES, NM 88005	IBM 00-06	01/01/00 12/31/05	11.9
CM-30B	MR. & MRS. JOSE MONTENEGRO 9727 DONIPHAN ANTHONY, TX 79821	IBM 00-19	04/01/00 03/31/05	0.41
CM-33-A1	FRANCIS BOWDEN STAR ROUTE, BOX 100 ANTHONY, NM 88021	IBM 98-25	04/10/03 04/09/08	9.17
CM-34	HENRY GALLEGOS, SR. P.O. BOX 331 CANUTILLO, TX 79835	IBM 99-20	05/01/99 04/30/04	17.9
CM-42	CITY OF LAS CRUCES P.O. DRAWER CLC LAS CRUCES, NM 88004	IBM 94-21	04/25/94 04/24/2019	343.0
CM-44	CITY OF SUNLAND PARK P.O. BOX 470 SUNLAND PARK, NM 88063	IBM 90-25	04/01/90 03/31/2015	57.0
EOF-377	CITY OF SUNLAND PARK P.O. BOX 470 SUNLAND PARK, NM 88063	IBM 90-26	05/15/90 05/14/2015	2.0

APPENDIX E
EXAMPLE PASTURE CONTROL SCORE SHEET

Pasture Condition Score Sheet

Purposes

- Evaluate current pasture productivity and the stability of its plant community, soil, and water resources.
- Identify what treatment needs, if any, are required to improve a pasture's productivity and protect soil, water, and air quality.

Suggested uses

This score sheet may be used to rate different pastures in a single growing season or the same pasture over a period of years. Rating a pasture yearly can track trends, either improvement or decline, in its condition. Some indicators change slowly in response to stresses caused by management or climate. Also, some indicators may change as each season progresses. An indicator or causative factor may rank high at one time and low another. Uniformity of use, plant residue, percent legume, severity of use, weather, and insect or disease pressure can vary widely on the same pasture depending on when they are scored during the year and the degree of management the pasture receives. Therefore, it is often wise to score a pasture at different, key times during the year before deciding to make changes in management. Indicate on the form the date the scoring occurred.

Procedure

Step 1—Rate each pasture one by one that is occupied all at the same time by a herd or flock and separated from other pasture areas by portable or fixed fencing. Paddocks in rotational pastures may be rated separately or as a combined unit. It depends on how alike they are. If any indicator looks markedly different from paddock to paddock, it may pay to rate each one separately.

Step 2—Score all 10 indicators regardless of your feelings of their relative worth. To learn or recall how each indicator reflects on how well a pasture is being managed, see *Guide to Pasture Condition Scoring*.

Step 3—Using the attached score sheet and indicator criteria, read the scoring criteria for each of the 10 pasture condition indicators one at a time and rate before moving onto the next. Use the 1 to 5 scale provided. Estimate by eye or measure as precisely as you feel is needed to rate the indicator reliably.

Step 4—When scoring plant vigor, enter a score based on the general criteria given on page 2 using the most limiting trait listed. Use this number to determine the overall pasture score. If the plant vigor score is less than 4, refer to the plant vigor causative factors' criteria on page 6 to identify the plant stress(es) causing reduced vigor. Rate each causative factor independently on the score sheet provided on page 5. Do not average to adjust the original vigor score.

Step 5—When scoring erosion, rate sheet and rill erosion every time. Rate other types of erosion only if present. When present, indicate which one(s) by identifying the erosion type with a unique symbol next to its score. Divide the box as needed to score them separately. Erosion is rated by averaging the individual scores. A need remains to prioritize which erosion problem is controlled first and how.

Step 6—Total the score for each pasture and compare to the following chart. Also, focus on any low scoring individual indicators or causative factors.

Pasture condition score		Management change suggested
Overall	Individual	
45-50	5	No changes in management needed at this time.
35-45	4	Minor changes would enhance, do most beneficial first.
25-35	3	Improvements benefit productivity and/or environment.
15-25	2	Needs immediate management changes, high return likely.
10-15	1	Major effort required in time, management, and expense.

Step 7—When an individual indicator's score falls below a 5, determine its worth to your operation. Then, decide whether to correct the cause or causes for the low rating. If you choose to correct, apply the most suitable management options for your area and operation.

Authors: Dennis Cosgrove is associate professor of agronomy, University of Wisconsin-River Falls and University of Wisconsin-Extension, Cooperative Extension. Dan Undersander is professor of agronomy, College of Agricultural and Life Sciences, University of Wisconsin-Madison and University of Wisconsin-Extension, Cooperative Extension. James Cropper is forage management specialist, USDA-Natural Resources Conservation Service, Grazing Lands Technology Institute. Authors extend their thanks to Extension and NRCS reviewers for their input on technical content.

Pasture Condition Score Sheet

Indicator	Score				
	1	2	3	4	5
Percent desirable plants	Desirable species < 20% of stand. Annual weeds and/or woody species dominant.	Desirable species 20–40% of stand. Mostly weedy annuals and/or woody species present and expanding. Shade a factor.	40–60% desirable forage species. Undesirable broad-leaf weeds and annual weedy grasses invading. Some woodies.	60–80% of plant community are desirable species. Remainder mostly intermediates and a few undesirables present.	Desirable species exceed 80% of plant community. Scattered intermediates.
Plant cover (Live stems and green leaf cover of all desirable and intermediate species.)	Canopy: < 50% Basal area: < 15% Photosynthetic area very low. Very little plant cover to slow or stop runoff.	Canopy: 50–70% Basal area: 15–25% Photosynthetic area low. Vegetal retardance to runoff low.	Canopy: 70–90% Basal area: 25–35% Most forages grazed close, little leaf area to intercept sunlight. Moderate vegetal retardance.	Canopy: 90–95% Basal area: 35–50% Spot grazed low and high so some loss of photosynthetic potential. Vegetal retardance still high.	Canopy: 95–100% Basal area: >50% Forages maintained in leafy condition for best photosynthetic activity. Very thick stand, slow or no runoff flows.
Plant diversity	One dominant (> 75% of DM wt.) forage species. Or, over 5 forage species (all <20%) from one dominant functional group, not evenly grazed - poorly distributed.	Two to five forage species from one dominant functional (>75% of DM wt.) group. At least one avoided by livestock permitting presence of mature seed stalks. Species in patches.	Three forage species (each ≥ 20% of DM wt.) from one functional group. None avoided. Or, one forage species each from two functional groups, both supply 25–50% of DM wt.	Three to four forage species (each ≥ 20% of DM wt.) with at least one being a legume. Well intermixed, compatible growth habit, and comparable palatability.	Four to five forage species representing three functional groups (each ≥ 20% of DM wt.) with at least one being a legume. Intermixed well, compatible growth habit, and comparable palatability.
Plant residue (Rate ground cover and standing dead forage separately and average score.)	Ground cover: No identifiable residue present on soil surface. Or, heavy thatch evident (> 1 inch). Standing dead forage: >25% of air dry weight.	Ground cover: 1–10% covered with dead leaves or stems. Or, thatch 0.5 inch to 1 inch thick. Standing dead forage: 15–25% of air dry weight.	Ground cover: 10–20% covered with dead residue. Or, slight thatch buildup but < 0.5 inch. Standing dead forage: 5–15% of air dry weight.	Ground cover: 20–30% covered with dead residue. No thatch present. Standing dead forage: some, but < 5% of air dry weight.	Ground cover: 30–70% covered with dead residue, but no thatch buildup. Standing dead forage: none available to grazing animal.
Plant vigor <i>If plant vigor rating is less than 4, determine cause by rating 6 possible causes listed on page 5.</i>	No recovery after grazing or pale yellow or brown, or permanent wilting, or plant loss due to insects or disease, exercise lot only. Or, lodged, dark green overly lush forage. Often avoided by grazers.	Recovery after grazing takes 2 or more weeks longer than normal, or yellowish green leaves, or major insect or disease yield loss, or plants wilted most of day. Productivity very low.	Recovery after grazing takes 1 week longer than normal, or urine/dung patches dark green in contrast to rest of plants, or minor insect or disease loss or mid-day plant wilting. Yields regularly below site potential.	Recovery after grazing takes 1 to 2 days longer than normal, or light green plants among greener urine and dung patches, or minor insect or disease damage. No plant wilting. Yields near site potential.	Rapid recovery after grazing. Healthy green color. No signs of insect or disease damage. No leaf wilting. Yields at site potential for the species adapted to the site's soil and climate.
Percent legume (Cool season stands. See footnote 3 of score sheet for warm season)	< 10% by wt. Or, greater than 60% of bloating legumes.	10–19% legumes. Or, losing grass, 40–60% spreading legume.	20–29% legumes.	30–39% legumes.	40–60% legumes. No grass loss; grass may be increasing.
Uniformity of use	Little-grazed patches cover over 50% of the pasture. Mosaic pattern throughout or identifiable areas of pasture avoided.	Little-grazed patches cover 25–50% of the pasture either in a mosaic pattern or obvious portion is not frequented.	Little-grazed patches cover 10–25% of the pasture either in a mosaic pattern or obvious portion is not frequented.	Little-grazed patches minor spots where isolated forage species is rejected. Urine and dung patches avoided.	Rejected areas only at urine and dung patches. No forage species rejection.

Pasture Condition Score Sheet

Indicator	1	2	Score 3	4	5
Livestock concentration areas	Cover >10% of the pasture; or all convey contaminated runoff directly into water channels.	Livestock conc. areas and trails cover 5-10% of pasture; most close to water channels and drain into them unbuffered.	Isolated livestock conc. areas and trails <5% of area; one close to water channel and drains into it unbuffered.	Some livestock trails and one or two small concentration areas. Buffer areas between them and water channels.	No presence of livestock concentration areas or heavy use areas sited or treated to minimize contaminated runoff.
Soil compaction	Infiltration capacity and surface runoff severely affected by heavy compaction. Excessive livestock traffic killing plants over wide areas. Very hard to push probe into soil without damaging the probe.	Infiltration capacity lowered and surface runoff increased due to large areas of bare ground and dense compaction layer at surface. Livestock trails common throughout. Off-trail hoof prints common. Hard to push probe past compacted layers.	Infiltration capacity lowered and surface runoff increased due to plant cover loss and soil compaction by livestock hooves. Soil resistant to soil probe entry at one or more depths within plow depth.	Infiltration capacity lowered and surface runoff increased due to reduced vegetal cover/retardance. Probe enters soil easily except at rocks. Scattered signs of livestock trails and hoof prints, confined to lanes or small, wet areas.	Infiltration capacity and surface runoff are equal to that expected for an ungrazed meadow; not affected by livestock traffic.
Erosion Sheet and rill	Sheet and rill erosion is active throughout pasture; rills 3-8 inches deep at close intervals and/or grazing terraces are close-spaced with some slope slippage.	Most sheet and rill erosion confined to steepest terrain of unit; well defined rills 0.5-3 inches deep at close intervals and/or grazing terraces present.	Most sheet and rill erosion confined to heavy use areas, especially in loafing areas and water sites; rills 0.5-3 inches deep. Debris fans at down-slope edge.	No current formation of rills; some evidence of past rill formation, but are grassed. Scattered debris dams of litter present occasionally.	No evidence of current or past formation of sheet flow or rills.
Rate additional erosion categories below only if present					
Wind	Blowouts or dunes forming or present.	Soil swept from the established pasture being rated causing plant death by burial or abrasion.	Soil swept from adjacent fields or pasture during seedbed prep. and seedling growth to cause pasture plant death by burial or abrasion.	Some vegetative debris windrowed. Some dust deposition from offsite source. Minor wind damage to foliage.	No visible signs of windblown soil or trash. No wind related leaf damage.
Streambank or shoreline	Banks mostly bare and sloughing. No native streambank or shoreline vegetation remaining.	Banks are heavily grazed and trampled all over. Many are actively eroding laterally. Little native streambank or shoreline vegetation. Bank sloughing common.	Banks are close grazed, but few are unstable. Some native streambank or shoreline vegetation remaining. Livestock enter only at specific points, but use heavy. Remote alternative water site present.	Banks are grazed but stable. Mix of pasture plants and native water's edge species. Muddy livestock stream crossing(s) or pond entrance(s) not used heavily. Alternative water sites present.	Banks ungrazed or grazed infrequently. Abundant streambank or shore loving vegetation. Gravelly or constructed stable livestock stream crossing(s) or watering ramp(s). Or, alternative water sources present and close-by.
Gully	Mass movement of soil, rock, plants, and other debris; occurrence of landslides, debris avalanches, slumps and earthflow, creep and debris torrents. Found in mountainous or very hilly terrain.	Gully(s) advancing upslope cutting longer channel(s). Revegetation difficult without using constructed structures & livestock exclusion; continuous gully(s) with many finger-like extensions into the hillside.	Gully(s) present with scattered active erosion, vegetation missing at heavy use slopes and/or on bed below overfalls. New eroding channels present and new overfalls appearing along sides and bed of main channel.	One or more existing stable gullies present, vegetation covers gully bottom and slopes well; no visual signs of active cutting at gully head or sides. Some soil moved in channel bottom.	No gullies; natural drainageways are stable grassed channels. Spring or seep fed bare channels are small and stable, often covered with overhanging vegetation.

Plant Vigor Causative Factors

Factor	----- Score -----				
	1	2	3	4	5
Soil fertility (P & K status) ^{1/}	Very low P & K, or very high P & K.	Low P and K; or low P, very high K; low K, very high P; opt. P, very high K; very high P, opt. K.	Low P, optimum K; or low P, high K; or optimum P, low K; high P, low K; or high P, high K.	Optimum P, high K; or high P, optimum K.	Optimum P and K
(Nitrogen status) ^{2/}	N deficient or excessive.		N marginal or high.		Adequate N.
Upper 4-inch root zone pH ^{3/}	< 4.5 or > 9.0	4.5-5.0 or, 8.5-9.0	5.1-5.5 or, 7.9-8.4	5.6-6.0 or, 7.4-7.8	6.0 to 7.3
Severity of use	All desirable species grazed out. Or no grazing, resulting in thatch and/or standing dead accumulation and woody invasion.	All edible plants grazed to lowest level feasible by the livestock type (mown lawn look). Or, undergrazed - mostly stemmy overgrowth and much dead leaf.	Spot grazing common. Equal amount of close-grazed and little-grazed areas. Close grazed areas are grazed as low as livestock can graze (mown lawn look.)	Some spot grazing, avoided areas primarily at dung and urine spots. Closer grazed areas are not grazed below proper height needed for plant vigor.	Forage species grazed within height ranges that promote dense sward and near maximum production.
Site adaptation of desired species	Properly planted and established (desired) species are no longer present.	Properly planted and established (desired) species are nearly gone. Volunteer unwanted species dominate.	One or more properly planted and established, or recruited desired species are missing. Unwanted species invading.	Properly planted and established, or recruited desired species still represented, but not in the desired proportions.	Properly planted and established, or recruited desired species are present in the desired proportions.
Climatic stresses	Brownout from drought. Or, frost heaved plants, most with severed roots and dying. Or, major loss due to submergence or ice sheets.	Wilted plants, little recovery during night. Or, some frost heaved plants, recovery slow. Some spotty stand loss due to submergence or ice sheets.	Wilting during heat of the day. Or, weak plants from winter damage or short-term submergence. Or, freezing damage to foliage.	Dry conditions, but no wilting. Or, above or below normal temperatures slowing growth. Or, slight leaf yellowing due to cold, wet conditions.	No climatic stress.
Insect and/or disease pressure	Severe insect attack, mortality high. Or, disease caused mortality high.	Insect or disease outbreak at economic threshold, treat now.	Insect or disease outbreak near economic threshold, continue watch and weigh options for treatment.	Some insect and/or disease present, but little impact on forage quality or quantity.	No visible damage.

^{1/} Names used to describe P & K levels not consistent nationwide; Very high referred to as excessive, and optimum as moderate or medium. Determined by approved soil testing procedures and comparing soil test results for exchangeable P and K with this table.

^{2/} Determined using chlorophyll meter or plant tissue test and comparing those results with this table.

^{3/} pH ratings may need to be regionalized to account for soil chemistry differences that influence range of acceptability as soils become more highly weathered or excess salts, exchangeable aluminum, or sodium begin to interfere with forage production. Establish exchangeable aluminum, electrical conductivity, and sodium absorption ratio criteria where their levels in the soil interfere with forage production.

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Pasture Condition Score Sheet

Farm or ranch site: _____ Date: _____

	Pasture Unit Description																													
Indicators																														
Percent desirable plants^{1/} Percent plant cover by weight that is desirable forage: <table style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td> </tr> <tr> <td><20</td><td>20-40</td><td>40-60</td><td>60-80</td><td>>80</td> </tr> </table>	1	2	3	4	5	<20	20-40	40-60	60-80	>80																				
1	2	3	4	5																										
<20	20-40	40-60	60-80	>80																										
Plant cover^{1/ 2/} Percent live, leafy canopy cover of desirables and intermediates is: <table style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td> </tr> <tr> <td><50</td><td>50-70</td><td>70-90</td><td>90-95</td><td>95-100</td> </tr> </table> Percent live basal area cover of desirables and intermediates is: <table style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td> </tr> <tr> <td><15</td><td>15-25</td><td>25-35</td><td>35-50</td><td>>50</td> </tr> </table>	1	2	3	4	5	<50	50-70	70-90	90-95	95-100	1	2	3	4	5	<15	15-25	25-35	35-50	>50										
1	2	3	4	5																										
<50	50-70	70-90	90-95	95-100																										
1	2	3	4	5																										
<15	15-25	25-35	35-50	>50																										
Plant diversity^{1/} The diversity of well-represented forage species is: <table style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td> </tr> </table> (Read criteria and select appropriate number)	1	2	3	4	5																									
1	2	3	4	5																										
Plant residue^{1/} Ground cover, standing dead forage, or thatch is: <table style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td> </tr> </table> (Read criteria and select appropriate number)	1	2	3	4	5																									
1	2	3	4	5																										
Plant vigor (Read criteria and select appropriate number) Degree of stress of plant community is: <table style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td> </tr> </table> (If less than 4, see Causative factors table. Rate those factors)	1	2	3	4	5																									
1	2	3	4	5																										
Percent legume^{1/ 3/} Percentage of legume present as total air dry weight: <table style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td> </tr> <tr> <td><10, or >60</td><td>10-19, or 40-60</td><td>20-29</td><td>30-39</td><td>40-60</td> </tr> <tr> <td>bloating legume</td><td>spreading legume</td><td></td><td></td><td>no grass loss</td> </tr> </table>	1	2	3	4	5	<10, or >60	10-19, or 40-60	20-29	30-39	40-60	bloating legume	spreading legume			no grass loss															
1	2	3	4	5																										
<10, or >60	10-19, or 40-60	20-29	30-39	40-60																										
bloating legume	spreading legume			no grass loss																										
Uniformity of use Degree of spot grazing is: <table style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td> </tr> <tr> <td>>50% ungrazed</td><td>25-50% ungrazed</td><td>10-25% ungrazed</td><td>Minor species rejection</td><td>Urine and dung spots ungrazed</td> </tr> </table>	1	2	3	4	5	>50% ungrazed	25-50% ungrazed	10-25% ungrazed	Minor species rejection	Urine and dung spots ungrazed																				
1	2	3	4	5																										
>50% ungrazed	25-50% ungrazed	10-25% ungrazed	Minor species rejection	Urine and dung spots ungrazed																										
Livestock concentration areas Presence of livestock conc. areas and proximity to surface water: <table style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td> </tr> </table> (Read criteria and select appropriate number)	1	2	3	4	5																									
1	2	3	4	5																										
Soil compaction Degree of soil compaction is: <table style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td> </tr> </table> (Read criteria and select appropriate number)	1	2	3	4	5																									
1	2	3	4	5																										
Erosion (Always rate sheet and rill; others only if present) Sheet and rill, and gully, streambank, shoreline, or wind erosion is: <table style="width: 100%; text-align: center;"> <tr> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td> </tr> <tr> <td>Very severe</td><td>Severe</td><td>Moderate</td><td>Slight</td><td>No visible</td> </tr> </table>	1	2	3	4	5	Very severe	Severe	Moderate	Slight	No visible																				
1	2	3	4	5																										
Very severe	Severe	Moderate	Slight	No visible																										
Pasture condition score																														

^{1/} Pastureland inventory worksheet helpful.

^{2/} Choose one proper, practical cover type estimation procedure to rate plant cover. The two procedures are not directly comparable.

^{3/} For warm season grass (C4)-legume stands, use the following criteria: 5, 30-40%; 4, 20-29%; 3, 10-19%; 2, 5-9%; and 1 <4%.

Pasture Condition Score Sheet

	Pasture Unit Description									
Causative Factors Affecting Plant Vigor										
Soil fertility (P & K status)* Phosphorus and potassium status of the soil are: 1 2 3 4 5 (Read criteria and select appropriate number)										
Soil fertility (N status)* Nitrogen status of the grasses is: 1 3 5 (Read criteria and select appropriate number)										
Soil pH* pH status of the soil for the upper 4-inch root zone best fits: 1 2 3 4 5 ≤ 4.5, or > 9.0 4.5-5.0, 5.1-5.5, 5.6-6.0, 6.0-7.3 or 8.5-9.0 or 7.9-8.4 or 7.4-7.8										
Severity of use Degree of forage removal is: 1 2 3 4 5 (Read criteria and select appropriate number)										
Site adaptation of desired species Presence of planted or desired forage species is: 1 2 3 4 5 (Read criteria and select appropriate number)										
Climatic stresses Degree of plant stress due to recent weather events is: 1 2 3 4 5 (Read criteria and select appropriate number)										
Insects and disease pressure Degree of plant stress due to insect or disease pressure is: 1 2 3 4 5 (Read criteria and select appropriate number)										

* Rate electrical conductivity and sodium adsorption ratios in regions where appropriate. Where excess salts, exchangeable sodium, or exchangeable aluminum hinder plant growth they are the controlling factor rather than soil pH conditions. Use appropriate criteria for them as found in the National Range and Pasture Handbook under Evaluating and rating pastures, Pasture Condition Scoring. See pH criteria below for highly weathered soils.

Soil pH Criteria for Major Landuse Resource Areas with Oxisols and Ultisols

pH status of the soil for the upper 4" rooting zone best fits:

1	2	3	4	5
< 4.0, or > 9.0	4.0-4.5	4.5-5.0	5.1-5.5	5.6-6.2
	or, 7.0-9.0	or, 6.5-7.0	or, 6.2-6.5	

Authors: Dennis Cosgrove is associate professor of agronomy, University of Wisconsin-River Falls and University of Wisconsin-Extension, Cooperative Extension. Dan Undersander is professor of agronomy, College of Agricultural and Life Sciences, University of Wisconsin-Madison and University of Wisconsin-Extension, Cooperative Extension. James Cropper is forage management specialist, USDA-Natural Resources Conservation Service, Grazing Lands Technology Institute. Authors extend their thanks to Extension and NRCS reviewers for their input on technical content.



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APPENDIX F

MITIGATION MEASURES FOR CONSTRUCTION AND VEGETATION TREATMENTS

The USIBWC will implement the following mitigation measures to offset or decrease the environmental effects of implementing the RMP. Most of these mitigations have been included in the project designs.

Mitigations are organized into two classes: 1) construction activities as a result of implementing environmental measures and levee rehabilitation; and 2) vegetation treatments used to control invasive species and establish desired vegetation. These mitigations are categorized by resource area.

Table F-1 Mitigation Measures for Construction Activities

Water Resources Protection
Water-C1. During construction near the river, best management practices and spill control procedures would be emplaced to prevent contamination and increased erosion to the river. Heavy equipment needing servicing (fueling, greasing, repair work) will be done out of the riparian zone. Fuel stored on-site will be in an upland position and in a cleared area with an earthen containment barrier.
Water-C2. Sediment would not be placed within the river during shavedowns and bank preparation, rather sediment would be moved to nearby floodway locations and stabilized by revegetation in conjunction with native grassland environmental measure. Design would promote backflow inundation reducing the possibility of sediment eroding and entering the river.
Water-C3. Bank shavedowns point projects and other locations inundated by peak flows would be design to promote backflow inundation thereby reducing the possibility of sediment entering the river. In sites where backflow inundation is not feasible, erosion controls would be put in place to limit the amount of sediment entering the river while still providing conditions suitable for native species germination.
Water-C4. The USIBWC would create an accounting system that would identify the locations and quantity of water removed from the river, the amount returned to the river as a result of environmental measures.
Water-C5. Removal of invasive salt cedar would reduce water consumption.
Soil Protection
Soils-C1. Construction during and after arroyo embankment creation, and opening former meanders will expose unprotected soil to rainfall runoff and wind erosion. USIBWC would consider performing construction during the dry season to limit exposure to rain.
Soils-C2. Bank shavedowns exposed to frequent high water velocities would be susceptible to erosion. When bank shavedown areas are located on the outer bend of the river, a river diversion barrier parallel to the river and between the bank shavedown area and the river will slow river course migration. River water should enter bank shavedown areas from a downstream section opening (back flooding). A drainage channel placed length-wise through the bank shavedown area, possibly below river elevation, will minimize erosion by limiting the runoff distance when the river recedes. This construction method will create a habitat similar to only opening a former meander to the river on the downstream end.
Soils-C3. Temporary materials and equipment-staging areas at the water diversion facility construction area would be reclaimed and revegetated with suitable native woody trees and shrubs.

Vegetation Protection
Vegetation-C1 Temporary materials- and equipment-staging areas at construction areas would be reclaimed and revegetated with suitable native woody trees and shrubs
Vegetation-C3. The USIBWC would restore riparian vegetation in the areas temporarily affected by the levee rehabilitation
Vegetation-C4. The USIBWC would monitor all environmental measures.
Vegetation-C5. Studies would need to be performed in order to determine locations and specific details for some of the bosque improvements, including: fire prevention through fuel reduction (assess fuel loads and priority areas), bank lowering (determine where low banks exist), channel cutting (determine locations in terrace to promote a better connection between the channel and floodplain), and removal of invasive species (determine areas of most invasion and priority areas)
Threatened and Endangered Species Protection
T&E Species-C1. No construction activities will be conducted in known habitats of listed or sensitive species.
T&E Species C2. Where construction would be necessary in proximity to known listed or sensitive species' habitats, the treatment would be selected to minimize the effect.
T&E Species C3. At least one acre of native riparian vegetation would be established in the general project area for each acre of potentially suitable southwestern willow flycatcher habitat disturbed during construction. Cottonwood and willow plantings would occur during the appropriate season and under appropriate soil moisture conditions
T&E Species C4. No potential bald eagle winter roosting trees would be disturbed during construction.
T&E Species C5. Presence/absence of bald eagles would be monitored during construction in the fall and winter.
T&E Species C6. If a bald eagle is present within 0.25 mile of the project area in the morning before project activity begins, or arrives during breaks in project activity, all construction activities will be suspended until the bird leaves of its own volition; or a trained biologist, in consultation with the USFWS, determines that the potential for harassment is minimal.
T&E Species C7. If bald eagles are consistently found in the immediate project area during the construction period, the USIBWC would contact the USFWS to determine if formal consultation under the ESA is necessary.
Aquatic Habitat Protection
Aquatic-C1. During construction near the river, best management practices and spill control procedures will be emplaced to prevent contamination and increased erosion to the river.
Aquatic-C2. When equipment is operating in the river, or arroyo tributaries, if fish are stranded, they will be salvaged and put into the main river channel.
Aquatic-C3. During construction in the river, the USIBWC would use BMPs to minimize and contain the discharge of suspended sediments into the Rio Grande.
Land Use and Socioeconomics
Land Use-C1. The USIBWC would adhere to project work-hour restrictions (work allowed only between 7 a.m. and 10 p.m.) within 500 feet of residences, hospitals, and schools.
Soc-C1 Existing road and utility rights-of-way would be used as much as possible to reduce permitting and land- acquisitions cost and to reduce disruptions to commercial facilities.
Soc-C2 Where possible local construction personnel would be hired to build the project.
Soc-C3 Local professional or service personnel would be hired and trained to operate and maintain facilities so direct and secondary spending remains in the local economy.

Cultural Resources
Cultural-C1. A cultural resources discovery plan would be prepared and made final through consultation with the SHPO prior to the beginning of construction.
Cultural-C2. Precautions would be taken to ensure that archaeological assistance is promptly available in case of a discovery. The discovery plan approved by the SHPO would detail these measures.
Cultural-C3. Before ground-disturbing construction work takes place, a preconstruction conference would be held with construction crews to inform them of the potential for disturbing subsurface cultural resources, and the procedures involved in the event that this occurs.
Cultural-C4. Any cultural resources found during construction would be documented and evaluated as to their eligibility for listing on the National Register of Historic Places.
Air Quality
Air-C1. Dust control measures are applicable to any construction site where dust is created and there is the potential for air and water pollution from dust traveling across the landscape or through the air. Dust control measures are particularly important in arid or semiarid regions, where soil can become extremely dry and vulnerable to transport by high winds. Dust control measures include sprinkling/irrigation, mulch, vegetative cover, and wind breaks.
Air-C2. Each construction contractor would be responsible for assuring that construction equipment (especially diesel equipment) meets local community opacity standards for operating emissions.
Air-C3 Each construction contractor would acquire excavation, grading, and surface-disturbance permits that specify BMPs to minimize particulate and dust emissions from construction work sites.
Air-C4 Mitigation would ensure that mechanized equipment is in good operating condition so that exhaust emissions are kept to a minimum.
Noise and Traffic
Noise-C1. Each contractor would adhere to project work hour restrictions (work allowed only between 7 a.m. and 10 p.m.) within 500 feet of residences, hospitals, schools, churches, and libraries. Each contractor would arrange the construction schedule to restrict to 4 the number of days in one work location within 500 feet of the same residence, hospital, school, church, or library.
Traffic C-1. Develop and implement traffic protocols and travel routes for all project construction trucks, vehicles, and equipment, including measures for ingress, egress, turning, and back-up movements at all proposed facility sites.

Table F-2 Mitigation Measures for Vegetation Treatments

Water Resources Protection
Water-V1. Herbicide would be applied directly to targeted plants in a manner to minimize runoff to surface water
Water-V2 Herbicides will not be aeriaily applied over open water.
Water-V3 Prescribed burns would incorporate BMPs to limit runoff into the river.
Water-V4 Mechanical removal of salt cedar during maintenance or fuel reduction would not be conducted on the river margin; rather material would be cut and removed manually. Avoidance of the river bank by equipment would reduce sediment input into the river.
Water-V5. – Woody debris as a result of salt cedar reduction will be burned or removed from the floodway.
Soil Protection
Soils-V1. The heavy equipment used for brush reduction would be wheeled and not tracked.
Soils-V2. Oversized wheels would be used to minimize soil compaction and rutting.
Soils-V3. Mechanical treatment would be conducted in the late summer and fall, which typically provide for dryer soil conditions, which would minimize soil displacement and compaction.
Soils-V4. Signage will indicate that riparian use is limited to designated trails and explaining that the purpose is to limit erosion, minimize damage to vegetation, and provide refuge areas away from trails where wildlife remain undisturbed.
Vegetation Protection
Vegetation-V1. Garlan-4® herbicide or equivalent would be sprayed by hand application to targeted species whenever feasible.
Vegetation-V2. Vegetation will be monitored (species, composition, abundance and distribution) before and after vegetation treatments.
Vegetation-V3. Re-vegetate the upland disturbed areas with native species
Vegetation-V4. Herbicides would not be aeriaily applied on areas where sensitive riparian vegetation such as cottonwoods and willows are extensively intermingled with the salt cedar.
Vegetation-V5. Protect revegetation sites for at least one growing season from grazing
Vegetation-V6. Prescribed burns would be conducted in accordance to techniques identified in a RGCP River Management Plan. The Plan will be developed by the USIBWC with guidance from resource agencies including the USFWS, BLM and state agencies.
Vegetation-V7. Planting would be conducted in accordance to techniques identified in a RGCP River Management Plan. Plantings would be conducted using native species.
Vegetation-V8. Degraded or burned areas would be inter-seeded with native grasses and forbs to further enhance the establishment of desirable browse and forage species. Seeding will be conducted in accordance to techniques identified in a RGCP River Management Plan.
Vegetation-V9. Saturated and ponded areas would be avoided during mechanical and chemical treatments.
Vegetation-V10. Burning would need to occur when woody plants such as salt cedar are not actively seeding, as burning would create open spaces for seedling establishment of salt cedar. If there are woody plants present on the areas considered for burning, these species would have to be assessed for fire-tolerance. Salt cedar tends to be more tolerant of fire than some native riparian species.

Wildlife Protection
Wildlife-V1. Treatments would occur outside the nesting season, which is generally March through August. If construction activity must occur during the migratory bird-nesting season, surveys would be conducted and active nests would be marked and avoided.
Wildlife-V2. USIBWC will develop a Fire Management Plan as part of the RGCP River Management Plan. The Fire Management Plan will detail perceived burn methods and BMPs to offset any potential negative effects to wildlife as a result of treatments.
Threatened and Endangered Species Protection
T&E Species-V1. Wherever possible, treatments would not be used in known habitats of listed or sensitive species.
T&E Species V2. Where treatments would be necessary in proximity to known listed or sensitive species' habitats, the treatment would be selected to minimize the effect.
Aquatic Habitat Protection
Aquatic Biota-V1. Herbicide would be applied directly to targeted plants in a manner to minimize runoff to surface water.
Aquatic Biota-V2 Herbicides will not be aerially applied over open water.
Land Use
Land Use-V1 Herbicides would not be aerially applied in populated areas or within 500 feet of residence.
Land Use-V2 – Prior to any treatments, notices and signage will be placed to assure any nearby communities are aware of upcoming treatments.
Cultural Resources Protection
Cultural-V1. Treatments would avoid deep soil disturbance (i.e. root plowing) whenever possible. In the event, deep soil treatments are required, mitigation measures for construction activities would be used.
Air Quality
Air-V1. The amount of vapors would be minimized by dispensing herbicide in a vegetable oil solution limiting airborne particulates. Application of this treatment would not occur during high-wind conditions.
Air-V2. Use smoke management techniques that rely on computer models to determine smoke dispersion prior to prescribed burns.
Air-V3. Use guidelines established by the National Weather Service; a clearing index of 500 or greater would be required for prescribed burning.