

# **Appendix A**

## **Revegetation Plan**

Sycamore Island Pond Isolation Project (Pit 46e)  
Madera and Fresno Counties



## **Purpose**

The San Joaquin River Conservancy (Conservancy) proposes to restore road connectivity at a berm breach within the San Joaquin River near River Mile (253.5), isolate an old gravel pond, and create floodplain habitat. The proposed project will impact wetlands, native trees, and native riparian vegetation during construction. This revegetation plan has been prepared to identify the project impacts and address mitigation for those impacts, and to incorporate habitat restoration elements into the project.

## **Site Location**

The proposed features would be constructed in Reach 1A of the San Joaquin River near River Mile (RM) 253.5 on the north and south banks in both Fresno and Madera Counties, and approximately 1.6 miles downstream of the Highway 41 Bridge (Figure 1).

Coordinates: Latitude 36° 51' 40.76" N, Longitude 119° 48' 38.04" W, Township 12S, Range 20E, U.S. Geological Survey quadrangle Fresno North.

## **Project Background**

Pit 46e was originally created during sand and gravel mining operations. The earthen berm that previously separated the gravel pit pond and river channel, and provided a vehicle access road between Sycamore Island and the Van Buren Unit was breached in the 2005 flood event, eliminating the vehicle access route, and directly connecting the waters of the pond and river.

Specific objectives of the project include:

- Restoring alternate and emergency response access by connecting Sycamore Island to the Van Buren Unit by creating an equalization saddle and re-connecting roads on the right (north) bank of the river channel.
- Strengthening the berm through construction of floodplain habitat on the left bank of the river channel.
- Isolating the gravel pond from the river.
- Restoring and enhancing habitat through the creation of other floodplain habitat on the left bank of the river channel.

## **Site Description**

The site is located on State property owned by the Conservancy and the river channel under the jurisdiction of the State Lands Commission. The site is situated north of the city of Fresno, and is located where the San Joaquin River has emerged from the foothills and has cut through the topography, creating tall, steep bluffs that confine the riparian zone and floodplain. Proposed features will primarily occur within Lacustrine, Riverine, Wetland, and Grassland habitat communities. The near surface soils that underlie the project site consist of a mix of Hanford Series, Grangeville Series, Cajon Series, Tujunga Series, Visalia Series, and Riverwash, and water. The Map Unit Descriptions indicate that all the soils are composed of sandy textures (USDA 2010).

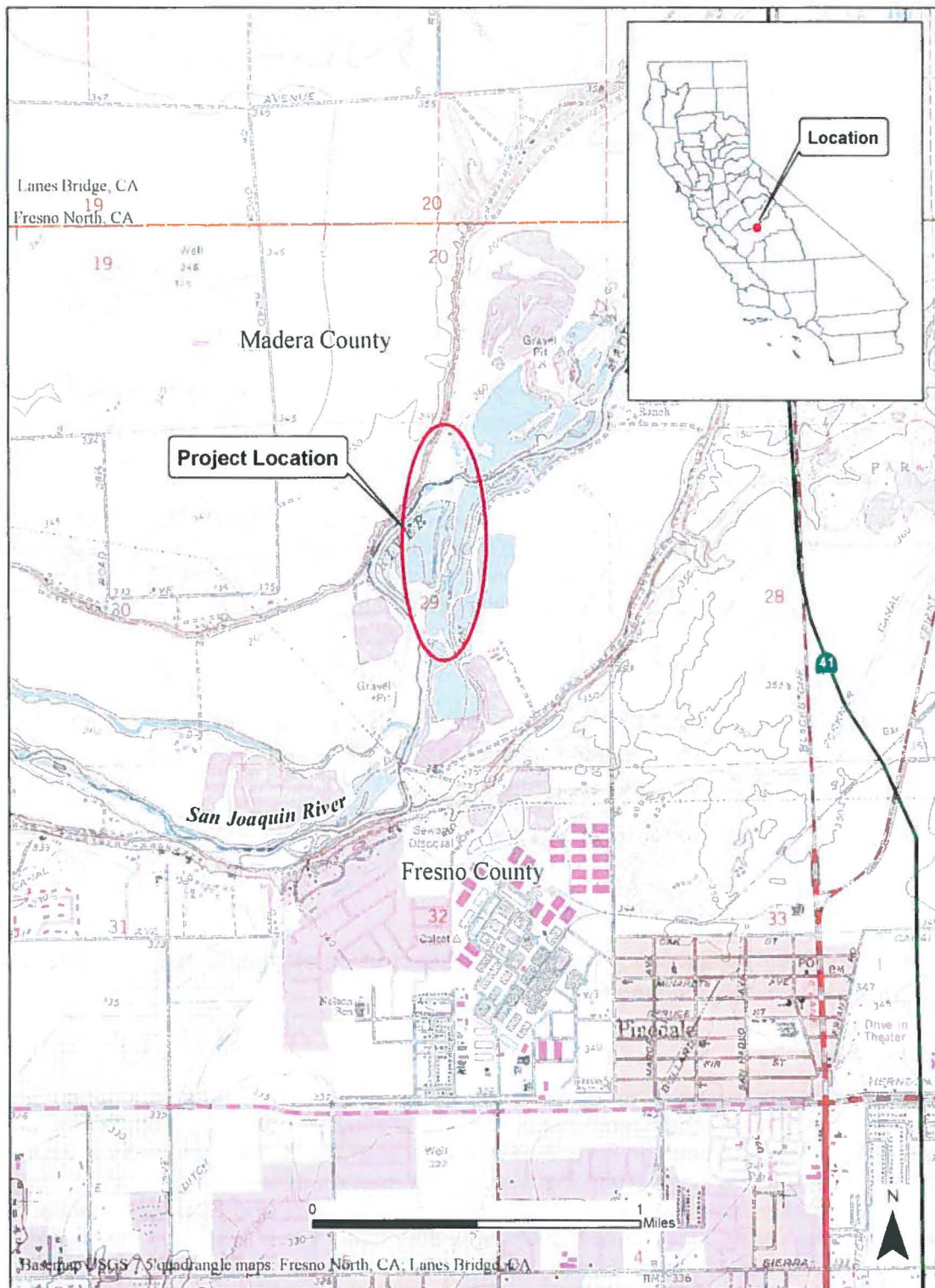


Figure 1: Project Location

The site is considered a Designated Floodway of the State (100-year flood zone) (CVFPB 2011). The channel width averages 350 feet and a small island sits within the San Joaquin River. River flows in the project area fluctuate from season to season, but generally have a low flow of 350 cfs and a high flow of 8,000 cfs.

### **Jurisdictional Waters/Wetlands**

Waters of the U.S. were delineated within the proposed project area for a total of 8.06 acres. Four components of the proposed project have potential to impact these waters: Pit 46e breach repair, floodplain creation, re-establishment of the road over a Lake area, and a temporary crossing. Approximately 2 acres of waters of the U.S. will be filled.

There were four locations that were delineated as wetlands for a total of 0.45 acres. These wetlands were characterized as Freshwater Emergent wetlands. Within the preliminary delineation of waters of the U.S., including wetlands, report(s) submitted to the U.S. Army Corps of Engineers these were more specifically classified using the U.S. Fish and Wildlife Service system as intermittent riverine, if inundated for part of the year, or as a lower perennial riverine system, if the gradient was low and water flowed throughout the year (Cowardin 1979).

One delineated intermittent riverine wetland will be directly impacted. This wetland is approximately 0.01 acres. The other three wetlands will be avoided. Protection of these will minimize or eliminate any indirect impacts that could occur.

The delineated wetland that would be impacted is primarily made up of two species: broadleaf cattail (*Typha latifolia*) and mosquito fern (*Azolla* sp.). Floating water primrose (*Ludwigia peploides*) is also present. The wetland sits at the bottom of a U-shaped cove and does provide some stabilization to the bank. However, its diminutive size puts constraints on the quality of function. Given its location (fishing location along the river) and potential for impact from recreation, minimal recreational/educational value, minimal pollutant removal/water quality function, lack of species richness, low capacity for supporting a diverse biological community, and minimal water storage function it could be considered a low functioning wetland with minimal value (WSDOT 2000) (NJDEP 2004).

### **Native Trees**

Proposed project activities are expected to result in the removal of approximately 20 native trees along the banks of the San Joaquin River Lake habitat where the embankments are to be cleared, or where existing vegetation will be covered by fill. These trees have a diameter at breast height (DBH) equal to or greater than 4 inches, but less than 24 inches DBH.

### **Avoidance and Mitigation of Impacts**

Where possible, wetland habitat and removal of native tree species will be avoided during construction activities. If avoidance is not possible, then other measures would be conducted to mitigate the loss of vegetation to the area.

A combination of hydroseed mix and cuttings will be planted (Tables 1 and 2). Seed mix may vary depending on availability.

**Table 1. Potential Pole cutting species.**

Species	Common Name
<i>Quercus lobata</i>	Valley Oak
<i>Plantanus racemosa</i>	Sycamore
<i>Populus fremontii</i>	Fremont cottonwood
<i>Salix exigua</i>	Narrow leaf willow
<i>Salix lasiolepis</i>	Arroyo willow

**Table 2. Potential Riparian Community Seed Mix**

Species	Common Name	Lbs per acre
<i>Elymus glaucus</i>	Western ryegrass	8.0
<i>Eschschilzia californica</i>	California poppy	2.0
<i>Leymus triticoides</i>	Creeping wild rye	2.0
<i>Mimulus cardinalis</i>	Scarlet monkey flower	1.0
<i>Nasella cernua</i>	Nodding needlegrass	3.0
<i>Vulpia microstachys</i>	Fescue	5.0

### Tree Planting

The main source for willow or cottonwood trees will be pole cuttings taken from young branches from vigorous trees on site to the extent practicable. Spacing will comply with the Central Valley Flood Protection Board's Barclays California code of Regulations requirements (Title 23, Division 1, Section 131). Additional permit conditions will also be implemented.

The following willow and cottonwood cutting techniques were excerpted from:

- 1) Lezberg, A., J. Giordanengo. 2008 [winter]. A Guide for Harvesting, Storing, and Planting Dormant Willow Cuttings. The Greenline: The Newsletter of the Colorado Riparian Association. Volume 19, Number 3. Wildlands Restoration Volunteers.
- 2) United States Department of Agriculture. TN-Plant Materials No. 23. 2007 rev. How to Plant Willows and Cottonwoods for Riparian Restoration. Technical Notes. The Natural Resources Conservation Service. Boise, Idaho.
- 3) Schalau, Jeff. 2010. Planting Pole Cuttings in Riparian Ecosystems. URL = <http://cals.arizona.edu/pubs/atresources/az1191.pdf>. Arizona Cooperative Extension, University of Arizona. Accessed: October 23, 2013.
- 4) Dreesen, D.R., G. Fenchel. 2010. Deep-planting Techniques to Establish Riparian Vegetation in Arid and Semiarid regions. Native Plants Journal. Volume 11, Number 3.



- All cuttings will be cut at the base with a clean diagonal angle (approximately 45°) with a hand saw or lops. Apical buds, along with all the side branches will be removed.(1)(2)(3)
- Willow cuttings will be, in general, 3/4 of an inch to 1 ¼ inch in diameter and 5 to 10 feet long; cottonwood cuttings will be, in general, 2 to 3 inches in diameter, and at least 12 feet long.(1)(2)(4)
- Cuttings will be soaked 5 to 14 days prior to planting with 60 to 100% of the length of the cuttings in contact with water while soaking.(1)(2)
- Cuttings will be installed before bud break. If installed in the fall or early winter, they will be installed deep enough to avoid being dislodged out of the ground by water flows. Cuttings will be installed no more than 3 feet above the lowest water table level of the year. (1)
- Cuttings will be spaced 12 feet apart and rows will be a minimum of 16 feet apart beginning at least 16 feet away from the overflow bank (CVFPB, 2009).

### Hydro seeding

Hydro seeding will occur in areas where vegetation is removed. Hydroseeding techniques were excerpted from a non-submitted, draft revegetation plan (DWR 2013).

- Prior to hydro seeding, both disturbed and undisturbed areas will have a seed bed prepared by mechanical or hand scarification to provide a roughened soil surface for seed attachment.
- At least 75% of the slurry will be locally adapted native plant ecotypes. Non-native supplements will be known not to be invasive or persistent.
- After the seed slurry has been applied, straw mulch will be applied uniformly by hand, blower, or other suitable equipment within 24 hours after the application of seed. A layer of fiber and tack, or hydro mulch, will be added on top of the straw mulch on that same day to anchor the straw mulch in.

### Site Preparation

Various site preparation techniques were excerpted from the following:

- 5) Apostol, D., M. Sinclair (Eds). 2006. Restoring the Pacific Northwest: The Art and Science of Ecological Restoration in Cascadia. Washington, D.C. Island Press. pp 160.
  - 6) Urban Drainage and Flood Control District [UDFCD]. 2012 [Revision]. Urban Drainage and Flood Control District: Standard Specifications Division 2 through Division 33. By CH2MHill. URL = [http://www.udfcd.org/downloads/pdf/dist\\_specifications/UDFCD\\_Standard\\_Specifications\\_March\\_2012\\_Revision.pdf](http://www.udfcd.org/downloads/pdf/dist_specifications/UDFCD_Standard_Specifications_March_2012_Revision.pdf). Accessed: October 31, 2014.
- Any topsoil excavated will be separated and stockpiled and clearly labeled. Depths will be dependent on habitat and soil types, but should range from 4 to 6 inches. However, delineated wetland topsoil will be excavated a minimum of 18 inches. (5)(6)
  - All stockpiles will be protected and covered from wind or water erosion.
  - Rough grading for most areas will proceed to 4 to 6 inches below the final grade, again dependent on habitat. Wetland area grading will proceed to approximately 18 inches below final grade.

- Surface of subsoil will be scarified before soils are introduced to permit bonding with the subsoil.
- Supplemental soils will be introduced into sensitive areas below the topsoil, or as topsoil where needed.
- Topsoil will be introduced during final stage of soil transfer to top-dress the appropriate habitat types, as assigned by labels. Topsoil from wetlands will be placed within 24 hours of excavation and will be replaced with a minimum number of machine passes to reduce disturbance to micro-organisms.<sup>(6)</sup>

#### Additional Measures if Removal of Wetland Can Be Prevented:

- Visqueen or plastic sheeting of a thickness of 10 ml's or higher (or whatever USACE deems suitable), may be laid out over the wetland, as well as on the surrounding riparian or floodplain area that would be disturbed.
- Fasteners would be installed at overlapping seems and the perimeter will be fastened down by stakes or other means before any fill or the temporary crossing is introduced to the area.
- When the temporary crossing is removed, the fill material will be removed until the visqueen is reached.
- The visqueen would then be removed to expose the protected soils.
- One or more bottomless culverts may be installed over the jurisdictional wetland to minimize damage from the creation of the temporary crossing (Dadey 2014).
- The bottomless culvert(s) will be set over the wetland, which will protect the wetland from the fill and construction.
- Once the project is completed, the fill and culvert(s) will be removed, re-exposing the wetland.

#### Supplemental Soils

- Topsoils not directly coming from Riverine habitat may be supplemented.
- Supplemental sub- and topsoil will possess a similar silt loam or sandy loam of sensitive soils specifications with the following average texture class percentages (Osman 2013):
  - sand – 25% to 65%
  - silt – 25% to 75%
  - clay – 0 to 20%
 Or the following minimum organic material requirement will be utilized to supplement sandy materials:
  - 30% Compost (Caltrans 2014)
- Supplemental sub- or topsoil must be free of PCB's or in concentrations of less than 0.1 mg/kg (RiverWorks 2009).

#### Weed Control

- Scarlet wisteria will be removed following eradication and control protocols.
  - Scarlet wisteria will be removed by hand before October 15<sup>th</sup> and herbicides will be applied (May 2005).



- If scarlet wisteria is treated with herbicides, it will be treated with chemical approved for use near water and follow anadromous fish guidelines from the Environmental Protection Agency (May 2005).
  - Any spoil piles containing wisteria or associated soils will be placed upon a tarp or visqueen.
  - Scarlet wisteria and soils associated with it will be removed and taken offsite to the appropriate disposal facility by November to protect fish and to project floodway conveyance from seed dispersion.
- Any spoil piles containing yellow star thistle (*Centaurea solstitialis*) and associated soils will be placed upon a tarp or visqueen. The material will be taken offsite to the appropriate disposal facility.

### **Performance Criteria**

Regulatory agencies require avoidance, minimization, or compensatory mitigation for all activities that could impact aquatic resources. Compensatory mitigation could include mitigation monitoring, mitigation banking, or in-lieu fee programs. Any habitat improvement occurring within the floodway must follow the Central Valley Flood Protection Board's Code of Regulations (2009).

The project will improve habitat conditions through floodplain creation, thus, final mitigation requirements will be determined in consultation with the appropriate regulatory agencies. Other compensatory mitigation may be required or preferred for different components of the Project.

## References:

- Apostol, D., M. Sinclair (Eds). 2006. Restoring the Pacific Northwest: The Art and Science of Ecological Restoration in Cascadia. Washington, D.C. Island Press. pp 160.
- California Department of Transportation [Caltrans]. 2014. Incorporate Materials. Landscape Architecture Program, Erosion Control Toolbox. URL = [http://www.dot.ca.gov/hq/LandArch/ec/organics/incorporate\\_materials.htm](http://www.dot.ca.gov/hq/LandArch/ec/organics/incorporate_materials.htm). Accessed: October 31, 2014.
- Central Valley Flood Protection Control Board [CVFPB]. 2011. Designated Floodways. State of California. URL = <http://www.cvfpb.ca.gov/maps/index.cfm>.
- Circuit Rider Productions, Inc. 2003. California Salmonid Stream Habitat Restoration Manual, Volume 2, Part X1, Third Edition. California Department of Fish and Wildlife, Inland Fisheries Division.
- Dreesen, D.R., G. Fenchel. 2010. Deep-planting Techniques to Establish Riparian Vegetation in Arid and Semiarid regions. Native Plants Journal. Volume 11, Number 3.
- Lezberg, A.,J. Giordanengo. 2008 [winter]. A Guide for Harvesting, Storing, and Planting Dormant Willow Cuttings. The Greenline: The Newsletter of the Colorado Riparian Association. Volume 19, Number 3. Wildlands Restoration Volunteers. URL = <http://coloradoriparian.org/a-guide-for-harvesting-storing-and-planting-dormant-willow-cuttings/>. Accessed: October 23, 2014.
- May, L., S. Lucas, et al. 2005. Dry Creek Watershed red sesbania control project - Initial successes and challenges. California Invasive Plant Council Symposium 2005. Chico, CA. URL = [http://www.cal-ipc.org/ip/management/plant\\_profiles/Sesbania\\_punicea.php](http://www.cal-ipc.org/ip/management/plant_profiles/Sesbania_punicea.php). Accessed: October 31, 2014.
- New Jersey Department of Environmental Protection [NJDEP]. 2004. Development of Wetland Quality and Function Assessment Tools and Demonstration. By Hatfield, C.A. et al. New Brunswick, NJ. URL = <http://www.state.nj.us/dep/dsr/wetlands2/report.pdf>. Accessed: October 29, 2014.
- Osman, Towhid. 2013. Soils: Principles, Properties and Management. Springer Science Business+Media Dordrecht. New York, London.
- RiverWorks. 2009. Haley's Ditch Stream and Wetland Restoration Plan. EnviroScience, Inc. Stow, Ohio. URL = <http://www.google.com/url?sa=t&rct=j&q=&esrc=s&frm=1&source=web&cd=3&ved=0CCwQFjAC&url=http%3A%2F%2Fwww.lockheedmartin.com%2Fcontent%2Fdam%2Flockheed%2Fdata%2Fcorporate%2Fdocuments%2Fremediation%2Fakron%2Frestoration-plan-may2009.pdf&ei=K4trVOCHG4-sogStvoDYDA&usg=AFQjCNFwlgIYglLFXcFDpNkx8wKEg8KX9w>. Accessed: October 31, 2014.

Schalau, Jeff. 2010. Planting Pole Cuttings in Riparian Ecosystems. URL = <http://cals.arizona.edu/pubs/atresources/az1191.pdf>. Arizona Cooperative Extension, University of Arizona. Accessed: October 23, 2013.

United States Department of Agriculture[USDA]. 1962. Soil Survey: Madera Area California. Soil Conservation Service. California Agricultural Experiment Station.

United States Department of Agriculture. 1971. Soil Survey: Eastern Fresno Area California. Soil Conservation Service. California Agricultural Experiment Station. U.S. Government Printing Office.

United States Department of Agriculture. TN-Plant Materials No. 23. 2007 rev. How to Plant Willows and Cottonwoods for Riparian Restoration. Technical Notes. The Natural Resources Conservation Service. Boise, Idaho.

United States Department of Agriculture. 2010. NRCS [on-line] Soil Data Mart. Map Unit Description. URL = <http://soildatamart.nrcs.usda.gov>. Accessed November 11, 2014.

Urban Drainage and Flood Control District [UDFCD]. 2012 [Revision]. Urban Drainage and Flood Control District: Standard Specifications Division 2 through Division 33. By CH2MHill. URL = [http://www.udfcd.org/downloads/pdf/dist\\_specifications/UDFCD\\_Standard\\_Specifications\\_March\\_2012\\_Revision.pdf](http://www.udfcd.org/downloads/pdf/dist_specifications/UDFCD_Standard_Specifications_March_2012_Revision.pdf). Accessed: October 31, 2014.

Washington State Department of Transportation [WSDOT]. 2000. Wetland Functions Characterization Tool for Linear Projects. Environmental Affairs Office. By W. Null, G. Skinner, and W. Leonard.

#### **Personal Communication:**

Dadey, Kate. 2014. United States Army Corps of Engineers. Regulatory Division, San Francisco District. Discussion on October 24, 2014.

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