

3 DESCRIPTION OF THE PROPOSED PROJECT

3.1 PROJECT OVERVIEW

3.1.1 PROPOSED ACTION AND PROJECT PURPOSE

The Nature Conservancy (TNC) is proposing to restore and enhance native riparian habitat on three project sites within the Sacramento River National Wildlife Refuge (SRNWR) owned by the U.S. Fish and Wildlife Service (USFWS). The project would be funded by a CALFED Bay-Delta Program (CALFED Program) Ecosystem Restoration Program (ERP) grant (California Bay-Delta Authority [CBDA] grant number ERP-02D-P65). The project sites proposed for restoration for this project are among those that have been the focus of several acquisitions, hydraulic modeling, and restoration planning studies (including this Draft Environmental Impact Report [Draft EIR]) funded by the CALFED Program ERP. As discussed in greater detail below, the proposed project would involve restoration of a mosaic of riparian communities—including forest, savannah, and grassland—where site conditions are appropriate for each community type.

In July 2000 CALFED prepared a Final Programmatic Environmental Impact Statement and Environmental Impact Report (CALFED Final PEIS/EIR) that addresses broad programmatic actions to restore ecosystem function to the San Francisco Bay/Sacramento-San Joaquin Delta (Bay-Delta). The Record of Decision (ROD) for the approval of the CALFED Program documents the final selection of the Preferred Program Alternative from the CALFED Final PEIS/EIR. The ERP is among the set of linked programmatic actions comprising the Preferred Program Alternative to be implemented over a 30-year period. The goal of the ERP is to improve and increase aquatic and terrestrial habitats and improve ecological functions in the Bay-Delta system to support sustainable populations of diverse and valuable plant and animal species (CALFED 2000a). The geographic scope of the ERP is made up of ecological zones that encompass the Central Valley of California; the *upland river-riparian system* is divided and subdivided into management zones and units, including those that cover the mainstem of the Sacramento River north of Colusa and south of the Red Bluff Diversion Dam. The proposed project sites are located approximately midway in this part of the Sacramento River. Specified restoration targets for the Sacramento River Ecological Management Zone include:

- ▶ Preserve and improve the existing stream meander belt by purchase in fee or through easements of 8,000 to 12,000 acres of riparian lands in the *meander zone* (further described below).
- ▶ Increase and maintain floodplains in conjunction with stream meander corridor restoration.
- ▶ Provide conditions for riparian vegetation growth along channelized portions of the Sacramento River.
- ▶ Maintain existing streamside riparian vegetation (CALFED 2000b).

Restoration of native riparian habitat at the proposed project sites would occur in accordance with the overarching vision for management units between Colusa and Red Bluff where protection and expansion of the quantity and quality of the stream meander corridor and management of a functioning ecosystem, including restoration of the riparian forest with varied forest age classes, would improve habitat and increase survival of important fish and wildlife resources (CALFED 2000b).

This riparian habitat restoration project is consistent with the programmatic guidance contained in the CALFED Final PEIS/EIR. As a CALFED Program ERP project, it is also consistent with the ROD for the approval of the CALFED Program. The ROD includes a summary list of programmatic actions designed to achieve the objectives of the ERP. The most applicable of these actions to the proposed project specifies protection and restoration of the Sacramento River meander corridor consistent with Senate Bill (SB) 1086 and Sacramento River Conservation Area (SRCA) Forum river corridor management plans and processes (CALFED 2000a). The ROD further specifies

completion of this particular program action by the end of Stage 1, which is planned to cover the first 7 years of the CALFED Program (CALFED 2000b).

As discussed in Chapter 1, “Introduction,” preparation of this Draft EIR included reviews of applicable sections of the CALFED Final PEIS/EIR. Review of Section 7.1, “Agricultural Land and Water Use,” resulted in identification of the following five mitigation strategies that apply to this proposed habitat restoration project:

- ▶ Mitigation Strategy 4: Involve all affected parties, especially landowners and local communities, in developing appropriate configurations to achieve optimal balance between resource effects and benefits.
- ▶ Mitigation Strategy 10: Focus habitat restoration efforts on developing new habitat on public lands before converting agricultural lands.
- ▶ Mitigation Strategy 11: If public lands are not available for restoration efforts, focus restoration efforts on acquiring lands that can meet ecosystem restoration goals from willing sellers where at least part of the reason to sell is economic hardship (i.e., lands that flood frequently or where levees are difficult to maintain).
- ▶ Mitigation Strategy 18: Minimize the amount of water supply required to sustain habitat restoration acreage.
- ▶ Mitigation Strategy 19: Develop buffers and other tangible support for remaining agricultural lands. Vegetation planted on these buffers should be compatible with farming and habitat objectives.

This proposed project is consistent with the aforementioned mitigation strategies, as discussed in Section 4.2, “Agricultural Resources and Land Uses.”

Also, as discussed in Chapter 1, “Introduction,” Mitigation Strategy 9 from the CALFED Final PEIS/EIR addresses potential significant impacts to special-status wildlife species and/or important wildlife use areas. As discussed below under “Project Area Preparation,” this proposed habitat restoration project is being designed to avoid impacts to sensitive species that could be present in the project area. Furthermore, ongoing USFWS management practices on refuge lands are intended to avoid disturbances to special-status wildlife species and associated habitats. See the discussion below for further detail.

The CALFED Program Multi-Species Conservation Strategy (MSCS) was developed for the CALFED Program in accordance with the federal Endangered Species Act (ESA), the California Endangered Species Act (CESA) and California’s Natural Community Conservation Planning Act (NCCPA). The MSCS is a comprehensive programmatic strategy for the conservation of numerous species of fish, wildlife and plants and their habitat based on key CALFED Program elements, such as the ERP and the Environmental Water Account. Implementation of the MSCS is intended to ensure that entities implementing CALFED Program actions will satisfy the requirements of ESA, CESA and the NCCPA. TNC will follow the CALFED Program MSCS for any necessary CESA and ESA compliance for the project. Refer to Section 4.4, “Biological Resources,” for further discussion of MSCS goals for wildlife and plant species that occur in the project area.

3.1.2 PROJECT OBJECTIVES

The CALFED Program ERP includes six goals and 32 related objectives for improving ecosystem functions and preserving habitats, and recovering and maintaining species’ populations in the Bay-Delta (CALFED 2000b). Selected ERP goals listed below are targeted to several species and natural habitat types in the Bay-Delta that occur in ecosystems upstream along the Sacramento River. This overlap of species and habitat types demonstrate the connectivity between the ecological zones outlined above and those that occur downstream to the Bay-Delta, as well as the relationship between the Bay-Delta system and its associated watersheds, including the Sacramento River. The objectives for the proposed project that are listed in Chapter 1 of this Draft EIR are incorporated below to show the connection between CALFED Program ERP goals with the objectives for this proposed project.

- ▶ ERP Goal 1: Achieve, first, recovery and then large self-sustaining populations of endangered and other at-risk species and native biotic communities.

The following USFWS and TNC objectives for the restoration of the three project sites are consistent with Goal 1 of the CALFED Program ERP:

- Provide habitat for neo-tropical migrant land birds.
- Provide potential habitat for the valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), a species listed as threatened under the federal Endangered Species Act (ESA).
- ▶ ERP Goal 2: Establish and maintain hydrologic and hydrodynamic regimes that support the recovery and restoration of native species and biotic communities.
- ▶ ERP Goal 4: Restore large expanses of all major aquatic, wetland, and riparian habitats, and sufficient connectivity among habitats, in the Central Valley and its rivers to support recovery and restoration of native species and biotic communities and rehabilitation of ecological processes.

The following USFWS and TNC objectives for the restoration of the three project sites are consistent with Goal 4 of the CALFED Program ERP:

- Establish early-successional stage and late-successional stage native riparian communities that have been severely reduced in extent along the Sacramento River since 1850.
- Provide habitat for neo-tropical migrant land birds.
- Provide shaded riverine aquatic (SRA) habitat for federally listed endangered winter-run Chinook salmon.
- Provide potential habitat for the valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*), a species listed as threatened under the ESA.
- ▶ ERP Goal 5: Limit the spread or, when possible and appropriate, eradicate populations of nonnative invasive species through focused management efforts.
 - ERP Objective 6: Reduce the impact of nonnative mammals on native birds, mammals, and other organisms.
 - ERP Objective 7: Limit the spread of, or, when possible and appropriate, eradicate populations of nonnative invasive species through focused management efforts.
- ▶ ERP Goal 6: Reduce loadings of oxygen-depleting substances and fine sediment loadings from human activities into aquatic ecosystems in the Bay-Delta estuary and watershed to levels that do not cause adverse ecological effects.

The following USFWS and TNC objective for the restoration of the three project sites is consistent with Goal 6 of the CALFED Program ERP:

- Improve water quality by decreasing sediment and pesticide runoff into the Sacramento River.

3.1.3 INNER RIVER ZONE OF THE MIDDLE SACRAMENTO RIVER

The three project sites are located within the *inner river zone* of the SRCA, on lands identified by the USFWS as having high potential for restoration of native riparian habitat that would benefit fish, wildlife and plant species dependent on a naturally functioning riverine ecosystem. The inner river zone stretches generally between Red Bluff and Colusa and is defined as the 150-year meander zone of the Sacramento River, or the location in which the river has meandered within the past 100 years and is predicted to meander over the next 50 years. Most of the properties within this zone also lie within the 2½- to 4-year flood zone of the river, which means that they get flooded, on average, once every 2 to 4 years, generally in winter or spring (based on aerial photograph-interpreted flood recurrence intervals generated by the California Department of Water Resources [DWR]) (Luster, pers. comm., 2005). The *inner river zone guideline* defines, for the most part, the SRCA planning boundary used by state and federal agencies, and private entities to restore and enhance natural riparian habitats and functions along the Sacramento River (SRCA Forum 2003). The suitable hydrology, soils and presence of protected native riparian habitat within the inner river zone contribute to the suitability of the proposed sites for restoration of riparian habitat that was historically extensive along the middle Sacramento River.

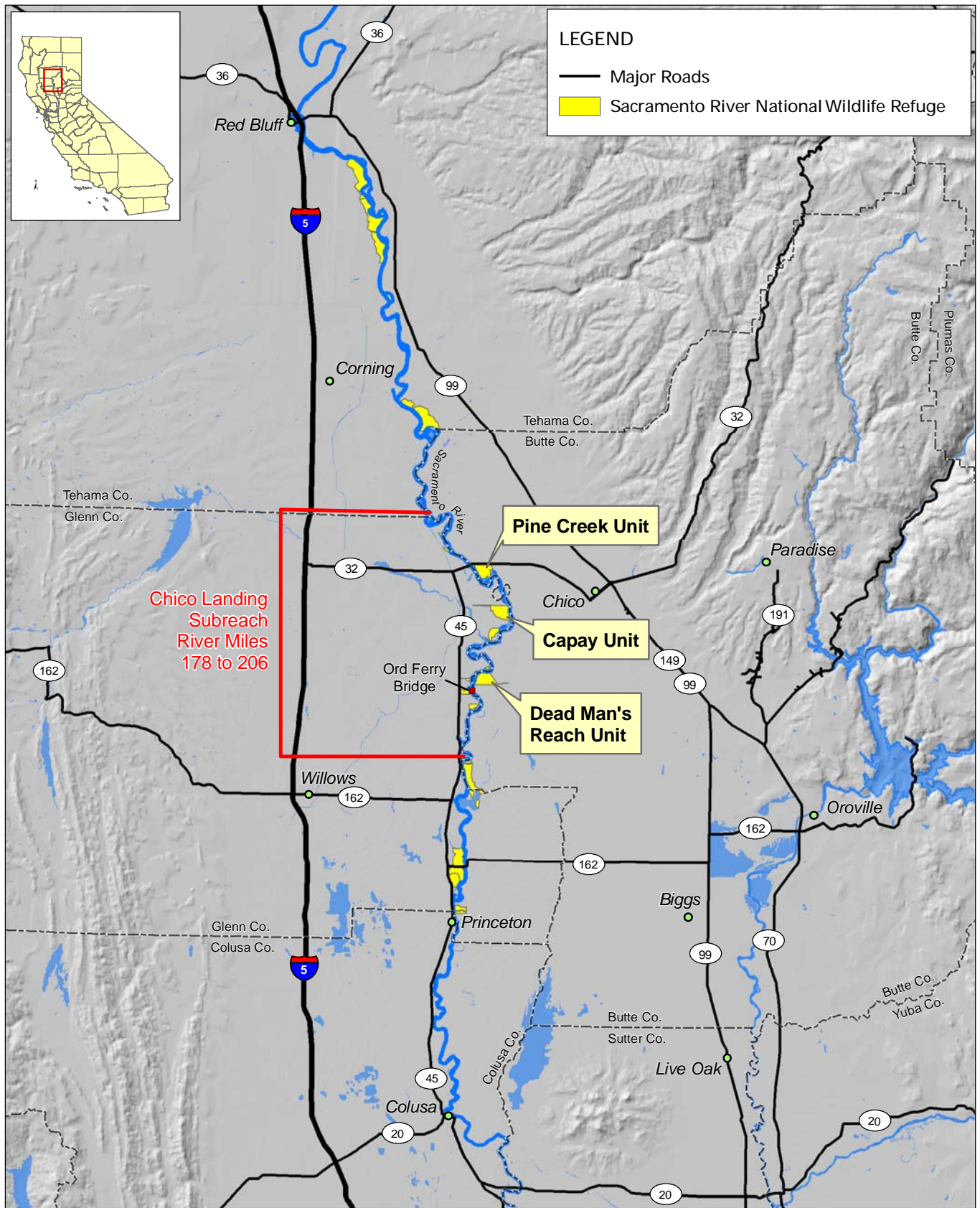
3.1.4 IMPORTANCE OF RIPARIAN HABITAT

Over 225 species of birds, mammals, reptiles, and amphibians in California depend on riparian habitats for nesting, foraging, dispersal corridors, and migration stop-over sites. Riparian vegetation supplies instream habitat important for fish, semi-aquatic reptiles and amphibians, and aquatic insects (Riparian Habitat Joint Venture [RHJV] 2004). It is also critical to the quality of instream habitat and aquatic life, providing shade, food, and nutrients that form the basis of the food chain (Jensen et al. 1993, cited in RHJV 2004). Riparian habitats may be the most important habitat for land bird species in California (Manley and Davidson 1993, cited in RHJV 2004). Despite their importance, riparian habitats have been decimated over the past 150 years as a consequence of reservoir construction, levee and channelization projects, livestock grazing, timber harvest, water pollution, introduction of nonnative plant species, gravel and gold mining, and clearing for agricultural, residential, and industrial uses (Knopf et al. 1988, cited in RHJV 2004). Today, depending on the bioregion, riparian habitat covers 2% to 15% of its historic range in California (Katibah 1984 and Dawdy 1989, cited in RHJV 2004).

3.2 PROPOSED PROJECT AREAS AND LOCATIONS

The SRNWR is composed of many units (federal properties) between the cities of Red Bluff and Princeton beginning at river mile (RM) 240 and ending at RM 164. Exhibit 3-1 displays the middle Sacramento River region between Red Bluff and Colusa, and the relative locations of the three units within the Chico Landing Subreach (RM 178 to RM 206) that contain the restoration project sites addressed in this Draft Environmental Impact Report (Draft EIR). The units and the corresponding restoration sites are known by the names Pine Creek (formerly part of the Harley tract; also known as Sunset Ranch), Capay (formerly known as the Kaiser tract), and Dead Man's Reach (formerly known as the Koehnen tract) (USFWS 2002). The latter two sites were acquired by USFWS with CALFED Program ERP funds (grant number 97-N02) awarded under a joint contract to TNC, USFWS, and the Wildlife Conservation Board (WCB; part of the California Department of Fish and Game [DFG]). Pine Creek was purchased with private funds and transferred to the USFWS by TNC on September 12, 2003.

The areas proposed for restoration in this Draft EIR occur within larger SRNWR units that were previously evaluated under the *Final Environmental Assessment for Proposed Restoration Activities on the Sacramento River National Wildlife Refuge* (USFWS 2002). Areas proposed for restoration will be referred to as *project sites* in this document. The 576-acre Pine Creek Unit at the northernmost end of the project area is located about 1 mile inland from RM 199R (right bank levee while looking upstream) and includes approximately 21 acres that are proposed for restoration. State Route 32 is near the north boundary of the site; the highway continues west to cross the Sacramento River and east to the City of Chico, about 5 miles east of the river. Pine Creek is a tributary to the Sacramento River and is near the east end of the Pine Creek Unit. The 666-acre Capay Unit is located a few miles southeast of Hamilton City between RM 194 and RM 193L (left bank levee) and includes approximately 570 acres



Source: Adapted from USFWS 2004, CASIL 1993 & 1999, TNC 2005, GAP 1997

Regional Context

Sacramento River–Chico Landing Subreach Habitat Restoration DEIR

EXHIBIT 3-1



EDAW

that are proposed for restoration. County Road 23 is along the north side of Capay. The 637-acre Dead Man's Reach Unit lies at the southernmost end of the project area between RM 186.5 and RM 185R and includes approximately 239 acres that are proposed for restoration. The southern boundary of Dead Man's Reach is about ½ mile north of Ord Ferry Road. Portions of both of the latter two project sites are adjacent to the river bank. The three project sites are collectively referred to as the *project area* in this document. A larger *study area* has also been applied that extends between RM 174 and RM 202 (almost matching the Chico Landing Subreach) and generally corresponds to the study area for the hydrological analysis in this Draft EIR. The project study area is displayed in Exhibit 3-2.

3.3 RELATED PLANNING AND MANAGEMENT EFFORTS, RELATED PROJECTS, AND CONFORMANCE WITH EXISTING PROGRAMS

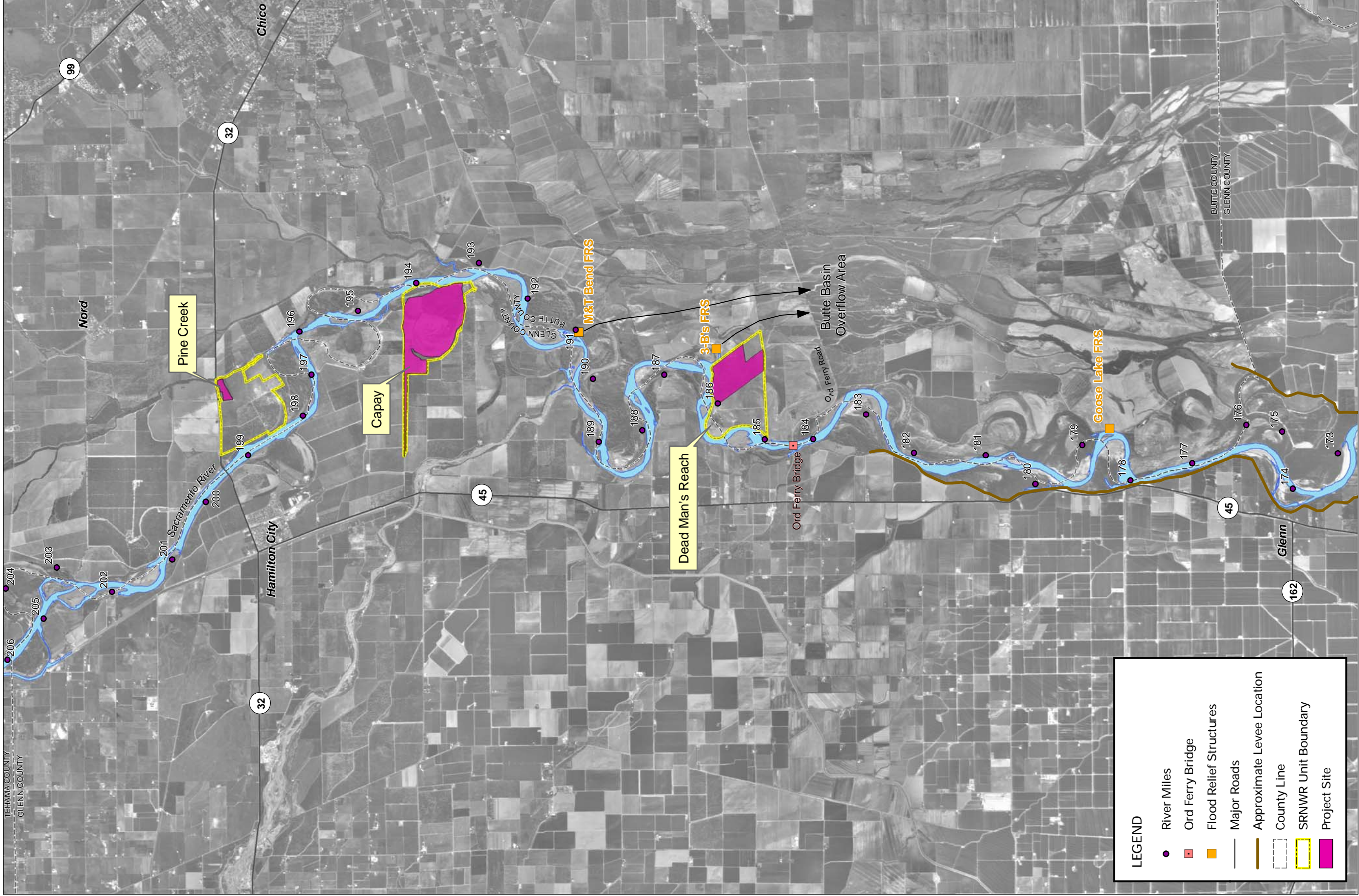
Ecosystems of the Sacramento River have been the subject of study and investigation for over 20 years as scientists, resource agency representatives, and elected officials have considered methods for protection of riverine resources that incorporate plans related to flood damage reduction, recreation, and agricultural uses. Complex planning and funding efforts by various agencies and other groups have contributed to the gradual implementation of projects to conserve and restore riparian habitat along the middle Sacramento River system between Red Bluff and Colusa.

3.3.1 BRIEF HISTORY OF THE SACRAMENTO RIVER NATIONAL WILDLIFE REFUGE

Federal legislative action in 1987 led Congress to direct USFWS to prepare a feasibility study proposing establishment of the SRNWR along the middle Sacramento River (USFWS 1987). The feasibility study concluded that creation of a riparian zone refuge could be accomplished by state or federal resource agencies, private conservation groups, or by multiple agencies. It also suggested possible land acquisition scenarios and addressed potential issues related to public use and bank stabilization work. Subsequent to preparation of the feasibility study, USFWS issued an Environmental Assessment and Finding of No Significant Impact (EA/FONSI) to establish and authorize acquisition of up to 18,000 acres for the SRNWR in Butte, Tehama, Glenn, and Colusa Counties (USFWS 1989). Ongoing habitat restoration by USFWS has contributed to fulfilling its Congressional mandate to preserve, restore, and enhance riparian habitat for threatened and endangered species, migratory birds, anadromous fish, resident riparian wildlife, and native plants (USFWS 2005).

The SRNWR is part of the Sacramento National Wildlife Refuge Complex, consisting of five refuges and three wildlife management areas within the Sacramento Valley of California. Reaches and subreaches of the river are delineated based generally on transitions in fluvial geomorphic riverine conditions. Criteria were added by TNC such as county boundaries in order to include socio-political management information. The combined criteria resulted in the identification of subreaches each measuring roughly 15 to 20 miles long. Land management and resource planning along the river has shifted from smaller-scale, parcel-size planning to larger-scale, floodplain planning partly as a result of the process used to define the subreaches.

In July 2004, USFWS prepared the *Sacramento River National Wildlife Refuge Draft Comprehensive Conservation Plan and Environmental Assessment* to serve as an integrated management plan for land that it acquires and manages for inclusion in the SRNWR. The plan is also in accordance with the federal requirement that all federal refuges have an approved Comprehensive Conservation Plan (CCP) in place by 2012 (National Wildlife Refuge System Improvement Act, 1997, Public Law [PL] 105-57). The draft plan was finalized and the FONSI was signed on March 5, 2005. The final CCP will be available to the public in July 2005. The SRNWR final CCP includes goals, objectives, and strategies to guide management of lands within the SRNWR. It also includes assessments of and establishes parameters for *compatible uses*, which are uses that are considered compatible with the primary purposes for which the area was established. Riparian habitat restoration projects are being implemented under cooperative agreements between USFWS and other entities such as TNC in accordance with the SRNWR final CCP. The proposed project is supported by the USFWS and will conform to performance standards such as buffers, vector control, and fencing that are outlined in the SRNWR final CCP (USFWS 2005). Key provisions are highlighted under "Management Considerations," below.

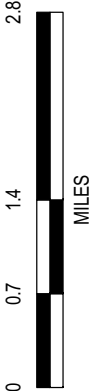


Source: TNC 1999 (river polygon), TNC 2005, CDFG (Spot Imagery) 2002, CASIL 1993, Ayres Associates 2001, USACE 2004

Study Area

Sacramento River–Chico Landing Subreach Habitat Restoration DEIR

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3.3.2 INTEGRATED MANAGEMENT OF THE SACRAMENTO RIVER AND FORMATION OF THE SACRAMENTO RIVER ADVISORY COUNCIL

Concurrent with the USFWS studies during the late 1980s, the State of California legislature passed SB 1086 in 1986 that called for a management plan for the Sacramento River and its tributaries to protect, restore, and enhance fisheries and riparian habitat in an area stretching from the confluence of the Sacramento River with the Feather River and continuing northward to Keswick Dam, about 4 miles north of Redding. The law established an Advisory Council that included representatives of state and federal agencies, county supervisors, and representatives of landowner, water contractor, commercial and sport fisheries, and general wildlife and conservation interests. Responsibilities of the Advisory Council included development of the Sacramento River Conservation Area Forum Handbook to guide management of riparian habitat and agricultural uses along the river (Sacramento River Conservation Area Forum 2003). A Memorandum of Agreement (MOA) between local, state, and federal agencies was signed by key agencies and several counties that formally adopted the Handbook. This action also resulted in formation in May 2000 of the Sacramento River Conservation Area (SRCA) Forum, a nonprofit, public benefit corporation with a Board of Directors that includes private landowners and public interest representatives from a seven-county area, an appointee of the Resources Agency, as well as ex-officio members from six state and federal resource agencies. The work of the organization is generally focused on planning actions and river management within the SRCA planning area, which is defined largely by the inner river zone guideline (described in Section 3.1.4). A parcel or property may be located within the planning area based on criteria that includes voluntary participation by a landowner, erosion and accretion projections due to river meander patterns, and flood frequency. The MOA, Handbook, and SRCA Forum represent a sustainable river corridor management process in which all possible interested and responsible groups and individuals are involved in management of riverine resources.

3.3.3 FORMATION AND PURPOSE OF THE CALIFORNIA BAY-DELTA AUTHORITY

CBDA was established as a state agency in 2003 to oversee implementation of the CALFED Program for the 25 state and federal agencies working cooperatively to improve the quality and reliability of California's water supplies while restoring the Bay-Delta ecosystem. The CALFED Program ERP has provided a funding source for projects that include those involving acquisition of lands within the SRCA, initial baseline monitoring and preliminary restoration planning, and preparation of long-term habitat restoration management and monitoring plans. The proposed project that is the subject of this Draft EIR is part of a grant award from CBDA to TNC in July 2004 (CBDA grant number ERP-02D-P65) for funding of similar projects.

3.4 PROPOSED PROJECT CHARACTERISTICS

The proposed project would involve revegetation and restoration of the three sites totaling approximately 836 acres with a combination of forest, savannah, and grassland habitats. To accomplish restoration, native species would be planted and actively maintained for 3 years. Over time, habitat management and natural processes would control the species composition and overall structure of the plant communities. Table 3-1 shows the proposed project implementation timeline. Most of the restoration work on the ground would occur between summer 2006 and fall 2009. Proposed project activities outlined below are based on approximately 15 years of adaptive management practices conducted by TNC on approximately 3,500 acres within the middle reaches of the Sacramento River.

3.4.1 TRACT HISTORIES

PINE CREEK

The Pine Creek Unit encompasses 576 acres. Detailed soil analyses conducted in 2002 and personal accounts document the presence of thick riparian forest throughout the property, including the 21-acre restoration site, prior to its staged removal between 1955 and 1974 for agricultural use of the site. The field was planted to Hartley walnuts (3.0 acres) in 1962 and replanted to Chandler walnuts (17.3 acres) in 1988. A walnut orchard was in its

Table 3-1 Proposed Project Implementation Timeline																	
Activities and Tasks	Responsible Party	2006				2007				2008				2009			
		W	SP	SU ¹	F	W	SP	SU	F	W	SP	SU	F	W	SP	SU	F ²
Propagation																	
Seed collection	TNC																
Nursery propagation	TNC																
Cutting collection	TNC																
Fieldwork																	
Site preparation	Contractor																
Layout	Contractor																
Irrigation system	Contractor																
Planting	Contractor																
Replant (if needed)	Contractor																
Maintenance																	
NIS ³ control	Contractor																
Irrigation	Contractor																
Monitoring and Reporting																	
30 days after planting	TNC																
End of growing	TNC																
Project completion	TNC																
Regular check-in	TNC																
Project Management																	
Annual Reports	TNC																
Quarterly reports	TNC																
Contract	TNC																
¹ project implementation		² project completion				³ NIS = nonnative invasive species (weeds)											

¹project implementation

²project completion

³NIS = nonnative invasive species (weeds)

Source: TNC 2002; Luster, pers. comm., 2005

13th year of production in 2001 when the property was purchased with private funds. The walnut orchard was removed in 2003. This property had been subject to a Williamson Act contract that became nullified when ownership was transferred to the USFWS on September 12, 2003. Approximately 90% of the riparian habitat on this unit has been restored under other projects (Luster, pers. comm., 2005).

CAPAY

Personal accounts and historical photographs from 1935, 1955, and 1968 document the land cover at the 666-acre Capay Unit as grassland with curvilinear bands of oak woodland following old river channels. Cottonwood forests still exist along the river bank. After 1911, portions of the open grassland on Capay were planted in row crops. Major clearing of riparian woodland habitat occurred between 1952 and 1970 and the land was subsequently planted in row crops and/or grazed. The remaining oak woodlands on the property were cut down or dynamited during the 1970s, and the land was partially leveled. A slough on the south and west sides was partially infilled in the same time frame. A decrepit 5-acre walnut orchard was removed from the property in 2002 by USFWS. Capay land was fallow between 1999 and 2002. TNC and USFWS have contracted with local farmers since 2002 to dryland farm 380 acres of the property. Poor soils consisting of coarse gravel wash and sandy loams and invasive yellow starthistle have challenged farming operations. Of the total 666 acres, 576 acres on Capay Unit are proposed for restoration. (Luster, pers. comm., 2005.)

DEAD MAN'S REACH

Land cover on the Dead Man's Reach Unit prior to site clearing for agricultural use consisted of mixed riparian forest and valley oak woodland interspersed with open grassland and savannah. Major clearing of the tract occurred between 1910 and 1920 with nearly all riparian vegetation removed by 1955. Leveling of the property was completed in the 1970s, and an almond orchard was planted in 1978. Replanting occurred in 1983 and 1995

following the loss of trees during high-water events and windstorms. The property was subject to heavy flooding between 1988 and 1999. By 2005, a total of 100 acres of almond trees had been lost due to over-bank flows and wind damage. Income from almond sales decreased by 80% as a result of these storm and wind events and the concomitant loss of trees. Approximately 10 acres of land were eroded by the river between 1980 and 1990. Bank protection measures consisting of the placement of concrete rubble by previous landowners were largely unsuccessful in preventing further erosion. A total of 239 acres are proposed for restoration within the 637-acre Dead Man's Reach unit (Luster, pers. comm., 2005).

3.4.2 PROPOSED PROJECT ACTIVITIES

SEED COLLECTION AND PLANT PROPAGATION

TNC uses a palette of approximately 30 native riparian plant species that are appropriate for a diverse array of native Sacramento River riparian habitats. Collection of plant materials would be conducted by TNC and plant materials propagation would be contracted out to these local nurseries:

- ▶ California State University, Chico
- ▶ Floral Native Nursery, Chico
- ▶ Hedgerow Farms, Winters

Container plants would be raised from seeds or cuttings collected from the Sacramento River floodplain. Willow and cottonwood cuttings refer to branches about 1 inch in diameter cut from mature cottonwood and willow trees and planted directly into the field.

COMPOSITION OF PLANT COMMUNITIES

The proposed restoration project sites would be planted with a combination of native habitat community types including forest, savannah, and grassland. Table 3-2 lists preliminary acreage figures for each community type. These habitat types are components of or correspond to habitats classified by DFG and identified in the MSCS for conservation and enhancement (CALFED 2000b). TNC has established the following list of measurable factors for habitat restoration projects that it uses as the basis for data collection to assess sites and determine relative proportions of habitat community types:

- ▶ existing vegetation on and near the project site (including remnant riparian habitat and weed communities within the project site),
- ▶ native fish and wildlife populations,
- ▶ soil profile,
- ▶ regional hydrology (e.g., flood frequency and duration),
- ▶ depth to the water table,
- ▶ historic geomorphic conditions, and
- ▶ topography.

The acreages presented in Table 3-2 may be adjusted as restoration plans are finalized in 2005 (Luster, pers. comm., 2005). Exhibits 3-3, 3-4, and 3-5 display the preliminary conceptual plan views for the Pine Creek, Capay, and Dead Man's Reach restoration areas that may be revised in 2005 as ongoing site analyses and planting plans are further developed.

Table 3-2
Community Composition Per Tract (in approximate acres) to be Restored

	Pine Creek (unit total 576 acres)	Capay (unit total 666 acres)	Dead Man's Reach (unit total 637 acres)	Total Acres to be Restored
Mixed Riparian Forest	21	136	96	253
Cottonwood Riparian Forest	--	55	--	55
Valley Oak Riparian Forest	--	23	--	23
Valley Oak Woodland	--	103	8	111
Elderberry Savannah	--	80	121	201
Grassland	--	175	14	189
Passive Restoration	--	4	--	4
Total acres to be restored	21	576	239	836
Source: Luster, pers. comm., 2005				

TNC has developed a list of native plant species to use for its riparian habitat restoration projects along this reach of the Sacramento River. The plant communities displayed in Table 3-2 would be comprised of many of the following species: cottonwood (*Populus fremontii*), sycamore (*Platanus racemosa*), valley oak (*Quercus lobata*), willow spp. (*Salix gooddingii*, *S. lasiolepis*, *S. exigua*), California rose (*Rosa californica*), coyote brush (*Baccharis pilularis*), Oregon ash (*Fraxinus latifolia*), mulefat (*Baccharis salicifolia*), button bush (*Ceanothus occidentalis*), elderberry (*Sambucus mexicana*), box elder (*Acer negundo*), poison oak (*Toxicodendron diversilobum*), mugwort (*Artemisia douglasiana*), California goldenrod (*Solidago californica*), hoary nettle (*Urtica dioica*), California blackberry (*Rubus ursinus*), pipevine (*Aristolochia californica*), clematis (*Clematis ligustifolia*), California grape (*Vitis californica*), creeping wildrye (*Leymus triticoides*), blue wildrye (*Elymus glaucus*), meadow barley (*Hordeum brachyantherum*), deer grass (*Muhlenbergia rigens*), purple needlegrass (*Nassella pulchra*), clustered-field sedge (*Carex praegracillis*), and Santa Barbara sedge (*Carex barbarae*) (Luster, pers. comm., 2005).

In accordance with an agreement with the State of California Reclamation Board (The Reclamation Board), TNC does not plant elderberry shrubs (host plant for the valley elderberry longhorn beetle) within 100 feet of levees or other flood control structures to avoid potential conflicts with maintenance activities in these areas (Luster, pers. comm., 2004). Refer to Section 4.4 of this Draft EIR for further discussion of valley elderberry longhorn beetle habitat.

PROJECT AREA PREPARATION

Restoration contractors would be responsible for project area preparation, planting, and maintenance, activities that would be overseen by TNC. The Dead Man's Reach project site includes a declining almond orchard that would be removed in spring 2006 after the possibility of flooding has diminished. Restoration contractors could begin project area preparations in summer 2006. These activities would generally include debris removal, disking, and removal of nonnative invasive species (weeds). Agricultural land on the Pine Creek project site has been fallow since an orchard was removed in 2003. Capay includes approximately 350 acres in mixed row crop production and approximately 200 acres that are fallow. Existing elderberry shrubs that are present in the restored and remnant riparian habitat near the proposed project sites would not be disturbed by work related to the proposed project (Luster, pers. comm., 2004).

The existing herbaceous cover on the three project sites is dominated by weeds. Applications of herbicides alternated with mowing and disking to a depth of 6–8 inches would be required to decrease weed density. Required equipment to apply an herbicide would include a standard diesel-powered tractor or an all-terrain vehicle pulling a spray rig. Disking would require a diesel-powered tractor pulling a disk. Herbicides would



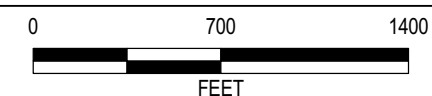
Source: TNC (date of aerial May 24, 1999) 2005, USGS Nord DOQQ 1998

Pine Creek Conceptual Restoration Plan

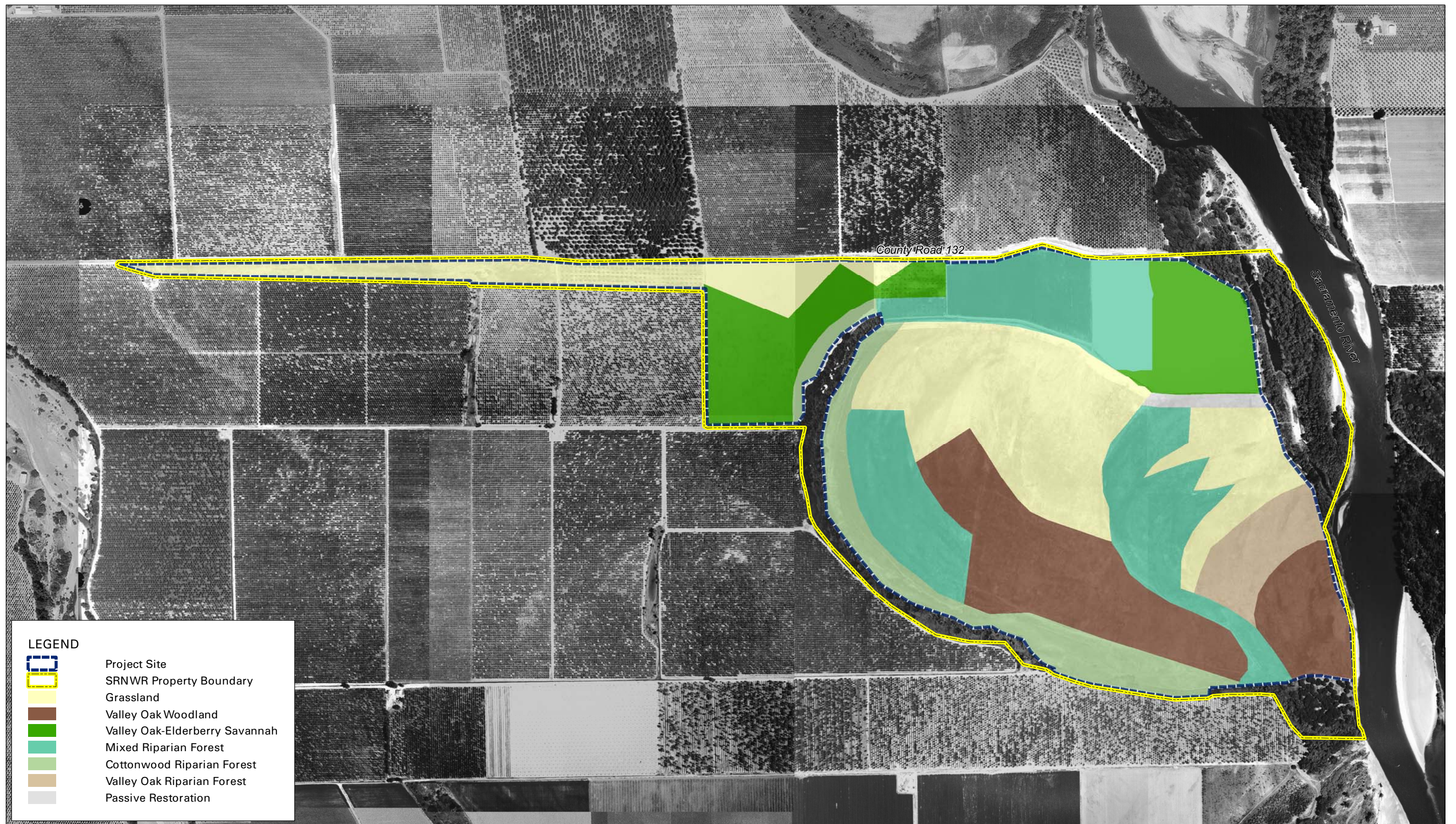
Sacramento River-Chico Landing Subreach Habitat Restoration DEIR

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EXHIBIT **3-3**



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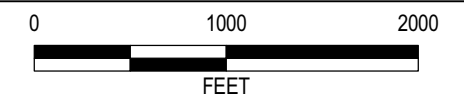


Source: TNC (date of aerial May 24, 1999) 2005, USGS Ord Ferry Quad DOQQ 1998

Capay Conceptual Restoration Plan

Sacramento River–Chico Landing Subreach Habitat Restoration DEIR

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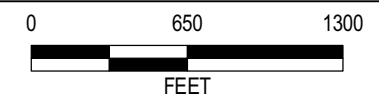
Source: TNC (date of aerial May 24, 1999) 2005, USGS Ord Ferry DOQQ (1998)

Dead Man's Reach Conceptual Restoration Plan

Sacramento River–Chico Landing Subreach Habitat Restoration DEIR

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EXHIBIT 3-5



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be applied as recommended by a licensed agricultural pest control adviser (PCA) in accordance with guidelines established by the California Department of Pesticide Regulation. Herbicides applied to SRNWR properties must be approved for use by USFWS. Weed control activities would be conducted as needed throughout the year over the 3 years of project implementation outlined in Table 3-1. Herbicide drift would be controlled in accordance with the California Department of Pesticide Regulation rules on pesticide use and the Material Safety Data Sheets (MSDS) developed by the U.S. Environmental Protection Agency (EPA) for each herbicide used (Luster, pers. comm., 2005).

Irrigation systems would be replaced or retrofitted after the tracts were disked and landplaned. Following project site preparation, site layout would involve organizing the restoration area to be planted according to the details outlined in the planting plan. Placement of color-coded flags would mark planting locations.

As described in Chapter 1, “Introduction,” Mitigation Strategy 9 from the CALFED Final PEIS/EIR addresses potential significant impacts to special-status wildlife species and/or important wildlife use areas. This mitigation strategy is based on “avoiding construction or maintenance activities within or near habitat areas occupied by special-status wildlife species or in important wildlife use areas when species may be sensitive to disturbance (CALFED 2000b).” The biological resources analysis prepared for this Draft EIR identified potential significant impacts to active bird nests (Section 4.4, “Biological Resources”). Ongoing USFWS management guidelines for SRNWR properties require that agricultural practices to control weed growth (e.g., mowing, spraying and disking) commence prior to April 15, before ground nesting birds have the opportunity to establish residence. If mowing begins before April 15, mowing may continue throughout the summer. If mowing is not initiated prior to April 15, it cannot occur until after July 15 to avoid destroying nests or otherwise disturbing ground-nesting birds (Moroney, pers. comm., 2005). As described above, the Dead Man’s Reach almond orchard would be removed in spring 2006. Prior to removal, the almonds would be harvested for the last time in fall 2005, and standard orchard maintenance practices (e.g., mowing and herbicide applications) would continue over the winter, which would discourage bird nesting and bat roosting in the orchard prior to felling of the trees. Pursuant to these guidelines, project site preparation activities will be designed and timed to avoid potential disturbances to birds and their nests and roosting bats (Luster, pers. comm., 2005). Because project activities will be in compliance with USFWS guidelines to avoid impacts to nesting birds, the proposed project is consistent with Mitigation Strategy 9.

The biological resources analysis prepared for the Draft EIR also identified potential impacts to giant garter snakes. Ongoing USFWS management guidelines require that a USFWS biologist conduct a site visit to determine if there is any suitable giant garter snake habitat present at the project sites. If suitable habitat is present at the project sites for this proposed habitat restoration project, the biologist will conduct additional site visits. If a giant garter snake is observed, or if suitable habitat is present, and there is a likely potential that giant garter snakes occur on the site, impact avoidance measures will be implemented. Earth disturbing activities will occur during the giant garter snake active period (May 1–October 31) to avoid negative impacts to giant garter snakes and their hibernacula. During this seasonal active period, earthwork should begin after temperatures reach a point (60–70°F) when any snakes present are warm enough to move away from potentially harmful earthmoving activities. If the biologist believes there is potential for adverse impacts to giant garter snakes during earthmoving activities, the biologist will be present onsite and monitor for the presence of snakes until the work is complete. If a giant garter snake is observed during earthmoving activities, appropriate measures will be taken to ensure adverse impacts to the snake are avoided. Because project activities will be in compliance with USFWS guidelines to avoid impacts to giant garter snake, the proposed project is consistent with Mitigation Strategy 9 from the CALFED Final PEIS/EIR.

IRRIGATION DESIGN AND INSTALLATION

Irrigation is frequently the most important factor in the success of riparian restoration projects in California. Adequate soil moisture allows vigorous plant growth, and that in turn inhibits weed growth. The irrigation system would consist of polyvinylchloride pipe buried 3 feet below the surface that would connect between existing

groundwater wells and aboveground hard hose outfitted with microdrip emitters (Luster, pers. comm., 2004). The irrigation system would be installed and be completely functional prior to planting.

As shown in Table 3-1, project site preparation, site layout, and installation of irrigation would generally occur from summer 2006 through winter 2007. Installation of the irrigation system would be completed prior to planting in winter 2006 and spring 2007.

PLANTING AND MAINTENANCE

Plantings would occur during these three phases:

- ▶ Potted stock and cover crops (or resident weeds to control soil erosion) would be planted in fall 2006 and spring 2007.
- ▶ Willow and cottonwood cuttings would be planted in winter 2006.
- ▶ Understory herbaceous (grasses and forbs) layer would be seeded in fall 2007.

The planting design for the proposed project was determined based on site conditions with the goal of optimizing habitat diversity and incorporating flow conveyance. Planting rows for overstory plants would be spaced between 15 and 30 feet, depending on the community type, with individual plants spaced 11 feet apart in the planting strips. These spacings have been calculated to achieve a planting density of 132 to 264 overstory plants per acre (Luster, pers. comm., 2005). Planting rows would be parallel to the direction of overbank flow at each project site. There are no Sacramento River Flood Control Project levees along either the Capay or Dead Man's Reach properties, and the Pine Creek restoration site is over ½ mile from the river bank; however, private bank protection has been placed along the northern edge of the Dead Man's Reach project site. Plantings for the proposed project at the Capay and Dead Man's Reach project sites would be set back a minimum of 50 feet from the river bank.

Depending on the weather, planting at the two larger project sites would take about one month each (Table 3-1). Planting could occur at the smaller Pine Creek project site over about one week. Removal of the almond orchard at Dead Man's Reach could delay the start of planting on the project site until spring 2007. Following planting, aisles between the planted rows would be mowed and the planted rows would be herbicide sprayed to deter weeds from setting seed. Standard farm equipment for mowing would include a diesel-powered tractor pulling a rotary or flail mower. Milk cartons would be placed around plants when the possibility of flooding was diminished to protect plants from herbicide drift during weed control sprays. Small bamboo stakes would be used to anchor the cartons. Once weed abatement activities were completed, understory native grass and forb seed would be planted using a rangeland drill. As described for herbicide spraying and mowing, a tractor (up to two per project site during planting) would be used to pull the rangeland drill. Over the 3-year project period, native riparian plants would be managed to grow and thrive until they could compete effectively with invasive weeds, after which active weed management would no longer be necessary. During 15 years of experience designing and implementing projects to restore native habitat along the Sacramento River, TNC has found that planted native vegetation can compete successfully with invasive weed species after a 3-year establishment period. USFWS monitoring of the project sites following project implementation would ensure that invasive weed species (e.g., *Arundo donax* and *Lepidium multiflorum*) were not becoming established on the project sites (Luster, pers. comm., 2005).

Irrigation of project sites would occur at low frequencies but for long durations depending on conditions between March and October. At the end of the 3-year project period, hard hose irrigation lines would be manually removed where it is possible to do so (Luster, pers. comm., 2005). (It is impossible to remove irrigation hose in some areas without damaging the root systems of newly established native plants.) Efforts to control weed emergence would occur year round. Irrigation and weed control work would continue as needed during the entire 3-year project

period. Irrigation wells would be filled and capped according to local and state regulatory standards by a certified well abandonment company following attainment of restoration goals (described below).

PERFORMANCE MEASURES, MONITORING, AND REPORTING REQUIREMENTS

Criteria used to determine the relative success of plantings at habitat restoration sites are generally successive and include assessments of the following:

- ▶ whether a plant has established in the soil
- ▶ whether it is surviving
- ▶ whether it is growing and thriving

These criteria are used overall to determine if planting has met design specifications and achieved initial success. Accumulated data from individual projects are used to refine, adapt, and develop restoration planning methodologies.

Monitoring phases conducted by TNC for this project would occur over a 3-year period and would include the following:

- ▶ An initial evaluation would occur 30 days after planting over 10% of the total planted acreage for each community type as outlined in restoration reports prepared for USFWS (USFWS and TNC 2003, 2004, 2005). Resulting data would establish baseline conditions against which the end of growing season and project completion monitoring would be compared.
- ▶ Annual monitoring would occur at the end of the growing season in November each year for the 3-year project period. These monitoring phases would include height measurements to indicate growth per species, an assessment of species density on the site, and the frequency of individually occurring species. Taken together, these criteria would be used to assess whether objectives for restoration success were met. Results of annual monitoring would be used to prepare reports that would be submitted to USFWS for review in January 2007, 2008, and 2009 (Luster, pers. comm., 2005).
- ▶ Monitoring at project completion in the fall at the end of the 3-year project period would include data on plant survivorship, height measurements, and species composition of all planted native species at the project sites.
- ▶ Additional weekly visits over the 3-year project period by TNC staff would ensure proper management of restoration activities in accordance with TNC guidelines and SRNWR management objectives.
- ▶ Following the 3-year project period, USFWS would assume responsibility for monitoring the project sites in accordance with management goals and guidelines for SRNWR properties.

Resulting data would be used to compare species growth across different restoration project sites. TNC requires an 80% overall average survival rate for plantings, as well as an 80% ground cover establishment criterion for seeded understory forb and grass species. TNC provides restoration activity updates to the SRCA Forum Technical Advisory Committee and Board of Directors. Stated threshold goals and monitoring and reporting activities would be consistent for each year of the project in accordance with equivalent goals at other TNC project sites.

MANAGEMENT CONSIDERATIONS

The proposed project has been designed to be respectful of neighboring public and private properties that together support a wide range of wildlife species and provide for economic vitality through agricultural production. To maximize conservation efforts along the river, USFWS encourages and supports a cooperative approach to problem solving by regularly communicating with neighbors and cooperatively addressing common issues. The

SRNWR participates in the SRCA Forum to assist with ongoing management coordination efforts (USFWS 2005).

Similarly, SRNWR law enforcement officers are responsible for coordinating their activities and cooperating with other local, state, and federal law enforcement officials. The purposes of law enforcement on SRNWR properties include protection of people and resources and incident prevention. Law enforcement officials protect the visiting public, staff, facilities, and natural and cultural resources from criminal action, accidents, vandalism, and negligence. The presence of law enforcement personnel inhibits or deters criminal activity that might otherwise occur. Their presence also inhibits criminal activity (e.g., vandalism, trespassing, and poaching) on adjacent private property.

The proposed project has also been designed to comply with SRNWR policy requiring fire prevention and fire hazard reduction programs on all its units, with a focus near homes, farms, businesses and developed areas. SRNWR follows the Wildland Urban Interface (WUI) program, a national fire management program designed to reduce the potential for wildfire damage in urban and suburban areas. Development of site specific projects includes involvement from local landowners, county and state fire fighting departments, the SRNWR manager, and the Sacramento National Wildlife Refuge Complex fire management officer. Projects include permanent fire breaks, selective cutting along boundaries and developed areas, prescribed burns for fuel reduction, and cooperative agreements with local fire districts for wildfire suppression (USFWS 2005).

STAKEHOLDER COORDINATION

The proposal to restore riparian habitat on Pine Creek, Capay, and Dead Man's Reach was presented by TNC to the SRCA Forum Board of Directors and Technical Advisory Committee at meetings in August 2001, May and September 2002, January 2003, and November 2004. TNC continues to provide project updates to Board of Director and sub-committee meetings. TNC also disseminates information in the *SRCA Forum Notes* that is distributed to 650 SRCA Forum stakeholders.

Pine Creek and Dead Man's Reach are located in Butte County, and Capay is located in Glenn County. TNC continues to coordinate with local county officials and to provide stakeholders with information and regular updates on its restoration efforts. A meeting was held on August 13, 2001 in Hamilton City with the Hamilton City Community Service District (HCCSD) working group that was attended by Glenn County officials, HCCSD members, and landowners. TNC and USFWS have attended meetings with neighboring landowners to gather views, opinions, and insights on the restoration process.

Coordination efforts between TNC and Butte County have included meetings on August 10 and 24, 2001 that were attended by the Sacramento River Reclamation District Board of Directors, local landowners, and Butte County officials.

COORDINATION WITH THE RECLAMATION BOARD

Although the federally owned and maintained SRNWR lands are exempt from The Reclamation Board's permitting requirements, USFWS maintains a working relationship with The Reclamation Board by providing draft habitat restoration plans for review and comment. Ongoing coordination between these two agencies includes incorporation of restoration project design elements that address The Reclamation Board's resource management concerns and maintenance issues. As the environmental review and project design and planning processes move forward for this proposed project, USFWS will continue its coordination efforts with The Reclamation Board and will satisfy any requests for modifications to the project site plans consistent with current and ongoing practices.

3.5 FLOOD CONTROL ALONG THE UPPER SACRAMENTO RIVER

The Chico Landing Subreach is a relatively unconfined section of the Sacramento River floodplain within the 100-year meander belt that is subject to regular flooding (SRCA Forum 2003). Management of flood flows is necessary, however, to protect adjacent properties and people from the effects of flooding during high flow events. Floodwaters overflow the east bank of the river into the Butte Basin at three sites within the Butte Basin Overflow Area, extending roughly from RM 174 to RM 194 and generally occurring within the Chico Landing Subreach. The purpose of the overflow area is to split flood flows between the Sacramento River and the Butte Basin to control downstream flooding. The three overflow locations are the M&T flood relief structure (FRS), the 3B's natural overflow site, and the Goose Lake FRS. These locations occur at low points on the east side of the river along private levees at historical overflow areas. The Reclamation Board regulates the height of these low points and the land uses within the Butte Basin (SRCA Forum 2003). Sacramento River levees that are maintained by the U.S. Army Corps of Engineers (USACE) begin near Dead Man's Reach (RM 176 on the east bank levee and RM 184.5 on the west bank levee) and continue southward to the Bay-Delta. Sacramento River levees north of USACE-leveed reaches are generally discontinuous and are privately maintained. Refer to Section 4.3, "Hydrology, Water Quality, and River Geomorphology," for further discussions of flooding and flood control.

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