McCormack-Williamson Tract Restoration: Wildlife-Friendly Levee Management

Project Information

1. **Proposal Title:**

   McCormack-Williamson Tract Restoration: Wildlife-Friendly Levee Management

2. **Proposal applicants:**

   Ramona Swenson, The Nature Conservancy

3. **Corresponding Contact Person:**

   Lisbeth Jakobsen
   The Nature Conservancy
   2015 J Street, Suite 103 Sacramento, CA 95814-3124
   916- 449-2850
   ljakobsen@tnc.org

4. **Project Keywords:**

   Flood Plain and Bypass Management
   Habitat Restoration, Wetland
   Wetlands, Tidal

5. **Type of project:**

   Implementation_Full

6. **Does the project involve land acquisition, either in fee or through a conservation easement?**

   No

7. **Topic Area**:

   Shallow Water, Tidal and Marsh Habitat

8. **Type of applicant:**

   Private non-profit

9. **Location - GIS coordinates:**

   Latitude: 38.253

   Longitude: -121.484

   Datum:

Describe project location using information such as water bodies, river miles, road intersections, landmarks, and size in acres.

McCormack Williamson tract is located in the North Delta immediately downstream of the confluence of the Cosumnes and Mokelumne Rivers. The island is west of Interstate 5 and north of the town of Walnut Grove. McCormack Williamson tract is 1,654 acres.

10. **Location - Ecozone:**

    1.1 North Delta

11. **Location - County:**

    Sacramento

12. **Location - City:**

    Does your project fall within a city jurisdiction?

    No

13. **Location - Tribal Lands:**

    Does your project fall on or adjacent to tribal lands?

    No

14. **Location - Congressional District:**

    11

15. **Location:**

    California State Senate District Number: 4

    California Assembly District Number: 8

16. **How many years of funding are you requesting?**

    3

17. **Requested Funds:**
    a) Are your overhead rates different depending on whether funds are state or federal?

    No

    If no, list single overhead rate and total requested funds:

Single Overhead Rate:	22
Total Requested Funds:	2,476,835

b) Do you have cost share partners already identified?

No

c) Do you have potential cost share partners?

Yes

If yes, list partners and amount contributed by each:

DWR Levee Subventions Program $91,875 to $712,500

d) Are you specifically seeking non-federal cost share funds through this solicitation?

No

If the total non-federal cost share funds requested above does not match the total state funds requested in 17a, please explain the difference:

18. **Is this proposal for next-phase funding of an ongoing project funded by CALFED?**

Yes

If yes, identify project number(s), title(s) and CALFED program (e.g., ERP, Watershed, WUE, Drinking Water):

1999-F03 McCormack-Williamson Wildlife-friendly Management ERP

1999-F04 McCormack-Williamson Acquisition, CALFED Directed Action ERP

Have you previously received funding from CALFED for other projects not listed above?

Yes

If yes, identify project number(s), title(s) and CALFED program.

1996-M06 Cosumnes River Preserve-Valensin Ranch Acquisition ERP

1997-N14-A Cosumnes River Floodplain Acquisition and Management ERP

1998-B17, 1998F-19	**Cosumnes River Floodplain Acquisition and Restoration**	**ERP**
1999-C01	**Cosumnes River Feasibility Study**	**ERP**
2001-N23	**Staten Island Acquisition**	**ERP**
2001-N10	**Cosumnes/Mokelumne Corridor Floodplain Acquisition, Management, and Restoration Planning**	**ERP**

19. **Is this proposal for next-phase funding of an ongoing project funded by CVPIA?**

No

Have you previously received funding from CVPIA for other projects not listed above?

Yes

If yes, identify project number(s), title(s) and CVPIA program.

1448-11300-98-9	**Howard Ranch Acquisition**	**Section (b)(1) other**
00-FG-20-0026	**Horizon Organic Dairy Conservation Easement**	**Section (b)(1) other**
1448-0001-96648	**Valensin Ranch**	**Section (b)(1) other**
00-FG-20-0187	**Schneider Conservation Easement**	**Section (b)(1) other**

20. **Is this proposal for next-phase funding of an ongoing project funded by an entity other than CALFED or CVPIA?**

No

Please list suggested reviewers for your proposal. (optional)

John Thompson	**US Fish and Wildlife Service**	**(916)414-6713x10**	**John_Thomson@fws.gov**
Stein Buer	**Department of Water Resources**	**(916) 653-6880**	**sbuer@water.ca.gov**
Curt Schmutte	**Department of Water Resources**	**(916) 227-7529**	**schmutte@water.ca.gov**

Gwen Knitweis	**Department of Water Resources**	**(916) 653-6077**	**916gwenk@water.ca.gov**

21. **Comments:**

CALFED awards # 1998-B17 and 1998-F19 were from the same proposal. Contracts were divided between FWS and BOR.

Environmental Compliance Checklist

McCormack-Williamson Tract Restoration: Wildlife-Friendly Levee Management

1. **CEQA or NEPA Compliance**
   a) Will this project require compliance with CEQA?

      No
   b) Will this project require compliance with NEPA?

      Yes
   c) If neither CEQA or NEPA compliance is required, please explain why compliance is not required for the actions in this proposal.

      At this time, we do not anticipate CEQA/NEPA requirements. However, if NEPA compliance is required, we will work with BLM (in their role as Preserve Manager) as the lead agency.

2. **If the project will require CEQA and/or NEPA compliance, identify the lead agency(ies).** *If not applicable, put "None".*

   CEQA Lead Agency:
   NEPA Lead Agency (or co-lead:) Bureau of Land Management
   NEPA Co-Lead Agency (if applicable):

3. **Please check which type of CEQA/NEPA documentation is anticipated.**

   CEQA
   -Categorical Exemption
   -Negative Declaration or Mitigated Negative Declaration
   -EIR
   Xnone

   NEPA
   -Categorical Exclusion
   XEnvironmental Assessment/FONSI
   -EIS
   -none

   If you anticipate relying on either the Categorical Exemption or Categorical Exclusion for this project, please specifically identify the exemption and/or exclusion that you believe covers this project.

4. **CEQA/NEPA Process**
   a) Is the CEQA/NEPA process complete?

      No

      If the CEQA/NEPA process is not complete, please describe the dates for completing draft and/or final CEQA/NEPA documents.

If the project is approved if NEPA process is necessary, NEPA documents will be completed in winter 2002/2003.

b) If the CEQA/NEPA document has been completed, please list document name(s):

5. **Environmental Permitting and Approvals** (*If a permit is not required, leave both Required? and Obtained? check boxes blank.*)

LOCAL PERMITS AND APPROVALS

Conditional use permit

Variance

Subdivision Map Act

Grading Permit

General Plan Amendment

Specific Plan Approval

Rezone

Williamson Act Contract Cancellation

Other

STATE PERMITS AND APPROVALS

Scientific Collecting Permit

CESA Compliance: 2081

CESA Compliance: NCCP

1601/03

CWA 401 certification

Coastal Development Permit

Reclamation Board Approval

Notification of DPC or BCDC

Other

FEDERAL PERMITS AND APPROVALS

ESA Compliance Section 7 Consultation

ESA Compliance Section 10 Permit

Rivers and Harbors Act

CWA 404

Other

PERMISSION TO ACCESS PROPERTY

Permission to access city, county or other local agency land.
Agency Name:

Permission to access state land.
Agency Name:

Permission to access federal land.
Agency Name:

Permission to access private land.
Landowner Name:

6. **Comments.**

Land Use Checklist

McCormack-Williamson Tract Restoration: Wildlife-Friendly Levee Management

1. **Does the project involve land acquisition, either in fee or through a conservation easement?**

   No

2. **Will the applicant require access across public or private property that the applicant does not own to accomplish the activities in the proposal?**

   No

3. **Do the actions in the proposal involve physical changes in the land use?**

   No

   If you answered no to #3, explain what type of actions are involved in the proposal (i.e., research only, planning only).

   resloping an existing levee, planting vegetation along levee toe. agricultural land use will not change.

4. **Comments.**

Conflict of Interest Checklist

McCormack-Williamson Tract Restoration: Wildlife-Friendly Levee Management

Please list below the full names and organizations of all individuals in the following categories:

- Applicants listed in the proposal who wrote the proposal, will be performing the tasks listed in the proposal or who will benefit financially if the proposal is funded.
- Subcontractors listed in the proposal who will perform some tasks listed in the proposal and will benefit financially if the proposal is funded.
- Individuals not listed in the proposal who helped with proposal development, for example by reviewing drafts, or by providing critical suggestions or ideas contained within the proposal.

The information provided on this form will be used to select appropriate and unbiased reviewers for your proposal.

Applicant(s):

Ramona Swenson, The Nature Conservancy

Subcontractor(s):

Are specific subcontractors identified in this proposal? No

Helped with proposal development:

Are there persons who helped with proposal development?

Yes

If yes, please list the name(s) and organization(s):

Gil Cosio MBK Engineers

Comments:

Gil Cosio is the District Engineer for the Reclamation District. MBK Engineers developed the pilot project for resloping the levee.

Budget Summary

McCormack-Williamson Tract Restoration: Wildlife-Friendly Levee Management

Please provide a detailed budget for each year of requested funds, indicating on the form whether the indirect costs are based on the Federal overhead rate, State overhead rate, or are independent of fund source.

Independent of Fund Source

Year 1												
Task No.	**Task Description**	**Direct Labor Hours**	**Salary *(per year)***	**Benefits *(per year)***	**Travel**	**Supplies & Expendables**	**Services or Consultants**	**Equipment**	**Other Direct Costs**	**Total Direct Costs**	**Indirect Costs**	**Total Cost**
1	Wildlife-friendly levee project	133	3590	1328	500	400	200000		100	205918.0	45302	251220.00
2	Project management	364	10649	3940	500	200			100	15389.0	3386	18775.00
		497	14239.00	5268.00	1000.00	600.00	200000.00	0.00	200.00	221307.00	48688.00	269995.00

Year 2												
Task No.	**Task Description**	**Direct Labor Hours**	**Salary *(per year)***	**Benefits *(per year)***	**Travel**	**Supplies & Expendables**	**Services or Consultants**	**Equipment**	**Other Direct Costs**	**Total Direct Costs**	**Indirect Costs**	**Total Cost**
1	Wildlife-friendly levee project	294	7661	2835	500	400	1600000		100	1611496.0	354529	1966025.00
2	Project management	364	10649	3940	500	200			100	15389.0	3386	18775.00
		658	18310.00	6775.00	1000.00	600.00	1600000.00	0.00	200.00	1626885.00	357915.00	1984800.00

Year 3												
Task No.	**Task Description**	**Direct Labor Hours**	**Salary *(per year)***	**Benefits *(per year)***	**Travel**	**Supplies & Expendables**	**Services or Consultants**	**Equipment**	**Other Direct Costs**	**Total Direct Costs**	**Indirect Costs**	**Total Cost**
1	Wildlife-friendly levee project	140	3566	1319	500	400	160000		100	165885.0	36495	202380.00
2	Project management	448	11179	4136	500	200			100	16115.0	3545	19660.00
		588	14745.00	5455.00	1000.00	600.00	160000.00	0.00	200.00	182000.00	40040.00	222040.00

Grand Total=2476835.00

Comments.

Budget Justification

McCormack-Williamson Tract Restoration: Wildlife-Friendly Levee Management

Direct Labor Hours. Provide estimated hours proposed for each individual.

Project Director II - 126 hours Science Specialist II - 581 hours Science Specialist I - 1036 hours

Salary. Provide estimated rate of compensation proposed for each individual.

Project Director II - $48.18/hour (or $87,696/year) Science Specialist II - $30.98/hour (or $56,376/year) Science Specialist I - $24.09/hour (or $43,848/year)

Benefits. Provide the overall benefit rate applicable to each category of employee proposed in the project.

Benefits are calculated at 37% of salary paid for hours worked in accordance with our Negotiated Indirect Costs Rate Agreement (NICRA) fringe benefit rate.

Travel. Provide purpose and estimate costs for all non-local travel.

Cost of $3,000 is for local travel to the McCormack-Williamson Tract and to meetings and presentations within California.

Supplies & Expendables. Indicate separately the amounts proposed for office, laboratory, computing, and field supplies.

Costs of $1,800 includes the costs of office supplies and other expendables.

Services or Consultants. Identify the specific tasks for which these services would be used. Estimate amount of time required and the hourly or daily rate.

Estimated costs of $1,960,000 include the cost of Engineering and Inspection at $5 per lineal foot, Biological and Environmental Work at $5 per lineal foot, Levee Construction at $80 per lineal foot. Levee Plantings at $8 per lineal foot, which includes the costs associated with mowing, planting, irrigation and weed control.

Equipment. Identify non-expendable personal property having a useful life of more than one (1) year and an acquisition cost of more than $5,000 per unit. If fabrication of equipment is proposed, list parts and materials required for each, and show costs separately from the other items.

No new equipment is required for this project.

Project Management. Describe the specific costs associated with insuring accomplishment of a specific project, such as inspection of work in progress, validation of costs, report preparation, giving presentatons, reponse to project specific questions and necessary costs directly associated with specific project oversight.

During the three years of the grant agreement, TNC will oversee all phases of the project. The Nature Conservancy will continue to participate in outreach activities promoting wildlife-friendly agriculture and floodplain management. In order to ensure that the levee improvements are consistent with long-term restoration planning, we will coordinate site selection, levee construction, and replanting

with DWR and UC Davis. We will also coordinate with the CALFED North Delta Improvements group to ensure that this and other restoration efforts are incorporated into the overall EIR for the Mokelumne corridor flood management plan. In addition, we will coordinate with the CALFED through Delta Conveyance group because the potential changes in water deliveries from the Sacramento River via the Cross Channel and/or Hood Diversion will have ramifications for local hydrologic patterns at the MW Tract.

Other Direct Costs. Provide any other direct costs not already covered.

Costs of $600 include photographs and maps among other associated costs.

Indirect Costs. Explain what is encompassed in the overhead rate (indirect costs). Overhead should include costs associated with general office requirements such as rent, phones, furniture, general office staff, etc., generally distributed by a predetermined percentage (or surcharge) of specific costs.

Costs of $446,642 included in this proposal are 22% of total direct project costs, including subcontracts. TNC has a Negotiated Indirect Cost Rate (NICRA) of 22% which was negotiated and approved by TNCs cognizant agency, USAID, and calculated in compliance with the requirements of OMB Circular A-122, and bound into our annual OMB Circular A-133 audit reports. TNCs indirect cost per the NICRA includes salaries, fringe benefits, fees and charges, supplies and communication, travel, occupancy, and equipment for general and administrative regional and home office staff. These costs are reflected in the Indirect Costs category of this proposal and are not reflected anywhere else in the proposal budget. Direct staff costs are reflected in the salary and benefits categories of the proposal budget.

Executive Summary

McCormack-Williamson Tract Restoration: Wildlife-Friendly Levee Management

CALFED priorities for Stage 1 implementation include restoration of ecosystem processes and habitat corridors, specifically shallow water tidal marsh, in the North and East Delta. Breaching levees on Delta islands is a promising technique to restore tidal wetlands by restoring key processes of tidal circulation, sediment deposition, and nutrient cycling. However, the interior levee slopes must be able to withstand erosion by wind-driven waves in order to protect the integrity of neighboring private lands. Levee resloping and protection with vegetation is one solution. The McCormack-Williamson Tract (MW Tract) offers an excellent opportunity to restore tidal freshwater wetlands, enhance riparian habitat, and potentially reduce flood damages. This island (1,654 acres) is located in the East Delta Ecozone, immediately downstream of the confluence of the Cosumnes and Mokelumne Rivers. Long-term planning for restoration and flood management is underway by the CALFED North Delta Improvement Group, Department of Water Resource, and UC Davis. To support restoration of the MW Tract, the Nature Conservancy requests $2,476,835 for a full-scale restoration project to implement the next phase of levee improvements. We hypothesize that levee resloping to a 5:1 slope with plantings will protect levees from interior wave erosion and maximize desired habitat attributes. We will reslope 20,000 linear feet of levee along the Mokelumne River shoreline to 5:1 slope, using on-site fill. We will plant the restored slope with native vegetation (trees, shrubs, grasses) to prevent erosion and create riparian habitat. The planting design will be based on results from a 2001 pilot project (reslope and plant 5,000 lf levee) and will test performance of different planting methods and native species. We propose implementation now, because levee protection is an essential element of any restoration design or floodway configuration that is under consideration, and because revegetating the inside slopes will require a long lead time to complete.

Proposal

The Nature Conservancy

McCormack-Williamson Tract Restoration: Wildlife-Friendly Levee Management

Ramona Swenson, The Nature Conservancy

MCCORMICK WILLIAMSON TRACT RESTORATION:
WILDLIFE-FRIENDLY LEVEE MANAGEMENT

The Nature Conservancy
September 28, 2001

A. Project Description: Project Goals and Scope of Work

1. Problem

Shallow water tidal marsh provides valuable habitat for at-risk species of fish and wildlife (CALFED 1999). Tidal freshwater wetlands have significantly declined in the Delta as a result of historic levee construction, dredging of slough channels, alteration of hydrologic and sediment regimes in the Delta and Central Valley streams, and reclamation of islands for agriculture.

One of the priorities for Stage 1 implementation is restoration of habitat corridors, specifically shallow water tidal marsh, in the North and East Delta (CALFED 2001). Breaching levees on Delta islands is a promising technique to restore tidal wetlands by restoring key processes of tidal circulation, sediment deposition, and nutrient cycling. However, protecting levee integrity from interior erosion is a familiar problem. For example, when Franks Tract and Mildred Island flooded, the levees were completely obliterated by the wind-driven waves. When Holland Tract was flooded in January 1980, emergency rip-rapping on the interior slopes was necessary to prevent levee failure before the island was pumped out in April (G Cosio, MBK Engineers, pers. comm.). In order to return tidal action to Delta islands, the interior levee slopes must be able to withstand wind-aided erosion in order to protect the integrity of neighboring private lands. Solutions that have been proposed or tried include (1) resloping the interior levee slopes to a more gradual slope (e.g. Kimball Island, Prospect Island), (2) planting vegetation to attenuate wave energy, (3) placing rip-rap, and (4) constructing interior islands or cross levees to break up wind fetch (e.g. Suisun Marsh).

The MW Tract offers an excellent opportunity to restore tidal freshwater wetlands and enhance riparian connectivity (Mount et al. 2000, Brown and Pasternack 2001), with the potential to also reduce flood damages. This island (1,654 acres) is located in the Sacramento-San Joaquin Delta (East Delta) Ecozone, immediately downstream of the confluence of the Cosumnes and Mokelumne Rivers (Figure 1). The MW Tract straddles the zero elevation line, historically supported wetlands, and consists of mainly mineral soils, which have not experienced subsidence (G. Pasternack, UC Davis, unpublished data). It is currently farmed, and has some of the best riparian habitat remaining in the Delta. The Nature Conservancy (TNC) acquired the tract in 1999, using Bay-Delta Act funds managed by the U.S. Fish and Wildlife Service. However, the MW Tract levees need significant improvements to bring them up to acceptable levels of flood protection before tidal inundation or flood flows can be returned to the island. The current levee is extremely steep and made of highly erodible sand. The seepage potential of this sandy levee could lead to uncontrolled breaching. The poor condition of these levees also threatens existing riparian habitat on the steep Mokelumne River side.

From a flood management perspective, the MW Tract impedes the floodway of the Cosumnes-Mokelumne. In the early stages of a major flood event, the tract exacerbates upstream flooding by functioning as a dam. In a flood's later stages, the tract causes problems downstream when its upstream levees fail, the island fills with water, and then the downstream levees fail, releasing a pulse of water into the Mokelumne corridor (CALFED North Delta Improvements Group 2000). The CALFED North Delta Improvements Group is considering scenarios that include using MW Tract as a floodway to reduce flood damages in the region.

To support ecological restoration of the McCormack-Williamson Tract ("MW Tract"), the Nature Conservancy (TNC) proposes a full-scale restoration project to implement the next phase of wildlife-friendly levee improvements along 20,000 linear feet of the MW Tract levees. This project will be coordinated with ongoing planning efforts at MW Tract by CALFED (North Delta Improvements Group), the Department of Water Resources (DWR, CALFED grant 99-B192), and the University of California at Davis Center for Integrated Watershed Science (UC Davis, CALFED grant 99-B192).

Goals:	1. To restore tidal freshwater wetlands on the McCormack-Williamson Tract by restoring tidal circulation to the leveed island. 2. To make the island available for use as a floodway.
Project Objective:	1. To improve levees on the McCormack-Williamson Tract as a necessary precursor to (a) restoring tidal inundation for wetland restoration and (b) allowing use of the island as a floodway during major flood events. 2. To restore future riparian habitat on the inside slope of MW Tract levees.
Hypothesis:	Resloping the interior levee slopes to 5:1 slope and planting will increase the strength and stability of the McCormack Williamson levee system and increase riparian habitat.
Hypothesis of the overall MW project:	Restoring tidal circulation to the McCormack-Williamson tract (e.g. breach levees) will increase the amount of tidal freshwater wetlands in the North Delta.

Restoration planning is currently being undertaken by TNC, UCD and DWR with input from various stakeholders and support from CALFED grants to UCD and DWR. Restoration of the MW Tract will eventually provide habitat (shallow water, tidal freshwater wetland, and riparian) and flood management benefits. Actions taken to ensure these benefits will result in the interior flooding of the tract under conditions ranging from shallow water inundation tied to habitat measures, to complete inundation relating to flood management. Flooding the interior of the tract, although beneficial for flood management and habitat, will raise concerns of interior levee integrity as a result of wind-wave erosion and flood velocities. Even under scenarios where the entire tract is restored to habitat, thus eliminating the need to keep the Tract from flooding, the Tract's levees must be maintained to ensure the integrity of the neighboring lands.

In 2001, Reclamation District 2110 and MBK Engineers worked with contractor A.M. Stephens to reslope the interior levee on the north side that was damaged in the 1997 floods. The toe drain

was moved inland and 5,000 linear feet of levee was resloped to a 5:1 grade along the interior (total levee perimeter of the island is 8.8 miles). In a separate contract, native vegetation will be planted this fall along the toe and on the slope (12.75 acres). These activities are being carried out with funds provided by CALFED and DWR's levee subvention program.

In this proposal, TNC is requesting next-phase funding for a full scale project to continue levee improvements on MW Tract. We will reslope 20,000 linear feet of levee, which corresponds to the length of shoreline along the Mokelumne River. We will plant the restored slope with vegetation, which will both protect the levee from erosion and create riparian habitat. The principal engineering specifications will be similar to those in 2001 pilot project (MBK Engineers 2001).

2. Justification

Understanding the key processes that support or impair tidal wetlands is critical for designing an effective management and restoration program. Gosselink and Turner (1978) demonstrated the importance of hydrology in controlling the spatial heterogeneity of wetlands, but very little is known about the evolution of tidal freshwater wetlands, and how stable the spatial heterogeneity is through time. Hydrologic and geomorphic processes are manifest through patterns and rates of sediment accumulation as well as spatial and temporal distributions of vegetation (Brown and Pasternack 2000, Mount et al. 1999). UC Davis' baseline studies of the historic and present configurations of these characteristics will provide important information on the functioning of tidal freshwater wetlands (Mount et al. 1999). As indicated in our conceptual model, key factors include elevation, tidal exchange, sediment deposition, erosion, nutrient cycling, and habitat requirements of biota (Figure 2). Substrate elevation and tidal range determine the extent and location of different communities, ranging from subtidal, intertidal, shrub scrub just above intertidal, and riparian forest. Sediment deposition and erosion is another critical process. High flows and wind-induced waves have high energy and can erode sediment from banks and shores, especially if no vegetation or hard structures are present to attenuate wave energy. Sediment deposition and biomass accretion can build up substrate elevations and help rebuild the marsh plain. Tidal circulation allows exchange of nutrients and biomass (e.g. organic carbon, fish that move between subtidal and intertidal habitat).

Hilgartner (1995) and Pasternack (1998) used a combination of paleoecological methods, field monitoring, and computer modeling to reconstruct the history and quantify the physical processes of evolution in a Chesapeake Bay tidal freshwater wetland. Their research showed that wetland habitat conditions are intimately linked with watershed fluxes of sediment, nutrients, and heavy metals (Pasternack et al., 1997; Knight and Pasternack, 1998). Also, they found that tidal freshwater wetland evolution does not follow a classic successional sequence such as any of those proposed by Cowles (1899), Clements (1916), or Redfield (1972). Instead, natural and anthropogenic disturbances drive habitat evolution. For example, development of Delta islands through levee construction and draining has disrupted the hydrological and sediment processes necessary to sustain freshwater tidal wetlands by eliminating tidal exchange and cutting off sediment sources.

The hypothesis of the long-term MW Tract project is that breaching levees to allow tidal inundation of the property will result in restoration of freshwater tidal wetlands. This concept,

however, raises several questions, which are the subject of ongoing research and restoration planning by UC Davis and Department of Water Resources (DWR). Key unknowns include:

1. How many breaches and where should they be located? This is an important issue because new openings for tidal water become the future exit points for flood flows in the event of a levee failure (or construction of a weir) at the upper end of the island. A related question is whether these new openings need to be armored to prevent future widening through erosion.
2. How do we protect the existing levees around the tract from interior erosion by wind-induced wave action when in a flooded state? This is potentially a significant issue for neighboring tracts (RD 1002 to the north and 348 to the southeast), since loss of the MW Tract levees (and the vegetation they support) would put more pressure on adjacent levees.
3. Should the island simply be reopened to tidal action (the "just add water" approach) or should there be a designed approach to recreating channels and hummocks prior to reopening?
4. What needs to be done to protect the interests of the tenant (Hearst-Argyle Corporation) on the property that owns and operates the existing major television transmitter? Their lease runs through the year 2033 and they have a right to non-interference with access and operations.
5. Is methyl mercury a concern or issue for this restoration concept?
6. Given the prevalence of non-native fishes in the Delta, is there a wetland restoration design that would favor native fishes over non-native fishes?

The proposed project seeks to address the second question: protecting the existing levees around the tract from interior erosion by wind-induced wave action when in a flooded state, in order to protect adjoining levees. As stated earlier, several solutions have been proposed or tried in the Bay-Delta. Placing rip-rap on the interior levees would protect the levee from erosion, but would not enhance riparian habitat. Creating interior "ridges" of islands to limit wave development would address the risk of wind-induced erosion. However, these islands could channel flood flows (which run parallel to the shoreline) and focus the erosive energy at the levee toe, thereby weakening the levee (P. Marshall [DWR] and G. Cosio [MBK Engineers], pers. comm. 2001). Based on the future objectives for the island, our desire to enhance habitat values on the levee, and the results of a pilot project on the island, the proposed project design involves creating shallower interior levee slopes (5:1) and armoring them with vegetation. This has the added benefit of increasing the amount of riparian habitat on the tract, and enhancing connectivity between aquatic, wetland and riparian habitats (ERP Restoration Priority 1 for Delta and Eastside Tributaries). We will also look for opportunities to investigate and assess additional methods of wildlife-friendly levee enhancement.

The CALFED North Delta Improvements Program (North Delta Program) provides the framework for addressing most of the MW Tract questions. The proposed project is consistent with this program's goals, and anticipates this program's intention to use the MW Tract as both a floodway and a tidal restoration site (CALFED 2000). We are proposing to implement inside levee resloping and planting now, because it is an essential element of any restoration design or

floodway configuration that is under consideration, and because revegetating the inside slopes will require a long lead time to complete.

The overarching hypothesis is that restoration of tidal inundation to the MW Tract will create tidal freshwater wetlands. The CALFED ERP hypothesizes that restored tidal wetland habitats will promote the recovery of native fishes (Simenstad et al. 1999). It is not possible at this time, however, to test these hypotheses because long-term restoration planning is still underway, and the island will not be inundated in the near future. Therefore, we hypothesize that levee resloping to a 5:1 slope with plantings will protect levees from interior wave erosion and maximize desired habitat attributes.

3. Approach

TNC will carry out levee improvements using the construction specifications developed by MBK Engineers for the 2001 pilot project (5:1 resloping) (Figure 3, MBK Engineers 2001). We will use information from the 2001 pilot project to adaptively manage this next implementation phase. For example, the local water table limited the depth to which fill could be taken from the borrow site; this will guide our selection of future borrow sites. We will also review alternative methods for strengthening interior levee slopes that would allow flooding of the MW Tract, and consider implementation of promising alternatives on certain sections. If implemented, we will compare costs and benefits with the 5:1 resloping method. The District Engineer for RD 2110 will be consulted throughout the final design and construction phases.

Selection of levee sections will be based on the need for repair, adjacent riparian habitat values, presence of elderberry habitat, and potential locations of future levee breaches. We will focus initially on securing the eastern shore along the Mokelumne River, because that levee protects Reclamation District 348 and the City of Thornton, a Reclamation District that has invested substantial money into protecting its houses, businesses and farmland. Pre-project assessment of the existing levees will be necessary to evaluate potential environmental impacts by the project, such as disturbance of elderberry shrubs and existing trees (mostly exotic species). Any necessary environmental documents (i.e. CEQA) will be prepared by a contractor (e.g. May Consulting), and any environmental consultations will be completed prior to project implementation (e.g. habitat for Valley elderberry longhorn beetle), and necessary mitigation carried out. The Bureau of Land Management, as one of the Cosumnes River Preserve partners, has agreed to provide a federal nexus for any ESA consultations with the US Fish and Wildlife Service.

Using local fill from the island will keep costs down on this type of levee work. The location of the borrow site(s) will be determined following a field assessment of soil characteristics, depth to water table, distance to project site, and other relevant parameters. According to the District Engineer, the quality of fill declines and the water table gets higher as one moves west along MW Tract (G. Cosio, MBK Engineers, pers. comm.). Costs increase the further one must move fill.

A plan with construction specifications for the selected site will be prepared by the District Engineer or other contracting engineer, complete with technical provisions and levee cross sections. For the most part, we will follow the general construction specifications prepared by

MBK Engineers for the recently completed 2001 project (MBK Engineers 2001, plan available upon request), as paraphrased below. First, the work area will be cleared, grubbed (minimum depth 1.5 feet below the surface) and stripped (minimum depth 2 inches) of brush, vegetation, and debris. If necessary, a new seep ditch will be excavated. The subgrade will be prepared and graded according to the District Engineer's specifications. The on-site fill material shall be well-graded, predominantly granular, non-expansive material (soil or soil-rock mixture) from the designated borrow area. All foundation areas to receive fill shall be scarified (top 18") and recompacted. Fill material shall be placed on the subgrade and compacted to at least 90 percent. The levee backslope shall be finished by track walking to provide roughness to enhance resistance to rainfall erosion. Levee embankment slopes will be no steeper than 5 horizontal to 1 vertical (5:1), and no flatter than 10:1. The District Engineer shall furnish survey points for each project site (beginning station, ending station, and vertical control point). All other lines will be established by the contractor. Levee crown surfaces shall be graded to a tolerance of 0.10 feet above and below the elevation and/or grades shown on the plans.

The newly constructed bare levee will be planted with herbaceous plants and trees in order to control erosion and to create riparian habitat. Using an adaptive management approach, we will develop a planting plan for the new levee slopes, incorporating lessons learned from the 2001 pilot project (12.75 acres) (TNC 2001, included as **Attachment A**). This pilot project is using native perennial grasses (e.g. *Leymus triticoides, Hordeum brachyantherum, Nasella pulchra,* and *Grindelia camporum*) to stabilize soils and provide habitat on the levee slopes. The planting design will evaluate the success of different species and planting methods (seed versus plugs, blocks 25-50 feet wide, in 3 rows) to find the most cost-effective method. Weed control measures will be conducted as needed. The planting methods for the pilot project are as follows:

Row One (35 feet wide, top of levee slope) - This row will be drill seeded with *Hordeum brachyantherum, Nassella pulchra,* and *Grindelia camporum*. Our intent is to get immediate cover with *Hordeum,* which germinates and establishes quickly, and to have *Nassella* fill in more slowly. We expect the *Nassella* to establish well here, due to its adaptation to xeric soils. We are testing the *Leymus triticoides* plugs here to see if, once established, they are able to survive without irrigation. *Grindelia* is being used because it is a native complement to the native grass community and provides an excellent source of pollen and nectar.

Row Two (50 feet wide, middle slope) **-** The intention of this planting is to inform us of the difference in establishment rates from seed and plug plantings. If the *Leymus* established well from seed, it may provide a more cost-effective planting method than plugging. Again, *Hordeum* is included here to provide immediate cover in the first season.

Row Three (35 feet wide, lower slope) - This planting area, closer to the water's edge; will be planted with two native *Carex* species, as well as *Hordium, Deschampsia, Leymus* and *Agrostis* and *Grindelia*. There is very little known about the efficacy of planting *Carex* from seed. Because we want good vegetative coverage on the levee, we are planting most of this row with plugs, which are known for quick establishment. Twenty-five percent of this row will be planted with *Carex* seed, using the best available techniques.. If the seed is able to germinate and plants establish, we may have discovered

a more cost effective method for revegetating *Carex* stands. The other grasses are being planted here because they are known to be a native complement to *Carex*. This entire row will also be planted with a 20-foot strip of native tree cuttings in order to protect the most vulnerable portion of the levee from erosion caused by internal wave wash.

Elevations will be measured to determine potential intertidal and emergent zones. Selection and placement of plants will need to accommodate levee inspection and maintenance requirements. The toe of the levee (approximately 35 feet wide) will be planted with riparian species that can withstand frequent inundation, such as willow (*Salix spp.*), buttonbush (*Cephalanthus occidentalis*), cottonwood (*Populus fremontii*), and alder (*Alnus rhomifolia*). These shrubs and trees will eventually protect the levee from wave wash when tidal inundation or flood flows are present. Further up the slope we will plant low herbaceous vegetation and/or grasses (approximately 85 feet wide). In addition to the native grasses used in the 2001 planting design, we may also experiment with seed mixes typically used on bare earth to control erosion following construction, in order to compare cost effectiveness.

We will measure the effectiveness of different species and planting methods by recording percent cover by native species (an indicator of ecosystem health and degree of invasion by nonnative species) and overall percent cover by all vegetation (a measure of erosion control). Riparian trees, such as valley oak (*Quercus lobata*) from acorns, may be planted on 50 foot centers on the levee slope to create an open forest. Dense shrubs (e.g. wild rose or blackberry) will not be planted on the levee slope because they make it difficult to inspect the levee for potential failure points.

Project management by TNC will involve hiring and oversight of contractor, coordination with the RD engineer, preparation of quarterly reports to CALFED, and extensive coordination with CALFED, DWR, and UC Davis researchers involved in the area. In order to ensure that the levee improvements are consistent with long-term restoration planning, we will coordinate site selection, levee construction, and replanting with DWR and UC Davis. We will also coordinate with the CALFED North Delta Improvements group to ensure that this and other restoration efforts are incorporated into the overall EIR for the Mokelumne corridor flood management plan. In addition, we will coordinate with the CALFED Through Delta Conveyance group because the potential changes in water deliveries from the Sacramento River via the Cross Channel and/or Hood Diversion will have ramifications for local hydrologic patterns at the MW Tract.

4. Feasibility

Resloping the levee to a 5:1 grade appears to be a good choice that balances the need for cost-effective stabilization of the levee with the need to create a shallow slope for restoring intertidal and riparian habitat. We have already carried out a successful pilot project for resloping the levee, which will be the basis for this next phase of levee improvements. The 2001 pilot project tested the engineering feasibility of the resloping work, and will provide feedback on the best planting design. We will be able to implement the levee resloping and plantings in a single year, allowing monitoring to continue the following year or two.

Increasing a levee's cross section is a proven technique for increasing levee stability. From an engineering perspective, using a 5:1 levee slope produces a stronger levee than 3:1 slope. This

gradual slope will be better able to withstand wave energy and resist erosion. The current levees are sandy; the project will select better quality fill material to further strengthen the levee. The 5:1 slope design also separates the structural levee section from the planting portion. The extra soil layer provided by the flat slope allows for deep root growth without penetration into the structural levee section. When the island is restored to tidal flooding, the broad shallow slope will provide a variety of elevations for different zones of vegetation, from subtidal to riparian forest. In addition, the flatter slope will facilitate levee maintenance (equipment can drive along the slope). However, this approach does require a lot of fill, which can be expensive to excavate and move. Costs will be kept down by using local fill wherever possible. It may difficult to excavate enough fill in areas where the groundwater table is close to the surface (G. Cosio, MBK Engineers, pers. comm.). Therefore, we will look for opportunities to investigate and assess additional methods of wildlife-friendly levee enhancement.

This project will benefit from input from other parties involved in long-term restoration and management of the MW Tract, including CALFED, DWR and UC Davis, but our ability to proceed will not be contingent on their progress. We already know that the levees need improvement right now just to maintain protection of the island. Our project will not preclude future actions that have been proposed for the island and should not result in any irrecoverable losses.

Access will not be a problem because TNC owns MW Tract. We will coordinate activities with the tenant farmer, Bud Fonseca. Any necessary environmental documents (i.e. CEQA) will be prepared by a contractor, and any environmental consultations will be completed prior to project implementation (e.g. habitat for Valley elderberry longhorn beetle). Environmental impacts will be minimized by working only on the landward side and avoiding riparian vegetation on the waterside of the levee.

5. Performance Measures

We will develop and implement a monitoring program to assess the project's success. Baseline pre-construction monitoring will include elevation of the unrestored levee, existing vegetation (e.g. species, density, location of exotics) along the entire island perimeter, and native bird species using the entire MW Tract (PRBO has conducted point counts here in 2000 and 2001)" (Haff 2001). Project actions will be measured at construction completion, using metrics such as linear feet of levee resloped, actual slope of constructed levee, and elevation of levee toe and crown. Elevation data will be useful in indicating the likely locations of future intertidal zones. In addition, MBK Engineers will conduct levee inspections every 5 years to monitor levee integrity and performance. Performance of the revegetation project will be measured for two years following planting by measuring survivorship of planted trees, percent herbaceous cover (grasses), and presence of non-native invasive species. Birds will be used as an environmental indicator of ecosystem health. PRBO will conduct point counts of birds on the MW Tract, consistent with their earlier surveys, and quantify avian species diversity, species richness, and abundance during the breeding season. These data will be compared with baseline data for MW Tract and data from other riparian and levee sites on the Cosumnes River Preserve.

6. Data Handling and Storage

Our findings will be shared with the CALFED North Delta Improvements Group, Mokelumne-Cosumnes Watershed Alliance, and other local forums. Data will be housed at the Cosumnes River Preserve and made available through the Information Center for the Environment (via our partnership with the UC Davis Center for Integrated Watershed Science and Management). Findings will be provided to CALFED in periodic progress reports and a final report.

7. Expected Products/Outcomes

Progress reports to CALFED. Final report to CALFED on levee construction, performance of replanted levee, ecological values, and how it relates to long-term restoration vision for MW Tract as being developed by DWR and UC Davis. Presentations to conferences if appropriate.

8. Work Schedule

Task 1. Wildlife Friendly Levee Work

Task 1, Subtask 1, Levee Construction

- Planning and site selection (Year 1)
- Final survey and levee design (Year 1)
- Construction contract and bid for levee work (Year 1) **Project Milestone**
- Reslope inside slopes of levee (Year 2) **Project Milestone**
- Post-construction monitoring of new levee slopes (Year 2 and 3) **Project Milestone**

Task 1, Subtask 2, Revegetation Plan.

- Development of planting design (Year 1)
- Construction contract and bid for replanting work (Year 2) **Project Milestone**
- Replant the new levee slopes (Year 3) **Project Milestone**
- Weed control if necessary (Year 2 and 3)
- Ecological monitoring once a year spring/summer (Year 2 and 3) **Project Milestone**

Task 2. Project Management.

The following activities will be ongoing throughout the term of the contract.

- Oversee all phases of the levee project
- Provide quarterly reports to CALFED
- Coordinate site selection, levee construction, and replanting with DWR and UC Davis
- Coordinate with the CALFED North Delta Improvements group
- Coordinate with the CALFED Through Delta Conveyance group

B. Applicability to CALFED ERP and Science Program Goals and Implementation Plan and CVPIA Priorities

1. ERP, Science Program and CVPIA Priorities

The proposed project is a critical component of the long-term restoration of the island, and is necessary to maintain flood protection for neighboring lands while facilitating restoration. Long-term restoration of MW Tract supports several goals identified in the ERP Strategic Plan for

ecological processes including establishing hydrodynamic regimes (Goal 2) for the Delta that support the recovery and restoration of native species (Goal 1) and biotic communities (Goal 2) and support the restoration and maintenance of functional natural habitats (Goal 4) (CALFED 2000 Strategic Plan, page 31). By restoring tidal inundation to the island, we will rehabilitate natural processes in the Bay-Delta estuary and its watershed to fully support, with minimal ongoing human intervention, natural aquatic and associated terrestrial biotic communities and habitats.

Restoration of the MW Tract will meet three restoration priorities for the Delta, as described in the ERP Draft Stage 1 Implementation Plan, 2001:

- Restore habitat corridors in the East Delta to create a mosaic of marsh, aquatic, and associated floodplain and riparian habitat types in the area of Georgianna and Snodgrass sloughs, and the lower Cosumnes and Mokelumne Rivers (priority 1)
- Restore shallow water habitats in the Delta for the benefit of at-risk species while minimizing potential adverse effects of contaminants (priority 6)
- Protect at-risk species in the Delta using water management and regulatory approaches (priority 7). What processes influence the interconnections between levee protection techniques, water quality, biological community characteristics and attainment of ecosystems restoration goals?

2. Relationship to Other Ecosystem Restoration Projects

This project is closely related to several other projects that CALFED is supporting: CALFED North Delta Improvements Group, CALFED and DWR's restoration planning for MW Tract, UC Davis' baseline studies of the island, and TNC's Wildlife Friendly Levee Grant (1999 Directed Action). The role of CALFED and DWR through the North Delta planning process is to carry out the detailed planning, environmental assessment, engineering and permitting for long-term flood management and ecological restoration of the North Delta. TNC expects that the North Delta Group's upcoming EIR/EIS for the Mokelumne corridor will incorporate the MW tract restoration scenarios. DWR has also received funding to carry out restoration planning for the island. UCD scientists are using a combination of seismic analysis and coring to develop a model for the topography and ecological function of the property prior to leveeing and leveling. Separately, we understand that UC Davis, CALFED, and CDFG are also studying potential mercury problems throughout the Delta. TNC and UC Davis are carrying out some activities that anticipate and support freshwater tidal marsh restoration, but there are a range of complex hydrologic and environmental issues that need to be addressed before major additional work can be done. TNC's role, as exemplified by the pilot resloping project and this proposed additional levee work, is to implement this long lead-time, "no-regrets" on-the-ground strategy (i.e. a strategy common to every scenario under consideration).

3. Next-Phase Funding

This proposal is to continue levee improvements that were funded on a pilot basis in the original CALFED acquisition grant. The summary of the existing project status is provided in Attachment B.

4. Previous recipients of CALFED Program or CVPIA funding

As a result of five previous rounds of proposals and directed action, CALFED has awarded TNC and our partners a total of $51,676,022 to acquire and restore Preserve lands, including $35,110,873 for Staten Island (Table 1). These grants have resulted in acquisition (or potential/probable acquisition) of properties totaling almost 14,300 acres. Additionally, almost $1,500,000 in CVPIA funds have been used on the acquisition of Valensin Ranch and Howard Ranch.

5. System-Wide Ecosystem Benefits

CALFED expects that long-term restoration of tidal freshwater wetlands on the MW Tract will benefit recovery of native fish populations in the Delta (CALFED 1999). Improving the tract to allow its use as a floodway will also have flood reduction benefits both upstream in the lower Cosumnes and Mokelumne River and the Franklin Pond, and downstream for Staten Island and other north Delta areas. This project will complement planning and management for Staten Island, and feed into future flood management solutions being explored by the CALFED North Delta Improvements Group. In addition, this project will provide useful information for the CALFED Delta Levees and Habitat Advisory Committee, which is seeking input on appropriate techniques for protection of levees surrounding flooded islands (Delta Levees and Habitat Advisory Committee, July 2001, meeting notes).

C. Qualifications

The Nature Conservancy is an international non-profit membership organization whose mission is to preserve the plants, animals, and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive. Founded in 1951, The Nature Conservancy and its 1 million members have safeguarded more than 11.6 million acres in the United States. The Conservancy has also worked with like-minded partner organizations to preserve more than 59 million acres in Latin America, the Caribbean, the Pacific, and Asia. The California Regional Office is the Conservancy's largest state program and a leader in program development. Headquartered in San Francisco, The Nature Conservancy of California has 110,000 members and has protected nearly one million acres in the state.

The Nature Conservancy uses a wide variety of tools to help forge solutions to conservation issues. We employ the following four methods most frequently: acquisition of land or conservation easements, land management and restoration, land-use planning and conflict resolution, and community education and outreach. Our strength and reputation are built on the policy and practice of applying the best conservation science available and of building partnerships with local communities, private organizations, and public agencies to achieve mutual conservation goals.

Table 1 – Previous CALFED and CVPIA funds received by The Nature Conservancy

Grant Number	Description	Agency	Agency Contract No.	Amount	Status and Accomplishments
CALFED					
99-F04	McCormack-Williamson Tract Acquisition	USFWS	10138-9-J015	$ 5,355,470	Acquired the property in 1999
96-M06	Valensin Ranch Acquisition	USFWS	1448-0001-96648	$ 1,250,000	Acquired Valensin Ranch to protect vernal pools and grassland
98-B17	Cosumnes Floodplain Acquisition and Restoration	BuRec	1425-98-FG-20-16880	$ 3,500,000	Acquired the Park, Whaley and Denier properties in 1999
98-F19	Cosumnes River Acquisition, Restoration, Planning and Demonstration	USFWS	11420-9-J046	$ 750,000	Acquired the R. Denier property in 2001, in part with funds provided under this grant.
97-N14a	Cosumnes Start-up Stewardship and Restoration	State	NFWF 97-N14a	$ 1,985,100	Acquired the Woods property in 1999. Acquired the R. Denier property in 2001, in part with funds provided under this grant. Stewardship activities ongoing on Park, Whaley, Denier, Woods and R. Denier
99-F03	McCormack-Williamson Wildlife Friendly Management	USFWS	114200J039	$ 680,237	Initiated startup stewardship. Coordinating with agencies for restoration planning. Resloped 5,000 linear feet of levee in 2001, and will plant native vegetation on new slopes in fall 2001.
ERP-01-N23	Staten Island Acquisition	State		$35,110,873	Currently negotiating contract and purchase of Staten Island
ERP-01-N10	Cosumnes/Mokelumne Floodplain Acq., Rest., Plan.	State		$ 3,044,342	Currently negotiating contract.
Subtotal				$51,676,022	
CVPIA	Howard Ranch Acquisition	USFWS	1448-11300-98-G	$ 300,000	Acquired property in 1999.
	Horizon Dairy	BuRec	00-FG-20-0026	$ 360,000	Acquired a conservation easement to protect habitat for giant garter snake along North Fork Badger Creek
	Schneider Conservation Easement	BuRec	00-FG-20-0187	$ 400,000	Easement acquired and held by WCB.
Subtotal				$ 1,060,000	
Grand Total				$52,736,022	

Cosumnes River Project — Sacramento and San Joaquin Counties
Working with public agencies and private landowners, The Nature Conservancy has protected nearly 40,000 acres of riparian forest, seasonal wetland, tidal habitats, vernal pool grasslands, blue oak woodlands, and wildlife-friendly farming along the floodplains and foothills of the Cosumnes River and eastern Delta. The Preserve has created more than 1,000 acres seasonal wetlands, restored 850 acres of riparian forest habitat, and implemented innovative levee set-back projects to restore natural channel meander. The project provides many opportunities for local involvement, including public visitation, research, and cooperative management with neighboring farmers. The Nature Conservancy is working to include protection and restoration of key parcels in the East Delta that are critical to the Bay-Delta ecosystem. The Nature Conservancy is an active participant in CALFED's North Delta Improvement Group, a stakeholder group addressing flooding and habitat issues in the Mokelumne Corridor.

Dr. Ramona Swenson will serve as the Project Manager. Since 1999, she has worked at the Cosumnes River Preserve as the Senior Project Ecologist for The Nature Conservancy. Dr. Swenson earned a bachelor's in Biology from Swarthmore College (Pennsylvania) in 1986, and a doctorate in Integrative Biology from the University of California at Berkeley in 1995 where she focused on aquatic ecology and fisheries. She provides ecological expertise for the development and implementation of conservation strategies at the Cosumnes River and throughout California, with a focus on riparian and aquatic ecosystems. Dr. Swenson collaborates with researchers to address key conservation issues. Prior to joining The Nature Conservancy, she worked at the Smithsonian Institution, U.S. Fish and Wildlife Service, and as an environmental consultant.

Rebecca Waegell will provide oversight for vegetation surveys, planting design and implementation, and vegetation monitoring. Ms. Waegell is a Project Ecologist with The Nature Conservancy at the Cosumnes River Preserve. She has been at the Preserve for the last 6 years and has worked closely with the Preserve Manager to carry out management activities on all lands within the Preserve. She is the lead person in charge of exotics control at the Preserve and has successfully implemented efforts to control such highly invasive weeds as fig, tree of heaven, locust and osage orange. In addition to her activities at the Preserve she is on the board of directors of the California Exotic Pest Plant Council and is a member of the Sacramento Weed Abatement Team. She has a B.S. in zoology from the University of California at Davis.

Keith Whitener will provide coordination between the project and ongoing initiatives for McCormack-Williamson restoration and management, which are being carried out by CALFED, DWR, and UC Davis. Mr. Whitener is a Project Ecologist specializing in fisheries and aquatic systems for The Nature Conservancy's Cosumnes River Preserve. He graduated from U.C. Davis in 1988 with a degree in Wildlife and Fisheries Biology. Prior to working at the Preserve, Mr. Whitener worked as an environmental consultant for four years specializing in riverine systems throughout the Western United States before moving to the Sacramento/San Joaquin Delta to concentrate on Delta fisheries. His work in the Delta included stints at the California Department of Fish and Game, Hanson Environmental and proprietary consulting. Since joining the Preserve in 1998, Mr. Whitener has focused on restoring the Cosumnes River salmon run, fisheries issues relating to floodplain restoration and native fish restoration. He also works on ongoing UC Davis fisheries studies in the Cosumnes River and Delta.

D. Cost

1. Budget

The total cost of the project is **$2,476,835.** Budget information and justification are supplied on the web forms.

2. Cost-Sharing

If funds are available in the DWR Levee Subventions program, the Reclamation District will apply for funds to help support this project. The Levee Subventions program can pay for improvements up to 3:1 slope, which is about half the cost of a 5:1 slope levee. Based on the formula for reimbursement, we believe that we can get at least $91,875 for the project. If the Levee Subventions program is fully funded, we may be able to get up to $712,500. The amount and availability of these funds is variable year to year, and depends on state appropriations. Therefore, we are not counting on subventions funds at this time. If we do obtain levee subventions funds, then we will consider doing additional levee resloping along the perimeter.

E. Local Involvement

The Cosumnes River Project is community-based and its successes are due in large part to the support of local people. In addition, we have been and will continue to coordinate and communicate our efforts through the CALFED North Delta group, the Delta Protection Commission, the Mokelumne Cosumnes Watershed Alliance (MCWA), and Cosumnes River Task Force. These groups include all of the relevant Resource Conservation Districts, Reclamation Districts, and other major stakeholders. The Cosumnes River Preserve also carries out a regular program of outreach to decision-makers and community groups in the greater Sacramento region.

F. Compliance with Standard Terms and Conditions

Regarding Attachment D, Section 3 Performance Retention, TNC requests that the 10% retention not be required for capital costs.

For Section 4, Expenditure of Funds, TNC requests the following language currently being negotiated for the CALFED 2001 agreements with TNC:

"Contractor shall expend funds in the manner described in the approved Budget. As long as the total contract amount does not increase, the Contractor may adjust (1) the Budget between individual tasks by no more than 10% and (2) the Budget between individual line items within a task by no more than 10%. Any other variance in the budgeted amount among tasks, or between line items within a task, requires approval in writing by CALFED or NFWF. The total amount to be funded to Contractor under this Agreement may not be increased except by amendment of this Agreement. Any increase in the funding for any particular Budget item shall mean a decrease in the funding for one or more other Budget items unless there is a written amendment to this Agreement."

For Section 5, Subcontracts, TNC requests the following language currently being negotiated for the CALFED 2001 agreements with TNC:

"Contractor is responsible for all subcontracted work. Subcontracts must include all applicable terms and conditions as presented herein. An approved sample subcontract is attached as [an exhibit]. Contractor must obtain NFWF's approval prior to entering into any subcontract that

will be funded under this Agreement, which approval shall not be unreasonably withheld if (1) contracted work is consistent with the Scope of Services and the Budget; and (2) the subcontract is in writing and in the form attached to this Agreement as [an exhibit]. Contractor must subsequently provide NFWF with a copy of the signed subcontract. Contractor must (a) obtain at least 3 competitive bids for all subcontracted work, or (b) provide a written justification explaining how the services are being obtained at a competitive price and submit such justification to NFWF with copy of the signed subcontract.

Notwithstanding the foregoing, the CALFED Program has acknowledged that the Contractor generally does not use a subcontract for routine land appraisals, surveys, and hazardous materials reports. For these one-time services, Contractor uses a group of vendors on a regular basis and pays no more than fair market value for such services by one-time invoice rather than written contract. Contractor will not be required to obtain competitive bidding for such services or to provide any further justification to NFWF."

For Section 9, Rights in Data, TNC requests the following language currently being negotiated for the CALFED 2001 agreements with TNC:

"All data and information obtained and/or received under this Agreement shall be publicly disclosed only in accordance with California law. All appraisals, purchase and sale agreements and other information regarding pending transactions shall be treated as confidential and proprietary until the transaction is closed. Contractor shall not sell or grant rights to a third party who intends to sell such data or information as a profit-making venture.

Contractor shall have the right to disclose, disseminate and use, in whole or in part, any final form of data and information received, collected, and/or developed under this Agreement, subject to inclusion of appropriate acknowledgment of credit to the State, NFWF, to the CALFED Program, and to all cost-sharing partners for their financial support. Contractor must obtain prior approval from CALFED to use draft data. Permission to use draft data will not be unreasonably withheld. CALFED will not disseminate draft data, but may make draft data available to the public upon request with an explanation that the data has not been finalized."

For Section 13, Termination Clause, TNC requests the following language currently being negotiated for the CALFED 2001 agreements with TNC:

"Default and Remedies.

1. In the event of Contractor's breach of any of Contractor's obligations under this Agreement, NFWF shall deliver to Contractor written notice which shall describe the nature of such breach (the "Default Notice"). If Contractor has not cured the breach described in a Default Notice prior to the expiration of the twenty (20) day period immediately following Contractor's receipt of such Default Notice, or, in the event the breach is not curable within such twenty (20) day period, Contractor fails to commence and diligently proceed with such cure within such twenty (20) day period, then Contractor shall be deemed to be in default under this Agreement, and NFWF shall have the right, after receiving approval from CALFED, to terminate this Agreement by delivering to Contractor a written notice of termination, which shall be effective immediately upon receipt by Contractor (the "Termination Date"). Upon and following the Termination Date, NFWF shall be relieved of the obligation under this Agreement to make any payments to Contractor for any work that has been performed prior to the

Termination Date; however, NFWF shall continue to be obligated to make any payments to Contractor for work properly performed and invoiced in accordance with the terms and conditions of this Agreement prior to the Termination Date. In no event shall Contractor be required to refund to NFWF, CALFED, the Agency or DWR any of the funds that have been forwarded to Contractor under this Agreement, except as provided in Section 10.I.2 below.

2. In the event of any termination of this Agreement by NFWF pursuant to Section 10.I.1 above prior to close of escrow of Contractor's acquisition of any real property interest funded by this Agreement, NFWF's sole remedy shall be to obtain the return of those funds that have been forwarded to Contractor under this Agreement to fund Contractor's acquisition of the Property. "

Section 24, may require revision depending upon the nature of the interest acquired by The Nature Conservancy.

For Section 25, Use, Management, Operation, and Maintenance, TNC requests the following language currently being negotiated for the CALFED 2001 agreements with TNC:

"The Contractor shall use, manage, operate, and maintain the real property in a manner consistent with the purpose of the acquisition. The Contractor further assumes all management, operation, and maintenance costs associated with the real property, including the costs of ordinary repairs and replacements of a recurring nature, and costs of enforcement of regulations. The State shall not be liable for any cost of such management, operation, or maintenance which is not expressly set forth in the Scope of Services and/or the Budget attached to this Agreement, as amended from time to time in accordance with this Agreement."

Section 26, may require revision depending upon the nature of the interest acquired by The Nature Conservancy.

G. Literature cited

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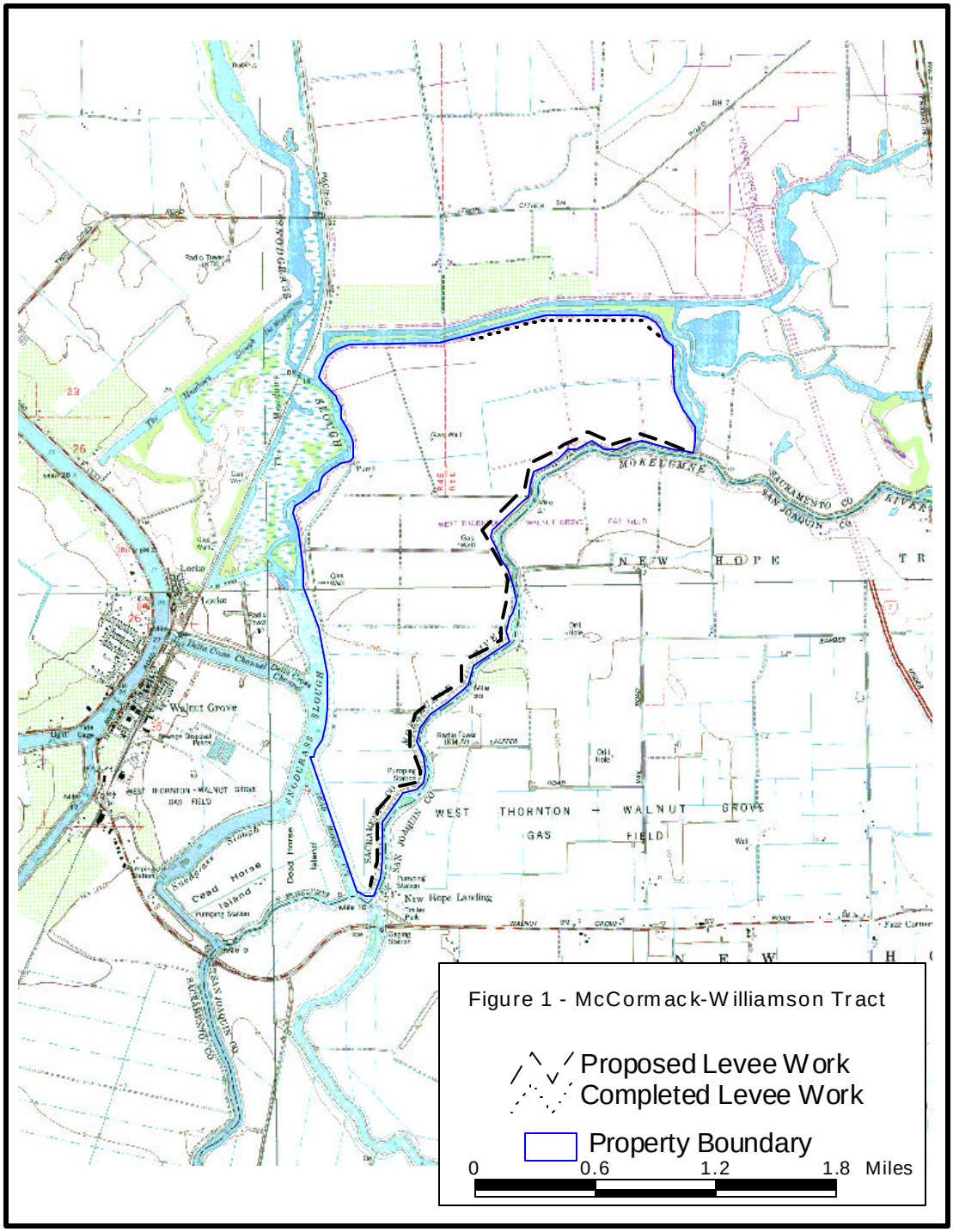
Figure 1 - McCormack-Williamson Tract
Proposed Levee Work
Completed Levee Work
Property Boundary
0
0.6
1.2
1.8 Miles
Walnut Grove
New Hope Landing
Dead Horse Island
WEST THORNTON → WALNUT GROVE GAS FIELD
NEW HOPE TR
MOKELUMNE
SACRAMENTO CO
SAN JOAQUIN CO
RIVER

Tidal Wetland Conceptual Model

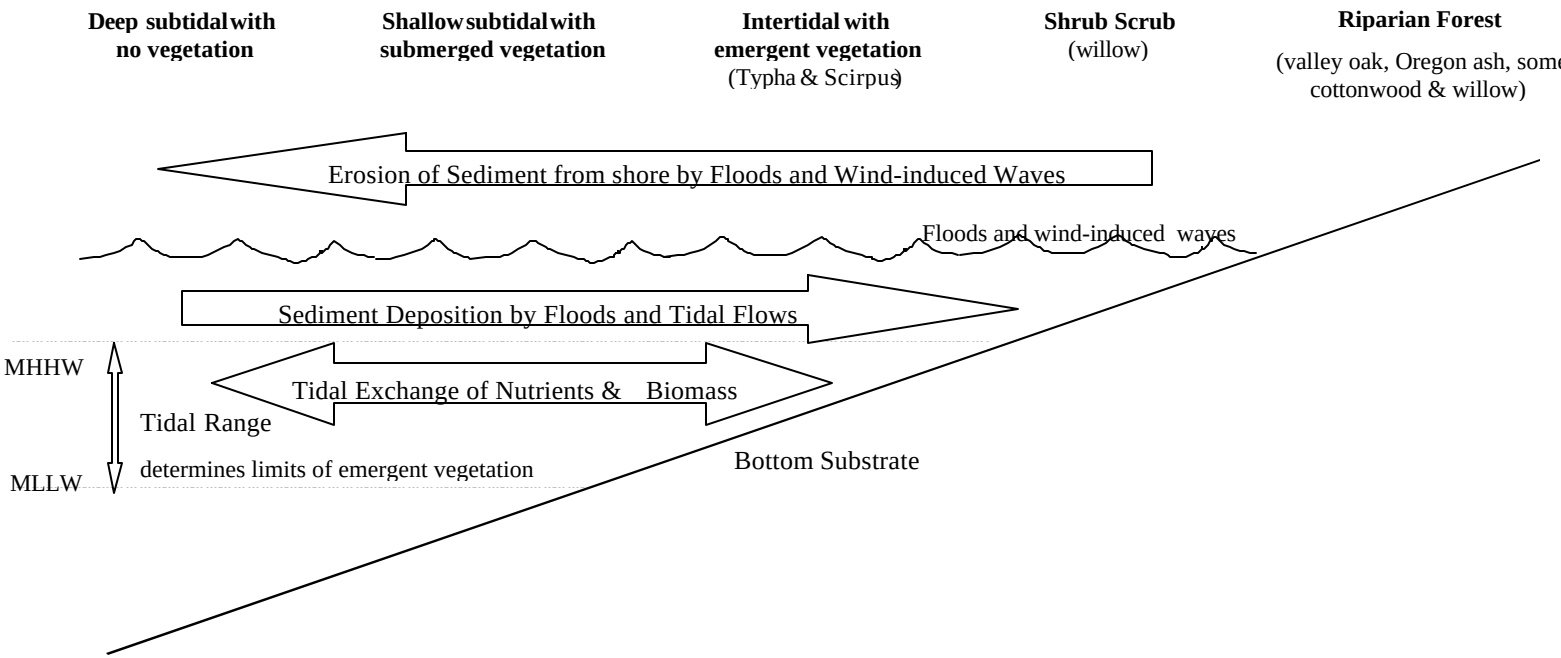

Figure 2 – Conceptual model of tidal wetlands and important processes. Substrate elevation and tidal range determine the extent and location of different communities, ranging from subtidal, intertidal, shrub scrub just above intertidal, and riparian forest. Sediment deposition and erosion is another critical process. High flows and wind-induced waves have high energy and can erode sediment from banks and shores, especially if no vegetation or hard structures are present to attenuate wave energy. Sediment deposition and biomass accretion can build up substrate elevations and help rebuild the marsh plain. Tidal circulation allows exchange of nutrients and biomass (e.g. organic carbon, fish that move between subtidal and intertidal habitat). Levee construction eliminates tidal exchange and sediment deposition. The steep levee slopes reduce the total area at suitable elevations for intertidal and riparian habitat.

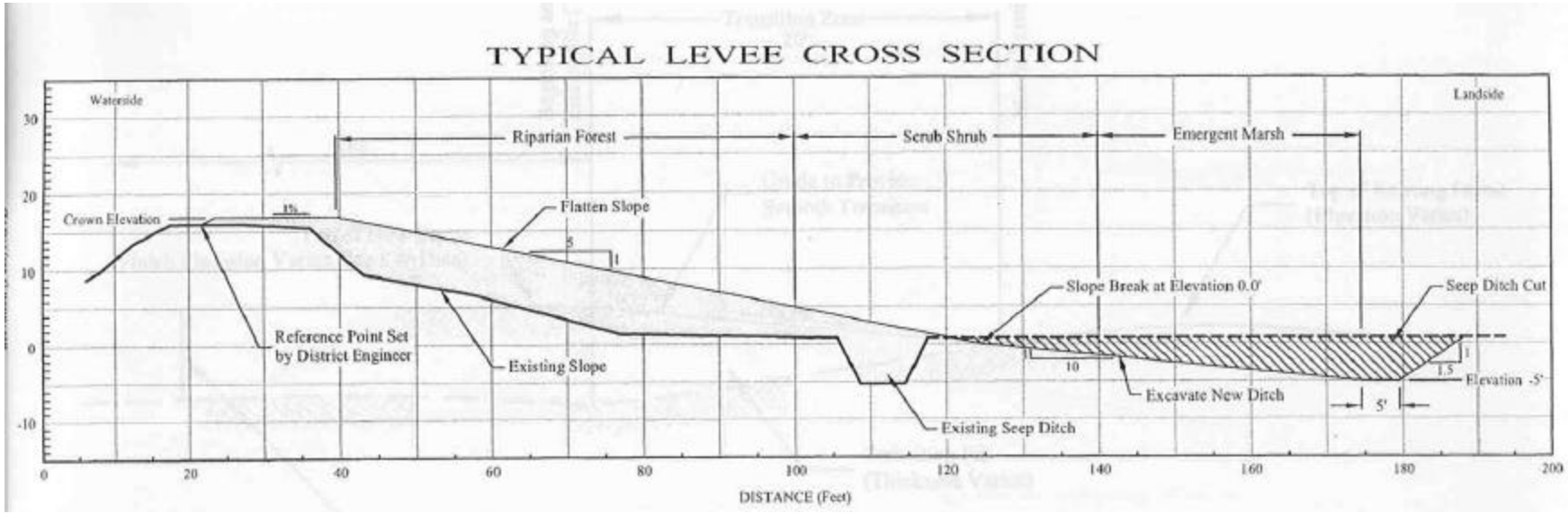

Figure 3 – Typical cross section of restored levee with 5:1 slope. From construction specifications of the 2001 McCormack Williamson Tract levee rehabilitation project (MBK Engineers 2000)

Attachments

Attachment A – The Nature Conservancy. 2001. McCormack-Williamson Tract: Backslope levee planting. August 2001.

Attachment B – Project Status Summary for McCormack-Williamson Tract Wildlife-Friendly Management Project

Attachment A
McCormack-Williamson Tract: Backslope Levee Planting
August 2001

Introduction

In 1999, The Nature Conservancy purchased the McCormack Williamson Tract, located in south Sacramento County, using CALFED funding. The property is strategically located; with a reconfiguration of levees and the addition of a system of wiers, the tract may provide both flood management opportunities and improved habitat conditions for the North Delta. Before any restoration of tidal influence can be pursued, however, it is critical that the interior levees are improved to withstand internal wave wash during high water and high winds events.

During the spring of 2001, Reclamation District 2110 (RD 2110) and MBK Engineers worked with contractor A. M. Stephens to reslope 5,000 feet of levee on the tract's north end. The levee was improved from an extremely steep slope covered with poison hemlock (a toxic, non-native, biennial plant), to a 5:1 slope roughly 135 feet long. This slope, roughly 15.5 acres, is currently unvegetated. In order to protect it from erosion, contractors will plant the levee with native, perennial grasses and sedges this fall. Plant species for this project were chosen based on their suitability for the given soil and water regime. Native perennial monocots are being planted because their root structure will provide long-term soil stability. The native plant species chosen will also provide high-quality habitat for birds, invertebrates and other wildlife.

In order to provide information that can be used on other, similar levee projects, a number of different planting methods are being pursued. The research questions that we will answer through this planting projects are:

1.) What difference do we see in plant size and density between areas planted with seed and areas planted with plugs?
2.) What difference do we see in exotic species density between areas planted with seeds and areas planted with plugs?
3.) Is it more cost effective to plant plugs or seeds on a 15.5 acre site?
4.) Once established, can *Leymus triticoides* survive on levees without irrigation?

Planting Scheme and Research Questions.

B. Row One. This row will be drill seeded with *Hordeum brachyantherum, Nassella pulchra*, and *Grindelia camporum*. Our intent is to get immediate cover with *Hordeum*, which germinates and establishes quickly, and to have *Nassella* fill in more slowly. We expect the *Nassella* to establish well here, due to its adaptation to xeric soils. We are testing the *Leymus triticoides* plugs here to see if, once established, they are able to survive without irrigation. *Grindelia* is being used because it is a

native complement to the native grass community and provides an excellent source of pollen and nectar.

C. Row Two. The intention of this planting is to inform us of the difference in establishment rates from seed and plug plantings. If the *Leymus* established well from seed, it may provide a more cost-effective planting method than plugging. Again, *Hordeum* is included here to provide immediate cover in the first season.

D. **Row Three.** This planting area, closer to the water's edge; will be planted with two native *Carex* species, as well as *Hordium, Deschampsia, Leymus* and *Agrostis* and *Grindelia*. There is very little known about the efficacy of planting *Carex* from seed. Because we want good vegetative coverage on the levee, we are planting most of this row with plugs, which are known for quick establishment. Twenty-five percent of this row will be planted with *Carex* seed, using the best available techniques.. If the seed is able to germinate and plants establish, we may have discovered a more cost effective method for revegetating *Carex* stands. The other grasses are being planted here because they are known to be a native complement to *Carex*. This entire row will also be planted with a 20-foot strip of native tree cuttings in order to protect the most vulnerable portion of the levee from erosion caused by internal wave wash.

		-625 feet-	-625 feet-	-625 feet-	-625 feet-	-625 feet-	-625 feet-	-625 feet-	-625 feet-
--35 feet--	**ROW 1** All drill-seeded with *Hordeum brachyantherum, Nassella pulchra* , and *Grindelia camporum*	**Leymus triticoides** plug 4,687 plugs	*Leymus triticoides* plug 4,687 plugs						
--50 feet--	**ROW 2** All drill seeded with *Hordeum brachyantherum* and *Grindelia*.	*Leymus* seed	*Leymus* seed	*Leymus* seed	*Leymus* seed	*Leymus* seed	*Leymus* seed	*Leymus* Plug 3125 plugs	*Leymus* Plug 3125 plugs
--35 feet--	**ROW 3** All drill seeded with *Hordeum brachyantherum, Leymus triticoides, Deschampsia elongata, Agrostis exarata* 20 feet planted with *Acer negundo v. californicum, Cephalanthus occidentalis v. californicus, Cornus glabrata, Populus fremontii spp. Fremontii, Alnus rhombifolia, Salix gooddingii, Salix laevigata,*and *Salix lasiolepis* cuttings and *Quercus lobata* acorns	***Carex praegracilis*** seed	*Carex praegracilis* plug	*Carex praegracilis* plug	*Carex barbarae* plug	*Carex barbarae* plug	*Carex barbarae* plug	*Carex barbarae* plug	*Carex barbarae* seed

Schedule

Activity	Date	Contractor
Project Management	On-going	Calegari
Stubble disc	September 2001	Fonseca
Irrigation installation	September 2001	Chan
Weed control (herbicide)	September 2001	Fonseca
Finish disc	September 2001	Fonseca
Drill seed	September 2001	Fonseca
Plant plugs	September 2001	Fonseca
Blow straw and apply tacifier	September 2001	Fonseca
Supplemental Irrigation	As needed	Chan
Mow	Spring 2002	Fonseca
Develop Monitoring Plan	Fall 2001	Waegell and Calegari
Plant tree cuttings along levee toe	Winter 2001/2	Calegari (volunteers)
Monitor and manage	Every 6 months for 3 years	Waegell or contract

IV. Plant list

Grasses, Sedges and Forbs
Agrostis exarata
Carex barbarae
Carex praegracili
Deschampsia elongata
Elymus glaucus
Grindelia camporum
Hordeum brachyantherum
Leymus triticoides
Nassella pulchra

Trees
Acer negundo v. californicum
Alnus rhombifolia
Cephalanthus occidentalis v. californicus
Cornus glabrata
Populus fremontii spp. Fremontii
Quercus lobata
Salix gooddingii
Salix laevigata
Salix lasiolepis

Attachment B
McCormack-Williamson Tract Wildlife-Friendly Management Project

Project Status Summary in support of 2001 CALFED ERP Proposal
September 25, 2001

The Nature Conservancy received a directed action grant (**FWS 114200J039**) for wildlife-friendly management of levees on the McCormack-Williamson Tract (MW Tract). This work is a necessary step in the long-term plan to restore tidal wetlands via levee breaching, with the potential to reduce flood damages as well. The MW Tract levees need significant improvements to bring them up to acceptable levels of flood protection before tidal inundation or flood flows can be returned to the island. The grant provided funding for implementing a wildlife-friendly levee project that would refine design and engineering, complete needed levee repairs, and test different planting strategies. In addition, the grant provided startup stewardship funding to manage MW Tract in environmentally-compatible agriculture and to support cooperation with agencies in the development of a long-term restoration plan. TNC is also conducting outreach to public and private stakeholders regarding management and restoration plans for the island.

Breaching levees on Delta islands to restore tidal wetlands is a promising restoration technique, which relies on restoring the key processes of tidal circulation, sediment deposition, and nutrient cycling. However, the interior levee slopes must be able to withstand wind-aided erosion in order to protect the integrity of neighboring private lands. Potential solutions include (1) resloping the interior levee slopes to a more gradual slope, (2) planting vegetation to attenuate wave energy, (3) placing rip-rap, and (4) constructing interior islands or cross levees to break up wind fetch. This project is using a combination of resloping and planting.

During the spring of 2001, Reclamation District 2110 (RD 2110) and MBK Engineers worked with contractor A. M. Stephens to reslope 5,000 feet of levee on the tract's north end, an area that was damaged in the 1997 floods (Figure 1). The toe drain was moved inland and 5,000 linear feet of levee were resloped to a 5:1 grade along the interior (total levee perimeter of the island is 8.8 miles) (Figure 2). The levee was improved from an extremely steep slope covered with poison hemlock (a non-native, biennial plant), to a 5:1 slope roughly 135 feet long. The new slope, roughly 12.75 acres, is currently unvegetated. In addition to restoring 5,000 feet of levee to a 5:1 slope, the contractor also brought the levee road up to its legally established height, where possible.

The next step in this project is to stabilize the new soil with plantings. In fall 2001, contractors will plant the levee slope with native, perennial grasses and sedges Plant species for this project were chosen based on their suitability for the given soil and water regime. Native perennial grasses are being planted because their root structure will provide long-term soil stability. The native plant species chosen will also provide high-quality habitat for birds, invertebrates and other wildlife. In addition, a 20-foot wide band at the toe of the levee will be planted with riparian woody vegetation (willows and cottonwood) to reduce future wave energy.

Using native perennial grasses is a new approach for levee plantings. In order to provide information that can be used on other, similar levee projects, this pilot project is testing a number

of different planting methods to revegetate the new interior levee slopes. The planting plan was developed this summer with the help of restorationists with expertise in native grasses. The planting scheme will use native rhyzomatous grasses, bunch grasses, and a complement of forbs on the levee slopes in order to anchor the new soil. A number of planting strategies will be employed experimentally, in order to test the most effective and cost-efficient planting techniques.

The research questions to be addressed are:

- What difference do we see in plant size and density between areas planted with seed and areas planted with plugs?
- What difference do we see in exotic species density between areas planted with seeds and areas planted with plugs?
- Is it more cost effective to plant plugs or seeds on the site?
- Once established, can *Leymus triticoides* survive on levees without irrigation?

Native trees such as willows and alders will be planted with cuttings at the base of the levee. The purpose of these plantings on the improved levee site is to prevent erosion and to establish a protective barrier against interior wave wash in the event of a levee breach. The plantings will be carried out through a combination of contract and volunteer labor during the early winter of 2001/2002.

In addition to the levee improvements project, TNC is continuing to coordinate with CALFED, DWR and UC Davis in working through the issues that precede the long-term restoration of the entire tract to tidal influence, including the role of the tract in the long-term flood solution for the Mokelumne corridor. TNC participates in CALFED's North Delta Improvements Group, a stakeholder group that meets regularly to discuss progress of CALFED's restoration projects within the North Delta (McCormack-Williamson Tract and Georgiana Slough), and to hear input from stakeholders regarding the impact of these projects.

Environmentally-compatible agriculture continues on MW Tract while restoration planning is underway. This year the lessee, C&F Farms, signed a new farm contract with TNC for a two-year lease with an automatic extension term of two years that allows either party to opt out at the time of extension. The farmers worked with TNC to accommodate this year's levee improvement project and a potential DWR pilot project to convert the lower 200 acres of the tract to tidal influence.

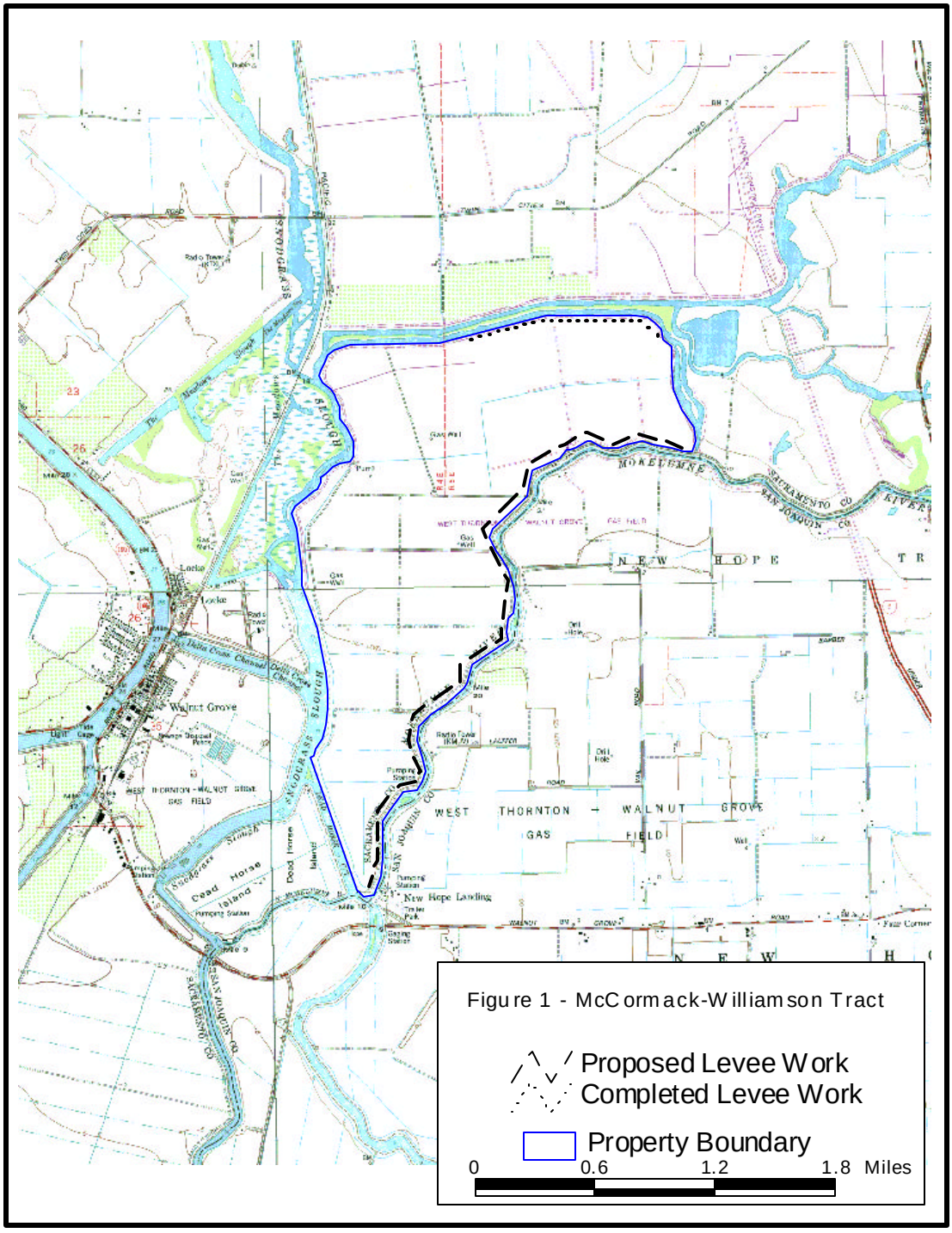
Figure 1 - McCormack-Williamson Tract
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Completed Levee Work
Property Boundary
0
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1.2
1.8 Miles
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New Hope Landing
Dead Horse Island
WEST THORNTON - WALNUT GROVE GAS FIELD
NEW HOPE TR
MOKELUMNE
SACRAMENTO CO.
SAN JOAQUIN CO.
RIVER

Figure 2 – Resloping of interior face of levee on McCormack Williamson, summer 2001. The surface is at a 5:1 slope.