

# MESSICK LAKE AND FLOODPLAIN DRAINAGE SWALE MITIGATION AREAS

YUBA COUNTY, CALIFORNIA



## LONG-TERM OPERATIONS AND MAINTENANCE PLAN

Submitted By:



Prepared By:



November 2008

# MESSICK LAKE AND FLOODPLAIN DRAINAGE SWALE MITIGATION AREAS

YUBA COUNTY, CALIFORNIA

## LONG-TERM OPERATIONS AND MAINTENANCE PLAN

***Submitted to:***

U.S. Army Corps of Engineers, Sacramento District  
Regulatory Division  
1325 J Street, Room 1480  
Sacramento, CA 95814-2922

Contact: Mike Jewell (916) 557-6605 or [michael.s.jewell@usace.army.mil](mailto:michael.s.jewell@usace.army.mil)  
Alternate Contact: Nancy Haley (916) 557-7772 or [nancy.a.haley@usace.army.mil](mailto:nancy.a.haley@usace.army.mil)

***Submitted by:***

Three Rivers Levee Improvement Authority  
1114 Yuba Street, Suite 218  
Marysville, CA 95901

Contact: Paul Brunner (530) 749-7841 or [pbrunner@co.yuba.ca.us](mailto:pbrunner@co.yuba.ca.us)  
Alternate Contact: Anja K. Raudabaugh (916) 782-7275 or [akraudabaugh@pbsj.com](mailto:akraudabaugh@pbsj.com)

***Prepared by:***

River Partners  
Contact: Helen Swagerty or [hswagerty@riverpartners.org](mailto:hswagerty@riverpartners.org)  
(530) 894-5401

***In Association with:***

Wildlands, Inc.  
Contact: Kim Erickson or [kerickson@wildlandsinc.com](mailto:kerickson@wildlandsinc.com)  
(916) 435-3555

November 26, 2008

## TABLE OF CONTENTS

Summary .....	4
I. Introduction.....	5
A. Purpose of Establishment.....	5
B. Purpose of this Long-term Operations and Maintenance Plan .....	5
C. Land Manager and Responsibilities.....	6
D. Conservation Easement Monitor and Responsibilities .....	7
E. Land Owner .....	8
F. Qualified Personnel / Monitoring Biologist.....	8
G. Changes in Personnel.....	8
II. Property Description .....	9
A. Setting and Location .....	9
B. History and Land Use .....	9
C. Cultural Resources .....	9
D. Hydrology and Topography .....	12
E. Soils.....	13
F. Existing Easements .....	13
G. Adjacent Land Uses .....	13
III. Habitat and Species Descriptions.....	14
A. Biological Resources .....	14
B. Endangered and Threatened Species .....	14
IV. Management and Monitoring.....	14
A. Biological Resources .....	14
B. Security, Safety, and Public Access.....	19
C. Reporting and Administration.....	19
V. Transfer, Replacement, Amendments, and Notices.....	20
A. Transfer .....	20
B. Replacement.....	20
C. Amendments .....	21
D. Notices .....	21
VI. Funding and Task Prioritization.....	22
A. Funding .....	22
B. Task Prioritization.....	23

**List of Tables**

Table 1. Special-Status Species with Potential to Occur within Project Area..... 16

**List of Figures**

Figure 1. General Vicinity Map of the Messick Lake Mitigation Area..... 10  
Figure 2. Site Property Map..... 11

**List of Attachments**

Attachment A. Property Analysis Record

## **SUMMARY**

The Three Rivers Levee Improvement Authority's (TRLIA) Feather River Levee Repair Project will improve flood protection and restore wildlife habitat in the southern portion of Yuba County, California. The Feather River Levee Repair Project Segment 2 (Corps file number 2007005778, Service file number 81420-2008-F-0344-4, NMFS file number 2007/07371 and SHPO file number COE 080211A) is part of an overall plan to enhance flood protection in TRLIA's service area, Reclamation District (RD) 784. These levee improvements are intended to reduce potential threats to four factors of levee integrity: seepage, stability, height, and susceptibility to erosion.

TRLIA's flood protection project includes constructing a setback levee that is 5.7 miles long and replaces 6.2 miles of existing levee. The new levee segment will be set back approximately 0.5 mile to the east of the existing Feather River levee. Construction of the project began in May 2008 and is expected to end in 2009-2010. Mitigation activities to restore wetlands and other waters of the United States on the project site will begin in 2009-2010.

TRLIA evaluated a range of project alternatives to determine the combination of project design and siting features that would avoid and minimize impacts to waters of the United States to the maximum extent practicable while achieving the necessary level of flood protection. The flood protection project was estimated to impact a total of 10.9 acres of waters of the United States, with 4.2 acres of temporary impacts and 6.7 acres of permanent impacts.

To offset the temporary and permanent impacts in accordance with Corps regulations, TRLIA has proposed a combined compensatory mitigation strategy with the goal of achieving no net loss of aquatic resource functions and services. To offset the temporary impacts to waters of the United States, TRLIA is proposing the concurrent restoration and creation of 6.0 acres of open water and adjacent riparian habitats in the floodplain drainage swale between the Plumas Lake Canal and the Feather River. This mitigation site is referred to as the floodplain drainage swale mitigation area.

To offset the permanent loss of approximately 6.7 acres of waters of the United States, TRLIA is proposing the restoration of approximately 20.1 acres (3:1 ratio) of jurisdictional waters of the United States at the Nordic property borrow area adjacent to Messick Lake. Based on historical aerial photographs, Messick Lake historically extended west into the proposed mitigation area and is part of a larger lake complex connected to Plumas Lake to the south. This mitigation site is referred to as the Messick Lake mitigation area.

TRLIA has prepared a habitat mitigation and monitoring proposal/plan (HMMP) for both the floodplain drainage swale and the Messick Lake mitigation areas. This document describes the long-term operations and maintenance activities of the mitigation areas that will be required to ensure the viability of the resources in perpetuity.

Since the mitigation areas are being provided to mitigate for 404 impacts only, the only approving agency is the U.S. Army Corps of Engineers (Corps).

## **I. Introduction**

### **A. Purpose of Establishment**

The Feather River Setback Levee will divide the Plumas Lake Canal with portions of the canal remaining intact on either side of the setback levee. To minimize potential for underseepage that could result from having an excavated feature too close to the levee, approximately 490 feet of the canal on the west (water) side of the setback levee will be completely filled (from the west side of the setback levee alignment to where the canal opens into the ponded section of the Plumas Lake Canal). Approximately 2,200 feet of canal on the east (land) side of the setback levee will be filled between the new Pump Station No. 3 and the setback levee alignment. An approximately 2-foot-deep ditch will remain along the canal alignment to drain surface runoff from landside areas at the southern end of the setback levee to the new Pump Station No. 3. (EDAW 2008.)

Following construction of the Feather River Setback Levee, a new floodplain drainage swale will be constructed along the alignment of the existing drainage swale that currently receives water pumped over the existing levee from the existing Pump Station No. 3. This drainage swale will connect the setback area lowlands to the Feather River and the existing channel will be enlarged and deepened to accommodate flood flows leaving the setback area to minimize the potential for fish stranding as flood waters recede. The setback area drainage swale will be constructed in a manner that minimizes vegetation disturbance, fish stranding, and other environmental impacts. (EDAW 2008.)

The setback area floodplain drainage swale will also act to allow backwater to flow into the setback area from the Feather River, increasing the inundation frequency of portions of the setback area and the quality of the aquatic habitat. It is estimated that the 31-foot stage would be inundated in 2 out of every 3 years for a period of at least 1 week between March 15 and May 15. Floodplain land at or below this elevation will provide a broad suite of valuable ecosystem functions, including provision of nutrients and seasonal habitat for aquatic species. (EDAW 2008.)

The Corps 404 mitigation areas ("Sites"), which consist of the Messick Lake mitigation area and floodplain drainage swale, will be established to compensate for unavoidable impacts to, and to conserve and to protect jurisdictional waters of the U.S, open water and riparian habitat. The Messick Lake mitigation area consists of 20.1 acres of seasonal wetland habitat with a dense riparian canopy. This mitigation area will seasonally host aquatic species dependent upon seasonally inundated floodplains. The 6-acre floodplain drainage swale will host terrestrial species that prefer edge habitats next to a water body and will aid in the passage of floodwaters.

### **B. Purpose of this Long-term Operations and Maintenance Plan**

The purpose of this long-term operations and maintenance plan (O&M Plan) is to ensure the mitigation areas are managed, monitored, and maintained in perpetuity. This management plan establishes objectives, priorities and tasks to monitor, manage, maintain and report on the jurisdictional waters of the U.S., open water and riparian habitat established on the mitigation areas. This management plan is a binding and enforceable instrument, implemented by the restrictive covenant covering the mitigation areas.

### **C. Land Manager Responsibilities**

TRLIA is considering various land managers and will choose the land manager prior to completion of construction. The land manager, and subsequent land managers upon any transfer of land manager responsibilities, shall implement this long-term management plan, managing and monitoring the property in perpetuity to preserve its habitat and conservation values in accordance with the restrictive covenant, the Habitat Mitigation and Monitoring Proposal/Plan (HMMP) and this long-term operations and maintenance plan (O&M Plan).

Long-term management tasks shall be funded through the Endowment Fund. The land manager shall be responsible for providing an annual report to the Corps detailing the time period covered, an itemized account of the management tasks and total amount expended. Any subsequent grading, or alteration of the Sites' hydrology and/or topography by the land manager or its representatives must be approved by the Corps and the necessary permits, such as a Section 404 permit, must be obtained, if required.

The land manager's responsibilities shall include, but not be limited to, overseeing or completing the following:

- Upholding the land manager's responsibilities and obligations as outlined in the restrictive covenant and this O&M Plan.
- Ensuring that gates and signage at the mitigation areas are maintained.
- Implementing capital improvements.
- Implementing all habitat management activities.
- Conducting trash removal at the mitigation areas at least semi-annually.
- Conducting non-native (exotic) plant management.
- Performing general inspections of the mitigation areas as required by this O&M Plan.
- Coordinating biological surveys by a qualified biologist.
- Coordinating with individuals or groups wishing to use the mitigation areas for educational purposes.
- Maintaining a file for the mitigation areas. The file will contain a record of management and maintenance related activities, correspondence and determinations regarding the mitigation areas, and shall be made available to the Corps within ten business days of request thereof.
- Reviewing potential future land use activities adjacent to the mitigation areas.
- Assessing and seeking correction for impacts to the mitigation areas from harmful uses or activities, and arranging for any corrective action necessary to ensure the performance of the Section 404 wetlands at the mitigation areas, as required by this O&M Plan.

- Submitting an annual written report to the Corps detailing:
  - land management activities planned for the following year,
  - known discrepancies from the terms of the restrictive covenant and the O&M Plan,
  - general plant health in the mitigation areas,
  - excessive weed competition,
  - appropriate hydrological conditions,
  - signs of herbivory,
  - use by wildlife,
  - vandalism,
  - management activities, and
  - the Endowment Fund.
  
- All other land manager responsibilities not otherwise described in this O&M Plan.

#### **D. Conservation Easement Monitor and Responsibilities**

TRLIA will be recording a restrictive covenant on the Sites. The land manager will be responsible for monitoring compliance with the requirements of the conditions of the restrictive covenant.

For the purposes of this O&M Plan, the term “Conservation Easement Monitor” is synonymous with the “Monitor of the Restrictive Covenant”. As such, the terms of the restrictive covenant govern any transfer or assignment of obligations or rights as the Conservation Easement Monitor.

The responsibilities and duties of the Conservation Easement Monitor shall include:

- Upholding the responsibilities and obligations as outlined in the Conservation Easement or restrictive covenant and this O&M Plan.
  
- Monitoring management activities to enforce the terms of the Conservation Easement or restrictive covenant.

## **E. Land Owner**

TRLIA is in the process of acquiring title to the mitigation areas. Title to all land acquired by TRLIA will be conveyed to the State of California Department of Water Resources. TRLIA will maintain an easement over the mitigation areas for O&M purposes.

## **F. Qualified Personnel / Monitoring Biologist**

The land manager shall retain professional biologists, botanists or other types of specialists (the Qualified Personnel, including the Monitoring Biologist) to conduct specialized tasks. The Monitoring Biologist shall be familiar with California flora and fauna, shall have knowledge regarding seasonal and perennial wetland habitats and their ecology. Although recommended, the monitoring biologist need not be permitted to sample for state and federally listed species.

Duties of the Qualified Personnel may include but are not limited to:

- Monitoring and maintaining wetland function.
- Monitoring and maintaining erosion control.
- Evaluating the accumulation of dead vegetative matter (thatch) and recommending removal, if needed.
- Evaluating the presence of newly introduced non-native (exotic) plant species and recommending management, if needed.
- Conducting biological surveys, collecting data on the mitigation areas, and preparing reports required by this O&M Plan.
- Evaluating site conditions and recommending remedial action to the land manager.
- Assisting in reviewing or planning restoration activities, use of the mitigation areas for education or other tasks such as grant proposals.
- Overseeing all construction activities.

## **G. Changes in Personnel**

If either the land manager or Conservation Easement Monitor are changed, or the land owner changes, the outgoing and incoming personnel will tour the mitigation areas together, and the outgoing personnel will advise the incoming personnel of trends, problem areas, and any administrative difficulties. The Corps will be notified of changes to the land manager or Conservation Easement Monitor or Qualified Personnel, and any changes to the land owners, and will be offered an opportunity to meet the new personnel and tour the mitigation areas together.

## **II. Property Description**

### **A. Setting and Location**

The Sites are located off Feather River Boulevard, County of Yuba, State of California, designated Assessor's Parcel No. 014-370-036. The mitigation areas are shown on the general vicinity map (Figure 1) and the site property map (Figure 2). The general vicinity map shows the locations of the Sites in relation to cities, towns, or major roads, and other distinguishable landmarks. Figure 2 shows the boundaries of the mitigation areas on a aerial photograph.

### **B. History and Land Use**

Prior to the arrival of Europeans, populations of the Nisenan, or southern Maidu, occupied the area, the western boundary of their territory being the western bank of the Sacramento River. These populations established villages and other settlements along major watercourses, typically on low rises. (EDAW 2008.)

In 1841, John Sutter became the first recipient of a Mexican land grant for the area that contained the Project site and the surrounding region. He named his lands New Helvetia and proceeded to raise cattle which were free to graze the lands along this portion of the Feather River. Beginning in the late 1800's, improvements to the flood control infrastructure were implemented throughout the central valley. This made lands available for agriculture, including the project area.

The land in the general area of the Sites is currently in production agriculture. Walnuts and prunes are the primary orchard crops grown on the site, with peaches, apples, pears and persimmons being grown as well. Row crops such as cantaloupe, melons and wheat are also grown. (EDAW 2008.)

### **C. Cultural Resources**

Several entities, including University of California, Berkeley (UC Berkeley), Jones and Stokes and EDAW have conducted surveys in the project area. In 1953, UC Berkeley archaeologists removed human remains and associated items from an archaeological site near the Messick Lake mitigation area (EDAW 2008). Currently, no artifacts are known to remain in the area. This burial ground is potentially eligible for National Register of Historic Places (NRHP) and California Register of Historic Resources (CRHR) status.

Within the Messick Lake mitigation area, an earthen ditch extends northwest and south from Messick Lake, crossing Anderson Avenue via corrugated steel pipe (EDAW 2008). This cultural resource is not eligible for NRHP or CRHR status because its architecture or historic value meets NRHP or CRHR criteria. All other historical resources found within the Levee Setback area fall outside or will not be affected by the wetland mitigation area.

Figure 1. General Vicinity Map of the Messick Lake Mitigation Area

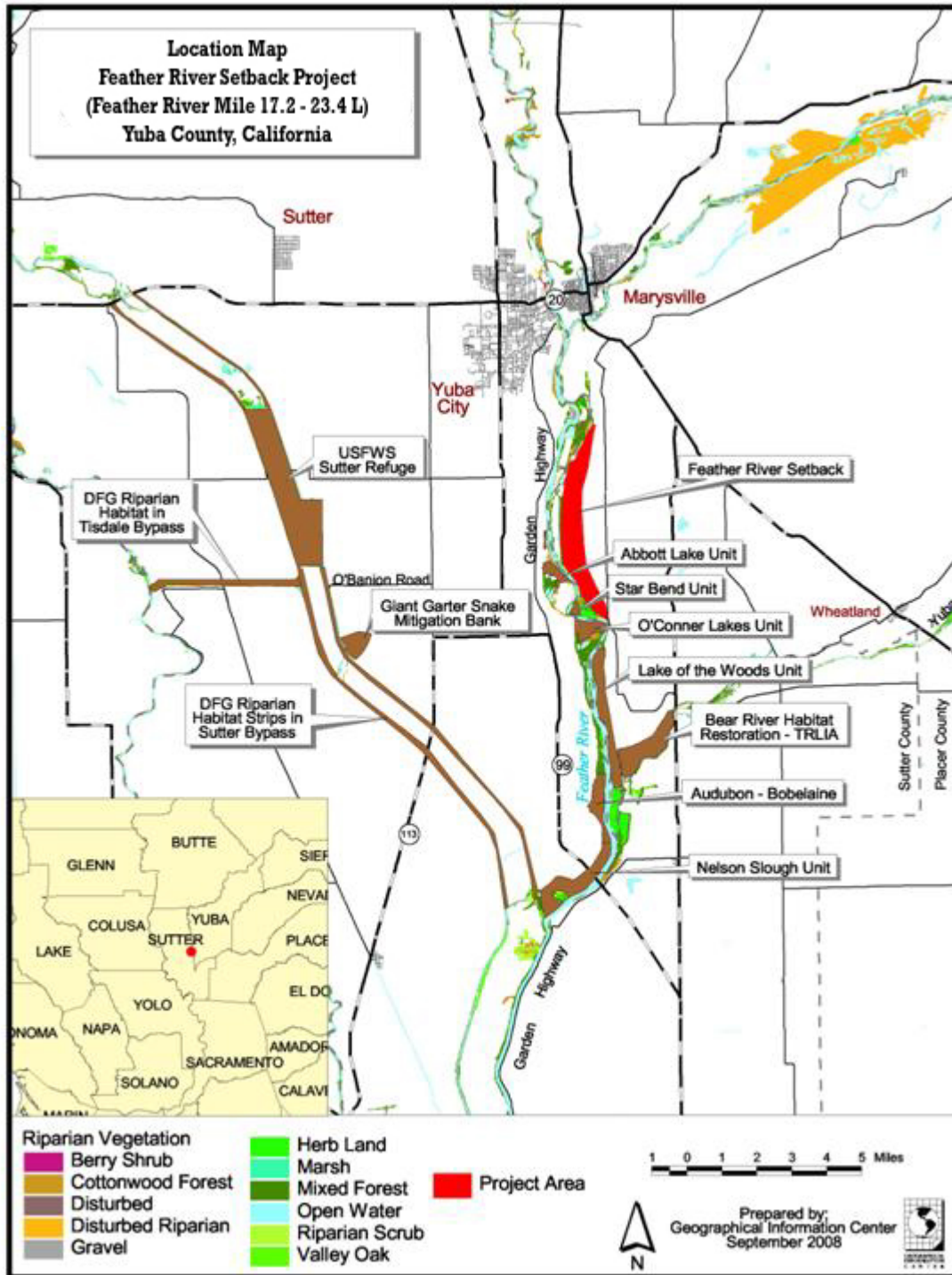
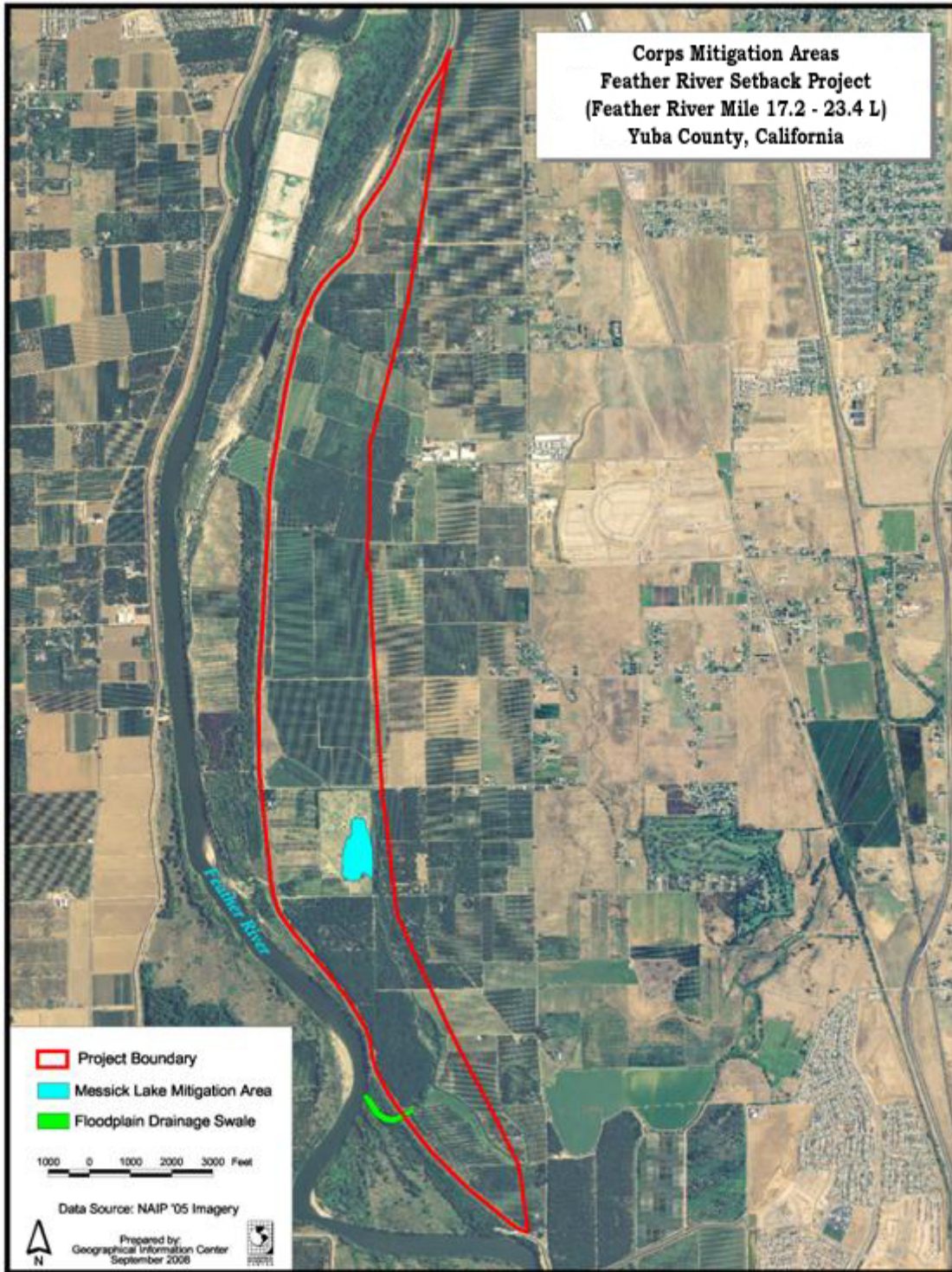


Figure 2. Site Property Map



## D. Hydrology and Topography

Current elevations across the setback floodplain area range from 54 feet in the northern section of the project area to 30 feet just south of Pump Station No. 3. However, because of the construction of the setback levee, there will be extensive changes to the topography of the setback area. An approximate total of 3.6 million cubic yards of compacted material will be needed for the setback levee construction. A primary borrow area for the setback levee construction will be located within the project area, on the waterside of the setback levee, and it is anticipated that borrow material will be removed from the Messick Lake mitigation area. Wide and shallow excavations, rather than deep trenches, are anticipated. The existing levee will be degraded down to the adjacent ground surface and that material will be used to fill in the borrow areas associated with setback levee construction. Additionally, unused materials may be spread back into the borrow area(s) from which it was removed. Despite these topographic changes, the borrow area will be contoured to drain south, toward the existing Messick Lake area, where water will flow south via existing surface drainage features. This drainage terminates into the downstream end of the Plumas Lakes Canal. Currently, Pump Station No. 3 pumps water through the existing levee to discharge it into the Feather River. After the existing levee is removed, a drainage swale through the floodplain (the floodplain drainage swale) will be enlarged and enhanced to pass receding floodwater back into the Feather River and reduce or minimize the potential for fish stranding. This floodplain drainage swale will be revegetated and enhanced as described in the HMMP.

Removal of the existing levee will increase the frequency of flood inundation of the Messick Lake mitigation site. The area where the floodplain swale is to be located is currently between the existing levees, so flood inundation frequency will remain the same. Hydrodynamic model results (completed for analysis of the levee setback designs) show that during the 2-year flood event, floodwaters inundate the Messick Lake mitigation site via flow from the Feather River (flowing east, roughly along the alignment of Country Club Road) and via backwater inundation coming north from the Star Bend point bar area. This backwater inundation also inundates the floodplain swale and areas upstream of the swale currently protected by the existing levee. Larger flood events (i.e., the 10-year event and larger) will inundate the entire floodplain. Modeling suggests that the floodplain should drain back to the river via the existing topography, drainage features, and the floodplain drainage swale.

Removal of the existing levee and the construction of the floodplain swale have additional benefits related to inundation and ecological processes. The frequently activated floodplain (FAF, also referred to as floodplain activation flood) discharge for the project area was estimated at between approximately 7,400 cubic feet per second (cfs) and 8,400 cfs (PWA 2008), meaning that under the managed hydrologic conditions of the Feather (and Yuba) Rivers, such a flow is sustained for at least seven consecutive days between March 15 and May 15, in two out of every three years. Floodplain inundation having this timing, duration and frequency is known to provide substantial ecological benefits for key native aquatic species such as Chinook salmon and Sacramento splittail. Assuming the levee setback, floodplain drainage swale, and the Messick Lake borrow area are completed, the 8,400 cfs FAF discharge is estimated to backwater into the floodplain drainage swale up the existing drainage features, and into the Messick Lake mitigation area. Modeling of the setback area indicates that the setback area should drain south towards the floodplain drainage swale.

## **E. Soils**

The Messick Lake mitigation area will be a borrow site for the Feather River Levee Setback Project. After the borrow is removed, spoils from degrading the existing levee will be used to backfill the borrow pit with a thickness of about ten feet over the native soils. If necessary for plant propagation, these spoils may be amended with topsoil prior to planting.

The substrate below the Messick Lake mitigation area will consist of sandy silty loam soils currently forming the existing Feather River levee. The soils will be placed and compacted to a compaction standard of 92 percent of Standard Proctor (ASTM D 698). This is a low level of compaction that approximates the density of soils as they naturally lie in undisturbed ground. Therefore, the porosity of the substrate will be approximately the same as the porosity of undisturbed alluvial soils and should not hinder wetland creation.

As the low point in the setback area, the Messick Lake area has a water table 0-60 inches deep throughout the winter and below 48 inches in the summer. Enough water should be present throughout the year to support the mitigation.

## **F. Existing Easements**

There are several existing easements associated with the Nordic property where the Messick Lake mitigation area is designed. The County of Yuba holds an easement for a road and there are two easements held by Reclamation District No. 784 for irrigation and drainage ditches, canals and pipelines.

There are numerous existing easements associated with the floodplain drainage swale including easements held by the Great Western Power Company of California, Sacramento and San Joaquin Drainage District, County of Yuba, and easements for irrigation ditches, roads, and gas mains or pipelines.

After TRLIA obtains title to the mitigation areas, TRLIA will map the easements at the two mitigation areas and describe the easements in the Property Assessment and Warranty included in the HMMP.

## **G. Adjacent Land Uses**

Within the 1,600-acre levee setback area, about 821 acres were farmed (as of October 2007). Historically, these farmlands have been planted to tree crops, including walnuts, pears, prunes, peaches and a few incidental crops including persimmons, and citrus. TRLIA has a commitment to balance opportunities for habitat restoration while maintaining as much of the agriculture as economically feasible and subject to public safety. Currently, information is being gathered to implement a sustainable long-term management program on lands located within the levee setback area, while balancing significant opportunities to enhance the ecological values through restoration of native habitats and compliment native habitat restoration projects within this reach of the Feather River.

### **III. Habitat and Species Descriptions**

#### **A. Biological Resources**

The final Environmental Impact Statement (EIS) completed in October 2008 identifies nine distinct habitat types contained within the setback area. These include Elderberry Savanna, Mixed Riparian Forest/Scrub, Lacustrine, Seasonal Wetland, Orchard, Row Crops, Fallow, Ruderal and Developed. The majority of the setback levee area is currently in orchards. A number of landowners will be ceasing farming once the levee is built, which will open up large areas for potential restoration. Agricultural and fallow areas can provide habitat and foraging areas for various bird, reptile and mammal species, but diversity will remain low.

The existing natural habitat at the floodplain drainage swale, primarily the Mixed Riparian Forest/Scrub and the corresponding Lacustrine areas, provides high-quality wildlife habitat. These areas are supported by the block of habitat within the Feather River floodway to the west of the existing levee. However, these areas are small and fragmented across the site. Once the existing levee is removed, restoring the surrounding area would improve continuity of wildlife habitat, linking it to habitat in the existing floodway, including the Star Bend Unit of the Feather River Wildlife Area.

The Messick Lake mitigation area is currently fallow with sparse riparian vegetation and non-native shrubs and forbs throughout the Site.

#### **B. Endangered and Threatened Species**

There is a potential for endangered and threatened species to occur at the Messick Lake mitigation area and floodplain drainage swale (Table 1).

### **IV. Management and Monitoring**

The overall goal of long-term management is to foster the long term viability of the Site's waters of the U.S. Routine monitoring and minor maintenance tasks are intended to assure the viability of the Site in perpetuity.

#### **A. Biological Resources**

The approach to the long-term management of the Site's biological resources is to conduct annual site examinations and monitoring of selected characteristics to determine stability and ongoing trends of the preserved and created waters of the U.S., including wetlands. Annual monitoring will assess the Site's condition, degree of erosion, invasion of exotic or deleterious (e.g., thatch producing) species, water quality, fire hazard, and/or other aspects that may warrant management actions. While it is not anticipated that major management actions will be needed, an objective of this long-term management plan is to conduct monitoring to identify any issues that arise, and using adaptive management to determine what actions might be appropriate. Those chosen to accomplish monitoring responsibilities will have the knowledge, training, and experience to accomplish monitoring responsibilities.

Adaptive management means an approach to natural resource management which incorporates changes to management practices, including corrective actions as determined to be appropriate by the Corps in discussion with the land manager. Adaptive management includes those

activities necessary to address the affects of climate change, fire, flood, or other natural events, force majeure, etc. Before considering any adaptive management changes to the long-term management plan, the Corps will consider whether such actions will help ensure the continued viability of Site's biological resources.

Table 1. Special-Status Species with Potential to Occur within Project Area		
Species	Federal Listing Status	Habitat
Valley elderberry longhorn beetle	Threatened	Elderberry shrubs within riparian areas
Northwestern pond turtle	Species of Concern	Slack- or slow-water aquatic areas with basking sites
Giant garter snake	Threatened	Open water associated with marshes, sloughs and ditches. Requires wetland vegetation for cover.
Western yellow-billed cuckoo	Candidate for Listing	Dense riparian forests
Loggerhead shrike	Species of Concern	Nests in open shrubs and trees and forages in grasslands
Tricolored blackbird	Species of Concern	Nests in marshes with dense cattails and tules, riparian scrub and other dense shrubs. Forages in grasslands and agricultural fields.
Pacific western big-eared bat	Species of Concern	May roost in tree cavities. Forages in a variety of upland habitats
Green Sturgeon	Threatened	Cold, freshwater streams with suitable gravel for spawning. Rears in seasonally inundated floodplains, rivers, tributaries and in the Delta
Pacific Lamprey	Species of Special Concern	Cool, freshwater streams with suitable gravel for spawning
Central Valley steelhead ESU	Threatened	Cold, freshwater streams with suitable gravel for spawning. Rears in seasonally inundated floodplains, rivers, tributaries and in the Delta
Sacramento River winter-run Chinook salmon	Endangered	Cold, freshwater streams with suitable gravel for spawning. Rears in seasonally inundated floodplains, rivers, tributaries and in the Delta
Central Valley spring-run Chinook salmon ESU	Threatened	Cold, freshwater streams with suitable gravel for spawning. Rears in seasonally inundated floodplains, rivers, tributaries and in the Delta
Central Valley fall/late fall-run Chinook salmon	Species of Special Concern	Cold, freshwater streams with suitable gravel for spawning. Rears in seasonally inundated floodplains, rivers, tributaries and in the Delta
Sacramento splittail	Delisted from Threatened Status	Shallow weedy areas inundated during seasonal flooding in the lower reaches and bypasses of the Sacramento River

The land manager shall implement the following:

### **Element A.1 Waters of the U.S., including wetlands**

**Objective:** Monitor, conserve and maintain the Site's waters of the U.S., including wetlands. Limit any impacts to waters of the U.S. from vehicular travel or other adverse impacts.

**Task A.1-1:** A qualified biologist or restoration ecologist will be responsible for conducting at least two annual walk-through **surveys** each year in perpetuity to qualitatively monitor the general condition of the mitigation areas. These general surveys will be conducted in January and July. General topographic conditions, hydrology, general vegetation cover and composition, invasive species, erosion, will be noted, evaluated and mapped during a site examination in the spring. Notes to be made will include observations of species encountered, water quality, general extent of wetlands, and any occurrences of erosion, and weed invasion.

**Task A.1-2:** A qualified biologist will be responsible for conducting at least two annual biological inspections every five years in perpetuity to qualitatively monitor the biological health of the mitigation areas. These biological inspections will be conducted in April or May and in September.

**Task A.1-3:** Establish a minimum of ten reference sites for photographs at each mitigation area and prepare a site map showing the reference sites for the mitigation sites' file. Reference photographs will be taken of the overall wetland mosaic at least every five years from the beginning of the long-term management.

### **Element A.2 Non-native Invasive Species**

Invasive species threaten the diversity or abundance of native species through competition for resources, predation, parasitism, interbreeding with native populations, transmitting diseases, or causing physical or chemical changes to the invaded habitat.

**Objective:** Monitor and maintain control over non-native invasive species, including but not limited to noxious weeds that diminish site quality for which the Site was established. The land manager shall consult the following sources for guidance on what species may threaten the site and on management of those species: The California Department of Food and Agriculture (CDFA) list of "noxious weeds" that are subject to regulation or quarantine by county agricultural departments, the California Department of Food and Agriculture's Integrated Pest Control Branch, and the University of California State Integrated Pest Management Program list of "Exotic and invasive pests and diseases that threaten California's agricultural, urban, or natural areas".

**Task A.2-1:** The land manager will prepare a map of non-native invasive species cover or presence during each year of the first five years of site management, to establish a baseline. Mapping shall be accomplished

through use of available technologies, such as GIS and aerial photography.

**Task A.2-2:** Each year's annual walk-through survey (or a supplemental survey) will include a qualitative assessment (e.g. visual estimate of cover) of potential or observed noxious weeds or other non-native species invasions, primarily in or around the wetlands. Actions to control invasive species will be evaluated and prioritized based on available funding. If invasive plants such as yellow star-thistle (*Centaurea solstitialis*) and Johnson grass (*Sorghum halepense*) become established, a weed abatement program may be implemented. Himalayan blackberry is found throughout southwestern Yuba County; therefore, management is deemed infeasible.

### Element A.3 Vegetation Management

**Objective:** Analyze effects of appropriate vegetation management throughout the site. If determined appropriate, develop and implement specific mowing and/or grazing actions in coordination with management at other local conservation sites to maintain habitat quality.

**Objective:** Adaptively manage vegetation based on site conditions and data acquired through monitoring to maintain biological values.

**Task A.3-1:** Implement vegetation management techniques, if determined beneficial and as funding allows, to increase vegetation height and composition similar to baseline conditions or as determined likely to maintain seasonal wetland function in the Messick Lake mitigation area or open water and riparian habitat in the floodplain drainage swale. Implementation of vegetation management techniques must be approved by the Corps.

### Element A.4 Adaptive Management

**Objective:** Maintain flexibility to modify management strategies and methods to ensure that the protected wetland habitats are maintained in good condition such that they will continue to persist as jurisdictional wetlands and support the flora and fauna of the wetland habitats in perpetuity.

**Task A.4-1:** The land manager shall consider new technologies and practices to achieve the goal of protecting the wetland habitats in perpetuity. Adaptation of the methods described in this O&M Plan must be agreed upon by the land manager, Monitoring Biologist, and Corps. Techniques to address management of the new conditions, if not addressed in this O&M Plan, may be implemented by the land manager upon review and written approval by the Corps.

## **B. Security, Safety, and Public Access**

The Site shall have no general public access, nor any regular public or private use. Research and/or other educational programs or efforts may be allowed on the Site as deemed appropriate by the Corps but are not specifically funded or a part of this long-term management plan.

Potential mosquito abatement issues will be addressed, as needed, through the development of a plan by the land manager and the mosquito and vector control district in coordination with and approved by the Corps.

Potential wildfire fuels will be reduced, as needed, by mowing in areas where approved by the Corps.

### **Element B.1 Trash and Trespass**

**Objective:** Monitor sources of trash and trespass.

**Objective:** Collect and remove trash, repair vandalized structures, and rectify trespass impacts as needed.

**Task B.1-1:** During each site visit, record occurrences of trash and/or trespass. Record type, location, and management mitigation recommendations to avoid, minimize, or rectify a trash and/or trespass impact.

**Task B.1-2:** At least once yearly, collect and remove as much trash and repair and rectify vandalism and trespass impacts.

### **Element B.2 Fire Hazard Reduction**

**Objective:** Maintain the site as required for fire control while limiting impacts to biological values.

**Task B.2-1:** Use appropriate means of vegetation control, i.e., mowing or grazing, to reduce vegetation in areas required by authority agency(ies), and as approved by the Corps, for fire control.

## **C. Reporting and Administration**

### **Element C.1 Annual Report**

**Objective:** Provide annual report on all management tasks conducted and general mitigation area conditions to Corps and any other appropriate parties.

**Task C.1-1:** The land manager shall be responsible for preparing an annual report on all management tasks conducted and general Site conditions. The annual report will include a summary of monitoring and management activities undertaken during the previous year. Each annual

report shall cover the period from July 1 of the preceding year through June 30th of the current year (the "Reporting Period").

The results of the general inspections and the biological surveys will be included in the annual report. The annual report will be completed and circulated to the Corps and other parties (land owners and Conservation Easement Monitor) by December 31st of each year. The annual report will include the following at a minimum:

- Maps of the mitigation areas;
- Photos documenting the status of each mitigation area;
- A description of proposed activities and maintenance or management actions as required by this O&M Plan;
- A description of actions for which Corps notification or approval was not needed, but were carried out during the year;
- Observations from the Monitoring Inspections; and
- Recommendations for altered (adaptive) management practices as needed.

Annual reports will be provided to the Corps, landowner and Conservation Easement Monitor, in perpetuity.

**Task C.1-2:** Make recommendations with regard to (1) any habitat enhancement measures deemed to be warranted, (2) any problems that need near short and long-term attention (e.g., weed removal, erosion control), and (3) any changes in the monitoring or management program that appear to be warranted based on monitoring results to date.

## **V. Transfer, Replacement, Amendments, and Notices**

### **A. Transfer**

Any subsequent transfer of responsibilities under this long-term management plan to a different land manager shall be requested by the land manager in writing to the Corps, shall require written approval by the Corps, and shall be incorporated into this long-term management plan by amendment. Any subsequent Property Owner assumes land manager responsibilities described in this long-term management plan and as required in the restrictive covenant, unless otherwise amended in writing by the Corps.

### **B. Replacement**

If the land manager fails to implement the tasks described in this long-term management plan and is notified of such failure in writing by any of the Corps, land manager shall have 90 days to cure such failure. If failure is not cured within 90 days, land manager may request a meeting with the Corps to resolve the failure. Such meeting shall occur within 30 days or a longer period if approved by the Corps. Based on the outcome of the meeting, or if no meeting is requested, the Corps may designate a replacement land manager in writing by amendment of this long-term management plan. If land manager fails to designate a replacement land manager, then such public or private land or resource management organization acceptable to and as directed

by the Corps may enter onto the property in order to fulfill the purposes of this long-term management plan.

### **C. Amendments**

The land manager, property owner, and the Corps may meet and confer from time to time, upon the request of any one of them, to revise the long-term management plan to better meet management objectives and preserve the habitat and conservation values of the property. Any proposed changes to the long-term management plan shall be discussed with the Corps and the land manager. Any proposed changes will be designed with input from all parties.

Amendments to the long-term management plan shall be approved by the Corps in writing shall be required management components and shall be implemented by the land manager.

If the CDFG or USFWS determine, in writing, that continued implementation of the long-term management plan would jeopardize the continued existence of a state or federally listed species, any written amendment to this long-term management plan, determined by either the CDFG or USFWS as necessary to avoid jeopardy, shall be a required management component and shall be implemented by the land manager.

### **D. Notices**

Any notices regarding this long-term management plan shall be directed as follows:

Property Owner:

Three Rivers Levee Improvement Authority  
1114 Yuba Street, Suite 218  
Marysville, CA 95901  
Attn: Executive Director  
Telephone: (530) 749-7841  
Fax: (530) 749-6990

With a copy to:

Reclamation District 784  
1594 Broadway  
Arboga, CA 95961  
Olivehurst, CA 95961-8821  
Attn: General Manager  
Telephone: 530-682-0303  
Fax: 530-742-3021

Land Manager:

To be determined

Approving Agency:

U.S. Army Corps of Engineers  
Sacramento District  
1325 J Street, Room 1480  
Sacramento, CA 95814-2922  
Attn: Chief, Regulatory Branch

Telephone: (916) 557-6605  
Fax: (916) 557-6877

## **VI. Funding and Task Prioritization**

### **A. Funding**

The value of the Endowment Fund is based upon the costs necessary to manage the mitigation areas in perpetuity calculated using the Center for Natural Lands Management's Property Analysis Record (PAR) software. The PAR documenting the amount required for the Endowment Fund is provided in Attachment A. The accrued interest and earnings from the Endowment Fund shall be used exclusively to fund the permanent management and long-term maintenance of the mitigation areas.

The Endowment Fund shall remain as a permanent capital endowment to manage the mitigation areas consistent with this O&M Plan. The land manager may use interest and earnings from the Endowment Account to pay any costs and expenses reasonably incurred through the monitoring, maintenance, or long-term management, including, without limitation, property taxes, contracts, equipment or materials, and signage related to the management of the mitigation areas and consistent with the restrictive covenant.

The Endowment Fund obligations, the management obligations described in this O&M Plan and the obligations under the restrictive covenant shall continue in perpetuity as a covenant running with the land.

The Endowment Principal amount should not decrease in value through expenditure or investment strategy. The Endowment Principal amount is intended to increase in value to keep up with inflation. After the Endowment Principal is fully funded, if interest earnings are insufficient to increase the Endowment Principal to keep up with inflation, additional Endowment monies will be required from TRLIA.

Interest earnings beyond those necessary to provide for Endowment Principal growth commensurate with inflation will be made available to fund annual management of the mitigation areas in accordance with the terms of this O&M Plan.

Any Endowment Fund revenues (including earnings and interest) remaining after the Endowment Principal is adjusted for inflation that exceed the anticipated annual management expenses of the mitigation areas shall be retained in the Endowment Fund and may be made available to fund unexpected expenses and Adaptive Management needs.

If there is not sufficient funding available from the Endowment Fund interest and earnings or if O&M expenses exceed those estimated in the Endowment Fund Analysis and Schedule, the land manager shall consult with the Corps to identify the most effective means to implement the management measures and tasks with the resources available. After consultation with the Corps, the land manager shall submit the resulting proposal in writing to the Corps within 60 days after completion of its consultation with the Corps. Upon written approval of the Corps, the land manager shall implement the approved management measures and tasks.

The anticipated costs of long-term management for the mitigation areas include estimates of time and funding needed to conduct the basic monitoring site visits and reporting, weed mowing, and trash removal. The ongoing management funding is approximately \$19,363, therefore, with the current annual estimated capitalization rate of 4.5% the total endowment amount required will be \$430,289.

## **B. Task Prioritization**

Due to unforeseen circumstances, prioritization of tasks, including tasks resulting from new requirements, may be necessary if insufficient funding is available to accomplish all tasks. The land manager and the Corps shall discuss task priorities and funding availability to determine which tasks will be implemented. In general, tasks are prioritized in this order:

1. required by a local, state, or federal agency;
2. tasks necessary to maintain or remediate habitat quality; and
3. tasks that monitor resources, particularly if past monitoring has not shown downward trends.

Equipment and materials necessary to implement priority tasks will also be considered priorities. Final determination of task priorities in any given year of insufficient funding will be determined in consultation with the Corps and as authorized by the Corps in writing.

# **Attachment A**

## **Property Analysis Record**

## PROPERTY ANALYSIS RECORD

The Property Analysis Record (PAR) is a computerized database methodology and due diligence process for calculating the tasks and costs of conservation lands management. The PAR program allows the user to analyze the specific site characteristics and the requisite tasks and costs associated with managing the property in perpetuity. These tasks and costs are broken down into budgets and an endowment required to sustain the property.

The following is a list of assumptions used in calculating the expected costs and obligations of the mitigation sites. Any changes to the assumptions may result in changes to the estimated costs.

1. Title. TRLIA will initially hold fee title to the mitigation areas and will eventually transfer title to the State of California.
2. Restrictive Covenant: TRLIA will protect the mitigation areas with recordation of a restrictive covenant. For the purpose of this PAR, it is assumed that the land manager will be responsible for ensuring compliance with the restrictive covenant.
3. Timing of the Restrictive Covenant. The restrictive covenant will be recorded early in the restoration period (anticipated to be 2009/2010).
4. Conservation Easement Monitoring. Compliance monitoring will begin the first year the restrictive covenant is recorded and will continue in perpetuity.
5. Funding the Endowment. The endowment will be fully funded at the time construction is completed.
6. Initial and Capital Costs. The initial and capital costs associated with restoration and habitat establishment will be funded by TRLIA and are not included in the estimated endowment costs. The habitat establishment period is estimated to be 8 years after construction.
7. Habitat Establishment Maintenance and Monitoring. The restoration contractor, to be selected by TRLIA in the future, will conduct all restoration activities and perform all active management, monitoring and agency reporting, including land management responsibilities during Years 1-8.
8. Long-Term Land Manager Maintenance and Monitoring. TRLIA will identify the long-term land manager who will be responsible for long-term management, monitoring, and agency reporting. Possible long-term land managers include the State or third party non-profit entities approved by the Corps. During the first eight years of habitat establishment, the land manager will be responsible for compliance monitoring only. The long-term land management responsibilities during this time will fall under the habitat establishment responsibilities.

9. Mitigation Performance Standards and Success Criteria. TRLIA or TRLIA's designee is responsible for any replacement plantings required until such time as the Corps confirms that the mitigation responsibilities have been completed. Costs associated with any replanting needs have not been included in this PAR.
10. Access. The land manager will be assured permanent, practical access to the mitigation areas, including vehicular/equipment access to the floodplain drainage swale mitigation area.
11. Boundaries. TRLIA or its assigns will survey and mark legal boundaries of the mitigation areas prior to recording the restrictive covenant.
12. Public Use. There will be no general public access to the mitigation areas.
13. Fences and Gates. Fencing of the mitigation areas is not feasible because the mitigation areas are located within the floodway. TRLIA or its assigns will, however, install gates to limit public access to the waterside of the setback levee. The land manager will not be responsible for replacing gates.
14. Signs. TRLIA is not proposing to install the signs identifying the mitigation areas as sensitive wetland habitats because signs may attract unwanted interest in the mitigation areas.
15. Permit Requirements. For the purposes of this PAR, it was assumed that the maintenance, monitoring and reporting requirements as described in the November 2008, Habitat Mitigation and Monitoring Proposal/Plan (HMMP) and the November 2008, Long-term Operations and Maintenance Plan (O&M Plan) will generally be accepted by the Corps as the final requirements.
16. Special-Status Species. For the purposes of this PAR, it was assumed that there are no maintenance, monitoring and reporting requirements associated with special-status species. The Messick Lake and Floodplain Drainage Swale Mitigation Areas are being established to provide mitigation as required by the U.S. Army Corps of Engineers under the Clean Water Act Section 404 Individual Permit process. Although special status species may be present on the mitigation areas, such as special-status fish in the drainages and during flood events, the mitigation areas are not intended to provide special status species mitigation. If special status species move into the mitigation areas, they will be noted by the biologists and the land manager will manage the mitigation areas in accordance with state and federal laws in effect at that time.
17. Site Maintenance. For the purposes of this PAR, it was assumed that TRLIA or Reclamation District 784 will be responsible for site maintenance activities related to sediment deposition and flood events. These maintenance activities include dredging and possible removal of sediment from the floodplain drainage swale mitigation area to maintain floodwater conveyance, and possible removal of sediment from the Messick Lake mitigation area that may be needed to restore drainage and eliminate or reduce fish stranding concerns.

18. Water Management. For the purposes of this PAR, it was assumed that TRLIA or Reclamation District 784 will be responsible for removing woody vegetation and/or beaver dams that have the potential to cause ponding in the floodplain drainage swale.
19. Public Services and General Maintenance. Patrolling the mitigation areas is important for proactively limiting impacts caused by vandalism, arson, poaching or general overuse. Such misuse of the mitigation areas is likely to increase as residents begin to occupy the residential subdivisions near Olivehurst and Plumas Lake. The PAR includes a limited amount of time for coordination with the landowner, homeowners associations, volunteers and land managers of other conservation areas in the region. Costs to patrol the mitigation areas on a weekly or as-needed basis ARE NOT included in the PAR. The cost estimate to clear and dispose of litter assumes the land manager will only need to clear and dispose of litter twice a year.
20. Other Expenses. The PAR contains funds for the following categories necessary for conducting the management and monitoring tasks listed above.
  - a. Office Equipment. The PAR contains a share of rent, utilities, supplies, and equipment for maintaining a local office.
  - b. Field Equipment. This category includes vehicles costs as well as an allowance for general field equipment and uniforms. The applied mileage rate includes fuel, insurance, registration, depreciation, maintenance and replacement.
  - c. Operations. This category includes liability insurance, audits and staff training.
  - d. Contingency. The contingency amount is 10% of annual operating costs.
  - e. Administration. The costs of administering contracts, running payroll, benefits, accounting and other tasks in support of employees is included in this category. A 24% overhead rate (as a percentage of annual operational costs) was used.
  - f. Legal and Research/Development Funds. No funds have been included for a one-time contribution to a legal defense fund or a Research and Development Fund.

The PAR estimates the endowment account to cover on-going costs. The Endowment must be sufficient to provide income to cover the costs of managing the mitigation areas, inflation, and trust management fees in perpetuity.

Developing the PAR requires an assumption on the rate of return. All California state agencies, such as the California Department of Fish and Game, are restricted by law (CA State Government Code, Sec. 53600) to lower risk/lower return options than nonprofits. Endowments held by state agencies typically assume a capitalization rate of not more than 2.2% for their endowments. Endowments held by nonprofits can achieve a higher rate of return; therefore, it has been assumed that the endowment will be held by a nonprofit. Thus, an endowment held by a nonprofit is about half the amount needed for an endowment held by a state agency to yield the same annual earning to pay for the perpetual management of the mitigation areas.

The cost estimates in this PAR should be reviewed and approved by the land manager prior to finalizing the Endowment Fund.

# Section 9 - Ongoing Tasks and Costs

Property Title: TRLIA Messick Lake

Dataset: CA005

PAR ID: TRLIA

11/26/2008

Budget: PAR

Task list	Specifcaton	Unit	Number of Units	Cost / Unit	Annual Cost	Divide Years	Total Cost
<b>BIOTIC SURVEYS</b>							
Project Management	Supervise/coordinate	L. Hours	4.00	45.00	180.00	1	180.00
Plant Ecologist	Field Svy. & Reports	L. Hours	16.00	45.00	720.00	1	720.00
Wildlife Biologist	Field Svy. & Reports	L. Hours	16.00	45.00	720.00	1	720.00
Sub-Total							1,620.00
<b>HABITAT MAINTENANCE</b>							
Exotic Plant Control	Vegetation management	L. Hours	16.00	45.00	720.00	1	720.00
Other	Adaptive management	Year	1.00	2,500.00	2,500.00	5	500.00
Sub-Total							1,220.00
<b>PUBLIC SERVICES</b>							
Volunteer Coordinator	Meetings	L. Hours	8.00	45.00	360.00	1	360.00
Owner Contact	Meetings	L. Hours	8.00	45.00	360.00	1	360.00
Sub-Total							720.00
<b>GENERAL MAINTENANCE</b>							
Sanitation Control	Collection and disposal	L. Hours	12.00	30.00	360.00	1	360.00
Other	Dumping fee	Item	2.00	50.00	100.00	1	100.00
Sub-Total							460.00
<b>REPORTING</b>							
Database Management	Field data input	L. Hours	8.00	45.00	360.00	1	360.00
GIS/CAD Management	Data Management	L. Hours	8.00	45.00	360.00	1	360.00
Aerial Photo, 2 sets color	Digital Georeference	Item	1.00	500.00	500.00	5	100.00
Annual Reports	Annual Report	L. Hours	16.00	45.00	720.00	1	720.00
Report Production	Maps, Copying, Binding	Item	4.00	30.00	120.00	1	120.00
Sub-Total							1,660.00
<b>OFFICE MAINTENANCE</b>							
Administrative	Operations	L. Hours	16.00	45.00	720.00	1	720.00
Office Supplies, Year	Supplies, equipment, utilities	Year	1.00	500.00	500.00	1	500.00
Sub-Total							1,220.00

Task list	Specificaton	Unit	Number of Units	Cost / Unit	Annual Cost	Divide Years	Total Cost
<b>FIELD EQUIPMENT</b>							
GPS, Rover & Base Unit	GPS/Corrected	Item	0.50	250.00	125.00	5	25.00
Vehicle	Small pickup	Item	0.50	30,000.00	15,000.00	8	1,875.00
Vehicle	Gas, maintenance, etc.	Item	0.50	5,000.00	2,500.00	1	2,500.00
Camera 35mm/lens	Digital camera	Item	0.50	500.00	250.00	5	50.00
Binoculars	Binoculars 10 X 50	Pair	0.50	300.00	150.00	5	30.00
Sub-Total							4,480.00
<b>OPERATIONS</b>							
Audit	CPA Audit	Item	1.00	2,500.00	2,500.00	1	2,500.00
Insurance	Liability/Fee	Item	1.00	300.00	300.00	1	300.00
Insurance	Liability/Conserv. Easement	Acres	30.40	0.50	15.20	1	15.20
Sub-Total							2,815.20
<b>CONTINGENCY &amp; ADMINISTRATION</b>							
Contingency							1,419.52
Administration							3,747.53
Sub-Total							5,167.05
Total							19,362.25

# Section 10 - Financial Summary

Property Title: TRLIA Messick Lake

Dataset: CA005

PAR ID: TRLIA

11/26/2008

PAR(26 ac.)

	Rate %	Total \$
<b>INITIAL FINANCIAL REQUIREMENTS</b>		
I & C Revenue		0
I & C Management Costs		0
I & C Contingency Expense	10.00	0
Total I & C Management Costs		0
I & C Administrative Costs of Total I & C Management Costs	24.00	0
Total I & C Costs		0
Net I & C Management and Administrative Costs		0
 <b>ANNUAL ONGOING FINANCIAL REQUIREMENTS</b>		
Ongoing Costs		14,195
Ongoing Contingency Expense	10.00	1,420
Total Ongoing Management Costs		15,615
Ongoing Administrative Costs of Total Ongoing Management costs	24.00	3,748
Total Ongoing Costs		19,363
 <b>ENDOWMENT REQUIREMENTS FOR ONGOING STEWARDSHIP</b>		
Endowment to Provide Income of \$ 19,363		430,289
Endowment per Acre is \$ 16,486.		
Ongoing Management Costs Based on 4.50% of Endowment per Year.		
Ongoing Management Funding is \$ 19,363 per Year Resulting in \$742 per Acre per Year.		
 <b>TOTAL CONTRIBUTION</b>		 430,289