Sacramento Area Flood Control Agency

REQUEST FOR PROPOSALS (RFP)

RESPONSE TO QUESTIONS

ADDENDUM NO. 1

LAND MANAGEMENT MAINTENANCE SERVICES IN THE NATOMAS BASIN
RFP 2021-004

Date: September 17, 2021

Written Proposals Due: ..... September 24, 2021 - 2:00 p.m.

Submit Proposals Electronically to:

SAFCA
KC Sorgen
sorgenk@saccounty.net

Please cc: herediaj@saccounty.net

Office 916-874-7606
Fax 916-874-8289
1007 7th Street, 7th Floor
Sacramento, CA 95814-3407

RESPONSES TO WRITTEN QUESTIONS:

1. Is there the potential to split contracts?
    A. No.

2. What is the anticipated frequency of site visits/the estimated level of effort of the maintenance work?
    A. The frequency and level of effort can be determined by the contractor by reviewing the required maintenance in the riparian woodland, grassland, and managed marshes in the proposal and the estimated quantity per year in Exhibit B Cost Sheet.

3. Do any of the sites have a need for non-native fish removal?
    A. None listed currently.

4. Who will be responsible for management of water flows?
    A. The Maintenance Contractor.

5. Who will be responsible for payment for water supply?
    A. SAFCA.

6. Will the Brookfield Site be fully farmed and managed, or will only half be farmed?
    A. As discussed in the RFP under "Agriculture (Contingency Only Tasks)", if the Agricultural lease (RFP 2021-003) is filled for Brookfield, the site will be farmed and/or left fallow but will be the responsibility of the agricultural lessee. If no agricultural lease is filled for the Brookfield site, the responsibility for establishing a cover crop and all maintenance of the Brookfield fields will be the responsibility of the maintenance contractor.

7. What is the threshold for sediment removal on the managed marshes?
    A. *Sediment removal is expected to be needed once enough sediment has been accrued to make the flow through the system insufficient, and the site can no longer maintain the design conditions. Channels are designed to be around 4.5-6.5 feet deep. This removal is expected to occur every 5 to 10 years. Please use an annual quantity of 200 cubic yards per year, as shown in Exhibit B Cost Sheet.*

8. What are the GGS protocols for vegetation management on the managed marshes?
    A. The aquatic herbicide application is preferred to be applied October 1 to November 30, outside of giant garter snake active season. Grazing by goats and sheep can be used to trim without injuring GGS. Mowing, chopping, and trimming to 6-12 inches can be used to control vegetation, and the giant garter snake will likely retreat given sound of the human activity. Please see Chapter 6 of the Draft Managed Marsh SSMP document for full vegetation management protocols with mention of specific Giant Garter Snake protocols. Pre-maintenance surveys would be conducted by ESA or other SAFCA contractor.

9. What is the flooding regime on the managed marsh?
    A. *Proper depths of flooding should be maintained in the various types of marsh wetlands. Constant water depth of 4.5-6.5 feet in the open-water channel habitat areas restrict tule and cattail growth. Frequently fluctuating levels must be avoided to avoid vegetation encroachment and flooding seasonal marshes too long should be avoided for the same reason. Please see Section 6.1.1 of the Draft Managed Marsh SSMP management document for more information.*

10. What is the water source for the managed marsh, well or canal?
    A. *Water for the managed marsh habitats is supplied by canal surface water from the Riverside Canal, operated by NCMWC, during the irrigation season. When the Riverside Canal is not in operation, two on-site wells have been installed to provide water. Well water will occasionally be blended with surface water to the managed marshes, but full replacement of water in the ditch system by well water is expected to be rare. Please see Section 4.1.1 in the Draft Managed Marsh SSMP management document for more information.*

11. Is there an option to use spray treatment for weeds vs. mowing?
    A. *Yes, please see page 7 of the RFP.*

12. How many mowing events are you expecting?
    A. *On average 1-2 per year.*

13. Where shall the debris and sediment be moved to once removed from the channels in the marshes?
    A. *Debris and sediment removed will be placed on the upland area greater than 10 feet away from the bank or hauled to a suitable location and allowed to dry, if needed. Once dry, spoils will be placed in an appropriate on-site or off-site location determined by the assigned land manager. If sediment needs to be hauled off-site, SAFCA would negotiate with the contractor the time and materials cost for hauling off-site and this would be covered under contingency. Therefore, off-site disposal does not need to be included in the cost proposal.*

14. What percentage of cattails need to be removed from the Sharma and Natomas Farm West areas as well as within the delivery ditch?
    A. *As long as vegetation is not dominated by the cattails or tule, but instead by a variety of low stature marsh plants, no physical vegetation manipulation is likely needed along the waterline. If the stands become monotypic, or the cattails become dominant, maintenance will be needed following the methods described in the upland vegetation management Section 6.3 of the Draft SSMP to open up the seasonal marsh area. The need for cattail removal would be directed by the preserve manager and SAFCA.*

15. What line item on the cost sheet should the trash removal be listed under?
    A. *Rio Linda Elverta Recreation & Parks District is responsible for picking up any large trash items or household items on SAFCA managed lands and is not responsible for picking up small pieces of trash that could be characterized as general trash*

pickup. Under this maintenance contract, litter should be removed from any of the sites where it is encountered. The Cost Proposal has been modified to include small trash pickup labor cost on the cost sheet. The modified cost sheet is included as ***Attachment 1****; the addition of the general trash maintenance is shown in* ***bold italics shaded****.*

16. Can you clarify the correct average of mowing as the cost sheet and scope of work do not match?
    A. *Not all grasslands will be mowed every year. Between 75 and 163 acres of grasslands will be mowed in a given year. Therefore, a conservative estimate is 100 acres, as shown in Exhibit B Cost Sheet.*

17. Can you verify numbers provided on the Exhibit B. Cost Sheet?
    A. *The estimated quantity per year are the best estimates for anticipated maintenance needs.*

18. What line item should the cattail removal be listed under?
    A. *Noxious weed treatments.*

19. Why is the management of these properties being transferred from TNBC to SAFCA?
    A. *The properties are owned by SAFCA and therefore their management is ultimately the responsibility of SAFCA.*

20. Who is the current land management maintenance contractor?
    A. *There is no current land maintenance contractor under contract to SAFCA.*

21. What is the current annual budget with the current land management maintenance contractor?
    A. *SAFCA does not currently have a land maintenance contractor covering the scope of activities within this Land Maintenance RFP.*

22. Is there an existing preserve manager who manages the water levels (i.e., input) or are the water levels managed by the land management maintenance contractor working with ESA?
    A. *The current maintenance contractor manages the water levels, with input from the land manager and SAFCA.*

23. Pricing for Irrigation maintenance and operation
    A. *The riparian woodlands are no longer irrigated, so there is no maintenance or operation of an irrigation system. Agriculture producers have the responsibility for irrigation of the crops they grow, under the agricultural lease. The Cost Proposal has been modified to include water management (marsh) labor cost on the cost sheet. The modified cost sheet is included as* ***Attachment 1****; the addition of the water management (marsh) is shown in* ***bold italics shaded****.*

24. Pricing for removal of dead and dying trees?
    A. *If there is tree removal it would be covered under the cost of contingency. SAFCA does not anticipate needing to remove trees unless they are hazardous. Even dead trees can provide habitat value, so in the rare instance that a dead tree is a fire hazard or other hazard the cost of removal would be covered under contingency.*

25. Pricing for general site maintenance?
    A. *All activities have been outlined in the RFP and cost sheet. Anything remaining would be covered under contingency.*

26. Pricing for browse protection cage maintenance?
    A. *Very few browse protection cages, if any, remain in the woodlands, and all trees are mature enough to withstand browsing. Therefore, the need for removal of browse cages is unlikely, and would be conducted as needed, under contingency.*

27. Pricing for water management?
    A. *Water management (marsh) labor cost has been added to the modified cost sheet (**Attachment 1**) as a modification to Exhibit B Cost Proposal. SAFCA covers the cost for water to the managed marshes.*

COST PROPOSAL:

1. Exhibit B Cost Proposal has been modified. Additions are shown in ***bold italics shaded***. The revised Cost Proposal is included as **Attachment 1** and shall be used for the Proposal.

PRE-PROPOSAL SITE VISIT ATTENDANCE LIST:

1. The pre-proposal site visit attendance list is included as **Attachment 2**.

DRAFT SITE-SPECIFIC MANAGEMENT PLAN (SSMP):

1. The DRAFT SSMP for the Managed Marsh Habitats at the Sharma and Natomas Farms West Properties is included at **Attachment 3**.

ATTACHMENT 1

Exhibit B. Cost Sheet

Activity	Estimated Quantity per Year	Unit	Unit Cost	Total Cost
Mowing	100	Acre	$	$
Disking	30	Acre	$	$
Fence Maintenance	2,500	Feet	$	$
Gate Maintenance	5	Each	$	$
Sediment removal (Marsh)	200	Cubic Yard	$	$
Road grading	20,000	Feet	$	$
Water management (Marsh)	***4***	***Events***	***$***	***$***
General Trash pickup	***16***	***Hours***	***$***	***$***
Woody plant removal (Marsh)	100	Feet	$	$
Noxious weed treatments	60	Acre	$	$
Agriculture - Cover Crop (Contingent)	90	Acre	$	$
Agriculture – Harvest/Mow (Contingent)	90	Acre	$	$
Agriculture – Noxious Weeding (Contingent)	90	Acre	$	$
Subtotal				$
10% General Contingency				$
Total Annual Contract Budget				$
3-year Contract Budget (Total Annual Contract Budget multiplied by 3)				$

Attachment 2

9/9/2021 1347

Maintenance RFP Meeting

KC Sorglen, SAFCA

Amanda Segura-Moon, ESA

Emily Dorrance, ESA

Josh Waddell River Partners

Jessica Johnston Triangle Properties, Inc.

Ralph Vigil Hanford ARC

Ruben Reynoso T&R Riparin Restore

Philip Brownsey, ESA

KC: Revieved time line

summary of Maintenance needs

Ag contingency

Grassland

Riparian Marsh

Riparian Woodland

Attachment 3

Draft Site-Specific Management Plan

Managed Marsh Habitats at the Sharma and Natomas Farms West Properties

Prepared for:

Sacramento Area Flood Control Agency

SAFCA

September 2021

Prepared by:

GEI Consultants

Consulting Engineers and Scientists

Draft Site-Specific Management Plan

Managed Marsh Habitats at the Sharma and Natomas Farms West Properties

Prepared for:

Sacramento Area Flood Control Agency
1007 7th Street, 7th Floor
Sacramento, CA 95814
(916) 874-7606

Prepared by:

GEI Consultants, Inc.
2868 Prospect Park Drive, Suite 400
Sacramento, CA 95670

Contact:

Vance Howard
Project Manager
(916) 921-4933

September 2021

Project No. 1602400.3

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Tables

Figures

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Abbreviations and Acronyms

APN	Assessor Parcel Number
BEMP	*Biological Effectiveness Monitoring Program*
CDFG 2012 Staff Report	California Department of Fish and Game's 2012 *Staff Report on Burrowing Owl Mitigation*
CDFW	California Department of Fish and Wildlife
CE Holder	Conservation Easement Holder
Central Valley RWQCB	Central Valley Regional Water Quality Control Board
LTMP	*Long-Term Management Plan*
MMP	*Mitigation and Monitoring Plan*
Natomas Basin HCP	Natomas Basin Habitat Conservation Plan
NCMWC	Natomas Central Mutual Water Company
NLIP	Natomas Levee Improvement Program
PCA	Pest Control Advisor
Project	Landside Improvements Project
RD 1000	Reclamation District Number 1000
Sacramento-Yolo MVCD	Sacramento-Yolo Mosquito Vector Control District
SAFCA	Sacramento Area Flood Control Agency
SSMP	site-specific management plan
State	State of California
TNBC	The Natomas Basin Conservancy
U.S.	United States
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
WSE	water surface elevation

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Chapter 1. Introduction

This site-specific management plan (SSMP) has been prepared for the Sacramento Area Flood Control Agency (SAFCA), and it provides guidance for the long-term maintenance and monitoring activities for two of the managed marshes at the Fisherman's Lake area that SAFCA constructed during Phase 4a of the Natomas Levee Improvement Program (NLIP) Landside Improvements Project (Project). These managed marsh habitats provide compensatory mitigation for impacts to jurisdictional wetland and water features (which are regulated by the U.S. Army Corps of Engineers [USACE] and the Central Valley Regional Water Quality Control Board [Central Valley RWQCB]) from NLIP Phases 3b and 4a, as well as compensation for permanent impacts to giant garter snake *(Thamnophis gigas)* aquatic, rice, and upland habitats (which is regulated by the U.S. Fish and Wildlife Service [USFWS] and California Department of Fish and Wildlife [CDFW]) from all NLIP Project phases. These managed marsh habitats are located on portions of the Sharma site and on the Natomas Farms West site (**Figure 1-1**). This SSMP was prepared as a stand-alone document, and it will also be included as an appendix to the *NLIP Landside Improvements Project Programmatic Long-Term Management Plan* (LTMP) (SAFCA 2021a). This SSMP will also assist the USACE in demonstrating compliance with mitigation requirements under the Federal Natomas Basin Project.

For NLIP obligations, implementation of this SSMP must adhere to the requirements of the LTMP, applicable Conservation Easement(s), and applicable management contract(s) between SAFCA and the assigned land manager. Both the LTMP and this SSMP have been developed to align with and support implementation of the Natomas Basin Habitat Conservation Plan (Natomas Basin HCP) (City of Sacramento, Sutter County, and The Natomas Basin Conservancy 2003), and to integrate the habitat benefits of these sites with the Natomas Basin HCP.

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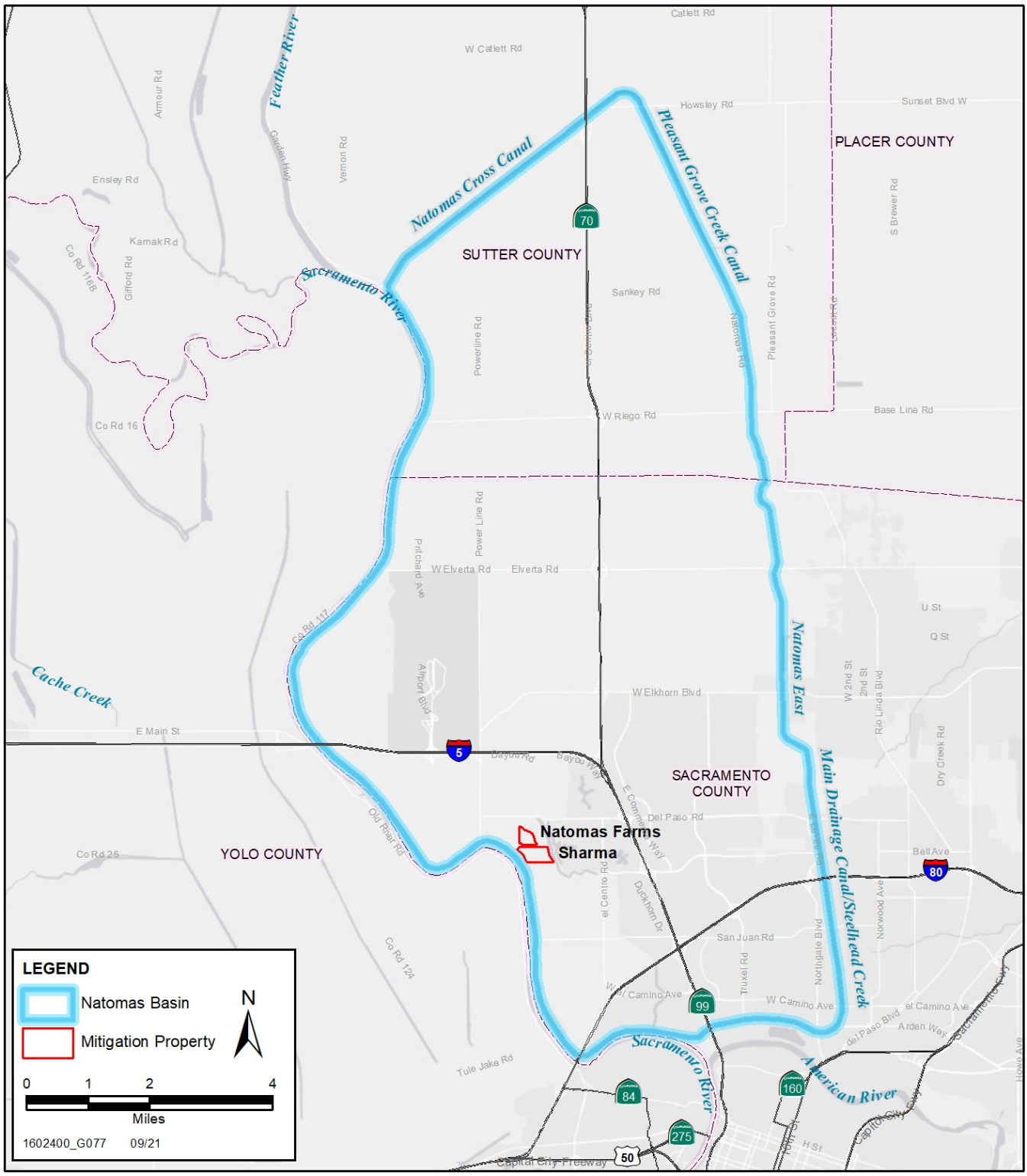
Figure 1-1. Sharma and Natomas Farms West Properties Locations



Source GEI Consultants, Inc. 2021

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Chapter 2. Site Description

The NLIP Project is located in northeastern Sacramento County and southern Sutter County, encompassing the flood risk reduction facilities surrounding the Natomas Basin (see **Figure 1-1**). The NLIP Project consisted of four phases of construction, which began in 2007 and were completed in 2014. Each phase of the NLIP Project included the establishment, enhancement, and preservation of various habitat types to compensate for unavoidable impacts to covered species and covered habitats, and to conserve and protect waters of the United States (U.S.) and the State of California (State).

During construction of Phase 4a of the NLIP Project, approximately 87 acres of managed marsh habitat were established and protected on portions of the Sharma property and the Natomas Farms West property. This SSMP describes long-term management strategies for the managed marsh habitat at two of those three properties. **Figure 2-1** shows the Sharma and Natomas Farms West properties' managed marsh habitats, the irrigation supply canals and turnouts, wells, and adjacent agricultural croplands and habitat reserves. The Phase 4a Mitigation and Monitoring Plan (MMP)*: NLIP Landside Improvements Project Phase 4a Final Mitigation and Monitoring Plan* (SAFCA 2011) describes the design, planting palettes, and interim monitoring and management activities for these managed marsh habitats. This SSMP reflects the as-constructed configuration (see as-built designs presented in the site-specific project plans in **Appendix A**, attached hereto) and anticipated operation of the managed marsh habitats.

These managed marsh habitats will be protected in perpetuity by Conservation Easements (see **Figures 2-2** and **2-3**). Each of the sites have a designated upland buffer around the perimeter of the managed marsh habitat complexes. These buffers separate the managed marsh habitats from adjacent land uses, which may include construction and mitigation activities associated with the NLIP Phase 4b project and/or implementation of the Natomas Basin HCP.

The Sharma property is an approximately 87-acre parcel located along the Sacramento River east levee, in the southwest area of the Natomas Basin (see **Figure 1-1**). Approximately 50.4 acres of the property are preserved as managed marsh habitat, for giant garter snake habitat (Sacramento County APN 225-0090-067); this is identified as Area 2 on the plat of the Conservation Easement boundaries (**Figure 2-2**). Approximately 19.5 acres of the property are preserved as agricultural Swainson's hawk foraging habitat and managed under a separate SSMP (SAFCA 2021b). The remainder of the property will be utilized for flood risk reduction features, canals, conservation easement buffers, and utility corridors. The Sharma managed marsh habitat is bordered on the north by Kimura Ditch, on the west by preserved agricultural Swainson's hawk foraging habitat, on the south by the Pumping Plant No. 3 Intake Channel, and on the east by the West Drainage Canal/Fisherman's Lake. Land use on adjacent properties to the north and south is primarily managed marsh habitat – the managed marsh associated with both SAFCA's Natomas Farms West property and TNBC's Natomas Farms East Reserve, and the AKT property managed marsh, respectively. Water is provided to the site via turnouts from the Kimura Ditch, which receives water from either the Riverside Canal (operated by NCMWC) or an on-site well operated by TNBC; tail water is discharged into the Pumping Plant No. 3 Intake Channel, which is managed by RD 1000 (**Figure 2-4**).

The Natomas Farms West property is an approximately 41-acre parcel located along the Sacramento River east levee, in the southwest area of the Natomas Basin (see **Figure 1-1**). Approximately 36.5 acres of the property will be preserved as managed marsh habitat, for giant garter snake habitat (Sacramento County

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APN 225-0090-079); this is identified on the plat of the Conservation Easement boundaries (**Figure 2-3**). The remainder of the property will be utilized for canals, conservation easement buffers, and utility corridors. The Natomas Farms West managed marsh habitat is bordered on the north and east by the TNBC Recirculation Ditch, on the west by preserved agricultural Swainson's hawk foraging habitat (associated with TNBC's Souza Reserve), and on the south by the Kimura Ditch and TNBC Supply Channel. Land use on adjacent properties to the north and east is primarily managed marsh (associated with TNBC's Natomas Farms Reserve), and to the west is preserved agricultural Swainson's hawk foraging habitat (associated with TNBC's Souza Reserve), and to the south is the Sharma property managed marsh habitat. Water is provided to the site via turnouts from the TNBC Supply Channel (operated by TNBC), which receives water from either the Riverside Canal (operated by NCMWC) the TNBC Souza Well or a well located on the Sharma property (operated by TNBC); tail water is discharged into the TNBC Recirculation Ditch, also managed by TNBC (**Figure 2-5**).

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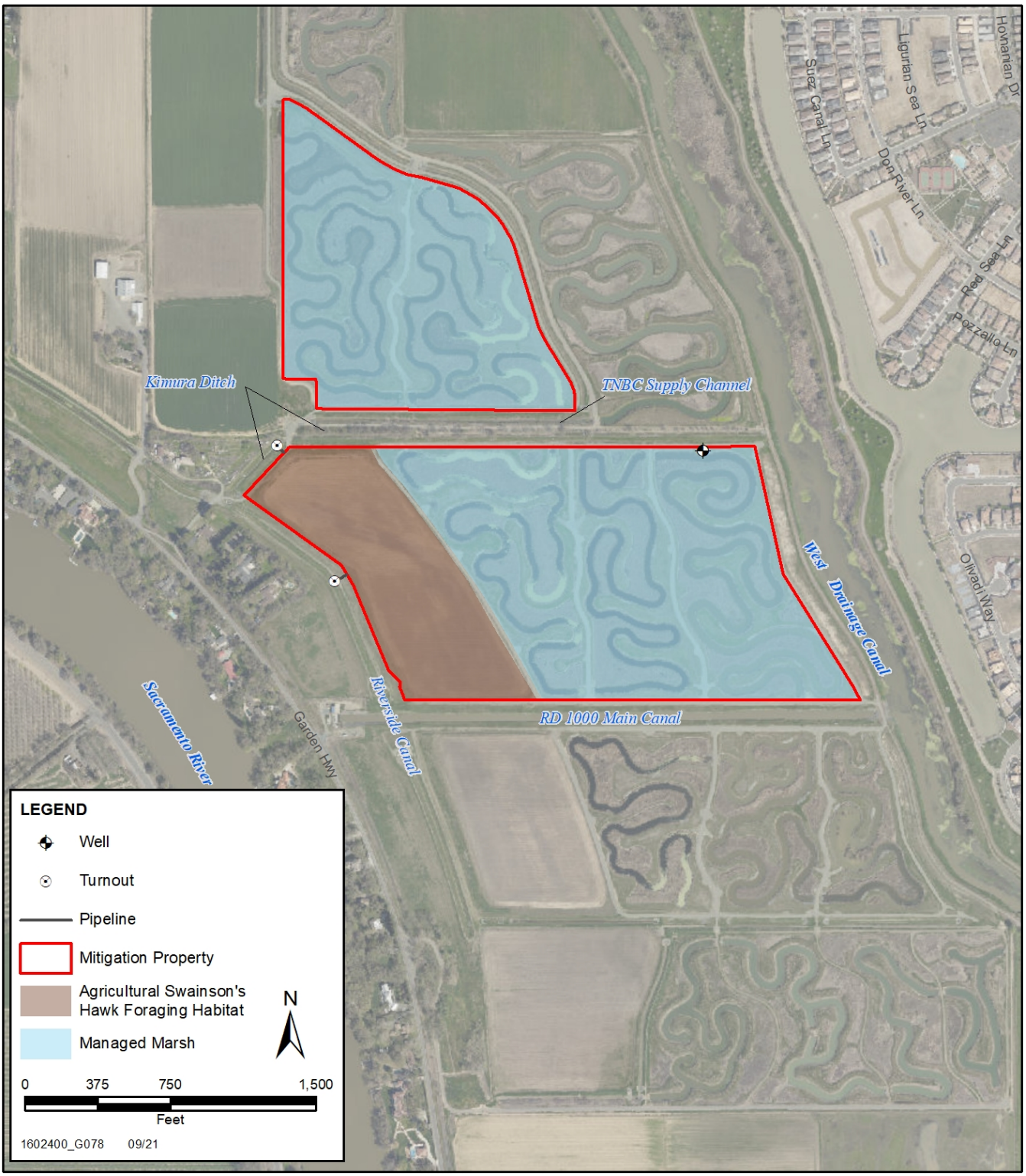
Figure 2-1. Sharma and Natomas Farms West Properties Land Cover and Vicinity



Source GEI Consultants, Inc. 2021

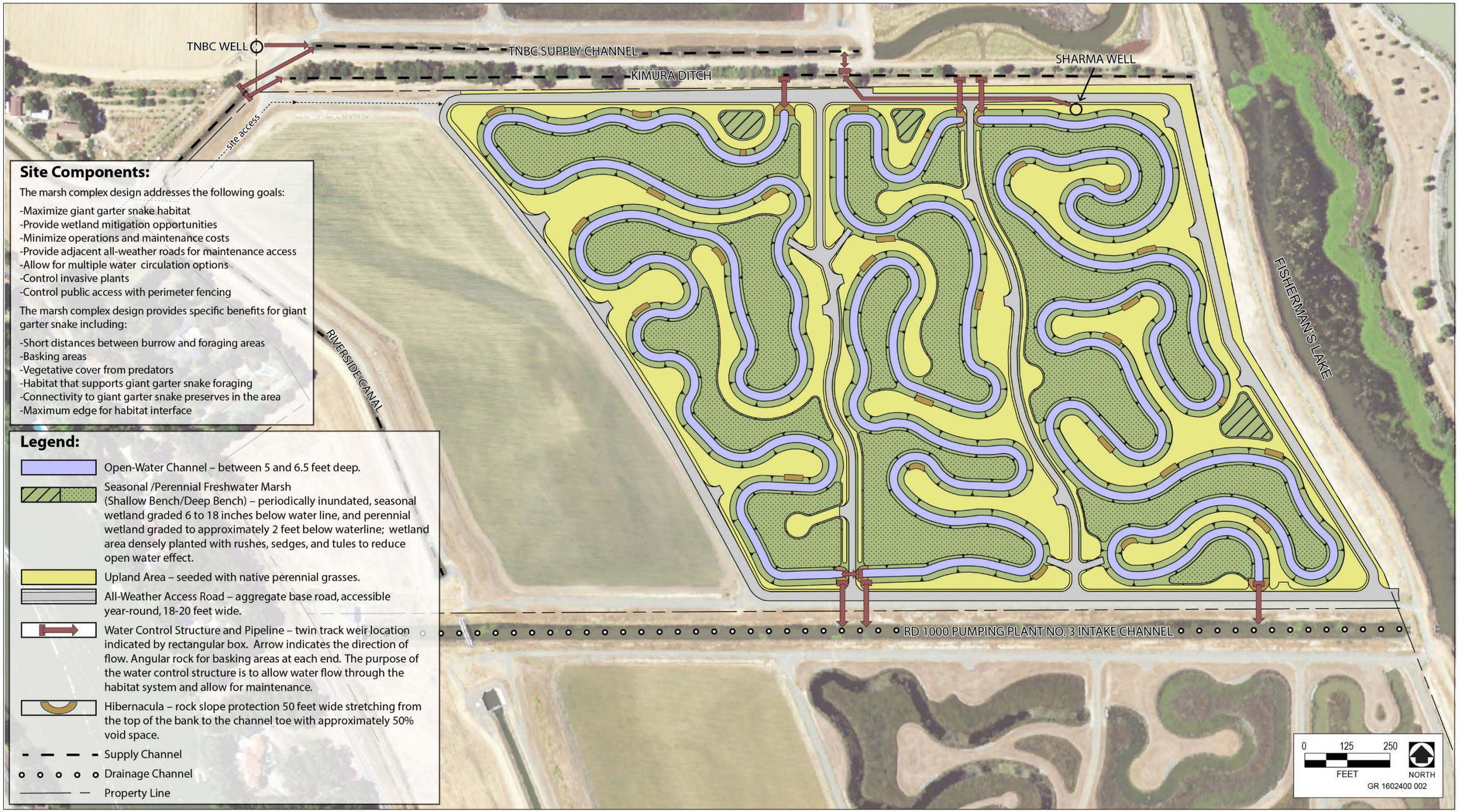
Figure 2-2. Sharma Conservation Easement Area

Source PSOMAS 2016

Figure 2-3. Natomas Farms West Conservation Easement Area

Source PSOMAS 2016

Figure 2-4. Managed Marsh Complex: Sharma Property



Source: Prepared by AECOM 2011 based on Bid Set Plans produced by Mead & Hunt on February 18, 2011; adapted by GEI Consultants, Inc. 2018

Figure 2-5. Managed Marsh Complex: Natomas Farms West Property

Source: Prepared by AECOM 2011 based on Bid Set Plans produced by Mead & Hunt on February 18, 2011; adapted by GEI Consultants, Inc. 2018

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Chapter 3. Responsibilities

This Chapter identifies and provides contact information for the landowner and assigned land manager responsible for maintaining and monitoring, in perpetuity, the Sharma and Natomas Farms West managed marsh habitats. This Chapter also describes the landowner's, assigned land manager's, conservation easement holder's (CE Holder), and third-party beneficiaries' responsibilities as set forth in the associated Conservation Easements and management contract(s) for these properties.

3.1 Landowner and Assigned Land Manager Responsibilities

SAFCA is the owner of the Sharma and Natomas Farms West properties and remains the primary agency responsible for compliance with the LTMP (SAFCA 2021a) and this SMMP.

In accordance with the conditions identified and negotiated in regulatory permits that allowed SAFCA to execute the NLIP, SAFCA will enter into a management contract with the assigned land manager that specifies commitments to the long-term management and monitoring guidelines described in the LTMP and this SSMP. Until 2038, SAFCA will be directly funding a maintenance contractor to conduct the field activities and an assigned land manager to conduct oversight of the Sharma and Natomas Farms West managed marsh habitats. After this date, management will be funded by the endowment provided by SAFCA.

The managed marsh habitats will be managed in a manner that maximizes habitat suitability and minimizes potential for giant garter snake injury and mortality. Monitoring and management of these habitats will also be consistent with the mechanisms described in the Natomas Basin HCP. The assigned land manager will operate and maintain the Sharma and Natomas Farms West managed marsh habitats in accordance with the terms, conditions, and restrictions of the Conservation Easements, the LTMP, and this SSMP.

3.1.1 Landowner

Sacramento Area Flood Control Agency
1007 Seventh Street, Seventh Floor
Sacramento, CA 95814
(916) 874-7606

3.1.2 Assigned Land Manager

To be determined by 2022.

3.2 Conservation Easement Holder Responsibilities

SAFCA will grant perpetual Conservation Easements over the managed marsh habitat portions of the properties to an agency-approved entity. The CE Holder will be responsible for monitoring the managed

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marsh habitats for compliance with the terms and conditions of the Conservation Easements (see **Figures 2-2** and **2-3**).

3.2.1 Conservation Easement Holder

To be determined

3.3 Third-Party Beneficiary Responsibilities

The USFWS, CDFW, and USACE (collectively, the "Regulatory Agencies") may be signatory to the Conservation Easements, and, thus, may act as third-party beneficiaries. As such, they may work with the landowner and assigned land manager to ensure that the terms, conditions, and restrictions of the Conservation Easements, the LTMP, and this SSMP are implemented accordingly.

3.3.1 Third-Party Beneficiaries

U.S. Fish and Wildlife Service
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, CA 95825
Contact: Deputy Field Supervisor
(916) 414-6600

California Department of Fish and Wildlife
North Central Region
1701 Nimbus Road
Rancho Cordova, CA 95670
Attn: Regional Manager
Telephone: (916) 358-2899
Fax: (916) 358-2912

U.S. Army Corps of Engineers
Sacramento District
1325 J Street, Room 1480
Sacramento, CA 95814-2922
Attn: Chief, Regulatory Division
Telephone: (916) 557-5250
Fax: (916) 557-6877

3.4 Dispute Resolution

If a dispute arises between the landowner, assigned land manager, and/or CE Holder concerning the consistency of any past, ongoing or proposed activity on the Sharma and Natomas Farms West managed marsh habitats, an attempt to resolve the dispute shall be made following the mediation procedures agreed to in the Conservation Easements for the Sharma and Natomas Farms West properties, and/or the management contract(s).

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Chapter 4. Desired Habitat Functions and Conditions

To compensate for loss of giant garter snake habitat (regulated by the USFWS and CDFW from all phases of the NLIP) and loss of jurisdictional wetland and water features (regulated by the USACE and the Central Valley RWQCB from Phases 3b and 4a of the NLIP), approximately 121 acres of managed marsh habitat were created at the AKT, Sharma, and Natomas Farms West properties during Phase 4a; a separate SSMP has been prepared for the 34.1-acre AKT managed marsh site. The associated permits/authorizations for NLIP Phases 2 – 4a specified, in accordance with the NLIP conservation strategy, that approximately 46 acres of managed marsh be created as mitigation to offset permanent impacts to the giant garter snake habitat; this acreage suffices to provide the approximately 42.8 acres of compensatory mitigation required by the USACE's permit to offset permanent impacts to Waters of the U.S. SAFCA acquired these three properties, which are located in the Fisherman's Lake area, for the dual purpose of extracting borrow material for levee construction and creating the managed marsh complex to provide compensation for giant garter snake habitat and wetlands and waters. These two sites were selected for their proximity to each other and adjacency to Fisherman's Lake and existing TNBC-managed wetland reserves. These two sites and the two adjacent TNBC-managed wetland reserves (i.e., the TNBC's Cummings Reserve, located south of the AKT property, and the TNBC's Natomas Farms East Reserve, located north and east of the Natomas Farms West property – which total approximately 114 acres) are designed to be managed consistently, providing approximately 235 acres of contiguous giant garter snake habitat.

In addition to providing giant garter snake habitat, the managed marsh habitats and their water supply and drainage channels are designed to improve water quality in existing TNBC-managed wetland reserves and Fisherman's Lake. Water in the two managed marsh habitats and the existing TNBC-managed wetland reserves are designed to provide water management flexibility, improved circulation, and variable uses of multiple, redundant water sources. Water quality in Fisherman's Lake directly affects water quality in the managed marshes and wetland reserves during the irrigation season because water for the managed marshes and wetland reserves is supplied by the Riverside Canal, which pulls water from Fisherman's Lake through RD 1000's Pumping Plant No. 3 Intake Channel. The managed marshes on the Sharma property discharges directly into the Pumping Plant No. 3 Intake Channel, creating a relatively closed system. However, the managed marsh on the Natomas Farms West property and TNBC's Natomas Farms East Reserve discharge to the TNBC Recirculation Ditch, which delivers the water to the upstream end of Fisherman's Lake, improving flow and water quality in Fisherman's Lake.

4.1 Habitat Description

The managed marsh habitats were designed to include a mix of open-water channels, seasonal and perennial marsh wetlands (shallow and deep benches), and uplands to provide habitat for giant garter snake foraging, basking, and refugia (see **Figures 2-4** and **2-5**). Aquatic habitats (open-water channels and marsh wetlands) cover approximately 68% of these managed marsh habitats, and the remaining approximately 32% is associated uplands (native perennial grassland and maintenance roads). **Table 4-1** provides the approximate acres of each habitat type for the three managed marsh habitats. The deep open-water channels are designed to be maintained free of emergent and submergent vegetation. The

wetlands consist of the banks along the open-water channel and inundated shallow benches, and are planted with a mix of native tules, sedges, and rushes. The uplands are planted with a mix of native perennial grasses.

Table 4-1. Estimated Preserved Managed Marsh Habitat Acreages at Sharma and Natomas Farms West Properties

	Habitat Type (Acres)			
Site	Open-Water Channel	Perennial and Seasonal Freshwater Marsh Wetlands	Upland	Total Acres
Sharma	14.9	19.2	16.3	50.4
Natomas Farms West	11.5	15.2	9.8	36.5
Total Acres	**26.4**	**34.4**	**26.1**	**86.9**
Percent of Total	30.4%	39.6%	30.0%	100%

Source: Appendix K: Wetland Delineation Maps and Data of the Natomas Levee Improvement Program Landside Improvements Project 2018 Annual Mitigation Monitoring Report (SAFCA 2019)

Artificial giant garter snake hibernacula (rock structures keyed into the bank) have been constructed on the banks of the open-water channels and wetland benches interspersed throughout the sites approximately every 300 – 1,200 feet (see **Figures 2-4** and **2-5**). Each hibernacula is approximately 50 feet long and extends from the top of the bank to below the waterline.

4.1.1 Water Delivery, Drainage, and Recirculation Plan

The Sharma managed marsh site is comprised of three individual wetland units; the Natomas Farms West managed marsh site is comprised of two individual wetland units. Dividing each managed marsh site into multiple units allows for greater flexibility for management of water levels and flushing flows to maintain desired water quality and habitat conditions and to accommodate maintenance activities, such as aquatic weed control or sediment removal. Each wetland unit has separate water level control structures and the ability to raise or lower water levels independently, or to receive fresh inflow from one or more water source locations. Wetland units are separated by an elevated upland corridor with a maintenance access road along the length of each unit (**Figures 2-4** and **2-5**).

Water Delivery

Water for managed marsh habitats is supplied by canal surface water originating from Riverside Canal during the irrigation season. On-site wells have been installed to provide water when the Riverside Canal is not in operation.

Groundwater Wells

Two new wells were installed: one well at the northwest corner of the TNBC Cummings Reserve, to the south of the AKT property, and the second to the north of the Sharma property (**Figure 2-1**). Well water will occasionally be blended with surface water supplied by a gravity ditch system to the managed marsh habitats, including the two TNBC managed marsh reserves. Full replacement of water in the ditch system by well water is expected to be rare, and would likely only happen when the entire site experiences a shortfall of surface water for management purposes generally.

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Facilities for Surface Water Supply

Surface water is provided via the Riverside Canal, which is operated by the NCMWC. The Kimura Ditch is a lateral canal that extends from Riverside Canal along the north side of the Sharma property and supplies water to the Sharma managed marsh through three water control structures (**Figure 2-4**). The TNBC Supply Channel is a lateral canal that extends parallel to the Kimura Ditch along the south side of the Natomas Farms West property and supplies water to both the Natomas Farms West property and the TNBC Natomas Farms East Reserve managed marshes through three water control structures (**Figure 2-5**).

Drainage and Recirculation

Recirculation throughout the Fisherman's Lake area is improved by an overall increase in water supply and drainage capacity during periods of high demand, and an improved ability to circulate water throughout the area to eliminate anaerobic conditions which commonly occur in late summer. Managed marsh habitats at the Sharma and Natomas Farms West properties have been constructed to have flexible and redundant drainage capabilities, draining into the Pumping Plant No. 3 Intake Channel or into the TNBC Recirculation Ditch (which discharges to the upstream end of Fisherman's Lake). Excess water in the Kimura Ditch drains directly into Fisherman's Lake. The advantage of direct drains is to boost the circulation and quality of water in Fisherman's Lake as water quality in the lake suffers from urban area run-off and inadequate through-flow following crop harvest season after irrigation water demand and field drainage trails off.

4.2 Habitat Objectives and Viability

Monitoring and management of the managed marsh habitats is intended to support the goals and objectives of the Natomas Basin HCP (City of Sacramento, Sutter County, and The Natomas Basin Conservancy 2003). The Natomas Basin HCP sets forth, in Section I.C.1, conservation objectives for giant garter snakes and other covered species dependent on similar habitat in the Natomas Basin. The Natomas Basin HCP conservation strategy for giant garter snake and other wetland-associated species, such as the northwestern pond turtle *(Emys marmorata marmorata)*, is discussed in Section IV.C.3. Consistent with this strategy, the managed marshes have been designed to support the long-term integrity of the Natomas Basin giant garter snake population by expanding and consolidating habitat for this species in the vicinity of Fisherman's Lake.

The Sharma and Natomas Farms West managed marsh habitats, which are designed in part to provide sustainable habitat for the giant garter snake, are made up of two hydrologically connected managed marsh sites that are adjacent to two existing TNBC-managed wetland reserves, providing an aggregated ecosystem complex of approximately 201 acres of contiguous giant garter snake habitat. The design of each managed marsh site is unique, based on the size and shape of the property and the alignment of water supply and drainage facilities and maintenance road connections to proposed adjacent managed marsh sites or existing TNBC-managed wetland reserves. However, the design of each managed marsh site is based on a set of common design guidelines and habitat objectives.

During the snake's active season, water depth in the open-water channels will be maintained at approximately 4.5 to 6.5 feet to preserve the open-water feature of the channel (except in where a marsh cell is temporarily drained for maintenance or repair, as described in Chapter 5, "Open Water Channel and Marsh Wetland Maintenance Activities") to minimize growth of tules, cattails, and submerged aquatic weeds in the bottom of the channel and to buffer diurnal water temperature fluctuations. Seasonal wetland and tule marsh vegetation will be maintained in the seasonal wetland benches and at

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the waterline on the banks between the open-water channels and the uplands. Upper banks and upland areas will be maintained as native perennial grasslands.

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Chapter 5. Open-Water Channel and Marsh Wetland Maintenance Activities

The assigned land manager will have the primary responsibility for routine maintenance activities at the two managed marsh habitats. In any given year, these activities will include open-water channel and marsh maintenance activities (discussed in this Chapter; see also **Table 5-1**), vegetation management and invasive weed control activities (discussed in Chapter 6, "Vegetation Management and Invasive Weed Control Activities" of this SSMP), and other site management activities (discussed in Chapter 7, "Other Site Management Activities" of this SSMP). The intent of these maintenance activities is to maintain the desired functions and conditions of the managed marsh habitats, as described in Chapter 4, "Desired Habitat Functions and Conditions." The implementation, frequency, and timing of the routine maintenance activities described in Chapters 5 – 7 of this SSMP are designed to have negligible or beneficial impacts to giant garter snakes, northwestern pond turtles, and Swainson's hawks. The additional conservation measures described in Chapter 8, "Conservation Measures to Avoid or Minimize Potential Impacts to Species," are designed to also ensure negligible impacts to burrowing owls *(Athene cunicularia)* and tricolored blackbirds *(Agelaius tricolor)*.

Table 5-1. Summary of Open-Water Channel and Marsh Wetland Maintenance Activities at Sharma and Natomas Farms West Properties

Activity	Prescription	Anticipated Frequency	Anticipated Timing
Water Level Management	Maintain depth in open water channels at 4.5 – 6.5 feet	Maintained daily	Year round
	Maintain depth in perennial marsh at 2 feet	Maintained daily	Year round
	Maintain depth in seasonal marsh at 0.5 – 1.5 feet	Seasonally maintained	May to October
Debris and Sediment Removal in Open Water Channels	Dewater one unit at a time; Use excavator operating from upland area; Place debris on upland ≥10 feet from bank; Conduct preconstruction survey and erosion control materials	Once every 5 – 10 years	October to May is preferred, but May to October if conducted under dewatered conditions
Channel Bank Repair	Dewater one unit at a time; Conduct preconstruction survey and erosion control materials	Infrequent (i.e., one project every 10 years) and small scale (10 to 100 linear feet)	October to May is preferred, but May to October if conducted under dewatered conditions

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5.1 Water Level Management and Water Supply

5.1.1 Depth, Duration, and Timing of Water Application

Management of water depth, duration, and timing within the managed marshes is necessary to support development of the desired mosaic of habitats designed for giant garter snake and other covered species that use the managed marsh habitats (TNBC 2003). Water is necessary to support vegetation growth that provide habitat structure in which marsh birds may nest, and along which giant garter snake may move as well as support aquatic organisms upon which giant garter snake and other marsh species prey. Water management presented below is based on guidance from TNBC Management Plan (TNBC 2003) and lessons learned by the contractor that planted and managed the marshes during the establishment phase (see **Appendix B** "Water Management Summary").

During the irrigation season (approximately April – October), water for the managed marsh habitats will be distributed via the NCMWC irrigation canal system, diverted from the Riverside Canal into lateral canals, and then released at controlled inlets into the managed marsh sites (see **Figures 2-4** and **2-5**). During the giant garter snake active season (approximately May to October), water depth in the open-water channels is designed to be at 4.5 to 6.5 feet to preserve the open-water feature of the channels by minimizing growth of submerged aquatic weeds and limiting growth of tules to the shallow banks to maintain desired flow capacity and water quality. In areas that are more shallowly flooded (i.e., less than 2 feet), tules and cattails will thrive, and can form dense patches. Water depth in the perennial marshes is designed to be approximately 2 feet deep; seasonal marshes, which are designed to be dry during most of the growing season, are targeted to support low-growing, seed-bearing wetland plants and are designed to have a water depth of 0.5 to 1.5 feet.

While perennial marsh and open-water habitats are flooded year-round, the timing of marsh flood and drawdown is a critical management tool for seasonal marshes. Generally, summer water levels should be maintained with an average of about 1 foot of water above tule benches and winter water levels should be maintained with an average of about 2 feet of water above tule benches. Water is typically supplied in the summer months (April-October) by the NCMWC. In winter, (November-March) water can be supplied through the use of ground water wells if water from NCMWC is unavailable. Water levels to all wetland cells are managed through the use of gate valves and check boards at inlets and check boards at outlets.

5.1.2 Water Level Control

Because water level management is crucial to vegetation development and management, water control structures constructed to hold water must be maintained to facilitate effective water management. Water levels to all individual wetland units are managed using gate valves and check boards at inlets and check boards at outlets. These structures, as well as the water levels in the marsh units, need to be routinely checked as conditions warrant to minimize the potential for interruption of water delivery.

All individual wetland units within each site can be managed as one if the boards on the interconnecting culverts are lowered. Water flow will be maintained over the inlet structures to maintain freshwater flow through the wetland system, to oxygenate the aquatic environment, and to deter the development of algae and other floating aquatic plants from propagating (HRS 2017). The outflow from the managed marshes will be monitored and calibrated to ensure a positive through-flow. However, greater discharges during hot, arid weather may be necessary, as well as less flow during cooler weather in spring and fall.

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5.2 Debris and Sediment Removal

Debris and sediment removal will be implemented when the assigned land manager can no longer maintain the design conditions of an individual wetland unit within a managed marsh site. Debris and sediment removal involves removing accumulated earthen matter and organic debris that has settled on the bed of the open-water channels within the managed marsh habitats. Over time, suspended matter in the water will gradually drop out of suspension and accumulate as water moves through open-water channels of the managed marsh habitats, thereby creating a layer of organic and fine mineral sediment on the bed of the open-water channels. Sediment and debris accumulation is problematic as it can decrease channel capacity and promote invasion by aquatic weeds, thereby compromising the functionality of the marsh.

The open-water channels have been designed to be approximately 4.5 to 6.5 feet deep. Over time, the channels, especially those areas near water control structures, are expected to accrue enough sediment that water flow through the system will become inefficient. When this occurs, the sediment accretion areas associated with the affected water control structure and channels will be excavated or dredged to reestablish proper water circulation and marsh functionality.

Because giant garter snakes are expected to occur in managed marsh habitats, following some simple preventive measures during sediment and debris removal can minimize potentially harmful impacts on this species and other wildlife. The following practices below are based on current adaptive management practices used by TNBC in its managed marshes, as adapted from TNBC's SSMP (TNBC 2003: 5-10):

- When channel cleaning is necessary, vegetation will be maintained on both channel banks to the greatest extent practicable, by excavating only the channel bottom, lifting the spoils straight up, and placing them at least 10 feet away from the channel banks to dry out, if needed. Once sufficiently dry, the spoils will be placed in an appropriate on-site or off-site location determined by the assigned land manager; for example, on upland areas designated for soil disposal (and surveyed for burrow sites as described below), graded onto non-graveled roads, or hauled off-site for use at other facilities. If it is not possible to maintain vegetation on both channel banks during channel excavation, vegetation must always be maintained on one bank.

- Movement of heavy equipment will be confined to existing roadways to the greatest extent practicable to minimize habitat disturbance.

- Because debris and sediment removal activities require complete (or approximate) marsh dewatering, debris and sediment removal activities will be conducted between May 1 and October 1 (i.e., the active season); if excavation is needed outside of this window, the Regulatory Agencies must be consulted for permission to proceed.

- Before channels are excavated, the channel will be de-watered to the extent feasible for a minimum of two weeks before cleaning begins.

- Drivers of vehicles accessing the site for maintenance, monitoring, and/or management activities will be observant of any basking snakes on the road and avoid driving over the animals.

These practices are intended to provide reliable habitat for giant garter snake and other wildlife species.

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5.2.1 Routine Debris/Sediment Removal Maintenance Activities

When debris and sediment removal activities in the open-water channels of the managed marsh habitats are needed, it is anticipated they will occur under dewatered or mostly dewatered conditions. However, due to groundwater seepage, complete dewatering may not always be possible. The managed marsh habitats are divided into two to three individual wetland units separated by a series of water control structures (see **Figures 2-4** and **2-5**). These water control structures will be used to dewater a unit within a managed marsh site for sediment removal and bank repair activities. If sediment removal is required, no more than one individual wetland unit of a managed marsh site will be dewatered at any given time (i.e., water control structures will be used to hold water in the other sections of the marsh while debris and sediment removal is occurring). If debris and sediment removal is carried out under watered conditions because of an emergency repair or because groundwater seepage prevents complete marsh cell drainage, careful operation of equipment will be employed to reasonably avoid damage to the open-water channel banks.

All debris and sediment will be removed with the use of an excavator or similar equipment. Operation of the equipment will be designed to avoid or minimize bank disturbance. The equipment will typically operate from the upland areas to scoop debris and sediment from the bed of the open-water channels. Movement of equipment will be limited to the upland areas to avoid bank disturbance. Debris and sediment removed will be placed on the upland area greater than 10 feet away from the bank, or hauled to a suitable location and allowed to dry, if needed. Once dry, spoils will be placed in an appropriate on-site or off-site location determined by the assigned land manager.

5.2.2 Debris/Sediment Removal Maintenance Frequency

Debris and sediment removal is anticipated to occur within a managed marsh unit every 5 to 10 years because the managed marsh habitats are designed to minimize maintenance requirements (e.g., 3H:1V slopes, vegetated banks). The scheduling of debris and sediment removal activities will be determined by the assigned land manager and will be included in the monitoring report (see Section 9.2, "Monitoring Report").

5.2.3 Debris/Sediment Removal Maintenance Timing

Although the preferred timing of debris and sediment removal is during the giant garter snake inactive/dormant season (October 1 to May 1) when the snake will not be using the aquatic habitat, this timing is not feasible because complete dewatering is not possible during this season. Therefore, these activities are typically conducted during the snake's active season (May 1 to October 1) under dewatered or mostly dewatered conditions. While removal of debris and sediment under dewatered conditions is preferred, completely dewatering the channel may not always be possible in some units due to groundwater seepage. A pre-removal survey for potential giant garter snakes will be conducted by a qualified biologist prior to the commencement of maintenance activity. Dewatering the open-water channel allows the equipment operator the best chance to see the channel bottom and submerged banks and to avoid damaging the banks while removing the debris and sediment. Potential giant garter snake burrows will be identified during the surveys and designated as areas to avoid placing debris and sediment material.

For active season maintenance, a unit within a managed marsh habitat would be temporarily dewatered to allow for efficient sediment removal to minimize suspended sediment. However, work under

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dewatered conditions during the giant garter snake active season should be completed within two (2) weeks of dewatering a marsh unit to minimize temporal loss of giant garter snake habitat.

5.3 Channel Bank Repair

Repairing channel banks in the event of bank deterioration may be required to reestablish the channel's original design cross section, carrying capacity, and structural integrity. Deterioration of banks is primarily caused by high groundwater conditions, fish (e.g., carp) and mammal (e.g., beaver, muskrat) activities, and wave action. This deterioration becomes evident in the form of sloughing and slumping of the banks, limiting the channel's carrying capacity and decreasing the structural integrity of the banks. As with other maintenance required, scheduling of bank repair activities will be determined by the assigned land manager and will be included in the monitoring report (see Section 9.2, "Monitoring Report").

5.3.1 Routine Bank Repair Maintenance Activities

Bank repair activities will mostly be conducted under dewatered conditions; however, complete dewatering may not always be possible due to groundwater seepage and stormwater drainage demands. As described in previous sections, the same best management practice procedures apply for channel bank repair (i.e. dewatering, use of existing maintenance roads and upland areas, and the requirement for pre-repair surveys prior to the start of operations). The managed marsh habitats are divided into several units by a series of water control structures (see **Figures 2-4** and **2-5**). These water control structures will be used to dewater units of the managed marsh habitats for bank repair activities. In the giant garter snake active season, no more than one unit of managed marsh habitat will be dewatered at any given time, and bank repair activities will be conducted within a 2-week period following dewatering. Preferably, coffer dams will be used to dewater only a short length of a channel within a unit, therefore leaving water in most of the unit. The water control structures will be used to hold water in the other units of the managed marsh habitats while bank repair activities are taking place. A preconstruction survey for giant garter snakes will need to be conducted by a qualified biologist prior to construction activities under both watered and dewatered conditions. Any giant garter snakes that are observed during the surveys will be monitored and avoided.

Bank repairs will likely require soil to be imported to the site by truck or other large equipment unless a local source of soil is available. Site preparation in advance of soil placement will include grubbing vegetation from the work area and compacting the existing bank surface. For bank repairs that are greater than 10 feet in length, the existing bank may be cut back to allow the new soil to be keyed-in. The placement and distribution of the soil will be done using a backhoe, hydraulic arm excavator, or small bulldozer depending on the size of the area to be repaired. The repaired bank will be compacted by hand-operated compactors (also referred to as "wackers"), by wheel rolling with heavy equipment or sheepsfoot roller, or tamping with the excavator/backhoe bucket or vibratory compaction equipment. Disturbed areas will be replanted with aquatic vegetation or reseeded with native perennial grass seed at the completion of the bank repair.

If bank repairs must be conducted under watered conditions, one strategy involves placing riprap (6- to 12-inch diameter rock) on the lower under-water portion of the open-water channel slope with an excavator or backhoe and "tamped" into the slope toe using the bucket of the excavator or backhoe.

No plastic, monofilament, jute, or similar erosion control matting that could entangle snakes will be placed by the assigned land manager or its contractors in or within 200 feet of the managed marsh

habitats. Possible substitutions include coconut coir matting, straw, tackified hydro seeding compounds, or other material approved by the Regulatory Agencies.

5.3.2 Bank Repair Frequency

Bank repair activities will be conducted on an as-needed basis. Once the planted vegetation has established, bank repair activities for these habitats are anticipated to be infrequent (i.e., one project every 10 years) and small scale (10 to 100 linear feet).

5.3.3 Bank Repair Timing

Bank repair activities will occur during the giant garter snake active season (May 1 to October 1), and possibly in April or October if a qualified biologist determines the snakes are active and, therefore, able to actively move and avoid danger during these months. If a unit of a managed marsh habitat is dewatered during the giant garter snake active season, bank repair activities will be conducted within a 2-week period following dewatering to avoid a temporal loss of giant garter snake habitat.

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Chapter 6. Vegetation Management and Invasive Weed Control Activities

Vegetation management to preserve desirable native and/or aquatic vegetation in the managed marsh habitats will be an ongoing annual activity. It is anticipated that the assigned land manager will utilize a variety of mechanical or chemical methods to manage and suppress undesirable aquatic and upland vegetation (i.e. noxious weeds) within and adjacent to the managed marsh habitats. The vegetation management methods, which are summarized in **Table 6-1** and described below in more detail, will be used by the assigned land manager to manage vegetation in the managed marsh habitats. These methods may be used separately or in combination by the assigned land manager. The list of methods described below is not intended to be exclusive.

Table 6-1. Managed Marsh Habitat Vegetation Management Schedule

Activity	Anticipated Frequency and Timing
Aquatic Vegetation Management	*The assigned land manager will employ a combination of the following activities at the anticipated frequencies:*
Water Level Manipulation	Water level drawdowns may occur on a rotational basis at each managed marsh site, with each open-water/perennial marsh habitat being drawn down approximately once every 5 to 7 years.
Manual Removal	Site-specific hand pulling/cutting, under watered or dewatered conditions, may be employed throughout the year, as needed.
Mechanical Removal	Site-specific excavator or backhoe removal of aquatic weeds, under watered or dewatered conditions, may be employed throughout the year, as needed, although wintertime is preferable.
Sediment Removal	Sediment removal, which may occur under watered or dewatered conditions generally during the active period for the giant garter snake, would occur in each managed marsh habitat unit every 5-10 years.
Chemical Treatment	Selective contact and systemic herbicides may be throughout the year, as needed.
Waterline and Upland Vegetation Management	*The assigned land manager will employ a combination of one or more of following activities at the anticipated frequencies:*
Grazing	Graze in spring, prior to target weeds setting seed.
Mowing	Mow to 6–12 inches twice a year, in spring and late summer/fall.
Manual Removal	Site-specific hand pulling/cutting may be employed throughout the year, as needed.
Prescribed Burning	Prescribed burning may be used intermittently every few years, as conditions warrant, between November 1 and April 1.
Chemical Treatment	Selective contact and systemic herbicides may be applied at various times throughout the year, as needed.

Source: Data compiled by GEI Consultants, Inc. 2016

If the assigned land manager intends to implement vegetation management methods in the managed marsh habitats that are not identified below, the assigned land manager will discuss these methods with

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SAFCA and the Regulatory Agencies to determine if an amendment to this SSMP is required. Aquatic Vegetation Management (Open-Water Channels and Perennial Marsh Wetlands)

6.1.1 Water Level Manipulation

The best way to reduce the need for aquatic vegetation management is by maintaining proper depths of flooding in the various types of marsh wetlands. Constant water depths of 4.5 to 6.5 feet in targeted open-water channel habitat areas will restrict tule and cattail growth. Frequent, versus seasonal, fluctuating water levels after establishment must be avoided or at least carefully managed; otherwise, vegetation encroachment into deeper parts of the marsh will occur. Also, flooding seasonal marshes too long into the spring may facilitate cattail invasion of shallowly flooded areas, and if left unaddressed can result in a cattail monoculture.

Water level manipulation includes dewatering individual wetland units of the managed marsh sites to expose submersed noxious aquatic plants. These plants depend on water for physical support because they lack a protective epidermal cell wall (or hardened cuticle layer), making them susceptible to desiccation. In order to be effective, the individual wetland unit must remain dewatered until aquatic vegetation has completely desiccated, has been chemically treated, or has been removed from the open-water channel. This technique may be employed throughout the year when aquatic vegetation growth restricts water flow in the managed marsh habitats.

Individual open-water channel and perennial marsh habitats may also be scheduled for occasional drawdowns in order to recycle nutrients to increase the marsh's productivity, to discourage populations of carp and other wildlife that prey on giant garter snake , and to facilitate inspections. Drawdowns will occur on a rotational basis at each managed marsh site, with each open-water/perennial marsh habitat being drawn down approximately once every 5 to 7 years or as may be needed. During the drawdown, any needed vegetation management, noxious weed control, sediment removal or berm repair would occur. Actions may include drying, mowing, excavation, grazing, and/or chemical applications.

6.1.2 Hand Pulling/Cutting

Manual removal of aquatic vegetation by pulling and/or cutting may be accomplished throughout the year to maintain the functionality of the open-water channels and perennial marsh habitats. Field personnel will enter the managed marsh habitats under watered conditions potentially using row boats or waders, for pulling/cutting the plants to limit their maturity and spread. Vegetation removed in this manner will be placed along the bank, and may be hauled off-site or incorporated into the existing access road fill. Hand pulling/cutting will likely be employed when equipment access is restricted, at water control structures, or when noxious weed issues are site-specific and/or scattered/distributed across the open-water channels. All applicable worker safety requirements must be observed when using this method of control.

6.1.3 Excavator/Backhoe Vegetation Removal

As with sediment removal (see Section 5.2, "Debris and Sediment Removal"), mechanical removal of aquatic vegetation may be accomplished using an excavator or similar equipment as conditions dictate. Removal by excavator may occur under watered or dewatered conditions throughout the year when aquatic vegetation growth restricts water flow in the open-water channels. As above, vegetated biomass will be allowed to desiccate, or be hauled away.

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6.1.4 Chemical Treatment

Use of both contact and systemic herbicides can be valuable for the suppression of aquatic weeds. Use of selective herbicides is preferred over broad-spectrum herbicides. Any herbicide will be applied in accordance with label instructions, evaluated for its potential effect on non-targeted vegetation and animals, and, applied under the direction of a State-licensed Pest Control Advisor (PCA). Chemicals not approved for use in or near water will not be used. Herbicide will not be used within 100 feet of elderberry shrubs.

Invasive aquatic weeds in the managed marsh habitats will be treated with herbicide, as-needed and at optimal timing, depending on the physiological conditions of the plant and water temperatures required for effective treatment. The preferred timing of aquatic herbicide applications is between October 1 and November 30, which is outside of the giant garter snake active season but before cold weather conditions. As above, a PCA will determine the appropriate timing and application rates to help ensure efficacy of treatments.

6.2 Waterline Vegetation Management (Seasonal Marsh Wetlands)

The seasonal marsh wetlands will be managed to provide aquatic habitat for giant garter snake. Seasonal marshes naturally dry out on an annual basis (see **Table 4-1**). Wetland vegetation planted at the waterline in the managed marsh habitats provides giant garter snakes with important refuge from predators and reduces bank erosion. As long as the vegetation is not dominated by cattails or tules, but by an assortment of low-stature marsh plants, no physical vegetation manipulation is likely to be needed. Thus, regular maintenance of wetland vegetation is not expected to be necessary; however, if stands become monotypic, or if cattails or tules become dominant, maintenance is needed. Mowing herbaceous vegetation growing along channel banks from the top of bank down to the waterline will be avoided to the greatest extent practicable except when required for management of noxious weeds. The assigned land manager will use the methods described below for upland vegetation management in order to open up the seasonal marsh area.

6.3 Upland Vegetation Management

The upland areas and upper banks of the managed marsh habitats will be managed as native perennial grassland. The grasslands will be maintained primarily to provide cover for giant garter snakes, and secondarily as foraging habitat for Swainson's hawks.

6.3.1 Grazing

Small-hooved ruminants (primarily goats or sheep) may be used to manage upland and wetland vegetation in managed marsh habitats. Grazing by goats and sheep has been successfully employed by the assigned land manager in its operations. Grazing techniques can be used to either trim the tops of the vegetation (similar to mowing) or to achieve a more thorough removal of vegetation and thatch similar to burning. Grazing may also be employed to remove aquatic vegetation if wetland areas and open-water channels are dewatered. Grazing for noxious weed control should typically be conducted in spring before weeds have set seed. If appropriate and conditions allow, grazing should be minimized between May 1 and July 1 to allow native perennial grasses to set seed. The use of grazing animals will be evaluated to determine whether the animals are causing bank erosion or damage to viable perennial

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grassland cover. Large livestock, such as cattle, are not permitted in soft soil or damp portions of the complex because of the substantial impacts they can cause to a waterway.

Grazing by goats or sheep has a low likelihood of injuring giant garter snakes and other species. Grazing goats and sheep move slowly through an area, providing time for giant garter snakes and other species to escape being trampled. The small-hoofed animals cause minimal or no damage to giant garter snake and burrowing owl burrows. Livestock are frequently rotated to new paddocks, causing only temporary disturbance of any one area.

6.3.2 Mowing, Chopping, and String Trimming

Mowing, chopping, and string trimming can be used to control terrestrial vegetation on operation and maintenance roads and in grasslands within managed marsh habitats, reducing risk of wildfire and discouraging the spread of noxious weeds. Height gages on all mechanical mowing and chopping equipment will be set so residual vegetation is at least 6 to 12 inches tall, with an exception for access roads where height restrictions are not required.

String trimming is accomplished using a hand-held motor-operated string trimmer and typically will be most often conducted in spring before noxious weeds have set seed. Treatment of late-season and warm-season weeds will occur later in the year. Timing will vary depending on weather conditions and target weed species, based on observations made by the assigned land manager during site inspections and in consultation with an experienced plant biologist. If appropriate and conditions allow, mowing, chopping, and string trimming should be minimized between May 1 and July 1 to allow native perennial grasses to set seed. Burrowing owl nesting sites should be protected and avoided if found on the property (See Section 8.3, “Burrowing Owl”), with the possible exception of careful vegetation reduction around nest burrows and nearby perches to reduce predation risk to burrowing owls by coyote and other predatory animals.

Because mowing, chopping, and string trimming will typically coincide with the giant garter snake active season, individual snakes present in upland habitats are likely to retreat to the water at the first sign of noise, vibration, and human activity, thereby reducing the chance of injury. In addition, the higher blade heights (6–12 inches) provide for a reduced likelihood to injure a snake. However, if mowing is conducted during the snake’s active season, it should be conducted in the afternoons or when ambient air temperatures are between approximately 75ºF and approximately 90ºF (when the snake may be actively foraging).For mowing, chopping, and string trimming proposed during the snake’s inactive season, individual snakes present in upland habitats are likely to be in burrows or other hibernacula and likely not threatened by these activities provided they are carried out with height gages set as discussed above.

6.3.3 Hand Pulling/Cutting

Periodic hand pulling or cutting of vegetation along the open-water channel slopes may be required to preserve the functionality of the upland vegetation. Species to target by field personnel include woody plants (e.g. cottonwood, willow), cattails, and noxious weeds on open-water channel slopes. Woody vegetation removed will be off-hauled to a disposal site, shredded, or used appropriately on-site for hibernacula and/or prey production purposes. Non-woody vegetation can be left to desiccate/decompose onsite.

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This technique is typically employed when equipment access is restricted, because it is labor-intensive and expensive, and can present worker safety issues. Site-specific hand pulling/cutting may be employed throughout the year to maintain the functionality of the open-water channel.

6.3.4 Prescribed Burning

Prescribed burning is defined as the practice of using controlled fires to reduce or eliminate unwanted organic matter, diseased plants, and undesirable insects and weeds. If conditions are conducive, burning can be an effective tool to remove unwanted biomass (i.e., thatch) and may be used in irrigation ditches and adjacent uplands areas. Prescribed burning should be used intermittently every few years as conditions warrant and permits are attainable from air quality and fire authorities. Burning must be conducted in accordance with all laws and local ordinances. Prescribed burning is not recommended in areas adjacent to homes and agricultural buildings, where wildfire would pose a hazard to humans, structures, livestock, and cropland, or decrease visibility for low-flying aircraft.

6.3.5 Chemical Treatment

As discussed above, use of both contact and systemic herbicides can be valuable for the suppression of noxious weeds. Spot spraying using broad-leaf selective herbicides is preferred over general application of broad-spectrum herbicides. Broad-leaved selective herbicides will be used as first priority and as conditions warrant, and selective pre-emergent formulations will be deployed secondarily. Also, as above, herbicide use (i.e., timing, formulation and application methods) will be directed by a licensed PCA prior to application. Herbicides will not be used within 100 feet of elderberry shrubs.

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Chapter 7. Other Site Management and Maintenance Activities

7.1 Rodent Burrow Management

Rodent burrows provide refuge and hibernacula for giant garter snakes and burrowing owls. Since the managed marsh habitats are not part of the levee maintenance areas, these habitats will be managed to minimize disturbance to rodent burrows. In cases when concentrations of rodent burrows (primarily ground squirrels) are causing severe bank erosion or threaten the stability of water control structures, banks will be repaired consistent with the practices for bank repair described in Section 5.3, "Channel Bank Repair," above.

7.2 Hibernacula Management

Constructed hibernacula are most often rock structures keyed into the banks of open-water channels. Their primary function is to provide refuge and winter habitat for giant garter snakes. Hibernacula are a critical component of the giant garter snake habitat and allow populations to become established in the absence of their typical rodent burrow habitat. It is anticipated that rodent burrows will become more common in the managed marsh habitats over time, and constructed hibernacula will provide secondary long-term habitat for giant garter snakes. Constructed hibernacula will typically not require active maintenance unless, for example, excessive rodent activities destabilize the integrity of the bank on which the hibernacula are placed. If repair of a hibernaculum is necessary, it will be repaired consistent with the practices for bank repair described Section 5.3, "Channel Bank Repair," above.

7.3 Beaver Management

Focused assessments beaver population on the managed marsh habitats will be conducted during the early part of the breeding season, between mid-February and the end of April, when beavers are actively searching for mates and den sites. Because beavers are a natural part of the ecosystem, the assigned land manager will determine the best course of action if beaver dams become established or beaver use becomes evident. Potential approaches include not disturbing the beavers, installing beaver baffling devices, breaching the beaver dam, and removing the beaver. The use of beaver baffling devices, which are designed to drain beaver ponds, is allowed by the Regulatory Agencies. If the assigned land manager determines that removal is appropriate, the assigned land manager will work with CDFW to obtain depredation permits to either trap and relocate or hunt the beaver population. USACE will be notified regarding beaver management, as USACE may require a permit for removal of beaver dams.

7.4 Mosquito and Vector Control Management

Vector control on the managed marsh habitats is operated by the Sacramento-Yolo Mosquito Vector Control District (Sacramento-Yolo MVCD), which operates in Sacramento County. The Sacramento-Yolo MVCD conducts mosquito-control efforts in the vicinity of the managed marsh sites and likely will continue to conduct these efforts on the sites. The assigned land manager will coordinate with Sacramento-Yolo MVCD to select the control mechanisms that are the least damaging to the resources.

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The mosquito-control program generally involves the use of mosquitofish (*Gambusia affinis*) and low-intensity application of *Bacillus thuringensis* var. *israelensis* or the use of other U.S. Environmental Protection Agency–approved insecticides in irrigation and drainage canals, irrigated pasture, rice fields, irrigation tail ponds, and wetlands. Sacramento-Yolo MVCD uses the guidelines found in the *Central Valley Joint Venture: Technical Guide to Best Management Practices for Mosquito Control in Managed Wetlands* (Kwasny, Wolder, and Isola 2004). The design of the canals includes features such as water level control, flowing water, and managed input of water to reduce the potential for nuisance conditions from mosquitoes (TNBC 2003).

If mosquito control is necessary, the assigned land manager will consult with the Sacramento-Yolo MVCD to select the control mechanisms that are the least damaging to managed marsh site's goals.

7.5 Infrastructure Inspections and Maintenance

As needed, the road surfaces will be maintained in a condition that facilitates maintenance and biological monitoring access. Road maintenance may include smoothing and/or leveling and, in areas where all-weather access is indicated, the addition of gravel or road base. Road work would occur during the giant garter snake active season (May 1 to October 1). The water control structures, which include the concrete weirs, pipes, rock, slide gates, and boards at the check structures, will be inspected regularly. In addition, the slide gates and the boards at check structures will be serviced or replaced as necessary, at any time of year.

7.6 Trespass and Public Access

The assigned land manager will be responsible for addressing trespass and public access issues. Public access to the sites will be discouraged through the use of gated access, fencing, and signage. The ongoing maintenance of these facilities will be the responsibility of the assigned land manager, as described below.

Roads. Maintenance access roads left in a natural vegetated state with grasses or other ground cover will be mowed to leave the access roads clean of cover to allow for maximum visibility for giant garter snakes, birds, or other species that could be harmed by maintenance vehicles. When access roads become unstable, rough, or damaged because of use over time, they will be regraded using a grader, dozer, or a blade attached to another piece of construction equipment. Where roads are within 200 feet of suitable aquatic habitat for giant garter snakes, road maintenance activity shall be conducted between May 1st and October 1st, when the giant garter snakes are most active and can escape the operations. Maintenance access roads graded with aggregate base will be regraded as needed due to normal wear or if damaged (such as by unauthorized four-wheel-drive vehicles). In some cases, regrading will require that additional aggregate base materials be imported and spread with a grader, dozer, or a blade attached to another piece of construction equipment.

Gates. Gates may be necessary at ingress and egress locations to reduce unauthorized access to the sites. Gates may need to be serviced or replaced if damaged or worn. Maintenance or replacement may be carried out throughout the year as necessary.

Fencing. Fencing may be necessary at ingress and egress points and other strategic locations to reduce unauthorized access to the sites. It may be welded wire mesh, barbed wire, post and cable, or other suitable materials necessary to limit access, especially motorized vehicles, such as four-wheel-drive vehicles, all-terrain vehicles, and motorcycles. Maintenance of the fences normally will be limited to

their repair or replacement when damaged or otherwise worn. Maintenance may be carried out throughout the year as necessary.

Signage. Signage may be needed to provide educational information to the public on the benefits provided by the managed marsh habitats and to notify the public that trespassing is prohibited. These signs may be posted at points of ingress and egress or at public access roads. Maintenance normally will be limited to the replacement of damaged or worn signs. Maintenance may be carried out throughout the year as necessary.

7.7 Trash Removal and Vandalism

The assigned land manager is responsible for ensuring the removal of trash and other unwanted debris from the managed marsh sites. The managed marsh habitats may be subject to vandalism and illegal dumping. The assigned land manager may need to take action, such as installing fences or gates, to curb such activities. Natural debris will be evaluated and removed if it is determined that it will cause bank erosion.

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Chapter 8. Conservation Measures to Avoid or Minimize Potential Impacts to Species

8.1 Giant Garter Snake and Northwestern Pond Turtle

The routine maintenance in the open-water channels and marsh, the vegetation management activities, and the other site management activities described above are designed to have negligible or beneficial impacts to giant garter snakes and northwestern pond turtles; therefore, additional conservation measures are not required for these two species.

8.2 Swainson's Hawk

The routine maintenance in the open-water channels, marsh, and uplands; the vegetation management activities; and the other site management activities described above are similar to standard agricultural operations in the Natomas Basin and would not be expected to adversely affect Swainson's hawk nesting habitat; therefore, additional conservation measures are not required for Swainson's hawk.

8.3 Burrowing Owl

Burrowing owls may be affected if routine maintenance activities are conducted in a unit of the managed marsh habitats that supports an occupied burrow. Prior to initiating routine maintenance activities in the managed marsh habitats that may affect an occupied burrow during the burrowing owl nesting season (February 1 through August 31), a qualified biologist will perform a pre-activity survey of the site to determine if any burrowing owls or signs of occupancy (e.g., pellets, whitewash, prey remains, or feathers) are present. If burrowing owls are present, the following conservation measures, which are adapted from CDFW's *Staff Report on Burrowing Owl Mitigation* (CDFG 2012 Staff Report) (CDFG 2012), will be followed:

- Occupied burrows will be avoided during the nesting period, from February 1 through August 31.
- If an occupied burrow is found, it will be flagged and field personnel will be notified. In consultation with a qualified biologist, the assigned land manager will establish avoidance/sensitivity buffers within which grading or other earth-disturbing activities will not be allowed. The buffer distance is recommended at 600 feet during April 1 to October 15 and 150 feet during October 16 to March 31. Routine maintenance activities, such as mowing, vegetation trimming, or access road repairs may still be allowed to occur on the opposite channel bank from an occupied burrow, where buffer distances can be maintained, visual screen implemented, or nest monitoring conducted.
- The assigned land manager will not conduct routine maintenance activities, such as access road repairs, within the established buffer distances of a previously flagged nest site until a qualified biologist has surveyed the surrounding area to verify that no burrowing owls will be harmed by the maintenance activity. However, the assigned land manager may carefully trim vegetation around

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burrowing owl nests while they are occupied, as well as nearby perches, to reduce predation risk to burrowing owls by coyote, neighborhood or feral dogs, and other predatory animals.

- Prior to any burrow exclusion and/or closure to facilitate a bank repair project, the assigned land manager shall consult with CDFW on an appropriate plan. According to the CDFG 2012 Staff Report, temporary or permanent burrow exclusion and/or closure should not be implemented unless or until: (a) a Burrowing Owl Exclusion Plan is developed and approved by the applicable local CDFW office; (b) temporary exclusion or permanent loss of occupied burrow(s) and habitat is mitigated in accordance with the Mitigation Impacts section of the CDFG 2012 Staff Report; (c) site monitoring is conducted prior to, during, and after exclusion of burrowing owls from their burrows sufficient to ensure take is avoided (Note: daily monitoring shall be conducted for one week to confirm young of the year have fledged if the exclusion will occur immediately after the end of the nesting season); and (d) excluded burrowing owls are documented using artificial or natural burrows on an adjoining mitigation site (if able to confirm by band re-sight).

8.4 Tricolored Blackbirds

If routine maintenance activities, vegetation management activities, or other site management activities are required in a unit of a managed marsh habitat supporting tricolored blackbird nesting habitat during the tricolored blackbird nesting season (April 1 to July 1), a qualified biologist will perform a pre-activity survey for the presence of breeding and nesting tricolored blackbirds prior to the activity. If the survey determines that tricolored blackbirds are present, no activities will occur within 500 feet of an active colony during the nesting season. A qualified biologist, with concurrence of USFWS and CDFW, must determine young have fledged and nest sites are no longer active before the nest site may be disturbed.

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Chapter 9. Monitoring, Adaptive Management, and Reporting

9.1 Site Inspections and Monitoring

The assigned land manager will provide ongoing site maintenance inspections and general biological monitoring of the managed marsh habitats to ensure compliance with the terms and conditions of the applicable Conservation Easements, the LTMP, and this SSMP.

Site maintenance inspections of the managed marsh habitats will concentrate on the evaluation of the following items: water supply and water control structure condition; bank erosion issues; fire hazards; fences, gates, and signs; trash accumulation; trespass and vandalism evidence; and beaver dam evidence. These site maintenance inspections will be conducted on an ongoing basis. In general, inspections will be consistent with normal inspection activities conducted by the assigned land manager.

The assigned land manager will monitor for noxious weeds on the managed marsh, and target these for treatment according to the methods outlined in Chapters 5 and 6 of this SSMP. The noxious weeds monitored are those species considered to be invasive to wildlands and natural vegetation, rather than weeds of agricultural importance. The noxious weed monitoring would align with the Natomas Basin HCP's *Biological Effectiveness Monitoring Program* (BEMP) (TNBC 2006). (Refer to Table 5 in **Appendix C**). In addition, vegetation cover types will be monitored qualitatively once per year in spring to ensure that vegetation management has occurred one or more times annually to an average height of 6-12 inches, where applicable.

The assigned land manager will document incidental sightings of special-status species observed during regular management activities. (Refer to Table 4 of **Appendix C**).

9.2 Biological Monitoring

TNBC conducts focused and basin-wide biological monitoring annually, in accordance with the schedule and methods set forth in the *Natomas Basin Habitat Conservation Plan's Biological Effectiveness Monitoring Program* (BEMP) (TNBC 2006). This biological monitoring consists of gathering and analyzing data on land use, vegetation cover, and abundance and distribution of giant garter snakes, Swainson's hawks, and other wildlife species on TNBC reserves and non-TNBC properties. Some of TNBC's biological monitoring would likely encompass the managed marsh habitats, as summarized below.

Habitat Types Monitoring. Twenty-five habitat types were identified and mapped using GIS to provide a baseline for basin-wide vegetation monitoring under the BEMP. Habitat types are field-verified annually, changes are tracked in the BEMP database, and the habitat type maps are modified accordingly (TNBC 2006:6–7). According to the BEMP, the objectives of the basin-wide habitat monitoring are to (1) quantify the distribution and abundance of general habitat types throughout the Natomas Basis, (2) track changes in the distribution and abundance of habitat types through time, and (3) provide spatially explicit information on the distribution and abundance of habitat types throughout

the Natomas Basin to guide future reserve site acquisitions and to provide information on potential dispersal corridors between reserves.

- ***Responsibility: TNBC.*** *Since TNBC monitors habitat types across the entire Natomas Basin, it is expected that the managed marsh sites will be included TNBC's annual habitat types monitoring efforts, and not be in addition to the BEMP.*

Noxious Weeds Monitoring. According to the BEMP, noxious weeds are mapped annually on TNBC reserve lands only (TNBC 2006:24–26). The noxious weeds monitored are those species the Natomas Basin HCP considers invasive to wildlands and natural vegetation, rather than weeds of agricultural importance.

- ***Responsibility: Assigned Land Manager.*** *Monitoring for noxious weeds on the managed marsh habitats will be implemented by the assigned land manager, following methods outlined in the SSMPs that are similar to the noxious weeds monitoring described in the BEMP. (Refer to Table 5 in* ***Appendix C****).*

Giant Garter Snake Monitoring. Giant garter snake monitoring under the BEMP consists of systematic passive and active surveys throughout the Natomas Basin, both on and off TNBC reserves (TNBC 2006:9–15). According to the BEMP, the objectives of the giant garter snake monitoring are to (1) track populations of giant garter snake throughout the Natomas Basin; (2) evaluate the effectiveness of mitigation land design, restoration, and management in providing habitat for giant garter snakes; (3) evaluate the comparative success of giant garter snake populations on reserve and non-reserve lands; and (4) determine whether the reserves are supporting the general population of giant garter snakes.

- ***Responsibility: TNBC.*** *Since the BEMP specifies that TNBC is to conduct annual giant garter snake monitoring both on and off TNBC reserves, it is expected that giant garter snake monitoring on the managed marsh habitats would periodically be included TNBC's monitoring efforts, according to the BEMP schedule and methodology.*

Swainson's Hawk Monitoring. Monitoring under the BEMP includes an annual survey of nesting Swainson's hawks to document distribution and density of the species throughout the Natomas Basin (TNBC 2006:15–17). According to the BEMP, the objectives of the Swainson's hawk monitoring are to document the numbers, distribution, density, and reproductive success of the species' population in the Natomas Basin and to document changes in land use and availability of Swainson's hawk foraging habitats throughout the Natomas Basin over time.

- ***Responsibility: TNBC.*** *Since the BEMP specifies that TNBC is to conduct annual Swainson's hawk monitoring, presumably basin-wide, it is expected that Swainson's hawk monitoring on managed marsh sites that support nesting hawks would be included TNBC's monitoring efforts, according to the BEMP schedule and methodology and not be in addition to the BEMP.*

Other Covered Species Monitoring. Protocols for monitoring Other Covered Species (e.g., avian species, western pond turtle, valley elderberry longhorn beetle) differ on reserve lands and non-reserve lands (TNBC 2006:17–23). The BEMP objectives for monitoring Other Covered Species on reserve lands are to (1) document the presence and absence of and use of reserve lands by Other Covered Species, (2) allow for comparison of the relative success of Other Covered Species on reserve and nonreserve lands, and (3) assess the degree to which TNBC reserves are supporting populations of Other Covered Species. The objectives for monitoring Other Covered Species on non-reserve lands are to (1)

generally document the presence and absence of Other Covered Species in the Natomas Basin, (2) allow for the comparison of the relative success of Other Covered Species on TNBC reserve and non-reserve lands, and (3) assess the degree to which TNBC reserve lands are supporting populations of Other Covered Species by providing information on basin-wide populations for comparison.

- ***Responsibility: Assigned Land Manager/TNBC.*** *Since the BEMP specifies more robust monitoring for Other Covered Species on TNBC reserve lands, monitoring for Other Covered Species on the managed marsh habitats will be implemented by the assigned land manager through documenting incidental observations of special-status species. (Refer to Table 4 in* ***Appendix C****).*

9.3 Adaptive Management

The assigned land manager will employ its adaptive management strategies, which incorporate feedback loops that link maintenance activities and monitoring to a decision-making process to improve site management. Changes to site configuration, management, and/or maintenance activities may require review and approval or permits from the Regulatory Agencies. Additionally, these changes may require revision to the LTMP and/or this SSMP.

The adaptive management strategy is based on the understanding that the assigned land manager must work within the constraints of the normal environmental conditions and natural processes affecting the mitigation area. The managed marsh habitats should be allowed to respond and conform to normal conditions and natural processes. The assigned land manager will evaluate changes to the managed marsh habitats and assess whether taking corrective action would result in recurring conflicts with normal conditions and natural processes. In some cases, changes to the managed marsh habitats may result in an improved habitat condition. In addition to naturally changing conditions, over time new information may become available, unanticipated factors may influence site conditions, a stochastic environmental event (e.g., fire, flood) may occur, or the managed marsh sites may be vandalized, triggering the need for adaptive management actions.

The adaptive management procedures described below can be used by the assigned land manager when making routine maintenance decisions in response to seasonal variations in site conditions and when responding to major events that create significant changes to managed marsh sites, requiring unanticipated and potentially significant site management adjustments. The Regulatory Agencies and the CE Holder will be notified when the adaptive management procedures have been triggered in response to a major event. The assigned land manager will use information gathered during site maintenance inspections and monitoring, as well as observations during routine site maintenance to determine whether adaptive management procedures should be initiated. By following the steps below, the assigned land manager will be able to make informed decisions about deviations from routine maintenance activities and changes to site management.

1. Adaptive management trigger: Routine maintenance triggers (e.g., invasive species infestation, plant mortality) and major event triggers (e.g., flood impacts, effects of climate change).

2. Assessment and Analysis: Once the adaptive management procedures have been triggered, the assigned land manager will define and map the issue, investigate and document the cause of the issue, and assess whether corrective action is warranted. If needed, the assigned land manager will conduct additional analysis to support development of the management response.

3. Management response: The management response will be based on the results of the assessment and analysis and site objectives.

4. Monitoring and Reporting: Following implementation of the management response, the assigned land manager will observe and document the effectiveness of the action taken during routine site maintenance inspections. When the adaptive management procedures have been used, the process and resulting management response will be documented in the Monitoring Report (*see* Section 9.4, "Monitoring Report;" refer also to Tables 1 and 2 in **Appendix C**).

5. Update LTMP: When the management response the addition or removal of and/or modification to the habitat management activities described in the LTMP, the assigned land manager will follow the procedures for updating the LTMP.

9.4 Monitoring Report

Annual Reports. Monitoring reports summarizing the results of site maintenance inspections and monitoring will be submitted to the Regulatory Agencies every year. The monitoring report will be submitted to SAFCA and the Regulatory Agencies by December 31st of each year that such a monitoring report is due. The assigned land manager shall assemble the following information for inclusion in the Monitoring Report,: (1) a summary of the managed marsh habitat conditions; (2) a summary of noxious weed occurrences (similar to those species that are monitored in the Natomas Basin HCP's BEMP (TNBC 2006); (3) a summary accounting of incidental observations of any federally or State-listed species utilizing the site; (4) recommendations for adaptive management in order to maintain identified site objectives (e.g., noxious weed management); and (5) any other information deemed relevant. Refer to **Appendix C** for a monitoring report template.

10-Year Reports. Every 10 years, the assigned land manager will submit a more in-depth monitoring report to the Regulatory Agencies. This report will be submitted to SAFCA and the Regulatory Agencies by December 31st of each year that such a monitoring report is due. This report will include the content required for that year's Annual Report, as well as the following:

- A summary of biological monitoring results and findings for the managed marsh habitats, as extracted from TNBC's annual BEMP report[1].

- An evaluation of the effectiveness of site management and design, a discussion of trends towards maintaining identified site objections, and any recommendations for adaptive management or design modifications.

- Photographs of the site taken from fixed-point perspectives that provide a qualitative review of the habitat conditions.

[1] TNBC annual biological monitoring reports are accessible at: https://www.natomasbasin.org/helpful-documents/monitoring-reports/.

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Chapter 10. Prohibited Activities

This Chapter outlines the restricted activities associated with the Sharma and Natomas Farms West managed marsh habitats, as described in the Conservation Easements (see **Figures 2-3** and **2-4**). It is understood that the following activities are prohibited, except as needed to accomplish habitat performance and the management and maintenance activities described in this SSMP, or as described below. If any of these activities must be undertaken because of special circumstances, they will be reviewed and approved by the Regulatory Agencies, and SAFCA on a case-by-case basis prior to implementation.

- Leveling, grading, landscaping, cultivating, or otherwise altering the managed marsh habitats' existing surface or topography for any purpose, including the building of new roads or trails, paving or otherwise covering the Conservation Easement areas with concrete, asphalt or any other impervious material, unless such activities are necessary to carry out the provisions of the Conservation Easements, the LTMP, or this SSMP.

- Manipulating, impounding or altering any natural water course, body of water or water circulation on the Conservation Easement areas, and any activities or uses detrimental to water quality, including but not limited to degradation or pollution of any surface or sub-surface waters, unless such activities are necessary to carry out the provisions of the Conservation Easements, the LTMP, or this SSMP.

- Use of off-road vehicles except as necessary to operate and maintain the managed marsh habitats as provided in the Conservation Easements, the LTMP, and this SSMP.

- Conducting fire protection activities, including the creation of fire breaks, that may adversely impact conservation values, except as required to respond to an imminent threat to public health or safety or to property. The Sacramento International Airport's *Wildlife Hazard Management Plan* (Sacramento County Airport System 2015) as most recently amended, states that mowing and disking, which can act as bird attractants, may need to be scheduled to avoid peak air traffic times (e.g., early morning vs. mid-day). Mowing (not disking) will be used for fire break creation whenever possible.

- Recreational activities, including, but not limited to, camping, campfires, horseback riding, biking, hunting or fishing, canoeing or kayaking, hiking, and dog-walking. Kayaking and canoeing, however, may be allowable for maintenance and monitoring activities.

- Commercial or industrial uses.

- Any legal or de facto division, subdivision or partitioning of the Conservation Easement areas that impairs or interferes with the conservation values of the Conservation Easement areas.

- Construction, reconstruction, or placement of any building, billboard, or signs with cement footings, or any other structure or improvement of any kind within the managed marsh habitats, except those necessary to carry out the purposes as defined in the Conservation Easements, including but not

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limited to installation of informational and/or warning signs or access control gates as provided in the LTMP.

- Discharging, dumping, burning, accumulating, or storing of soil, trash, ashes, refuse, waste, grass clippings, dredge materials, chemicals, bio-solids, or any other materials except as provided in this SSMP.

- Planting, introduction, or dispersal of exotic plant, aquatic, or animal species, except for mosquitofish.

- Planting trees within the managed marsh habitats, except with consultation and approval by USFWS and CDFW.

- The use of heavy grazing livestock (e.g., cattle and horses) on banks or channel bottoms.

- Filling, dumping, excavating, draining, dredging, mining, drilling, removing, or exploring for or extracting of minerals, loam, soil, sands, gravel, rocks or other material on or below the surface of the Conservation Easement areas, excepting activities described above in Chapter 5, "Open-water Channel and Marsh Wetland Maintenance Activities."

- Without the prior written consent of SAFCA and the Regulatory Agencies, transferring, encumbering, selling, leasing, or otherwise separating the mineral, air or water rights for the Conservation Easement areas; changing the place or purpose of use of the water rights; abandoning or allowing the abandonment of, by action or inaction, any water or water rights, ditch or ditch rights, spring rights, reservoir or storage rights, wells, groundwater rights, or other rights in and to the use of water historically used on or otherwise appurtenant to the Conservation Easement areas, including but not limited to: riparian water rights; appropriative water rights; rights to waters which are secured under contract with any irrigation or water district, to the extent such waters are customarily applied to the Conservation Easement areas; and any water from wells that are in existence or may be constructed in the future on the Conservation Easement areas.

- Engaging in any use or activity that may violate, or may fail to comply with, relevant federal, State, or local laws, or regulations, the Conservation Easement areas, or the use or activity in question.

- Use of the managed marsh habitats in violation of the LTMP.

- Public recreation and access.

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Appendix A. Project Plans for Construction of Managed Marsh Habitats at the AKT, Natomas Farms West, and Sharma Sites (As-Builts)

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NLIP FISHERMAN'S LAKE GGS PLANTING AS-BUILTS

Contract # 4146

REVISION - December 21, 2016

Sacramento County, California

Scientific Name	Common Name	Type 1 Seed Mix - Upland (lbs/acre)	Type 2 Seed Mix - Side Slope (lbs/acre)
Agrostis exarata	bentgrass	0	0.1
Elymus glaucus	blue wildrye	3	3
Elymus trachycaulus	slender wheatgrass	3	3
Hordeum brachyantherum ssp. brachyantherum	meadow barley	3	0
Hordeum brachyantherum ssp. californicum	California barley	0	4
Leymus triticoides, Elymus triticoides	creeping wildrye	4	4
Melica californica	California melic	1	2
Nassella pulchra, Stipa pulchra	Purple needlegrass	7	4
Poa secunda ssp. secunda	pine bluegrass	1	0.9
	Total	**22**	**21**

Scientific Name	Common Name	CODE
Carex barbarae	Santa Barbara sedge	CABA
Carex praegracilis	slender sedge	CAPR
Eleocharis macrostachya	common spikerush	ELMA
Juncus balticus	Baltic rush	JUBA
Juncus hesperius	common rush	JUHE
Juncus xiphioides	flat-blade rush	JUXI
Scirpus accutus, Schoenoplectus accutus	common tule	SCAC
Scirpus californicus, Schoenoplectus californicus	California bulrush	SCCA

Fisherman's Lake Acronyms and Symbols	
NF	Natomas Farms
SH	Sharma
AKT	AKT
SS	Side Slope
SST	Side Slope Tule
SSS	Seeded Side Slope
SB	Seasonal Bench
TB	Tule Bench
PH	Pot Hole
UP	Upland
EDS	East Drainage Swale
HF	Hay Field
WC	West Cell
CC	Center Cell
EC	East Cell
SC	Supply Channel
TNBC	The Natomas Basin Conservancy
RD	Recirculation Ditch
PP3	Pump Plant 3

Natomas Farms Complex Container Plants - 2013

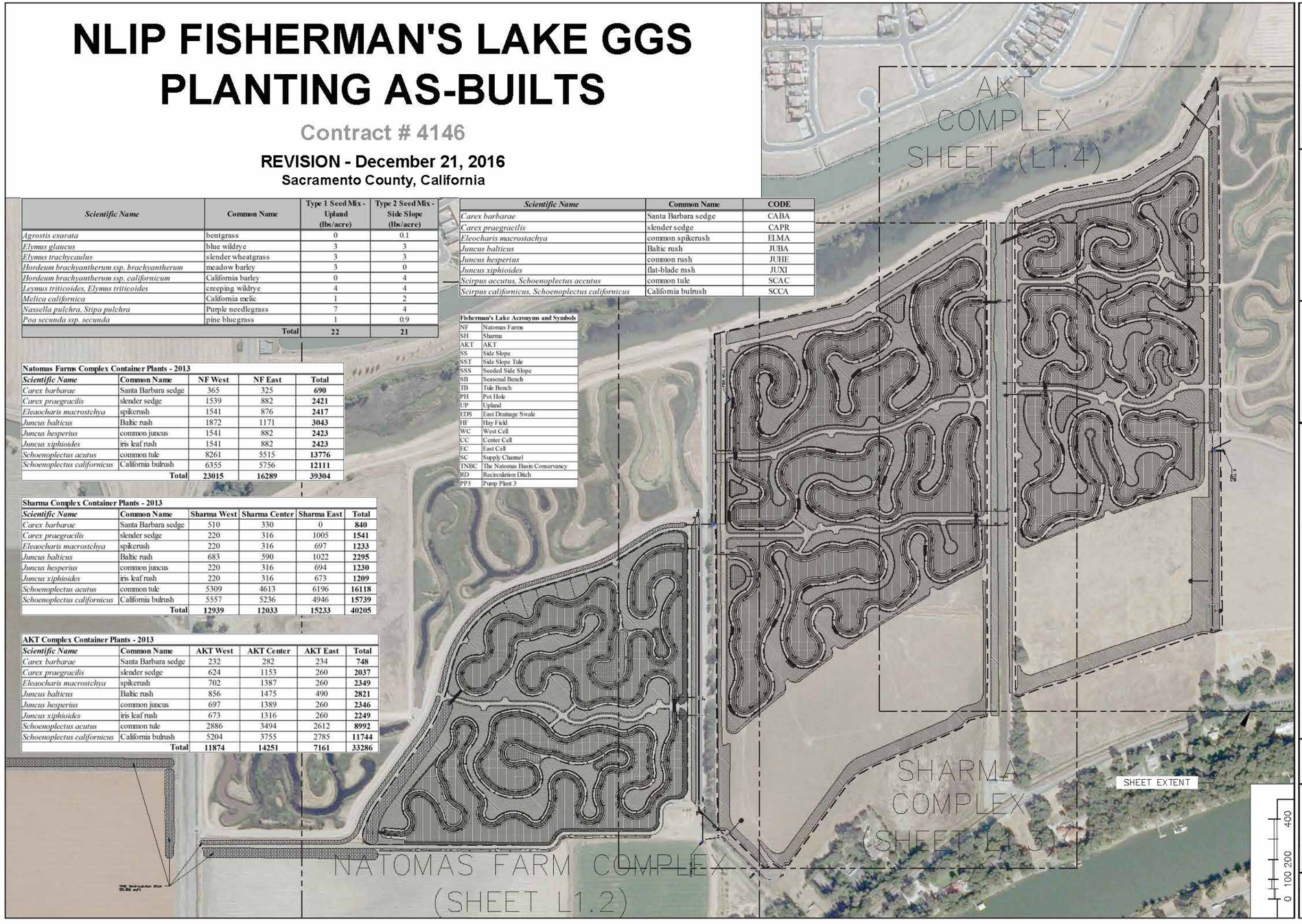
Scientific Name	Common Name	NF West	NF East	Total
Carex barbarae	Santa Barbara sedge	365	325	**690**
Carex praegracilis	slender sedge	1539	882	**2421**
Eleocharis macrostchya	spikerush	1541	876	**2417**
Juncus balticus	Baltic rush	1872	1171	**3043**
Juncus hesperius	common juncus	1541	882	**2423**
Juncus xiphioides	iris leaf rush	1541	882	**2423**
Schoenoplectus acutus	common tule	8261	5515	**13776**
Schoenoplectus californicus	California bulrush	6355	5756	**12111**
	Total	**23015**	**16289**	**39304**

Sharma Complex Container Plants - 2013

Scientific Name	Common Name	Sharma West	Sharma Center	Sharma East	Total
Carex barbarae	Santa Barbara sedge	510	330	0	**840**
Carex praegracilis	slender sedge	220	316	1005	**1541**
Eleaocharis macrostchya	spikerush	220	316	697	**1233**
Juncus balticus	Baltic rush	683	590	1022	**2295**
Juncus hesperius	common juncus	220	316	694	**1230**
Juncus xiphioides	iris leaf rush	220	316	673	**1209**
Schoenoplectus acutus	common tule	5309	4613	6196	**16118**
Schoenoplectus californicus	California bulrush	5557	5236	4946	**15739**
	Total	**12939**	**12033**	**15233**	**40205**

AKT Complex Container Plants - 2013

Scientific Name	Common Name	AKT West	AKT Center	AKT East	Total
Carex barbarae	Santa Barbara sedge	232	282	234	**748**
Carex praegracilis	slender sedge	624	1153	260	**2037**
Eleaocharis macrostchya	spikerush	702	1387	260	**2349**
Juncus balticus	Baltic rush	856	1475	490	**2821**
Juncus hesperius	common juncus	697	1389	260	**2346**
Juncus xiphioides	iris leaf rush	673	1316	260	**2249**
Schoenoplectus acutus	common tule	2886	3494	2612	**8992**
Schoenoplectus californicus	California bulrush	5204	3755	2785	**11744**
	Total	**11874**	**14251**	**7161**	**33286**



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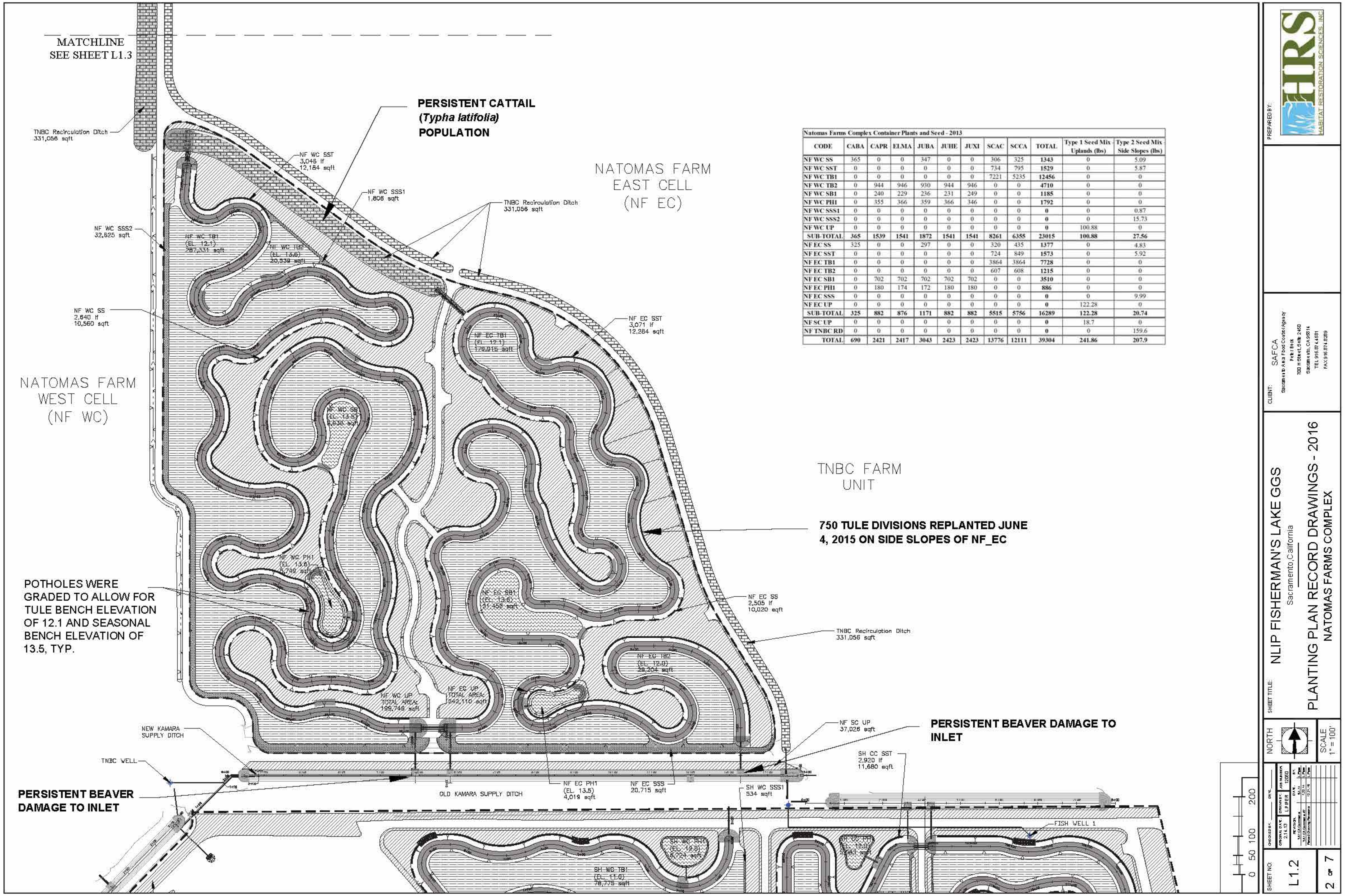
SHEET TITLE: NLIP FISHERMAN'S LAKE GGS
Sacramento, California
PLANTING PLAN RECORD DRAWINGS - 2016
OVERALL SITE PLAN

NORTH

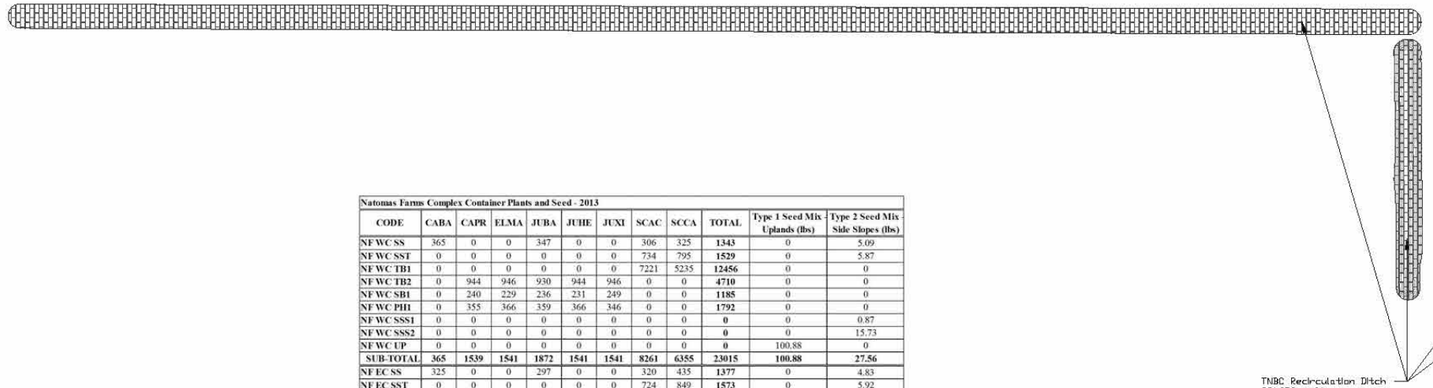
SCALE 1" = 200'

SHEET NO: L1.1

1 of 7



Natomas Farms Complex Container Plants and Seed - 2013											
CODE	**CABA**	**CAPR**	**ELMA**	**JUBA**	**JUHE**	**JUXI**	**SCAC**	**SCCA**	**TOTAL**	**Type 1 Seed Mix - Uplands (lbs)**	**Type 2 Seed Mix - Side Slopes (lbs)**
NF WC SS	365	0	0	347	0	0	306	325	**1343**	0	5.09
NF WC SST	0	0	0	0	0	0	734	795	**1529**	0	5.87
NF WC TB1	0	0	0	0	0	0	7221	5235	**12456**	0	0
NF WC TB2	0	944	946	930	944	946	0	0	**4710**	0	0
NF WC SB1	0	240	229	236	231	249	0	0	**1185**	0	0
NF WC PH1	0	355	366	359	366	346	0	0	**1792**	0	0
NF WC SSS1	0	0	0	0	0	0	0	0	**0**	0	0.87
NF WC SSS2	0	0	0	0	0	0	0	0	**0**	0	15.73
NF WC UP	0	0	0	0	0	0	0	0	**0**	100.88	0
SUB-TOTAL	**365**	**1539**	**1541**	**1872**	**1541**	**1541**	**8261**	**6355**	**23015**	**100.88**	**27.56**
NF EC SS	325	0	0	297	0	0	320	435	**1377**	0	4.83
NF EC SST	0	0	0	0	0	0	724	849	**1573**	0	5.92
NF EC TB1	0	0	0	0	0	0	3864	3864	**7728**	0	0
NF EC TB2	0	0	0	0	0	0	607	608	**1215**	0	0
NF EC SB1	0	702	702	702	702	702	0	0	**3510**	0	0
NF EC PH1	0	180	174	172	180	180	0	0	**886**	0	0
NF EC SSS	0	0	0	0	0	0	0	0	**0**	0	9.99
NF EC UP	0	0	0	0	0	0	0	0	**0**	122.28	0
SUB-TOTAL	**325**	**882**	**876**	**1171**	**882**	**882**	**5515**	**5756**	**16289**	**122.28**	**20.74**
NF SC UP	0	0	0	0	0	0	0	0	**0**	18.7	0
NF TNBC RD	0	0	0	0	0	0	0	0	**0**	0	159.6
TOTAL	**690**	**2421**	**2417**	**3043**	**2423**	**2423**	**13776**	**12111**	**39304**	**241.86**	**207.9**



Natomas Farms Complex Container Plants and Seed - 2013											
CODE	CABA	CAPR	ELMA	JUBA	JUHE	JUXI	SCAC	SCCA	TOTAL	Type 1 Seed Mix - Uplands (lbs)	Type 2 Seed Mix Side Slopes (lbs)
NFWC SS	365	0	0	347	0	0	306	325	**1343**	0	5.09
NFWC SST	0	0	0	0	0	0	734	795	**1529**	0	5.87
NFWC TB1	0	0	0	0	0	0	7221	5235	**12456**	0	0
NFWC TB2	0	944	946	930	944	946	0	0	**4710**	0	0
NFWC SB1	0	240	229	236	231	249	0	0	**1185**	0	0
NFWC PH1	0	355	366	359	366	346	0	0	**1792**	0	0
NFWC SSS1	0	0	0	0	0	0	0	0	**0**	0	0.87
NFWC SSS2	0	0	0	0	0	0	0	0	**0**	0	15.73
NFWC UP	0	0	0	0	0	0	0	0	**0**	100.88	0
SUB-TOTAL	**365**	**1539**	**1541**	**1872**	**1541**	**1541**	**8261**	**6355**	**23015**	**100.88**	**27.56**
NFEC SS	325	0	0	297	0	0	320	435	**1377**	0	4.83
NFEC SST	0	0	0	0	0	0	724	849	**1573**	0	5.92
NFEC TB1	0	0	0	0	0	0	3864	3864	**7728**	0	0
NFEC TB2	0	0	0	0	0	0	607	608	**1215**	0	0
NFEC SB1	0	702	702	702	702	702	0	0	**3510**	0	0
NFEC PH1	0	180	174	172	180	180	0	0	**886**	0	0
NFEC SSS	0	0	0	0	0	0	0	0	**0**	0	9.99
NFEC UP	0	0	0	0	0	0	0	0	**0**	122.28	0
SUB-TOTAL	**325**	**882**	**876**	**1171**	**882**	**882**	**5515**	**5756**	**16289**	**122.28**	**20.74**
NFSC UP	0	0	0	0	0	0	0	0	**0**	18.7	0
NFTNBC RD	0	0	0	0	0	0	0	0	**0**	0	159.6
TOTAL	**690**	**2421**	**2417**	**3043**	**2423**	**2423**	**13776**	**12111**	**39304**	**241.86**	**207.9**

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SHEET TITLE: NLIP FISHERMAN'S LAKE GGS
Sacramento, California
PLANTING PLAN RECORD DRAWINGS - 2016
TNCB RECIRCULATION DITCH

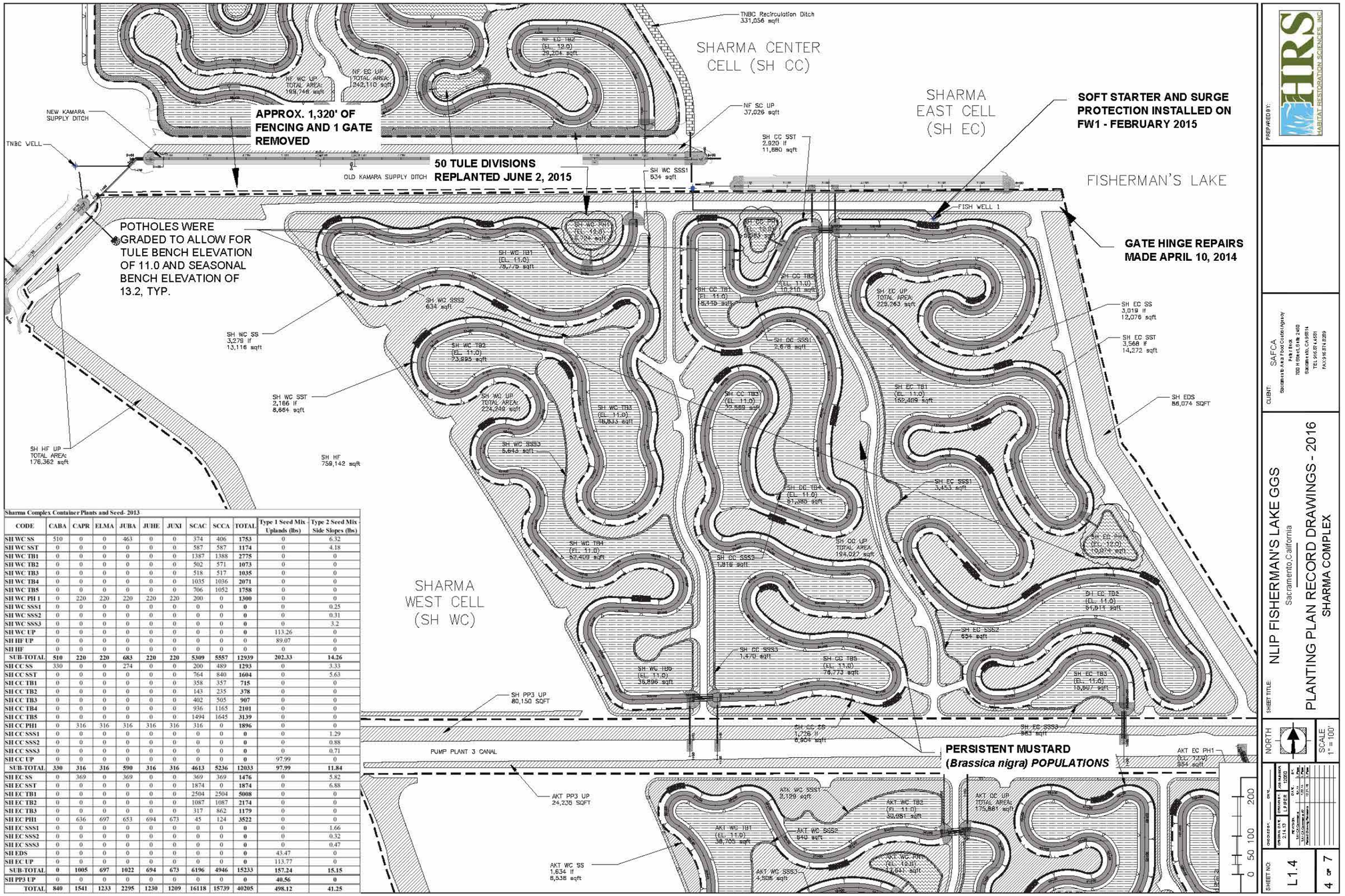
NORTH

SCALE: 1" = 100'

0 50 100 200

SHEET NO: L1.3

3 of 7



Sharma Complex Container Plants and Seed- 2013

CODE	CABA	CAPR	ELMA	JUBA	JUHE	JUXI	SCAC	SCCA	TOTAL	Type 1 Seed Mix Uplands (lbs)	Type 2 Seed Mix Side Slopes (lbs)
SH WC SS	510	0	0	463	0	0	374	406	**1753**	0	6.32
SH WC SST	0	0	0	0	0	0	587	587	**1174**	0	4.18
SH WC TB1	0	0	0	0	0	0	1387	1388	**2775**	0	0
SH WC TB2	0	0	0	0	0	0	502	571	**1073**	0	0
SH WC TB3	0	0	0	0	0	0	518	517	**1035**	0	0
SH WC TB4	0	0	0	0	0	0	1035	1036	**2071**	0	0
SH WC TB5	0	0	0	0	0	0	706	1052	**1758**	0	0
SH WC PH 1	0	220	220	220	220	220	200	0	**1300**	0	0
SH WC SSS1	0	0	0	0	0	0	0	0	**0**	0	0.25
SH WC SSS2	0	0	0	0	0	0	0	0	**0**	0	0.31
SH WC SSS3	0	0	0	0	0	0	0	0	**0**	0	3.2
SH WC UP	0	0	0	0	0	0	0	0	**0**	113.26	0
SH HF UP	0	0	0	0	0	0	0	0	0	89.07	0
SH HF	0	0	0	0	0	0	0	0	0	0	0
SUB-TOTAL	**510**	**220**	**220**	**683**	**220**	**220**	**5309**	**5557**	**12939**	**202.33**	**14.26**
SH CC SS	330	0	0	274	0	0	200	489	**1293**	0	3.33
SH CC SST	0	0	0	0	0	0	764	840	**1604**	0	5.63
SH CC TB1	0	0	0	0	0	0	358	357	**715**	0	0
SH CC TB2	0	0	0	0	0	0	143	235	**378**	0	0
SH CC TB3	0	0	0	0	0	0	402	505	**907**	0	0
SH CC TB4	0	0	0	0	0	0	936	1165	**2101**	0	0
SH CC TB5	0	0	0	0	0	0	1494	1645	**3139**	0	0
SH CC PH1	0	316	316	316	316	316	316	0	**1896**	0	0
SH CC SSS1	0	0	0	0	0	0	0	0	**0**	0	1.29
SH CC SSS2	0	0	0	0	0	0	0	0	**0**	0	0.88
SH CC SSS3	0	0	0	0	0	0	0	0	**0**	0	0.71
SH CC UP	0	0	0	0	0	0	0	0	**0**	97.99	0
SUB-TOTAL	**330**	**316**	**316**	**590**	**316**	**316**	**4613**	**5236**	**12033**	**97.99**	**11.84**
SH EC SS	0	369	0	369	0	0	369	369	**1476**	0	5.82
SH EC SST	0	0	0	0	0	0	1874	0	**1874**	0	6.88
SH EC TB1	0	0	0	0	0	0	2504	2504	**5008**	0	0
SH EC TB2	0	0	0	0	0	0	1087	1087	**2174**	0	0
SH EC TB3	0	0	0	0	0	0	317	862	**1179**	0	0
SH EC PH1	0	636	697	653	694	673	45	124	**3522**	0	0
SH EC SSS1	0	0	0	0	0	0	0	0	**0**	0	1.66
SH EC SSS2	0	0	0	0	0	0	0	0	**0**	0	0.32
SH EC SSS3	0	0	0	0	0	0	0	0	**0**	0	0.47
SH EDS	0	0	0	0	0	0	0	0	**0**	43.47	0
SH EC UP	0	0	0	0	0	0	0	0	**0**	113.77	0
SUB-TOTAL	**0**	**1005**	**697**	**1022**	**694**	**673**	**6196**	**4946**	**15233**	**157.24**	**15.15**
SH PP3 UP	0	0	0	0	0	0	0	0	**0**	**40.56**	**0**
TOTAL	**840**	**1541**	**1233**	**2295**	**1230**	**1209**	**16118**	**15739**	**40205**	**498.12**	**41.25**

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SHEET TITLE: NLIP FISHERMAN'S LAKE GGS
Sacramento, California
PLANTING PLAN RECORD DRAWINGS - 2016
SHARMA COMPLEX

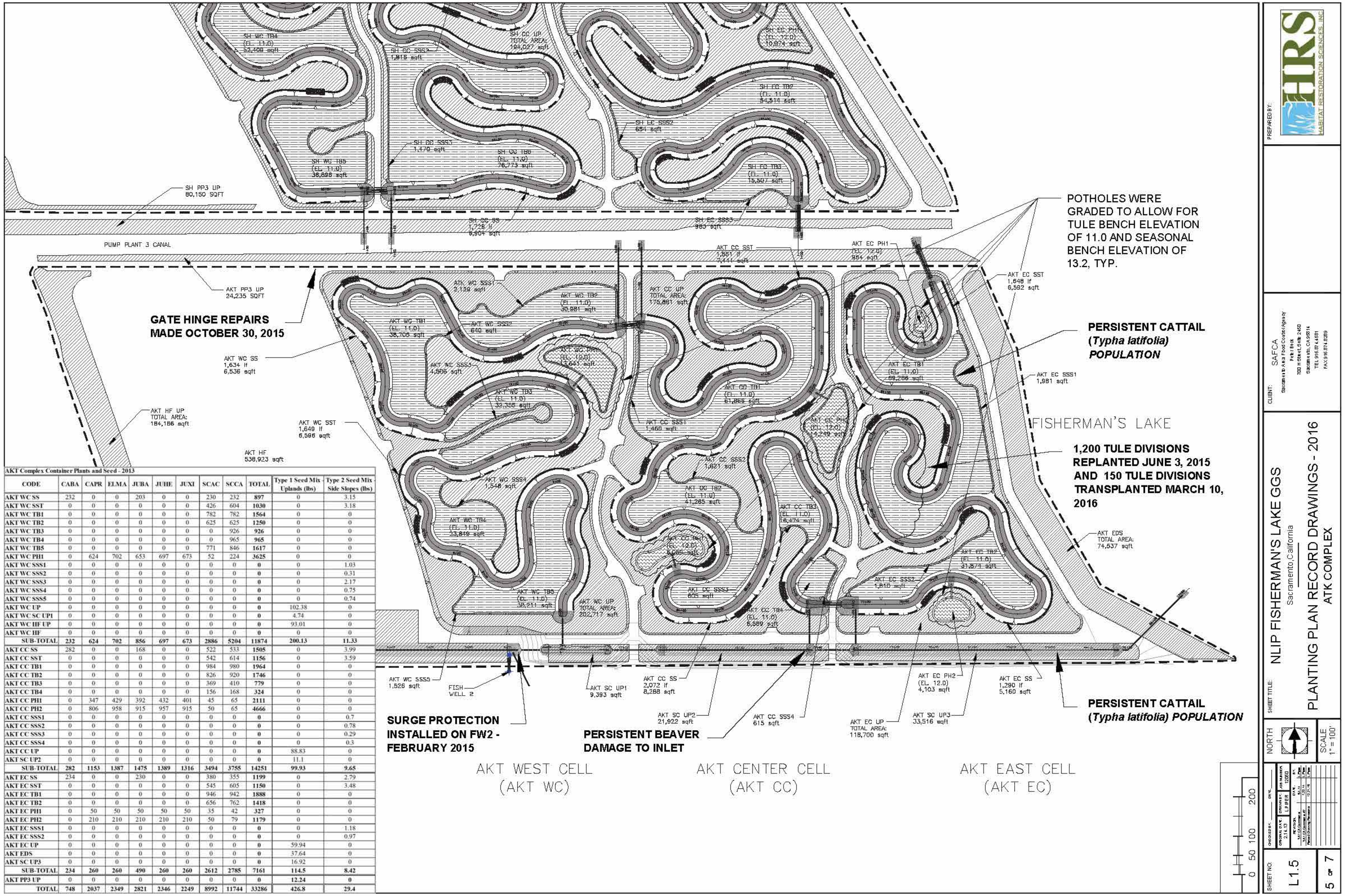
NORTH

SCALE 1" = 100'

0 50 100 200

SHEET NO. L1.4

4 of 7



AKT Complex Container Plants and Seed - 2013

CODE	CABA	CAPR	ELMA	JUBA	JUHE	JUXI	SCAC	SCCA	TOTAL	Type 1 Seed Mix - Uplands (lbs)	Type 2 Seed Mix - Side Slopes (lbs)
AKT WC SS	232	0	0	203	0	0	230	232	**897**	0	3.15
AKT WC SST	0	0	0	0	0	0	426	604	**1030**	0	3.18
AKT WC TB1	0	0	0	0	0	0	782	782	**1564**	0	0
AKT WC TB2	0	0	0	0	0	0	625	625	**1250**	0	0
AKT WC TB3	0	0	0	0	0	0	0	926	**926**	0	0
AKT WC TB4	0	0	0	0	0	0	0	965	**965**	0	0
AKT WC TB5	0	0	0	0	0	0	771	846	**1617**	0	0
AKT WC PH1	0	624	702	653	697	673	52	224	**3625**	0	0
AKT WC SSS1	0	0	0	0	0	0	0	0	**0**	0	1.03
AKT WC SSS2	0	0	0	0	0	0	0	0	**0**	0	0.31
AKT WC SSS3	0	0	0	0	0	0	0	0	**0**	0	2.17
AKT WC SSS4	0	0	0	0	0	0	0	0	**0**	0	0.75
AKT WC SSS5	0	0	0	0	0	0	0	0	**0**	0	0.74
AKT WC UP	0	0	0	0	0	0	0	0	**0**	102.38	0
AKT WC SC UP1	0	0	0	0	0	0	0	0	**0**	4.74	0
AKT WC HF UP	0	0	0	0	0	0	0	0	**0**	93.01	0
AKT WC HF	0	0	0	0	0	0	0	0	**0**	0	0
SUB-TOTAL	**232**	**624**	**702**	**856**	**697**	**673**	**2886**	**5204**	**11874**	**200.13**	**11.33**
AKT CC SS	282	0	0	168	0	0	522	533	**1505**	0	3.99
AKT CC SST	0	0	0	0	0	0	542	614	**1156**	0	3.59
AKT CC TB1	0	0	0	0	0	0	984	980	**1964**	0	0
AKT CC TB2	0	0	0	0	0	0	826	920	**1746**	0	0
AKT CC TB3	0	0	0	0	0	0	369	410	**779**	0	0
AKT CC TB4	0	0	0	0	0	0	156	168	**324**	0	0
AKT CC PH1	0	347	429	392	432	401	45	65	**2111**	0	0
AKT CC PH2	0	806	958	915	957	915	50	65	**4666**	0	0
AKT CC SSS1	0	0	0	0	0	0	0	0	**0**	0	0.7
AKT CC SSS2	0	0	0	0	0	0	0	0	**0**	0	0.78
AKT CC SSS3	0	0	0	0	0	0	0	0	**0**	0	0.29
AKT CC SSS4	0	0	0	0	0	0	0	0	**0**	0	0.3
AKT CC UP	0	0	0	0	0	0	0	0	**0**	88.83	0
AKT SC UP2	0	0	0	0	0	0	0	0	**0**	11.1	0
SUB-TOTAL	**282**	**1153**	**1387**	**1475**	**1389**	**1316**	**3494**	**3755**	**14251**	**99.93**	**9.65**
AKT EC SS	234	0	0	230	0	0	380	355	**1199**	0	2.79
AKT EC SST	0	0	0	0	0	0	545	605	**1150**	0	3.48
AKT EC TB1	0	0	0	0	0	0	946	942	**1888**	0	0
AKT EC TB2	0	0	0	0	0	0	656	762	**1418**	0	0
AKT EC PH1	0	50	50	50	50	50	35	42	**327**	0	0
AKT EC PH2	0	210	210	210	210	210	50	79	**1179**	0	0
AKT EC SSS1	0	0	0	0	0	0	0	0	**0**	0	1.18
AKT EC SSS2	0	0	0	0	0	0	0	0	**0**	0	0.97
AKT EC UP	0	0	0	0	0	0	0	0	**0**	59.94	0
AKT EDS	0	0	0	0	0	0	0	0	**0**	37.64	0
AKT SC UP3	0	0	0	0	0	0	0	0	**0**	16.92	0
SUB-TOTAL	**234**	**260**	**260**	**490**	**260**	**260**	**2612**	**2785**	**7161**	**114.5**	**8.42**
AKT PP3 UP	0	0	0	0	0	0	0	0	**0**	**12.24**	**0**
TOTAL	**748**	**2037**	**2349**	**2821**	**2346**	**2249**	**8992**	**11744**	**33286**	**426.8**	**29.4**

C#4146 As- Maintained Records 2016
Record of Work

Year	Month	Maintenance Action	Method	Location	Notes
2013	August	Water Management	NCMWC	All NF, SH, AKT Cells	
2013	August	GGS Silt Fence Removal		Natomas Farms	Per Field Instruction 11.
2013	September	Water Management	NCMWC	All NF, SH, AKT Cells	
2013	October	Water Management	NCMWC, FW 1 and 2	All NF, SH, AKT Cells	
2013	November	Water Management	FW 1 and 2	All NF, SH, AKT Cells	
2013	November	Weeding Hand Pulling	Hand removal and cutting	All NF, SH, AKT Cells	Performed cattail removal in all open water channels.
2013	December	Water Management	FW 1 and 2	All NF, SH, AKT Cells	
2013	December	Herbicide Application	Spot spray applications	All NF, SH, AKT Cells	Used Roundup Custom to treat roads, side slopes, and grasslands.
2014	January	Water Management	FW 1 and 2	All NF, SH, AKT Cells	
2014	February	Water Management	FW 1 and 2	All NF, SH, AKT Cells	
2014	February	Habitat Sign Installation		All NF, SH, AKT Cells	Signs were installed at locations identified by SAFCA.
2014	March	Water Management	FW 1 and 2	All NF, SH, AKT Cells	
2014	March	Mowing	Flail and string trimmers	All NF, SH, AKT Cells	Focused on all uplands and side slopes.
2014	April	Water Management	NCMWC, FW 1 and 2	All NF, SH, AKT Cells	
2014	April	Weeding Hand Pulling	Hand removal and cutting	All NF, SH, AKT Cells	Focused on wetland edges and side slopes for mustard, radish, and Johnson grass.
2014	April	Mowing	Flail and string trimmers	All NF, SH, AKT Cells	Focused on all uplands and side slopes.
2014	April	Herbicide Application	Spot spray applications	All NF, SH, AKT Cells	Garlon 3A for uplands and recirc ditches, Roundup Custom for RSP and refugia.
2014	May	Water Management	NCMWC	All NF, SH, AKT Cells	
2014	May	Mowing	Flail and string trimmers	All NF, SH, AKT Cells	Focused on all uplands and side slopes.
2014	May	Herbicide Application	Wicking/Spot applications	All NF, SH, AKT Cells	Targeted cattails on tule benches, side slopes, open channels with Roundup Custom.
2014	June	Water Management	NCMWC	All NF, SH, AKT Cells	
2014	June	Mowing	String trimmers	All NF, SH, AKT Cells	Focused on wetland edges and side slopes.
2014	June	Herbicide Application	Broadcast applications	All NF, SH, AKT Cells	Used Roundup Custom to treat all gravel access roads.
2014	July	Water Management	NCMWC	All NF, SH, AKT Cells	
2014	July	Weeding Hand Pulling	Hand removal and cutting	All NF and SH Cells	Focused on mustard and Johnson grass on side slopes.
2014	August	Water Management	NCMWC	All NF, SH, AKT Cells	
2014	August	Herbicide Application	Spot spray applications	All NF, SH, AKT Cells	Used Roundup Custom to treat all side slopes and uplands.
2014	September	Water Management	NCMWC	All NF, SH, AKT Cells	
2014	September	Weeding Hand Pulling	Hand removal and cutting	All NF, SH, AKT Cells	Focused on mustard, Johnson grass, and horseweed on all potholes and side slopes.
2014	September	Herbicide Application	Spot spray applications	AKT_SD and TNBC_RD	Used Roundup Custom to treat the AKT supply and TNBC Recirc. ditch.
2014	October	Water Management	NCMWC, FW 1 and 2	All NF, SH, AKT Cells	
2014	October	Herbicide Application	Broadcast applications	All SH and AKT Cells	Used Sonar A.S. to treat open water channels for Eurasian milfoil.
2014	October	Weeding Hand Pulling	Hand removal and cutting	SH_WC and CC	Focused on mustard, Johnson grass, and Malva sp. on side slopes.
2014	November	Water Management	FW 1 and 2	All NF, SH, AKT Cells	
2014	November	Herbicide Application	Broadcast applications	All SH and AKT Cells	Used Sonar A.S. to retreat open water channels for Eurasian milfoil.
2014	December	Water Management	FW 1 and 2	All NF, SH, AKT Cells	
2015	January	Water Management	FW 1 and 2	All NF, SH, AKT Cells	
2015	January	Herbicide Application	Broadcast applications	All NF, SH, AKT Cells	Used Milestone, Telar XP, and Garlon 3A to treat all uplands.
2015	February	Water Management	FW 1 and 2	All NF, SH, AKT Cells	
2015	March	Water Management	FW 1 and 2	All NF, SH, AKT Cells	

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SHEET TITLE: NLIP FISHERMAN'S LAKE GGS
Sacramento, California

PLANTING PLAN RECORD DRAWINGS - 2016
MAINTENANCE RECORD OF WORK 1 OF 2

NORTH

SCALE

SHEET NO: L1.6

6 of 7

C#4146 As- Maintained Records 2016
Record of Work Cont.

2015	March	Herbicide Application	Broadcast applications	All NF, SH, AKT Cells	Used Roundup Custom to treat all gravel access roads.
2015	April	Water Management	FW 1 and 2	All NF, SH, AKT Cells	
2015	April	Mowing	Flail and string trimmers	All NF, SH, AKT Cells	Focused on all uplands and side slopes.
2015	April	Herbicide Application	Broadcast applications	All NF Cells	Used Roundup Custom to retreatment of all gravel access roads.
2015	May	Water Management	NCMWC	All NF, SH, AKT Cells	
2015	May	Herbicide Application	Spot spray applications	All NF and SH Cells	Used Roundup Custom to treat cattails in open water channels.
2015	May	Weeding Hand Pulling	Hand removal and cutting	All NF, SH, AKT Cells	Focused on mustard and Johnson grass on side slopes.
2015	June	Water Management	NCMWC	All NF, SH, AKT Cells	
2015	June	Replanting	Transplant and divisions	NF, SH, AKT	Replanted tules on AKT_EC TB1, NF_SST, and SH_WC PH.
2015	June	Mowing	Flail and string trimmers	All NF, SH, AKT Cells	Focused on all uplands and side slopes.
2015	June	Herbicide Application	Spot spray applications	NF and AKT	Used Roundup Custom to treat AKT gravel roads and TNBC_RD.
2015	July	Water Management	NCMWC	All NF, SH, AKT Cells	
2015	July	Herbicide Application	Broadcast applications	All NF, SH, AKT Cells	Used Sonar A.S. to treat open water channels for Eurasian milfoil.
2015	July	Herbicide Application	Spot spray applications	All NF, SH, AKT Cells	Used Roundup Custom to treat grasslands for broadleaf weeds and Johnson grass.
2015	August	Water Management	NCMWC	All NF, SH, AKT Cells	
2015	August	Mowing	String trimmers	All NF, SH, AKT Cells	Focused on cattail seed heads on tule benches.
2015	August	Herbicide Application	Spot spray applications	All NF, SH, AKT Cells	Used Roundup Custom to treat all cut cattails on tule benches.
2015	September	Water Management	NCMWC	All NF, SH, AKT Cells	
2015	October	Water Management	NCMWC, FW 1 and 2	All NF, SH, AKT Cells	
2015	November	Water Management	FW 1 and 2	All NF, SH, AKT Cells	
2015	November	Herbicide Application	Broadcast applications	All NF, SH, AKT Cells	Used Milestone, Pendulum Aquacap to treat all uplands.
2015	December	Water Management	FW 1 and 2	All NF, SH, AKT Cells	
2016	January	Water Management	FW 1 and 2	All NF, SH, AKT Cells	
2016	February	Water Management	FW 1 and 2	All NF, SH, AKT Cells	
2016	February	Well Pump Repair	FW 1 and 2	FW 1 and 2	Soft starter replaced in FW1 and Surge protection installed in both. FI #18 and 19.
2016	March	Water Management	FW 1 and 2	All NF, SH, AKT Cells	
2016	March	Weeding Hand Pulling	Hand removal and cutting	All NF, SH, AKT Cells	Focused on broadleaf weeds and Johnson grass.
2016	April	Water Management	NCMWC, FW 1 and 2	All NF, SH, AKT Cells	
2016	April	Mowing	Flail and string trimmers	All NF, SH, AKT Cells	Focused on all uplands and side slopes.
2016	April	Weeding Hand Pulling	Hand removal and cutting	All NF, SH, AKT Cells	Focused on broadleaf weeds and Johnson grass.
2016	May	Water Management	NCMWC	All NF, SH, AKT Cells	
2016	June	Water Management	NCMWC	All NF, SH, AKT Cells	
2016	June	Fence Removal		Kimura supply ditch, SH	Removed approximately 1/4 mile of fencing, hardware, and 1 gate per FI #20.
2016	June	Weeding Hand Pulling	Hand removal and cutting	All NF Cells	Focused on mustard and Johnson grass on side slopes.
2016	June	Mowing	Flail and string trimmers	All NF, SH, AKT Cells	Focused on all uplands and side slopes.
2016	June	Herbicide Application	Spot spray applications	All NF, SH, AKT Cells	Used Roundup Custom to treat all uplands and side slopes.
2016	July	Water Management	NCMWC	All NF, SH, AKT Cells	
2016	October	Herbicide Application	Broadcast applications	All SH and AKT Cells	Used Sonar A.S. to treat open water channels for Eurasian milfoil.
2016	November	Weeding Hand Pulling	Hand removal and cutting	All SH Cells	Focused on mustard, Johnson grass, and cattails on uplands and side slopes.
2016	December	Herbicide Application	Spot spray applications	All NF, SH, AKT Cells	Used Roundup Custom to treat all cattails and broadleaf weeds.
2016	December	Weeding Hand Pulling	Hand removal and cutting	All NF, SH, AKT Cells	Focused on cattail seed heads on side slopes.

PREPARED BY: HRS HABITAT RESTORATION SCIENCES, INC.

CLIENT: SAFCA
Sacramento Area Flood Control Agency
Partners
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SHEET TITLE: NLIP FISHERMAN'S LAKE GGS
Sacramento, California

PLANTING PLAN RECORD DRAWINGS - 2016
MAINTENANCE RECORD OF WORK 2 OF 2

NORTH | SCALE

SHEET NO: L1.7

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Appendix B. Water Management Summary

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Natomas Levee Improvement Program
Fisherman's Lake Marsh Complex
Giant Garter Snake Habitat Enhancement Project
Contract 4146

Water Management Summary

Sacramento County, CA

December 2016

HABITAT RESTORATION SCIENCES, INC.

Submitted to:
Sacramento Area Flood
Control Agency
1007 7th Street, 7th Floor
Sacramento, CA 95814

Submitted by:
Habitat Restoration Science, Inc.
3888 Cincinnati Avenue
Rocklin, CA 95765

General Management

The mitigation project requires open water to be provided through controlled conveyances in order to supply adequate water levels for the Giant Garter Snake. Generally, summer water levels should be maintained with an average of 1 foot of water above tule benches and winter water levels should be maintained with an average of 2 feet of water above tule benches. Water is typically supplied in the summer months (April-October) by the Natomas Central Mutual Water Company (NCMWC). In winter, (November-March) water can be supplied through the use of 2 ground water wells (Fish Well 1 and Fish Well 2). Water levels to all wetland cells are managed through the use of gate valves and check boards at inlets and check boards at outlets. The acronyms and codes used to describe each inlet, discharge, channel, and culvert are references to the NLIP Fisherman's Lake GGS, Water Management Plan, Sacramento County, California (Plan) attached in Appendix A. The Plan displays the general high and low elevations for water supply, as well as, the top elevations of each concrete inlet and discharge structure. A template for recording water levels at each inlet and outlet is provided in Appendix B.

Natomas Farms Wetland Cells

The Natomas Farms wetland cells are located on the northern end of the mitigation site. Natomas Farms West (NF_WC) and Natomas Farms East (NF_EC) are supplied with water through the use of three inlets along the TNBC supply channel. NF_WC is fed by one inlet labeled NF_WI. NF_EC is fed by two inlets labeled NF_EI1 and NF_EI2. Water is discharged at one location on each cell (NF_WD and NF_ED1) and allowed to flow offsite towards Del Paso Blvd. Water can be allowed to enter the wetland cells through all inlets or one at a time if specific management activities are required. Both wetland cells can be managed as one if the boards on the interconnecting culvert (NF_ED2) are lowered. This technique was often employed to make management easier. For example, water was allowed to flow into NF_EC through NF_EI1, flow through NF_ED2 and NF_WC, and discharge through NF_WD. This is possible when all other inlets and outlets are closed or boarded above the spill elevation.

During summer months, water supplied by NCMWC enters the Kimura supply channel and is diverted to the TNBC supply channel through a culvert (K_SC_ED) located at the east end of the TNBC supply channel. Check boards on K_SC_ED must be removed or lowered to allow water from the Kimura supply channel to enter the TNBC supply channel. Similarly, check boards must be installed on K_SC_C1 to prevent the loss of water further down the Kimura supply channel. Fish Well 1 will need to be utilized to supply water to the Natomas Farms cells in the winter months. Fish Well 1 pumps water into the Kimura supply channel directly adjacent to K_SC_ED and has sufficient flow volume to supply water to both Natomas Farms cells simultaneously. Fish Well 1 also supplies water to the Sharma wetland cells, but it has been noted that it doesn't supply enough flow volume to maintain target elevations for all Natomas Farms wetland cells and Sharma cells at the same time. During winter well operation, water was alternated on a weekly basis to flood either the Natomas Farms cells or the Sharma cells. Water was typically not allowed to discharge during winter months by shutting down the well or alternating water to other wetlands as to limit the dependency on groundwater reservoirs.

Sharma Wetland Cells

The Sharma wetland cells are located in the center of the mitigation site. Sharma West (SH_WC), Sharma Center (SH_CC), and Sharma East (SH_EC) are supplied with water through the use of three inlets along the Kimura supply channel. Each Sharma cell is fed by their respective inlets: SH_WI, SH_CI, and SH_EI. Each Sharma cell also has their own individual discharges: SH_WD1, SH_CD1, and SH_ED1 that all drain into the PP3 O&M channel and eventually into Fisherman's Lake. Water can be allowed to enter the wetland cells through all inlets or one at a time if specific management activities are required. All three wetland cells can be managed as one if the boards on the interconnecting culverts (SH_WD2 and SH_CD2) are lowered. This technique was often employed to make management easier. For example, water was allowed to flow into SH_WC through SH_WI, flow through SH_WD2, SH_CC, SH_CD2, SH_EC and discharge through SH_ED1. This is possible when all other inlets and outlets are closed or boarded above the spill elevation.

During summer months, water supplied by NCMWC enters the Kimura supply channel and is allowed to enter each Sharma cell inlet. Check boards on K_SC_ED must be installed to prevent all water from entering the TNBC supply channel. Similarly, check boards must be removed or lowered on K_SC_C1 to allow water to flow further down the Kimura supply channel. Fish Well 1 will need to be utilized to supply water to the Sharma cells in the winter months. Fish Well 1 pumps water into the Kimura supply channel directly adjacent to K_SC_ED and has sufficient flow volume to supply water to all Sharma cells simultaneously. Fish Well 1 also supplies water to the Natomas Farms wetland cells, but it has been noted that it doesn't supply enough flow volume to maintain target elevations for all Natomas Farms wetland cells and Sharma cells at the same time. During winter well operation, water was alternated on a weekly basis to flood either the Natomas Farms cells or the Sharma cells. Water was typically not allowed to discharge during winter months by shutting down the well or alternating water to other wetlands as to limit the dependency on groundwater reservoirs.

AKT Wetland Cells

The AKT wetland cells are located on the southern end of the mitigation site. AKT West (AKT_WC), AKT Center (AKT_CC), and AKT East (AKT_EC) are supplied with water through the use of three inlets along the AKT supply channel. Each AKT cell is fed by their respective inlets: AKT_WI, AKT_CI, and AKT_EI. Each AKT cell also has their own individual discharges: AKT_WD1, AKT_CD1, and AKT_ED that all drain into the PP3 O&M channel and eventually into Fisherman's Lake. Water can be allowed to enter the wetland cells through all inlets or one at a time if specific management activities are required. All three wetland cells can be managed as one if the boards on the interconnecting culverts (AKT_WD2 and AKT_CD2) are lowered. This technique was often employed to make management easier. For example, water was allowed to flow into AKT_WC through AKT_WI, flow through AKT_WD2, AKT_CC, AKT_CD2, AKT_EC and discharge through AKT_ED. This is possible when all other inlets and outlets are closed or boarded above the spill elevation.

During summer months, water supplied by NCMWC enters the AKT supply channel and is allowed to enter each AKT cell inlet. Check boards on AKT_SC_C1 must be lowered

to allow water to flow east through the AKT supply channel. Similarly, check boards must be installed on AKT_SC_C2 to prevent water from draining into Fisherman's Lake. Fish Well 2 will need to be utilized to supply water to the AKT cells in the winter months. Fish Well 2 pumps water into the AKT supply channel directly adjacent to AKT_SC_C1 and has sufficient flow volume to supply water to all AKT cells simultaneously. Fish Well 2 also supplies water to The Natomas Basin Conservancy lands to the south AKT_TNBC and is typically allowed to flow in both directions under normal operation. Water was typically not allowed to discharge during winter months by operating the well on alternating weeks as to limit the dependency on groundwater reservoirs.

Overview of Habitat Elevations and Management Objectives

Summer Management: April – October

- Water supplied by NCMWC

- **Natomas Farms Cells**

Habitat Type	Elevation (ft)
Tule Bench	12.1
Seasonal Bench	13.5
Pothole	13.6
Seasonal Side Slope	14.7
High Water	14.2

  - Summer water levels to be maintained to keep an average of 1 foot of water over the tule benches.
  - Two to three boards to be installed at each discharge in order to flood waters up at or above high water (14.2 ft) to help maintain seasonal side slope plantings which are installed at 14.7 ft. This water management technique to be maintained for one week out of each month.
  - An average of 2-inches of flow to be maintained over the inlet structure to maintain fresh water flow through the wetland system. This will help oxygenate the aquatic environment and deter the development of algae and other floating aquatic plants from propagating.
  - Overall, discharge boards to be maintained at 13.1 ft except once per month when flood up is desired to side slope elevations.

- **Sharma Cells**

Habitat Type	Elevation (ft)
Tule Bench	11
Seasonal Bench	13.2
Pothole	11
Seasonal Side Slope	13.5
High Water	13

  - Summer water levels to be maintained to keep an average of 1 foot of water over the tule benches.

- Two to three boards to be placed at each discharge in order to flood waters up above high water (13 ft) to help maintain seasonal side slope plantings which are installed at 13.5 feet. This water management technique to be maintained for one week out of each month.
- An average of 2-inches of flow to be maintained over the inlet structure to maintain fresh water flow through the wetland system. This will oxygenate the aquatic environment and deter the development of algae and other floating aquatic plants from propagating.
- Overall, discharge boards to be maintained at 12 feet except once per month when flood up is desired to side slope elevations.

- **AKT Cells**

Habitat Type	Elevation (ft)
Tule Bench	11
Seasonal Bench	13.2
Pothole	11
Seasonal Side Slope	13.5
High Water	13

- Summer water levels to be maintained to keep an average of 1 foot of water over the tule benches.
- Two to three boards to be placed at each discharge in order to flood waters up above high water (13 ft) to help maintain seasonal side slope plantings which are installed at 13.5 feet. This water management technique to be maintained for one week out of each month.
- An average of 2-inches of flow to be maintained over the inlet structure to maintain fresh water flow through the wetland system. This will oxygenate the aquatic environment and deter the development of algae and other floating aquatic plants from propagating.
- Overall, discharge boards to be maintained at 12 feet except once per month when flood up is desired to side slope elevations.

Winter Management: November – March

- Water supplied by Fish Well Operation

- **Natomas Farms Cells**

Habitat Type	Elevation (ft)
Tule Bench	12.1
Seasonal Bench	13.5
Pothole	13.6
Seasonal Side Slope	14.7
High Water	14.2

- Winter water levels to be maintained to keep an average of 2 feet of water over the tule benches.
- Well operation to be stopped when high water elevation is reached. Anticipate operation for one week every two to three weeks. There will be

at most 2 inches of water flowing over inlet weirs when drawing water to high water levels.
- Overall, discharge boards will be maintained at 14.7 feet to prevent discharge.

- **Sharma Cells**

Habitat Type	Elevation (ft)
Tule Bench	11
Seasonal Bench	13.2
Pothole	11
Seasonal Side Slope	13.5
High Water	13

- Winter water levels to be maintained to keep an average of 2 feet of water over the tule benches.
- Well operation to be stopped when high water elevation is reached. Anticipate operation for one week every two to three weeks. There will be at most 2 inches of water flowing over inlet weirs when drawing water to high water levels.
- Overall, discharge boards will be maintained at 13.5 feet to prevent discharge.

- **AKT Cells**

Habitat Type	Elevation (ft)
Tule Bench	11
Seasonal Bench	13.2
Pothole	11
Seasonal Side Slope	13.5
High Water	13

- Winter water levels to be maintained to keep an average of 2 feet of water over the tule benches.
- Well operation to be stopped when high water elevation is reached. Anticipate operation for one week every two to three weeks. There will be at most 2 inches of water flowing over inlet weirs when drawing water to high water levels.
- Overall, discharge boards will be maintained at 13.5 feet to prevent discharge.

Appendix A
NLIP Fisherman's Lake GGS
Water Management Plan

Appendix B
Water Management
Data Sheet Template

Date:		Observer:		
Cell	**Structure**	**Measurement**	**Level in Feet**	**Notes**
NF_WC	INLET (21.4')	TOP OF BOARDS		
		WATER LEVEL		
	DISCHARGE (15.6')	TOP OF BOARDS		
		WATER LEVEL		
NF_EC	INLET 1 East (21.55')	TOP OF BOARDS		
		WATER LEVEL		
	INLET 2 West (21.5')	TOP OF BOARDS		
		WATER LEVEL		
	DISCHARGE (15.6')	TOP OF BOARDS		
		WATER LEVEL		
SH_WC	INLET (22.12')	TOP OF BOARDS		
		WATER LEVEL		
	DISCHARGE (15.4')	TOP OF BOARDS		
		WATER LEVEL		
SH_CC	INLET (21.67')	TOP OF BOARDS		
		WATER LEVEL		
	DISCHARGE (15.3')	TOP OF BOARDS		
		WATER LEVEL		
SH_EC	INLET (22.22')	TOP OF BOARDS		
		WATER LEVEL		
	DISCHARGE (18.2')	TOP OF BOARDS		
		WATER LEVEL		
AKT_WC	INLET (17.8')	TOP OF BOARDS		
		WATER LEVEL		
	DISCHARGE (15.8')	TOP OF BOARDS		
		WATER LEVEL		
AKT_CC	INLET (17.17')	TOP OF BOARDS		
		WATER LEVEL		
	DISCHARGE (15.85')	TOP OF BOARDS		
		WATER LEVEL		
AKT_EC	INLET (17.96')	TOP OF BOARDS		
		WATER LEVEL		
	DISCHARGE (15.45')	TOP OF BOARDS		
		WATER LEVEL		
Other Notes:				

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Appendix C. Monitoring Report Template

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Monitoring Report for Managed Marsh Mitigation Sites

Natomas Levee Improvement Program: Project Phases 2, 3, and 4a

Monitoring Period: _____ to _____

[Month/Year] [Month/Year]

Report Background

The Sacramento Area Flood Control Agency (SAFCA) constructed Phases 2, 3, and 4a of the Landside Improvement Project (Project), as a component of the Natomas Levee Improvement Program (NLIP) between 2009 – 2012. This Project included creation and enhancement of several habitats at various mitigation sites, including managed marsh habitats at the AKT, Sharma, and Natomas West properties. The Project's Programmatic Long-term Management Plan and the respective Site-Specific Management Plans identify that that these sites would be managed and monitored in perpetuity. The assigned land manager would be responsible for long-term management, site monitoring, and reporting.

The land manager(s) shall be responsible for providing a monitoring report to the Regulatory Agencies every year, and no later than December 31 of each calendar year that a Monitoring Report is due.

Associated Project Permit Numbers

- USACE Regulatory file numbers: SPK-2007-211 [Phase 2], SPK-2009-00513 [Phase 3a], SPK-2008-1039 [Phase 3b], SPK-2009-0480 [Phase 4a]
- USFWS file numbers: 81420-2008-F-0195-5 [Programmatic and Phase 2], 81420-2009-F-0890-1 [Phase 3], 81420-0210-F-0446-1 [Phase 4a]
- CDFW file numbers: 2081-2009-003-02 [Phase 2], 2081-2009-020-02 [Phase 3]

List of Individuals

- **Report Preparation:**
  - _____
    [Name] [Title] [Affiliation]
  - _____
    [Name] [Title] [Affiliation]
  - _____
    [Name] [Title] [Affiliation]
- **Monitoring:**
  - _____
    [Name] [Title] [Affiliation]
  - _____
    [Name] [Title] [Affiliation]
  - _____
    [Name] [Title] [Affiliation]
  - _____
    [Name] [Title] [Affiliation]

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Adaptive Management

Implemented Adaptive Management. Describe any modifications to or deviations from the management practices outlined in the Managed Marsh SSMP that were implemented during this monitoring period and indicate why these were needed.

Table 1. Implemented Adaptative Management at Managed Marsh Sites During This Monitoring Period		
Mitigation Site	Management Modification	Reason
AKT – Managed Marsh		
Natomas Farms West – Managed Marsh		
Sharma – Managed Marsh		

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Proposed Adaptive Management. Describe any proposed additions or modifications to ongoing management practices, as outlined in the Managed Marsh SSMP, that are proposed to be implemented during the next Monitoring Period. Indicate why these are needed. Please provide a map to depict a location of where these specific modifications are needed.

Table 2. Proposed Adaptive Management at Managed Marsh Sites During the Following Monitoring Period

Mitigation Site	Management Modification	Timing	Reason
AKT – Managed Marsh			
Natomas Farms West – Managed Marsh			
Sharma – Managed Marsh			

Habitat and Species Monitoring

Habitat Condition Monitoring: Describe how the habitat conditions compare to the expected conditions and identify any proposed actions to remedy downward trends, if appliable.

Table 3. Achievement of Expected Site Conditions at Managed Marsh Sites During This Monitoring Period

Mitigation Site	Expected Site Condition	Actual Site Condition	Proposed Actions
AKT – Managed Marsh	Maintain 60/40 ratio of aquatic/upland. Between May 1 -Oct. 1, maintain water level within ± 6 inches of design water surface elevation. Maintain native perennial grasslands on banks. Suppress noxious weeds in channels and uplands.		
Natomas Farms West – Managed Marsh			
Sharma – Managed Marsh			

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Incidental Observations of Special-status Species: Check the appropriate box if a special-status species has been observed using the mitigation sites during this monitoring period. Provide a map to depict a location of where these species were observed, or include in the "Notes" row of the Table.

Table 4. Incidental Observations of Special-Status Species at Managed Marsh Sites During This Monitoring Period

Mitigation Site	Giant Garter Snake	Swainson's Hawk (nesting or foraging)	Valley Elderberry Longhorn Beetle	Western Pond Turtle	Tricolored Blackbird	Burrowing Owl	White-tailed Kite			Notes Regarding Location and Dates of Observation(s)
AKT – Managed Marsh										
Natomas Farms West – Managed Marsh										
Sharma – Managed Marsh										

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Noxious Weed Monitoring: Following the guidance outlined in the Natomas HCP's Biological Effective Monitoring Program[2], track the presence, distribution, and prevalence of noxious weeds on the managed marsh sites.

Table 5. Presence and Prevalence of Noxious Weeds at Managed Marsh Sites During Monitoring Period

Species	AKT	Natomas Farms	Sharma
Edible fig			
Perennial Pepperweed			
Himalayan Blackberry			
Stinkwort			
Bull Thistle			
Italian Thistle			
Pennyroyal			
Sweet Fennel			
Yellow Star-Thistle			

Notes: T = Trace (rare): less than 1% cover. λ L = Low (occasional plants): 1–5% cover. λ M = Moderate (scattered plants): 5–25% cover. λ H = High (fairly dense): 25–75% cover. λ D = Dense (dominant): more than 75% cover.

[2] Using CalFlora (http://calflora.org), compile a list of noxious weeds found in Sutter and Sacramento Counties Track those rated High or Moderate, or designated a Red Alert species by the California Invasive Plant Council (http://www.cal-ipc.org/ip/management/ipcw/categories.php). These lists comprise plants considered invasive to wildlands and natural vegetation, rather than weeds of agricultural importance that are found primarily in disturbed habitats. Each noxious weed occurrence observed during floristic surveys is mapped and added to the cumulative list of plant species. Nomenclature follows the second edition of The Jepson Manual: Vascular Plants of California (Baldwin et al. 2012). When highly invasive species requiring immediate management action are detected, a KMZ file is created and emailed to TNBC that identifies the weed type and location. The level of infestation is recorded in five cover/distribution categories.

Additional Information

Modifications to Monitoring Activities: If applicable, describe any modifications to the monitoring methods are proposed during the next reporting period.

_____

_____

_____

_____

_____

Additional Activities: If applicable, describe below any additional research and remediation activities that were conducted during this reporting period.

_____

_____

_____

_____

_____

Copies of original field notes and monitoring data sheets will be available for Regulatory Agency review upon request.

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