State of California
The Natural Resources Agency
DEPARTMENT OF WATER RESOURCES
Bay-Delta Office

Emergency Drought Barrier Project
Environmental Permit Compliance Report: Installation 2015

July 2015

Edmund G. Brown Jr. Governor State of California	John Laird Secretary for Natural Resources The Natural Resource Agency	Mark W. Cowin Director Department of Water Resources

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1.0 Introduction

The purpose of this report is to fulfill the reporting requirements of the following permits:

- The Department of Fish and Wildlife 2081 Incidental Take Permit 2081-2014-026-03 and Streambed Alteration Agreement 1600-2014-0111-R3,
- The Central Valley Regional Water Quality Control Board 401 Water Quality Certification,
- The Army Corps of Engineers 404 Permit SPK-2014-00187,
- The National Marine Fisheries Service conservation recommendations (5/1/2015 email), and
- The United States Fish and Wildlife Service conservation recommendations (5/1/2015 email).

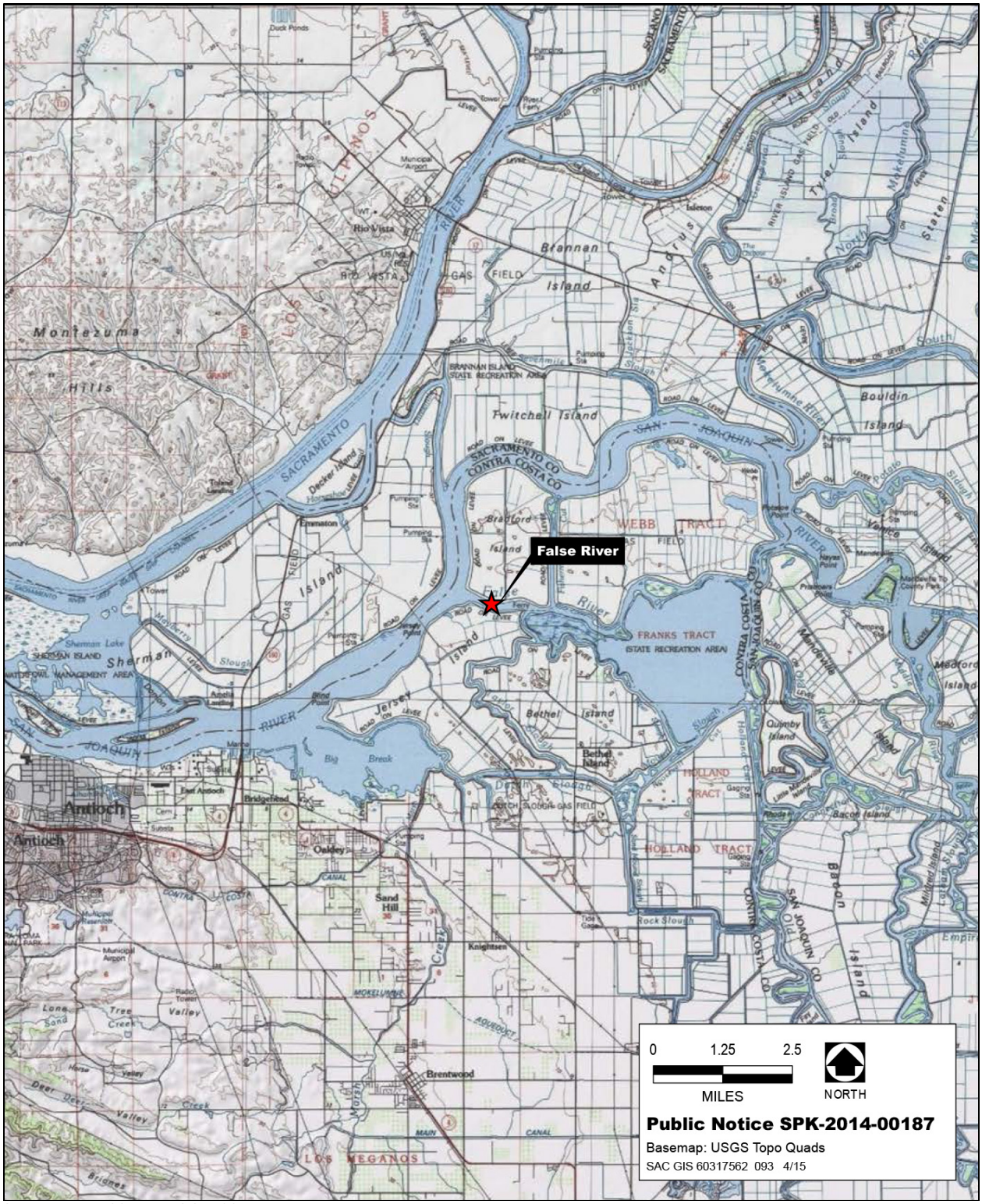
The Emergency Drought Barrier Project (EDB) is a project to construct (install and remove) a temporary salinity/drought barrier, in West False River, in response to the current drought condition in the State of California. The False River barrier is a temporary physical (rock rip-rap) barrier to reduce the intrusion of high-salinity water into the central and south Delta. The barrier measures approximately 800 feet long and up to 200 feet wide at the base and 12 feet wide at the top. The barrier includes two king pile-supported sheet pile walls (abutments) extending out from each levee into the channel for a distance for 75 feet. The abutments are buttressed with rock on both sides. To address erosion on the water side toe of both the Jersey and Bradford Island levees approximately 4,000 cubic yards of rock was placed along the levee toes. The rock runs for a distance of approximately 225 feet up and downstream of the centerline of the barrier (approximately 125 feet from the ends of the barrier rock placement). In addition to river sheet piles, approximately 300 feet of sheet piles were installed to a depth of approximately 35 feet parallel to the channel to prevent water piping from the river through the levee. These piping preventer sheet piles were set in to the tops of the levees on each side of the barrier and would remain in place. In addition to abutment piles and piping preventer piles, four 12-inch buoy line anchors were placed on the levees at the barrier site. To support water quality monitoring stations, twelve 12 –inch steel pipe piles were installed throughout the Delta. The solar-powered equipment will monitor water quality parameters like dissolved oxygen, turbidity, salinity as measured by electrical conductivity (EC), river stage, and flow velocity.

Mobilization to the West False River Site started on May 5, 2015, the barrier was closed May 28 and completed June 12, and construction for installation was completed July 2, 2015.

1.1 Project Location

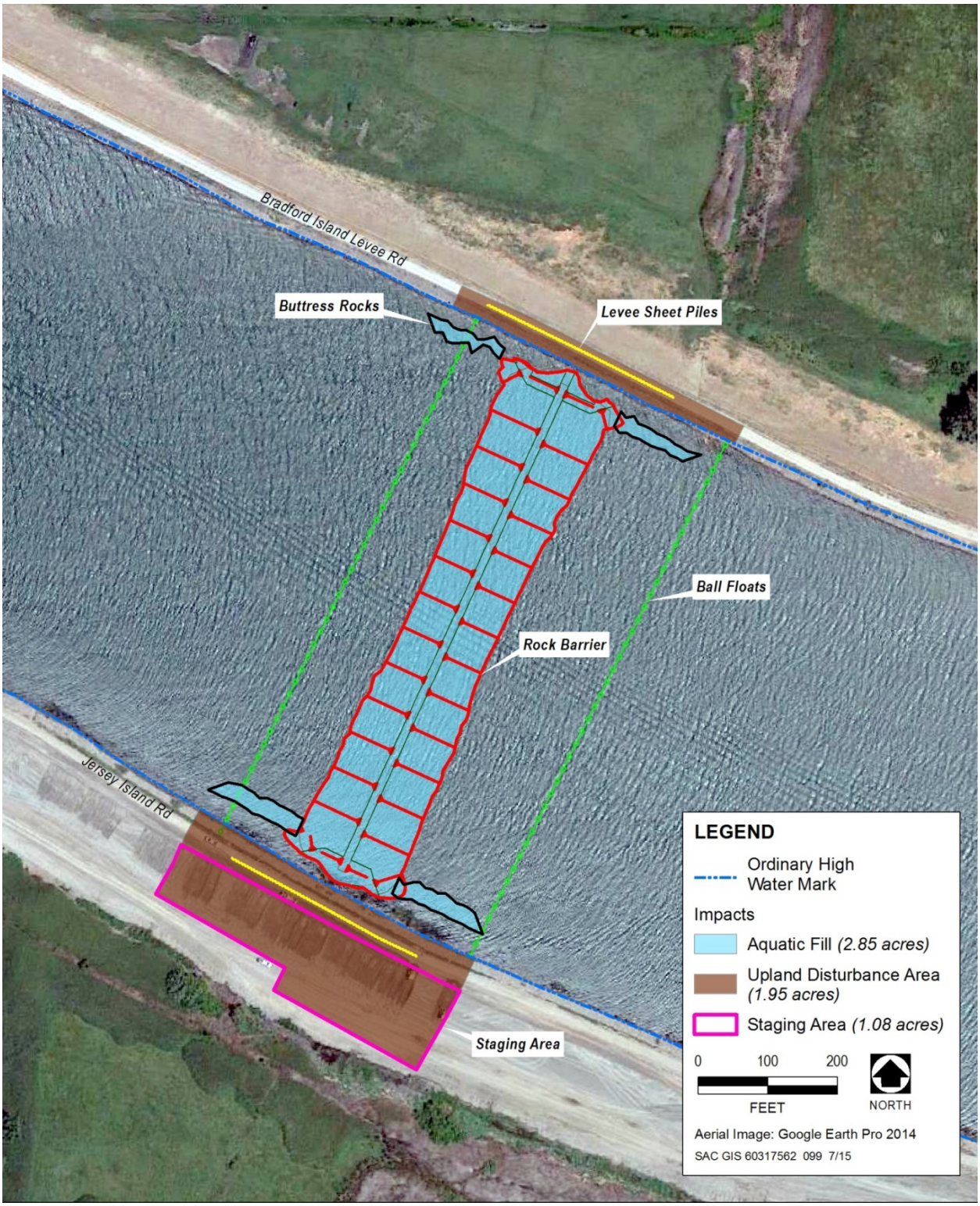
The West False River Barrier is located approximately 0.4 mile east of the confluence with the San Joaquin River, between Jersey and Bradford Islands in Contra Costa County, and is about 4.8 miles northeast of Oakley. The banks of the West False River site are rock-lined levees. Coordinates for the barrier are Latitude 38.057057°, Longitude 121.670432° (Figures 1 and 2). Representative site photos can be found in Appendix A.

Water quality monitoring station piles were installed throughout the Delta (Figure 3), see Table 1 for specific coordinates.



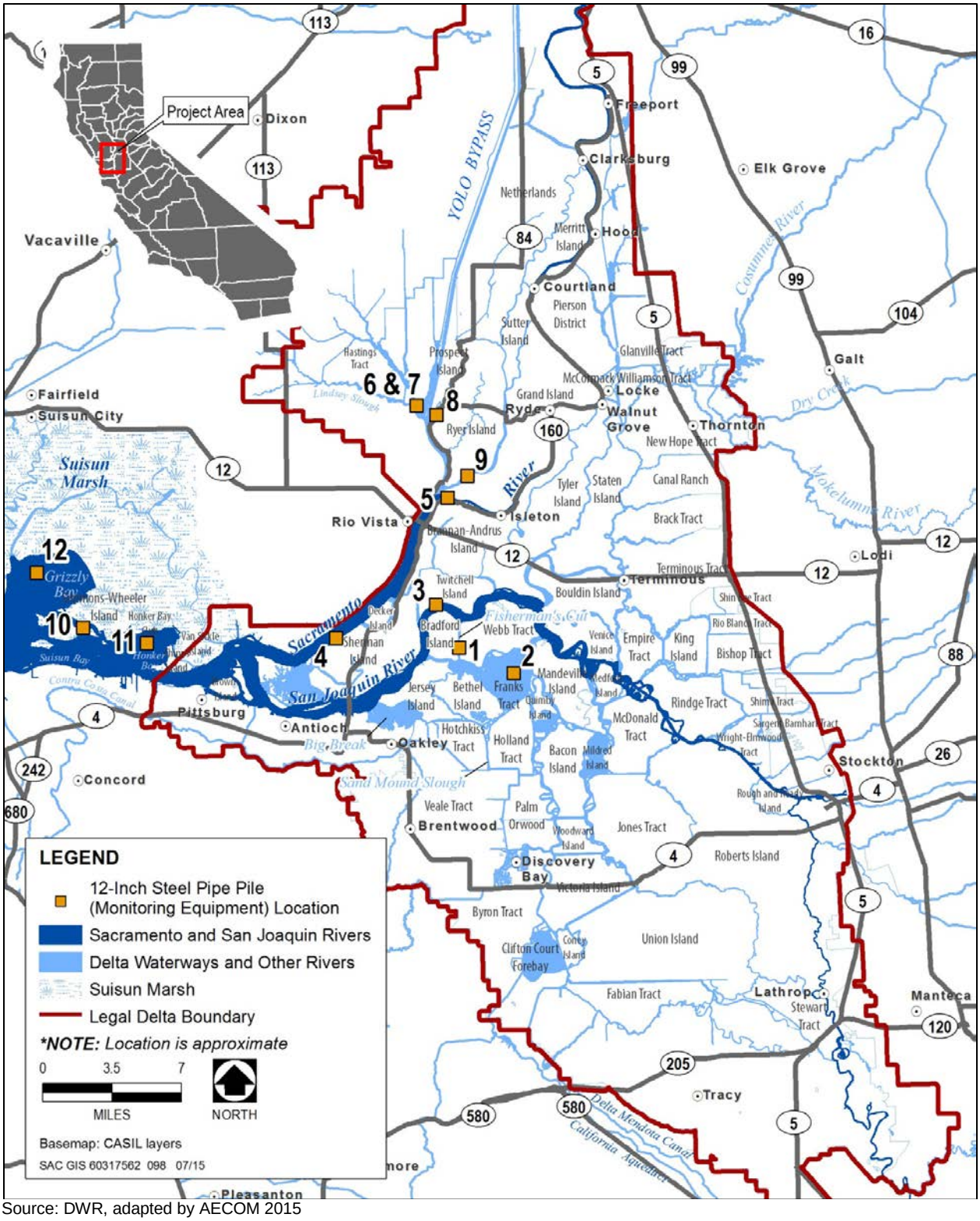
Source: DWR 2015, AECOM 2015

Figure 1: Location of Emergency Drought Barrier



Source: DWR 2015, AECOM 2015

Figure 2. Aerial View of the Project Site



Source: DWR, adapted by AECOM 2015

Figure 3: Locations of the Water Quality Monitoring Station Piles

Table 1. Coordinates of the 12-Inch Steel Pipe Piles			
No.	Station Name	Latitude	Longitude
1	Fisherman's Cut	38.0655930°	-121.6479052°
2	Franks Tract	38.0464952°	-121.5980619°
3	Twitchell Island	38.0974562°	-121.6687057°
4	Sacramento River No. 1	38.0741445°	-121.7617272°
5	Sacramento River No. 2[1]	38.17548°	-121.65686°
6	Liberty Island No. 1 (Left)[2]	38.2430074°	-121.6842674°
7	Liberty Island No. 2 (Right)[2]	38.2430074°	-121.6842674°
8	Miner Slough	38.2360264°	-121.6660510°
9	Steamboat Slough	38.1912650°	-121.6378798°
10	Ryer Island	38.0839000°	-121.9956167°
11	Honker Bay	38.0722000°	-121.9369833°
12	Grizzly Bay	38.1243500°	-122.0380167°

Notes:
[1] The coordinates for Sacramento River No. 2 are based on reporting from the California Data Exchange Center not surveyors.
[2] The same coordinates are used for Liberty Island No. 1 and No. 2 because they are separated by only five feet.
Source: DWR 2015

1.2 Project Description

The 2015 EDB installation included placement of buttress rock for erosion repair of the levees, placement of sheet piles in the levee as a piping preventer, and placement of king and sheet piles to create abutments. The barrier itself consists of an approximately 74,000 cubic yards of rock formed 800 foot long berm, 200 feet wide at the base (approximately 2.6 acres). Construction of the EDB started on May 5, 2015 and concluded on July 2, 2015 for a total of 43 working days. On June 4-6 and 8-10, the contractor installed twelve permanent 12-inch steel pipe piles to be used for water quality monitoring equipment during EDB operation. DWR conducted in-water noise monitoring during in-water pile driving. A timeline of key installation activities is summarized in Table 2. For representative photos of construction activities see Appendix A.

Table 2: Installation Timeline	
Date	Activity
April 21, 23, 27, 29, 30 and May 4, 2015	Pre-construction surveys
May 4, 2015	Environmental Awareness Training at Contractor's yard
May 5 and 6, 2015	Mobilized equipment
May 6-12, 2015	Installed buttress rock on the levee toes of Bradford and Jersey islands
May 7-June 12, 2015	Placed and shaped embankment rock with cranes and dump scows
May 8-13, 2015	Installed pipe preventer sheet piles on Bradford and Jersey islands
May 14-15, 2015	Backfilled pipe preventer sheet pile trenches on Bradford and Jersey island levees
May 14-16, 2015	Installed king piles on and perpendicular to Bradford and Jersey islands[1]
May 16 and 18-26, 2015	Installed sheet piles and whaler systems on and perpendicular to Bradford and Jersey islands[2]
May 28, 2015	Barrier closed
June 4-6 and 8-10, 2015	Installed water quality monitoring station piles throughout the Delta[3]
June 13-17, 2015	Demobilized equipment
June 25, 2015	Placed soil stabilization and regraded upland disturbance areas
July 2, 2015	Installed spike strips and metal baffles on whaler system for rodent migration prevention

Notes:
[1] Pile driving for king piles occurred in-water on three days (May 14-16). DWR conducted in-water noise monitoring during these days.
[2] Pile driving for sheet piles occurred in-water on only six days (May 16 and 18-22). DWR conducted in-water noise monitoring for five of these days (May 18-22). Pile driving did not occur on May 17 because of strong wind.
[3] Pile driving for the monitoring stations occurred in-water on all six days (June 4-6 and 8-10). DWR conducted in-water noise monitoring during these days.
Source: DWR 2015

2.0 Pre-Construction

Biological surveys for special status plants (and elderberry shrubs), nesting birds, western pond turtle, and giant garter snake were performed by qualified biologists on April 21, 2015 at the West False River Barrier site. Surveys were conducted by boat at low tide to maximize visibility of intertidal plants and to maximize visibility of potential nesting habitat on both levees. The same day, the staging area was surveyed on foot. Biologists identified a Red-tailed Hawk nest and a Great Horned Owl nest on Bradford Island approximately 500 feet and 0.25 mile east of the project site, respectively. On Jersey Island biologists identified a giant garter snake on the levee road approximately 0.15 mile west of the project site. Also on Jersey Island a hawk nest was identified approximately 450 feet south of the project site, Delta tule pea was identified on the waterside slope of the levee approximately 175 feet east of the project site, and Mason's lilaeopsis and Suisun Marsh aster were identified along the waterside slope of the levee approximately 0.20 mile east of the project site.

Raptor surveys were repeated on April 23, 2015 and confirmed that both hawk nests observed near the project site during the April 21, 2015 surveys were Red-tailed Hawk nests. A territorial Swainson's Hawk was also observed in an area approximately 0.25 mile east of the project site on Jersey Island, but no mate or nest was observed. Raptor surveys were repeated on April 27 and 29, 2015 but no new raptor nest were observed.

On April 30, 2015, biologists visited the barrier site to flag the special plants identified on April 21 and they observed a dead giant garter snake nearly a mile southeast of the project site on the ferry road; this snake appeared to be a casualty of the fisherman and ferry traffic on that section of road. Biologists contacted Laura Patterson at CDFW and Dave Kelly at USFWS and were given authorization to collect it and took it to the USGS Dixon Field Station.

On May 4, 2015, pre-construction surveys for western pond turtle and giant garter snake were conducted. No special status reptiles were observed on the project site but a western pond turtle was observed walking on the ferry road approximately 0.75 mile south of the ferry on Jersey Island.

Prior to installation of the water quality monitoring station piles, pre-construction surveys were conducted. Since piles were placed in open water and all work was conducted by barge, botanical surveys and surveys for other terrestrial species were not conducted, only surveys for nesting birds were conducted. Since the pile locations were spread throughout the Delta, the surveys took place on various dates from May 9-20, 2015. Of the twelve locations surveyed, only the Miner Slough location had a Swainson's Hawk nest within a 0.50-mile radius, but this nest was over 0.25 mile away (approximately 0.3 mile) and was visually obstructed from the proposed monitoring station location.

For complete details of all preconstruction surveys, see Appendix B.

Environmental Awareness Training was held for several DWR staff and most of the contractor's personnel by an approved biologist at the contractor's yard in Rio Vista on May 4, 2015. Topics covered included the biology, listing status, and project-specific protection measures of giant garter snake, Burrowing Owl, Swainson's Hawk, general migratory birds, western pond turtle, valley elderberry longhorn beetle, special status plants, Delta Smelt, Chinook Salmon, Central Valley Steelhead, and Green Sturgeon. Environmental Awareness Training was subsequently repeated by the environmental monitors for all new personnel throughout the project. See Appendix C for a copy of the signed training forms.

3.0 Construction

3.1 Biological Monitoring

On-site biological monitoring was performed by approved biologists daily for all construction activities. During 24-hour work, monitors were on site from sunrise to sunset. In general, there was a morning and afternoon monitoring shift and monitoring logs were completed for each shift (Appendix D). Upon arrival the monitor would typically clear the Jersey Island side then get on a boat that was on site and clear the Bradford Island side (when work was taking place on Bradford Island). The monitor then would go back

and forth between the islands as necessary. Representative photos of construction activities can be found in Appendix A.

In addition to the giant garter snake observations during pre-construction, there were several observations of possible giant garter snakes during construction. Incidences that were in close proximity to the project site and were identifiable were reported to USFWS and CDFW immediately. Incidences that were far from the project site and/or when identification was uncertain were recorded on an internal GGS Observation Form for documentation. Pre-construction observations were submitted to CNDDB immediately, construction observations are being compiled to be submitted upon completion of the project (after barrier removal is complete). Two individuals were captured and moved to an area west of the EDB site after an individual was observed in rip-rap on the waterside slope (between the upland exclusion fencing and in-water construction area) on 3 consecutive days and Agency approval was attained. A summary of confirmed and possible giant garter snake sightings can be found below in Table 3, and documentation of GGS sightings, including CNDDB forms and GGS Observation Forms with photos when available, can be found in Appendix E.

Table 3: Confirmed and Potential Observations of Giant Garter Snakes in the Vicinity of the Project Site Before and During 2015 Barrier Installation

Date	Description of Observation
April 21, 2015	One confirmed individual observed during pre-construction survey, on the Jersey Island levee road, approximately 900 feet west of the project site.
April 30, 2015	One confirmed individual found dead on public road on the east side of Jersey Island, nearly 1 mile east of the project site; collected (after agency approval) and taken to the Dixon U.S. Geologic Survey Field Station.
May 6, 2015	One confirmed individual found inside the incomplete exclusion fence on Jersey Island; fence was lifted and the snake left the area.
May 8, 2015	One possible individual observed just outside the Jersey Island exclusion fencing; moved quickly into the wetland area to the south before a photograph could be taken or identification confirmed.
May 10, 2015	One possible individual observed on the public road on the east side of Jersey Island; moved into water before photograph could be taken or identification confirmed
May 14, 2015	One possible individual observed on private land, outside the project site on Bradford Island (captured and released by the landowner); a photograph was taken by the contractor it was shown to, but the quality was not adequate to confirm identification.
May 17, 2015	One possible individual observed by contractor on Jersey Island levee road near project site (outside exclusion fencing); no longer present when monitor went to investigate.
May 18 – 20, 2015	One confirmed individual observed in rip-rap between Jersey Island exclusion fencing and in-water work area.
May 21, 2015	Two confirmed individuals, presumably including the one observed in rip-rap on the previous 3 days were captured and relocated (after agency approval) to an area of similar habitat west of the project site.

Source: DWR 2015

Several other snake species were observed on or near the project site, including gopher snakes, king snakes, and yellow-bellied racers. Several bird species were observed on or near the project site and several sea lions were observed in the area. On May 11, 2015, a smashed killdeer egg was observed approximately 300 feet east of the Jersey Island staging area exclusion fence and 10 feet north of the wetland area at the toe of the levee; the cause of damage was unknown (activities prior to the project, predation, or other circumstances). On May 26, 2015, a dead gopher snake was observed on a road just west of the ferry (on Jersey Island); the snake did not appear to be a vehicle mortality, and cause of death was unknown. On June 6, 2015, a dead gopher snake was observed east of the Jersey Island exclusion fence along the waterside levee hinge; this snake may have been crushed by rocks shifting due to people walking on the rip-rap. No fish mortalities were observed during in-water pile driving. No other impacts to biological resources were reported.

An environmental monitor was also present for the water quality monitoring station pile driving. No environmental concerns were reported during these activities, and the relevant monitoring logs can be found in Appendix D.

3.2 Water Quality Sampling

Water quality measurements including turbidity and settleable solids were taken, upstream and downstream of barrier construction at approximately 9am, 12pm, and 3pm each in-water work day. The water quality objectives, as outlined in the Water Quality Certification issued May 4, 2015, were met on all occasions. At no point during the construction of the barrier did the turbidity reach the background turbidity threshold of 150 Nephelometric Turbidity Units (NTU) agreed upon for the Delta, nor did settleable solids exceed the 0.1 ml/L threshold. The highest recorded turbidity measurement of 34.3 NTU occurred on May 15, 2015 during rock placement; for complete water quality monitoring data see Appendix F.

3.2.1 Continuous Water Quality Monitoring

Monitoring was conducted of water quality measurements including flow, temperature, and salinity downstream of the Project at Jersey Point sampling station in the San Joaquin River and for flow, temperature, salinity, turbidity, chlorophyll, and dissolved oxygen. The water quality monitoring plan is attached as Appendix G, and real-time data from the continuous water quality monitoring plan as well as the newly installed flow monitoring station on Fisherman's Cut is graphically summarized in the Water Quality Monitoring Interactive Map found at the following link: http://www.water.ca.gov/waterconditions/emergencybarriers.cfm.

3.3 Sound Monitoring

Since all pile driving for this project was conducted using a vibratory hammer, there were no applicable sound thresholds for the project, but sound monitoring was conducted to facilitate a quantitative analysis of potential impacts. On May 15, 2015, pile driving was paused when sound levels neared impact hammer thresholds, driving recommenced after DWR received confirmation from the regulatory agencies that these thresholds did not apply to vibratory driving. Sound monitoring was conducted on all days that in-water pile driving was scheduled, although on some days pile driving occurred at both abutments simultaneously and it was not possible to monitor both locations at once. Sound monitoring was also

conducted for all the water quality monitoring station piles. Various precautionary measures were taken because of the uncertainty of potential effects due to the lack of accepted sound criteria for vibratory pile driving. On May 15, 2015, a bubble curtain was placed around the vibratory driver to attenuate the sound, although effectiveness was likely reduced when tidal currents were sufficiently rapid to disperse the bubbles. When sound measurements neared the impact hammer thresholds, visual monitoring for dead or injured fish in the vicinity of the pile driving was undertaken, with the intent of halting work should any such fish have been observed; were any of these fish found and confirmed to be ESA- or CESA-listed, USACE and the appropriate fish agency would have been notified, with pile driving recommencing only after approval by USACE and the appropriate fish agency. However, no dead or injured fish of any species were observed, so pile driving proceeded without being paused further.

In-water pile driving at the barrier site was undertaken on 8 days from May 14 to May 16 and May 18 to May 22. The number of pile driving sessions per day that was monitored ranged from 3 to 8, with the total duration spent pile driving ranging from just under an hour on May 14 (king piles, south side) to around 4.5 hours on May 20 (sheet piles, north side). The mean cumulative sound exposure level (SEL) per session that was monitored for sound was 193.8 decibels (dB) (range 178.7 to 205.1 dB). Pile driving for the water quality monitoring stations was undertaken on 6 days from June 4 to June 9. The number of piles driven per day was 2 to 3, with a mean total duration spent pile driving at each site of around 7 minutes (range 2 to 13 minutes). The mean cumulative SEL per session was 171.8 dB (range 149.0 to 202.5 dB), although note that one relatively high value (202.5 dB at Miner Slough near Cache Slough on June 6) skewed the mean upwards. The pile in Grizzly Bay was not actually driven, but simply pushed into the soft muddy bottom. The complete data sets and summary of results can be found in Appendix H.

4.0 Post-Construction: Installation

Upon completion of barrier installation, materials installed for staging and exclusion fencing were removed and the levee roads and staging area were restored to pre-project conditions. Soil stabilizer was used for temporary erosion control on the landside levee; the area will be hydroseeded upon completion of barrier removal. All appropriate regulatory agencies were notified upon completion of installation. For representative photos of the site after installation was complete, see Appendix A.

5.0 Conclusions

The terms and conditions of the environmental permits were met during installation of the drought barrier and on-site environmental disturbance of the surroundings were minimized. In addition to the avoidance and minimization measures implemented, giant garter snake and shallow water disturbances have been compensated for through the purchase of mitigation credits at approved mitigation banks in accordance with the CDFW Incidental Take Permit (2081-2014-026-03). Proof of purchase for 1 acre of giant garter snake credit and 4.9 acres of smelt/salmonid credit can be found in Appendix I.

Appendix A: Representative Site Photographs

Pre-construction

Photo 1: West False River Jersey Island Levee on March 14, 2014.

Photo 2: West False River Bradford Island Levee on March 14, 2014.

Photo 3: Looking west along the Jersey Island levee crown (April 14, 2015).

Photo 4: Looking south at the staging area on Jersey Island (April 14, 2015).

Photo 5: Looking west along the Bradford Island levee crown (April 14, 2015).

Construction

Photo 6: Installing sheet piles as piping preventer on Bradford Island (May 8, 2015).

Photo 7: Installing sheet piles as piping preventer on Jersey Island (May 10, 2015).

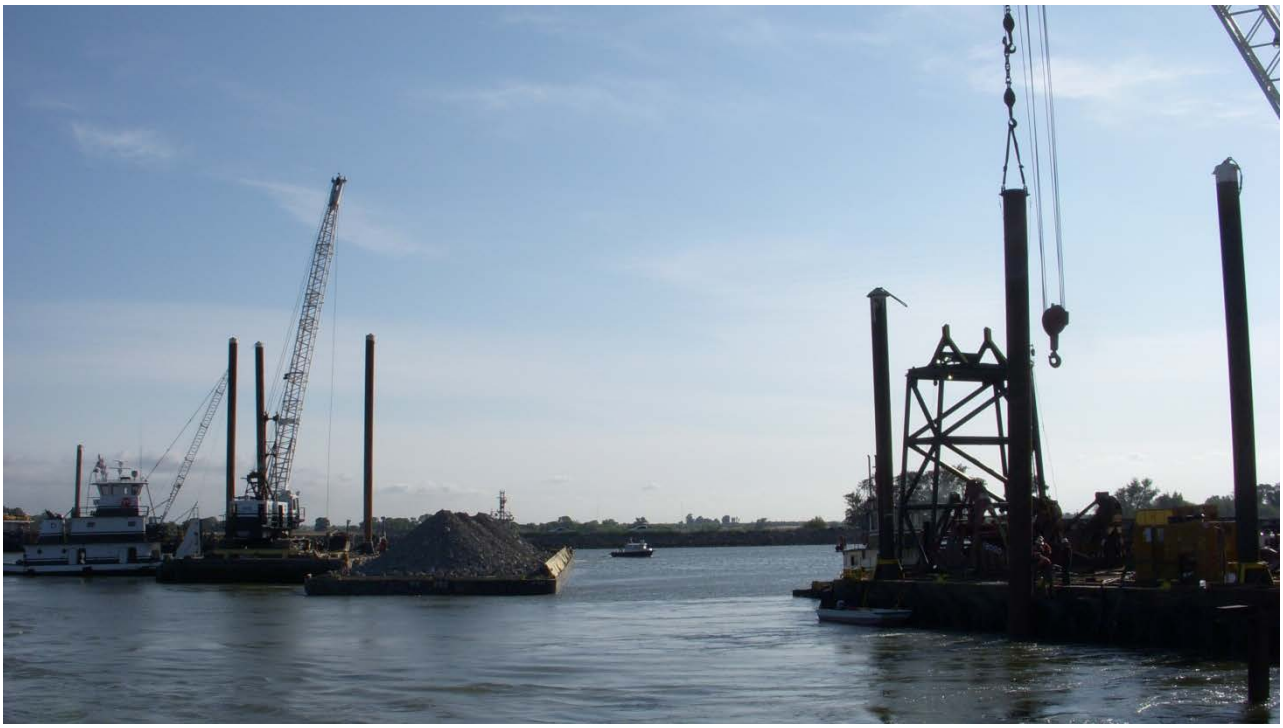


Photo 8: Dropping Rock for Barrier (May 15, 2015).

Photo 9: Installing king piles for abutment on Jersey Island (May 15, 2015).

Photo 10: Installing sheet piles as for abutment on Jersey Island (May 20, 2015).

Photo 11: Placing rock for barrier (May 26, 2015).

Post Construction Photos

Photo 12: Taken from Jersey Island facing Bradford Island (June 17, 2015).

Photo 13: Take from Jersey Island Facing Bradford Island (June 17, 2015).

Photo 14: On Jersey Island facing East (June 17, 2015).

Photo 15: Jersey Island staging area immediately after application of soil stabilizer (June 25, 2015).

Photo 16: Taken from Bradford Island facing Jersey Island (June 17, 2015).

Photo 17: On Bradford Island facing West (June 17, 2015).

Appendix B: Pre-construction Survey Reports

From: Marquez, Katherine@DWR
To: Tomera, Nick@AECOM; McQuirk, Jacob@DWR; Davis, Cindy@AECOM; King, Anne; Tsao, Danika@DWR; Kim_S_Turner@fws.gov; Erin_Gleason@fws.gov; William.H.Guthrie@usace.army.mil; tiffany_heitz@fws.gov
Subject: RE: DWR EDB USFWS BA
Date: Wednesday, April 22, 2015 9:35:00 AM

On April 21, 2015, DWR Biologists conducted preconstruction surveys specifically for migratory birds, Burrowing Owl, Swainson's Hawk, elderberry trees (VELB) and special status plants, western pond turtle, and giant garter snake. The survey was conducted by boat at low tide so that both the Bradford Island Levee and Jersey Island Levee could be surveyed. Biologists also drove to Jersey Island and surveyed that project area by foot. They observed a Great Horned Owl Nest, potential Swainson's Hawk nest, potential Red-tailed Hawk nest, Delta tule pea, Mason's Lilaeopsis, Suisun Marsh Aster, and a giant garter snake. See the figure for approximate locations.

-----Original Appointment-----
From: Tomera, Nick [mailto:Nick.Tomera@aecom.com]
Sent: Thursday, April 16, 2015 12:44 PM
To: Tomera, Nick; McQuirk, Jacob@DWR; Davis, Cindy@AECOM; King, Anne; Tsao, Danika@DWR; Kim_S_Turner@fws.gov; Erin_Gleason@fws.gov; William.H.Guthrie@usace.army.mil; Marquez, Katherine@DWR; tiffany_heitz@fws.gov
Subject: DWR EDB USFWS BA
When: Wednesday, April 22, 2015 9:30 AM-10:30 AM (UTC-08:00) Pacific Time (US & Canada).
Where: 866.203.6896; 483.572.6916

Hello All,

The purpose of this call is to follow-up on the issues discussed at the 4/15/15 meeting (e.g., VELB, GGS). Please use the following call-in information:

Dial-in: 866.203.6896

Conference code: 483.572.6916

Thanks,

Nick

This e-mail and any attachments contain AECOM confidential information that may be proprietary or privileged. If you receive this message in error or are not the intended recipient, you should not retain, distribute, disclose or use any of this information and you should destroy the e-mail and any attachments or copies.

Stick nest (Potential Red-tailed Hawk)
GHOW
GGS
Delta Tule Pea
Potential SWHA
Mason's Lilaeopsis and Suisun Marsh Aster
Google earth
851 ft
Tour Guide
1939
Imagery Date: 6/9/2014 38°03'14.95" N 121°39'50.28" W elev -6 ft eye alt 3667 ft

8
7>
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1

From: Bandy, Katherine@DWR
To: Marquez, Katherine@DWR
Subject: EDB GGS and WPT survey 4/21/2015
Date: Thursday, April 23, 2015 3:13:15 PM

Hi Katherine,

Lesley Hamamoto, Danika Tsao, and I surveyed the West False River barrier site by boat and on foot on Monday April 21, 2015. Windy and choppy conditions on the water were not ideal for observing western pond turtles basking along the shoreline. Also, due to safety concerns we were not able to access the shore from boat.

Bradford Island:

- The shoreline was scanned by boat, the island was not accessed on foot.
- No WPT or GGS were observed.
- Potential basking habitat is present along the shoreline for WPT and they could utilize landside for nesting habitat.

Jersey Island:

- The shoreline was scanned by boat and the shoreline, levee crown, and landside area (staging area) was walked in meandering transects.
- No WPT observed.
- Potential basking habitat is present along the shoreline for WPT and they could utilize landside for nesting habitat.
- No GGS were observed in the project area; however, while on route to leave the island after surveys were complete, a GGS was spotted basking on the road approximately 900ft. west of the proposed project site. It was on the north shore of the island near the confluence of False River with the San Joaquin River. High resolution photos were taken of identifying characteristics of the snake (i.e. upper labial scales, scale texture, and head size relative to neck) to confirm identity with experts. Identity was confirmed with high confidence by Laura Patterson (CDFW), Jess Barnes (DWR), Eric Hansen (CEB), and Brian Halstead (USGS) that this individual was in fact a GGS.

The map you created yesterday accurately shows the location of the GGS sighting. Please let me know if you have any questions or would like any additional information.

Thank you,

Katherine Bandy
Environmental Scientist
Department of Water Resources
Environmental Compliance and Evaluation Branch
3500 Industrial Blvd.
West Sacramento, CA 95691
phone: 916-376-9793
Katherine.Bandy@water.ca.gov

Botanical Survey Report

for the

2015 Emergency Drought Barrier Project

Prepared by

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INTRODUCTION

Project Location

The proposed project is located on West False River, spanning the waterway between Bradford and Jersey Islands in the Jersey Island USGS 7.5 minute quadrangle, Township 3N, Range 3E, Section 32.

Project Description

The proposed project would include installation of a temporary rock barrier at West False River, near its confluence with the San Joaquin River, to limit salinity intrusion along the lower San Joaquin River and the channels leading from it. A plan view schematic of the proposed project, including the rock barrier, boom lines, and staging area is provided in Figure 1 below.

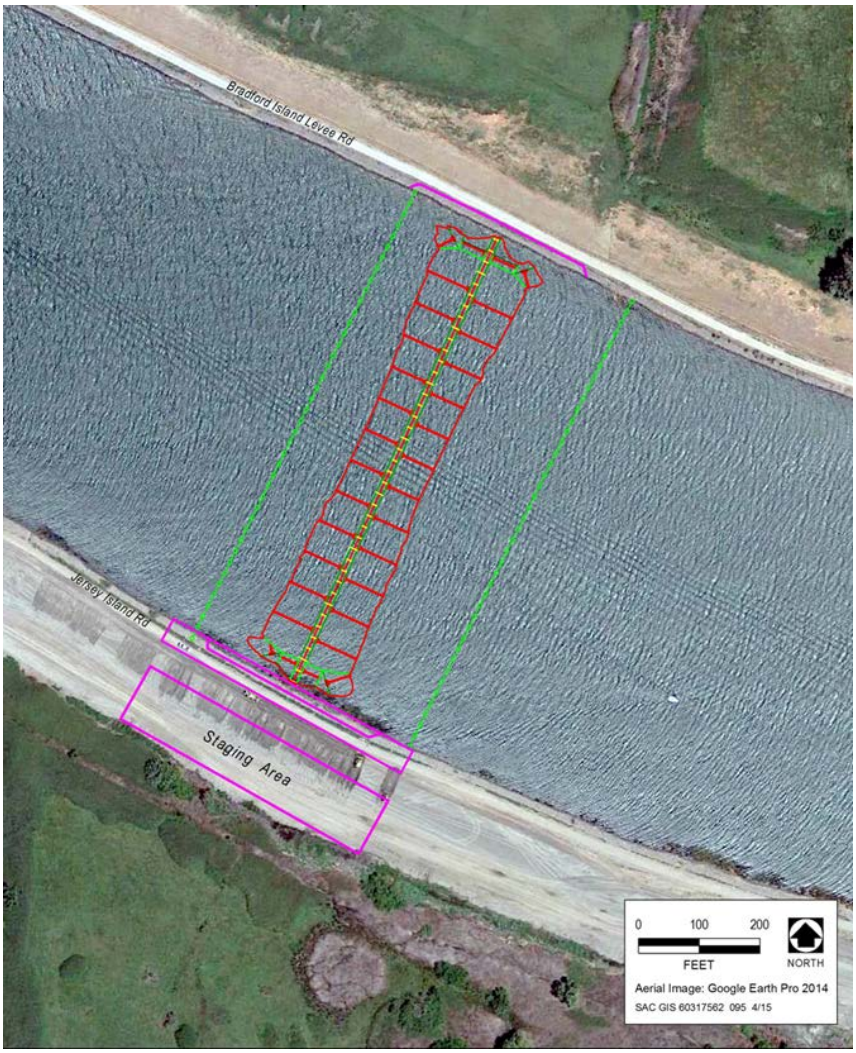

Figure 1- Project Footprint Map

BOTANICAL SURVEY METHODS

Survey Purpose

The purpose of this botanical survey was to provide a pre-construction evaluation of sensitive botanical resources that have the potential to be impacted by the construction of the barrier. Additionally, this survey was intended to identify any elderberry shrubs (*Sambucus nigra* spp. *caerulea*) which may be present within the project area, and are susceptible to use as host plants for the federally threatened valley elderberry longhorn beetle.

Survey Area

The botanical survey was conducted within and around the proposed project footprint, and included the waterside shorelines of both Jersey Island and Bradford Island levees, and an area on the landside of the Jersey Island levee which will be used for staging.

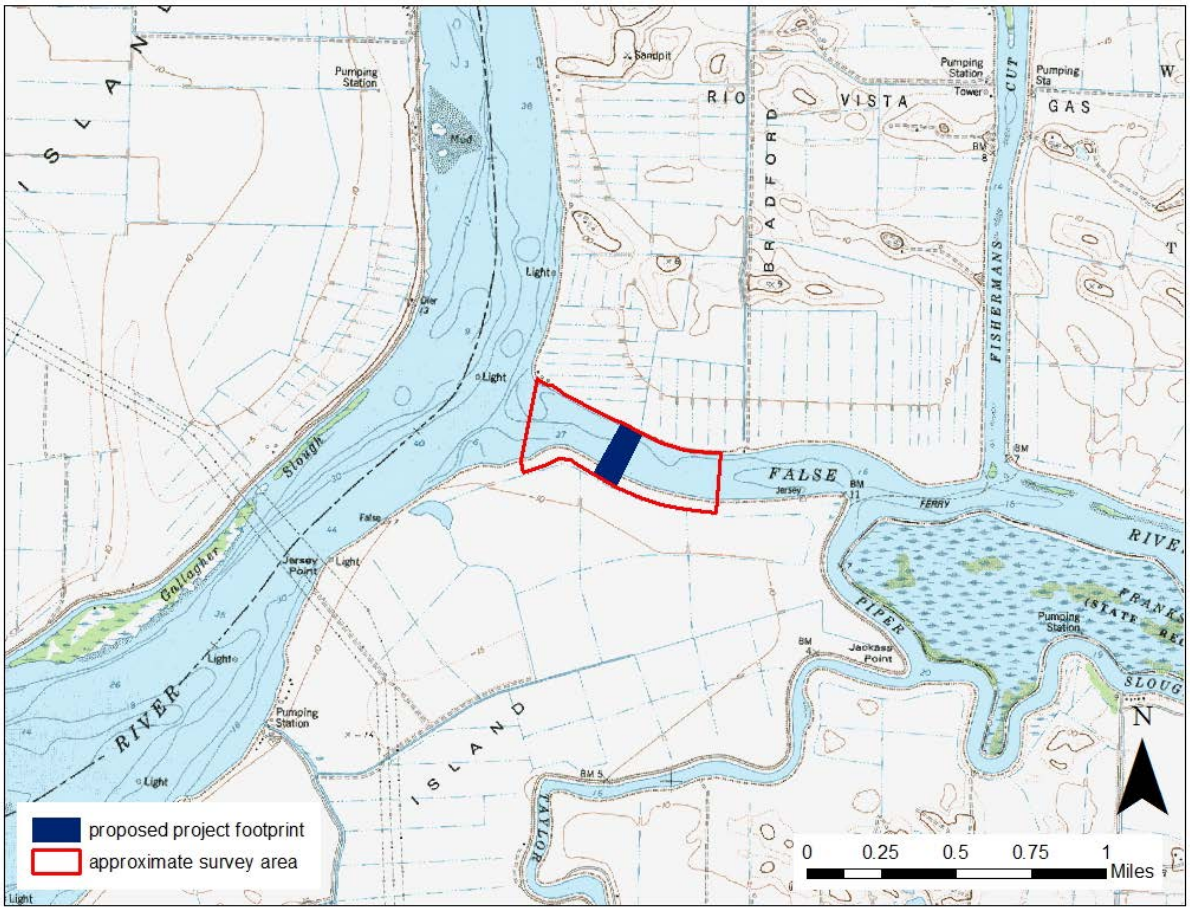

Figure 2-Survey Area

Literature Review

Nine-quad searches centered on the Jersey Island USGS 7.5' Quadrangle were conducted of the California Natural Diversity Database (CNDDB; CDFW, 2015), the CNPS Inventory of Rare, Threatened,

and Endangered Plants of California (CNPS Inventory; CNPS, 2015) and the US Fish and Wildlife Species List Generator (USFWS, 2015) to identify sensitive plant species that have the potential to occur within the project area. A summary table of species which were identified through database searches as having potential to occur within the project area is presented as Appendix A of this report.

Field Investigation Methodology

Surveys were conducted on April 21, 2015 by Lesley Hamamoto (Senior Environmental Scientist (Specialist), botany), and accompanied by Danika Tsao (Senior Environmental Scientist (Specialist)) and Katherine Bandy (Environmental Scientist).

Surveys were conducted along the waterside via boat and from the landside on Jersey Island. Surveys followed Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities (CDFG, 2009) and the California Native Plant Society's Botanical Survey Guidelines (CNPS, 2001), in that they were conducted at the proper time of year when special status plants were evident and identifiable, floristic in nature, included all habitat suitable for supporting sensitive species, and sought to identify all plant taxa encountered within the project site to a level which allows determination of rarity and sensitive species status.

The boat survey was timed to coincide with a reduced tide to maximize the potential for detecting subtidal species such as Mason's lilaeopsis (*Lilaeopsis masonii*), Delta mudwort (*Limosella subulata*), and Sanford's arrowhead (*Sagittaria sanfordii*). A low tide of -0.3 feet at 2:18 pm was predicted for the mouth of Threemile Slough. The boat survey within the project footprint began at approximately 1:15 pm and was concluded at 1:45 pm.

Survey Limitations

Although the boat survey was timed to maximize tidal exposure of the shoreline, high winds in excess of 15 mph and strong waves made surveying through binoculars from approximately 20 feet offshore extremely difficult. The Bradford Island levee and shore were not accessible for further surveys by land, but the bank is heavily riprapped to below the waterline and little vegetation was observed. Therefore, the likelihood that rare plant species were present on the Bradford Island portion of the project area and remained undetected is low.

BOTANICAL SURVEY RESULTS

Waterside habitat within the project area is heavily riprapped, but some vegetation is present among the rip rap and in the subtidal shallows at the levee toes on both islands. Waterside levee vegetation above the high water mark was sparse, but included species such as prickly sowthistle (*Sonchus asper*), wild radish (*Raphanus sativus*), poison hemlock (*Conium maculatum*), hybridized black walnut (*Juglans* x *hindsii*), and Himalayan blackberry (*Rubus armeniacus*). Delta tule pea (*Lathyrus jepsonii* var. *jepsonii*) was also found in one location on Jersey Island (Figure 3). Species found below the high water mark and in the subtidal shallows included tules (*Schoenoplectus acutus* and *S. californica*), water hyacinth (*Eichornia crassipes*), Brazilian waterweed (*Egeria densa*) and sensitive species such as Mason's lilaeopsis (*Lilaeopsis masonii*), Suisun March aster (*Symphyotrichum lentum*) (Figure 3).

Figure 3-Survey Results

The landside staging area on Jersey Island was recently disturbed due to levee repairs conducted in summer of 2014. Soils were especially sandy in this disturbed area, and may have been imported during the levee repair. A survey of this area found species such as hairy vetch (*Vicia villosa*), meadow barley (*Hordeum brachyantherum*), red sandspurry (*Spergularia rubra*) and brass buttons (*Cotula coronopifolia*). No sensitive species were found in the staging area.

No elderberry shrubs were identified within the surveyed area.

A complete list of plant species identified within the surveyed area is included as Appendix B.

SUMMARY AND CONCLUSIONS

Delta tule pea the only sensitive plant species found immediately adjacent to the project footprint. Three or possibly four individuals were located approximately midway up the Jersey Island levee on the eastern edge of the project area. While these plants are close to the project boundary, they are limitied in distribution within the area, and should be avoidable. Several Suisun Marsh aster individuals and patches of Mason's lilaeopsis were found approximately 800 feet east of the project's eastern boundary.

These should be avoidable as well, and adverse impacts to these species are not expected as a result of the construction of the barrier.

Therefore, the construction of the barrier is not expected to impact sensitive plant species or elderberry longhorn beetle.

REFERENCES

Calflora: Information on California plants for education, research and conservation, with data contributed by public and private institutions and individuals, including the Consortium of Calif. Herbaria. [web application]. 2015. Berkeley, California: The Calflora Database [a non-profit organization]. Available online at http://www.calflora.org/. Accessed April 23, 2015.

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California Native Plant Society (CNPS). 2001. CNPS Botanical Survey Guidelines, CNPS Inventory, 6th Ed. Revised June 2.

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APPENDIX A

Summary table of species which have been found to occur within a 9-quad search area (centered on the USGS 7.5' Jersey Island Quadrangle) of the CNDDB, CNPS Inventory, and USFWS Species List Generator.

Scientific Name	Common Name	Federal Status	State Status	CRPR
Amsinckia grandiflora	large-flowered fiddleneck	Endangered	Endangered	1B.1
Arctostaphylos auriculata	Mt. Diablo manzanita			1B.3
Arctostaphylos manzanita ssp. *laevigata*	Contra Costa manzanita			1B.2
Astragalus tener var. *tener*	alkali milk-vetch			1B.2
Atriplex cordulata var. *cordulata*	heartscale			1B.2
Atriplex coronata var. *coronata*	crownscale			4.2
Atriplex depressa	brittlescale			1B.2
Blepharizonia plumosa	big tarplant			1B.1
Brasenia schreberi	watershield			2B.3
Calandrinia breweri	Brewer's calandrinia			4.2
California macrophylla	round-leaved filaree			1B.1
Calochortus pulchellus	Mt. Diablo fairy-lantern			1B.2
Carex comosa	bristly sedge			2B.1
Centromadia parryi ssp. *congdonii*	Congdon's tarplant			1B.1
Centromadia parryi ssp. *parryi*	pappose tarplant			1B.2
Centromadia parryi ssp. *rudis*	Parry's rough tarplant			4.2
Chloropyron molle ssp. *molle* (=*Cordylanthus mollis* ssp. *mollis*)	soft salty bird's-beak	Endangered	Rare	1B.2
Cicuta maculata var. *bolanderi*	Bolander's water-hemlock			2B.1
Cirsium hydrophilum var. *hydrophilum*	Suisun thistle	Endangered		1B.1
Convolvulus simulans	small-flowered morning-glory			4.2
Cryptantha hooveri	Hoover's cryptantha			1A
Downingia pusilla	dwarf downingia			2B.2

Eriogonum nudum var. *psychicola*	Antioch Dunes buckwheat			1B.1
Eriogonum truncatum	Mt. Diablo buckwheat			1B.1
Eryngium racemosum	Delta button-celery		Endangered	1B.1
Erysimum capitatum var. *angustatum*	Contra Costa wallflower	Endangered	Endangered	1B.1
Eschscholzia rhombipetala	diamond-petaled California poppy			1B.1
Etriplex joaquinana	San Joaquin spearscale			1B.2
Fritillaria agrestis	stinkbells			4.2
Fritillaria liliacea	fragrant fritillary			1B.2
Galium andrewsii ssp. *gatense*	phlox-leaf serpentine bedstraw			4.2
Helianthella castanea	Diablo helianthella			1B.2
Hesperevax caulescens	hogwallow starfish			4.2
Hesperolinon breweri	Brewer's western flax			1B.2
Hibiscus lasiocarpos var. *occidentalis*	woolly rose-mallow			1B.2
Isocoma arguta	Carquinez goldenbush			1B.1
Juglans hindsii	Northern California black walnut			1B.1
Lasthenia conjugens	Contra Costa goldfields	Endangered		1B.1
Lathyrus jepsonii var. *jepsonii*	Delta tule pea			1B.2
Lilaeopsis masonii	Mason's lilaeopsis		Rare	1B.1
Limosella australis	Delta mudwort			2B.1
Madia radiata	showy golden madia			1B.1
Malacothamnus hallii	Hall's bush-mallow			1B.2
Myosurus minimus ssp. *apus*	little mousetail			3.1
Navarretia heterandra	Tehama navarretia			4.3
Navarretia leucocephala ssp. *bakeri*	Baker's navarretia			1B.1
Navarretia nigelliformis ssp. *nigelliformis*	adobe navarretia			4.2
Navarretia nigelliformis ssp. *radians*	shining navarretia			1B.2
Neostapfia colusana	Colusa grass			1B.1
Oenothera deltoides ssp. *howellii*	Antioch Dunes evening-primrose	Endangered	Endangered	1B.1
Plagiobothrys hystriculus	bearded popcornflower			1B.1

Plagiobothrys hystriculus	bearded popcorn-flower			1B.1
Potamogeton zosteriformis	eel-grass pondweed			2B.2
Sagittaria sanfordii	Sanford's arrowhead			1B.2
Scutellaria galericulata	marsh skullcap			2B.2
Scutellaria lateriflora	side-flowering skullcap			2B.2
Senecio aphanactis	chaparral ragwort			2B.2
Senecio hydrophiloides	sweet marsh ragwort			4.2
Sidalcea keckii	Keck's checkerbloom	Endangered		1B.1
Symphyotrichum lentum	Suisun Marsh aster			1B.2
Tropidocarpum capparideum	caper-fruited tropidocarpum			1B.1
Viburnum ellipticum	oval-leaved viburnum			2B.3

California Rare Plant Rank (CRPR)
1A = ranked as presumed extinct in California by the CNPS
1B.1 = ranked as rare, threatened, or endangered in California and elsewhere (seriously threatened in CA) by the CNPS
1B.2 = ranked as rare, threatened, or endangered in California and elsewhere (fairly threatened in CA) by the CNPS
2.1 = ranked as rare, threatened, or endangered in California, but more common elsewhere (seriously threatened in CA) by the CNPS
2.2 = ranked as rare, threatened, or endangered in California, but more common elsewhere (fairly threatened in CA) by the CNPS
3.1 = ranked as plants requiring more information in California that are under review (seriously threatened in CA) by the CNPS
4.2 = ranked as plants having a limited distribution within California that should be watched (fairly threatened in CA) by the CNPS

APPENDIX B

List of all plant species encountered during surveys of the project area.

Waterside and Levee	Staging Area
Asparagus officinalis	*Atriplex prostrata*
Avena fatua	*Centaurea solstitialis*
Bromus diandrus	*Chenopodium album*
Carduus pycnocephalus	*Chenopodium berlandieri*
Centaurea solstitialis	*Cotula coronopifolia*
Conium maculatum	*Descurainia sophia*
Cortaderia selloana	*Epilobium ciliatum*
Egeria densa	*Erigeron bonariensis*
Eichornia crassipes	*Festuca perennis*
Erigeron bonariensis	*Helminthotheca echioides*
Hordeum murinum	*Hordeum brachyantherum*
Hydrocotyle verticillata	*Hordeum marinum*
Iris pseudacorus	*Hordeum murinum*
Juglans x hindsii	*Lactuca saligna*
Juncus effusus	*Lepidium latifolium*
Juncus xiphioides	*Polygonum aviculare*
Lactuca saligna	*Polypogon monspeliensis*
Lathyrus jepsonii var. *jepsonii*	*Raphanus sativus*
Lilaeopsis masonii	*Sonchus asper*
Persicaria amphibia	*Spergularia rubra*
Phragmites australis	*Vicia villosa*
Polygonum aviculare	
Raphanus sativus	
Rubus armeniacus	
Rumex crispus	
Schoenoplectus acutus	
Schoenoplectus californicus	
Sonchus asper	
Symphyotrichum lentum	
Trifolium repens	
Xanthium strumarium	

APPENDIX C

Representative photos of rare plant occurrences within the project area.

Delta tule pea growing in rip-rap

Suisun Marsh aster and Mason's lilaeopsis growing at waterside levee toe

From:	Tsao, Danika@DWR
To:	McQuirk, Jacob@DWR; Cane, Michael@DWR; Marquez, Katherine@DWR; King, Anne (Anne.King@aecom.com)
Cc:	Kuenster, Gail@DWR
Subject:	EDB Raptor nest survey 4/21/15
Date:	Wednesday, April 22, 2015 11:21:30 AM
Attachments:	EDB2015_WFR_042115.pdf

Hello,

We surveyed the West False River barrier site by boat and on foot on Monday, April 21. Windy conditions were not ideal for confirming identification of nesting raptors, so a second site visit will need to be made to confirm. Please see attached map for locations of raptor nests observed.

Bradford Island:

- A Great Horned Owl was observed nesting approximately 325 meters east of the construction footprint. There were at least two large chicks at the nest, near fledging.
- A stick nest was observed 130 meters east of the construction footprint. The nest did not appear to have an adult sitting on it, but with poor viewing conditions, it was not possible to confirm whether the nest was occupied. A Red-tailed Hawk was observed flying over the field immediately north of the potential nest.

Jersey Island:

- A nest was observed 130 meters southwest of the staging area. There was an adult raptor sitting very low on the nest, but windy conditions prevented a positive ID. A Swainson's Hawk was observed flying and perched on trees approximately 250 meters east of this nest, so there is a strong chance this is a SWHA nest. Another site visit will be necessary to confirm which species is using this nest; I can go back tomorrow if needed. If this is indeed a SWHA, we should consider measures to reduce disturbance, such as moving the staging area to the east, if possible.
- A pair of Northern Harriers was observed foraging/flying near the site, which indicates a nest may be nearby. Most of the possible nesting habitat is likely outside of the 500 foot buffer commonly used for nesting raptors.

Please let me know if you have any questions,
Danika

Danika Tsao
Senior Environmental Scientist (Specialist)
CA Department of Water Resources
Division of Environmental Services
(916) 375-4221
Danika.Tsao@water.ca.gov

Emergency Drought Barriers - West False River
Raptor nests as of 4/21/2015

- GHOW
- possRTHA
- possSWHA

- 500 ft buffer
- 1/2 mile buffer
- 1/4 mile buffer
- Construction footprint

N

0 75 150 300 450 600 Meters

0 0.05 0.1 0.2 0.3 0.4 0.5 Miles

From:	Tsao, Danika@DWR
To:	McQuirk, Jacob@DWR; Cane, Michael@DWR; Marquez, Katherine@DWR; King, Anne (Anne.King@aecom.com)
Cc:	Kuenster, Gail@DWR
Subject:	RE: EDB Raptor nest survey 4/23/15
Date:	Thursday, April 23, 2015 3:56:25 PM
Attachments:	EDB2015_WFR_042315.pdf

Hello,
Here is the updated map showing raptor nest locations as of 4/23/2015. I also included the approximate location where the single Swainson's Hawk was observed exhibiting territorial behavior. I would like to clarify that this does not necessarily mean that a nest will be established, but we should be aware that there is a possibility of a Swainson's Hawk nest and keep an eye out as the project moves forward.
Cheers,
Danika

-----Original Message-----
From: Tsao, Danika@DWR
Sent: Thursday, April 23, 2015 10:14 AM
To: McQuirk, Jacob@DWR; Cane, Michael@DWR; Marquez, Katherine@DWR; King, Anne (Anne.King@aecom.com)
Cc: Kuenster, Gail@DWR
Subject: RE: EDB Raptor nest survey 4/21/15

Hello,
Quick update:
This morning, Rhiannon Klingonsmith and I re-surveyed the site from Jersey Island. The nest on the Bradford Island is occupied by a Red-tailed Hawk pair. The pair was observed carrying nest material to the nest, so it appears the pair have not begun incubating eggs yet.
On the Jersey Island side, the nest southwest of the barrier is occupied by another Red-tailed Hawk pair. The female was low on the nest, and appears to be incubating eggs.
A single Swainson's Hawk was observed exhibiting territorial behavior approximately 450 meters southeast of the construction footprint, but no nest or mate was observed. This could become a nest territory, as Swainson's Hawks can establish nests into mid-May.
In summary, there are currently no Swainson's Hawk nests within 1/2 mile of the construction footprint. We will be conducting another preconstruction survey 5 days and 3 days prior to the start of work, as stipulated in the draft ITP.
Let me know if you have any questions!
Danika

From: Tsao, Danika@DWR
Sent: Wednesday, April 22, 2015 11:21 AM
To: McQuirk, Jacob@DWR; Cane, Michael@DWR; Marquez, Katherine@DWR; King, Anne (Anne.King@aecom.com)
Cc: Kuenster, Gail@DWR
Subject: EDB Raptor nest survey 4/21/15

Hello,
We surveyed the West False River barrier site by boat and on foot on Monday, April 21. Windy conditions were not ideal for confirming identification of nesting raptors, so a second site visit will need to be made to confirm. Please see attached map for locations of raptor nests observed.
Bradford Island:

· A Great Horned Owl was observed nesting approximately 325 meters east of the construction footprint. There were at least two large chicks at the nest, near fledging.

· A stick nest was observed 130 meters east of the construction footprint. The nest did not appear to have an adult sitting on it, but with poor viewing conditions, it was not possible to confirm whether the nest was occupied. A Red-tailed Hawk was observed flying over the field immediately north of the potential nest.

Jersey Island:

· A nest was observed 130 meters southwest of the staging area. There was an adult raptor sitting very low on the nest, but windy conditions prevented a positive ID. A Swainson's Hawk was observed flying and perched on trees approximately 250 meters east of this nest, so there is a strong chance this is a SWHA nest. Another site visit will be necessary to confirm which species is using this nest; I can go back tomorrow if needed. If this is indeed a SWHA, we should consider measures to reduce disturbance, such as moving the staging area to the east, if possible.

· A pair of Northern Harriers was observed foraging/flying near the site, which indicates a nest may be nearby. Most of the possible nesting habitat is likely outside of the 500 foot buffer commonly used for nesting raptors.

Please let me know if you have any questions, Danika

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Emergency Drought Barriers - West False River
Raptor nests as of 4/23/2015

Species

- GHOW
- RTHA
- territorial SWHA

- 500 ft buffer
- 1/2 mile buffer
- 1/4 mile buffer
- Construction footprint

N

0 75 150 300 450 600 Meters

0 0.05 0.1 0.2 0.3 0.4 0.5 Miles

From: Tsao, Danika@DWR
To: Marquez, Katherine@DWR
Subject: EDB preconstruction survey
Date: Tuesday, April 28, 2015 9:29:48 AM

Hello,

Below are the results of the Swainson's Hawk preconstruction survey (within 5 days of Friday, 5/1) conducted on Monday, April 27:

Danika Tsao and Rhiannon Klingonsmith surveyed the West False River barrier site from Jersey Island on April 27, 2015. All suitable trees on both sides of the river were scanned using binoculars and spotting scope within ½ mile of the construction footprint. No new raptor nests were observed. A single Swainson's Hawk was observed soaring over the trees southeast of the construction footprint, but no mate or nest was found. The site will be surveyed again within three days prior to construction.

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CA Department of Water Resources
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(916) 375-4221
Danika.Tsao@water.ca.gov

From: Tsao, Danika@DWR
To: Marquez, Katherine@DWR
Subject: EDB 5 day preconstruction survey
Date: Wednesday, April 29, 2015 2:24:45 PM

Hello,
Below are the results of the Swainson's Hawk preconstruction survey (within 5 days of Monday, May 4) conducted on Wednesday, April 29:
Danika Tsao and Gina Radieve surveyed the West False River barrier site from Jersey Island on April 29, 2015. All suitable trees on both sides of the river were scanned using binoculars and spotting scope within ½ mile of the construction footprint. No new raptor nests were observed.

- A single Swainson's Hawk was observed soaring over the trees southeast of the construction footprint, but no mate or nest was found.
- The Great Horned Owl nest on Bradford Island was empty; it is likely the chicks have either fledged or are brancher stage close to fledging.
- Two chicks were observed in the Red-tailed Hawk nest on Bradford Island. The chicks were approximately 3 weeks old, so have approximately another 3-4 weeks before fledging.

The site will be surveyed again within three days prior to construction on Friday, May 1.

Danika Tsao
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(916) 375-4221
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From:	Marquez, Katherine@DWR
To:	Spurr, Crystal@Wildlife (Crystal.Spurr@wildlife.ca.gov); Squires, Kim@fws.gov
Cc:	McQuirk, Jacob@DWR
Subject:	EDB pre-construciton surveys
Date:	Monday, May 04, 2015 4:40:00 PM
Attachments:	IMG_1739.jpg IMG_1738.jpg EDB_Tailgate_050415_signed.pdf

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Hi,

As required in our LSAA (1600-2014-0111-R3) and as stated in our BA for the Emergency Drought Barrier Project, a pre-construction survey for western pond turtle and giant garter snake was conducted this morning 5/4/2015 at approximately 9:30 am (within 24 hours of initiation of work, we plan to mobilize to the site 5/5/2015 at 6 am). No turtles or snakes were observed within the footprint of the project but a western pond turtle was observed along the public levee road when on the way to the project site, approximately 0.75 miles south of the Ferry, and a gopher snake was identified on the private road (see photos) approximately 0.1 miles west of the ferry. I have also attached, for your records, the a copy of the environmental awareness training that was conducted at the contractors facilities this morning.

Katherine Marquez
Senior Environmental Scientist
Environmental Studies and Compliance Section
Department of Water Resources
3500 Industrial Boulevard
West Sacramento, CA 95691
(916) 376-9785

Avian Survey Report

Emergency Drought Barrier Water Monitoring Station Pile Installation

Prepared by

Danika Tsao
Senior Environmental Scientist (Specialist)
California Department of Water Resources
(916) 375-4221
Danika.Tsao@water.ca.gov

INTRODUCTION

This document presents the findings of avian surveys conducted for the Emergency Drought Barrier water monitoring stations, to be installed in prior to the barrier closure in spring 2015. Installation of the monitoring stations will involve pile driving, which has the potential to affect nesting birds near the installation locations. Preconstruction surveys were conducted to assess potential for take of nesting Swainson's Hawks and other raptors and migratory birds.

Project Location

The proposed monitoring stations will be located throughout the Sacramento-San Joaquin Delta and Suisun Marsh, in Contra Costa, San Joaquin, Sacramento, and Solano counties, California and are listed in Table 1. Locations of the proposed locations are presented in Figure 1.

Table 1. Proposed Water Monitoring Stations

1	Fisherman's Cut near Franks Tract
2	Franks Tract (Mid Tract)
3	Steamboat Slough
4	Sacramento River near Steamboat Slough
5	San Joaquin River at Twitchell Island
6	Miner Slough near Sacramento River
7	Liberty Island
8	Sacramento River near Sherman Lake
9	Old River
10	Middle River
11a	Cutoff Slough near Ryer Island
11b	Grizzly Bay
12	Honker Bay

Project Description

To document the effects of the Emergency Drought Barrier at West False River on water quality throughout the Sacramento-San Joaquin Delta and Suisun, DWR will install twelve solar-powered monitoring stations on 12-inch steel pipe piles. Parameters such as dissolved oxygen, turbidity, salinity as measured by electrical conductivity (EC), river stage, and flow velocity will be measured. Installation of the piles will last up to one day per location. The piles remain in place after removal of the Emergency Drought Barrier for future use.

SURVEY METHODS

All suitable nesting habitat within 500 feet of the proposed monitoring station locations was surveyed using binoculars and naked eye for raptors and other nesting birds. Swainson's Hawk surveys were conducted within ½ mile of the Project site following the *Recommended Timing and Methodology for Swainson's Hawk Nesting Surveys in California's Central Valley* (http://www.dfg.ca.gov/wildlife/nongame/survey_monitor.html). Locations of active nests were recorded and mapped using ArcGIS version 10.2.

SURVEY RESULTS

Surveys were conducted by Danika Tsao, Rhiannon Klingonsmith, and Gina Radieve on May 9, 12, 14, and 20, 2015. Survey results are listed by station number below:

1. *Fisherman's Cut near Franks Tract*- No nesting raptors or other birds were found within 500 feet; no Swainson's Hawks were observed.
2. *Franks Tract* – Not surveyed; location is surrounded by open water
3. *Steamboat Slough* - No nesting raptors or other birds were found within 500 feet; no Swainson's Hawks were observed.
4. *Sacramento River at Steamboat Slough* - No nesting raptors or other birds were found within 500 feet; no Swainson's Hawks were observed.
5. *San Joaquin River at Twitchell Island* - No nesting raptors or other birds were found within 500 feet; no Swainson's Hawks were observed. One Red-tailed Hawk nest, approximately 0.2 miles west, is visually obstructed from the monitoring station location by a row of trees.
6. *Miner Slough near Sacramento River* – No nesting raptors or other birds were found within 500 feet. A Swainson's Hawk nest was observed approximately 0.3 miles north of the monitoring station location (Figure 2). This nest is visually obstructed from the monitoring station location by a line of trees as the slough curves away from the location.
7. *Liberty Island* – not surveyed; location is surrounded by open water.
8. *Sacramento River* - No nesting raptors or other birds were found within 500 feet; a Swainson's Hawk was observed flying approximately 0.2 miles south of the monitoring station location, but no nests were observed.
9. *Old River* - No nesting raptors or other birds were found within 500 feet; no Swainson's Hawks were observed.

10. *Middle River* - No nesting raptors or other birds were found within 500 feet; no Swainson's Hawks were observed.

11a. *Cutoff Slough near Ryer Island* - No nesting raptors or other birds were found within 500 feet; no Swainson's Hawks were observed.

11b. *Grizzly Bay* – not surveyed; location is surrounded by open water.

12. *Honker Bay* - not surveyed; location is surrounded by open water.

FINDINGS

Installation of the proposed monitoring station piles for the Emergency Drought Barrier is not anticipated to adversely affect nesting birds. Four of the locations are situated over open water, with no suitable nesting habitat nearby. No active nests were observed within 500 feet of any of the proposed locations, raptor nests observed within 0.5 mile from two proposed locations are visually obstructed, and the pile installation work will be of short duration at each location. No Swainson's Hawk nests were observed within ½ mile of any of the proposed locations, except for station #6, Miner Slough at Sacramento River.

The Swainson's Hawk nest observed 0.3 miles upstream of the proposed Miner Slough monitoring station location is visually obstructed by a row of trees along the slough (Figure 2). Furthermore, existing baseline disturbance in the vicinity of the nest, including boat traffic under the nest and farm operations and frequent vehicle traffic on Highway 84 directly across Miner Slough, indicate that the nest is regularly exposed to human disturbance. Considering the distance, visual obstruction, baseline disturbance, and short duration of pile installation, the project is not likely to cause disturbance resulting in nest abandonment or premature fledging of chicks.

Modeled suitable habitat for California Black Rail exists within 500 feet of Station #6, Miner Slough at Sacramento River, however this habitat is limited in area and no Black Rails were detected on multiple surveys in 2009 – 2014, thus the habitat likely does not support nesting Black Rails (D. Tsao et al., unpublished data). This species resides in dense wetland and riparian scrub vegetation and has very small territory size. Black Rails are very secretive and are not likely to be disturbed off of nests unless a threat directly approaches its territory. Considering the limited habitat availability, the species' behavior, and short duration of pile installation, the project is not likely to cause disturbance resulting in nest abandonment.

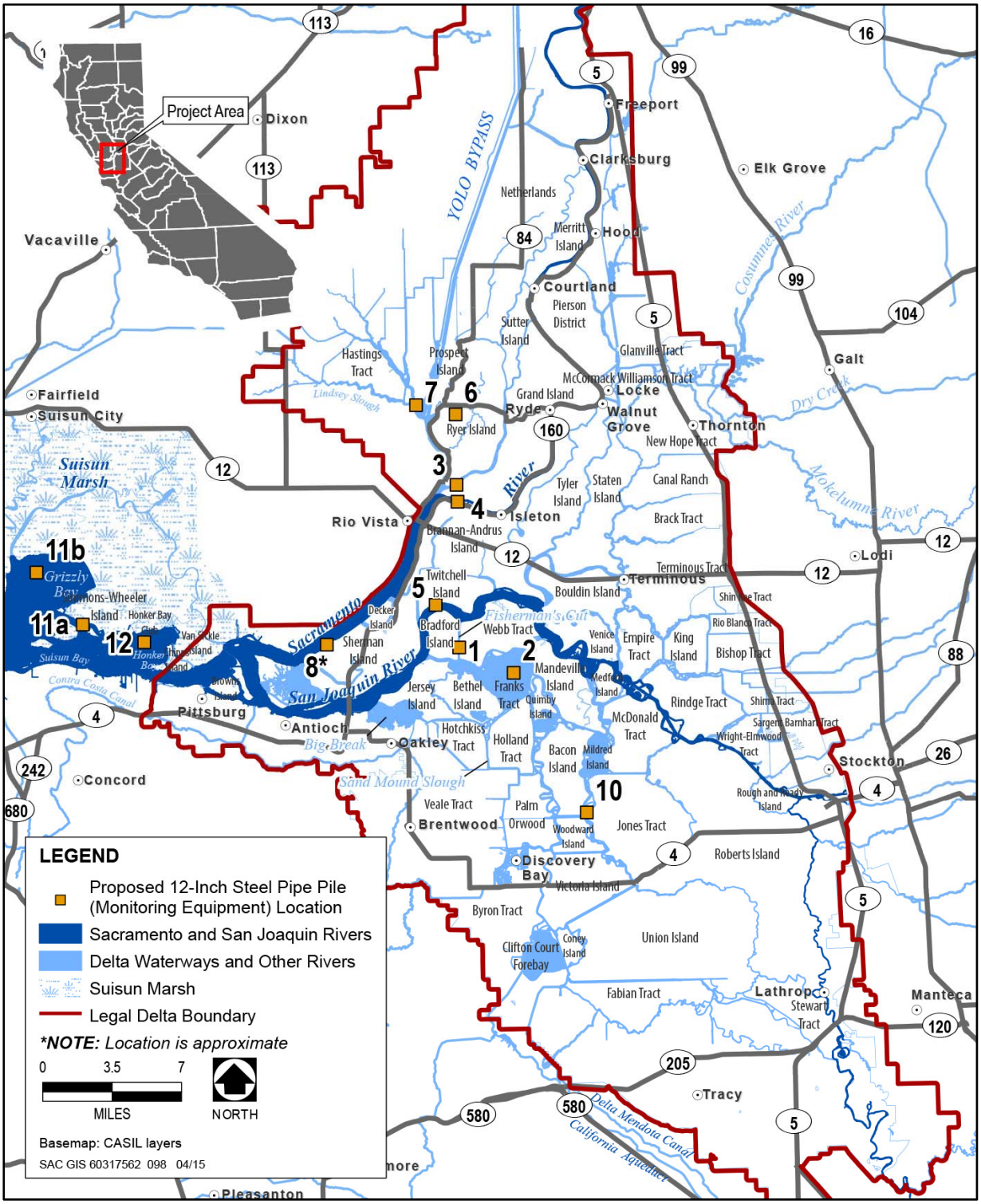

Figure 1. Map indicating locations of twelve water monitoring stations installed on 12-inch steel pipe piles for the Emergency Drought Barrier.

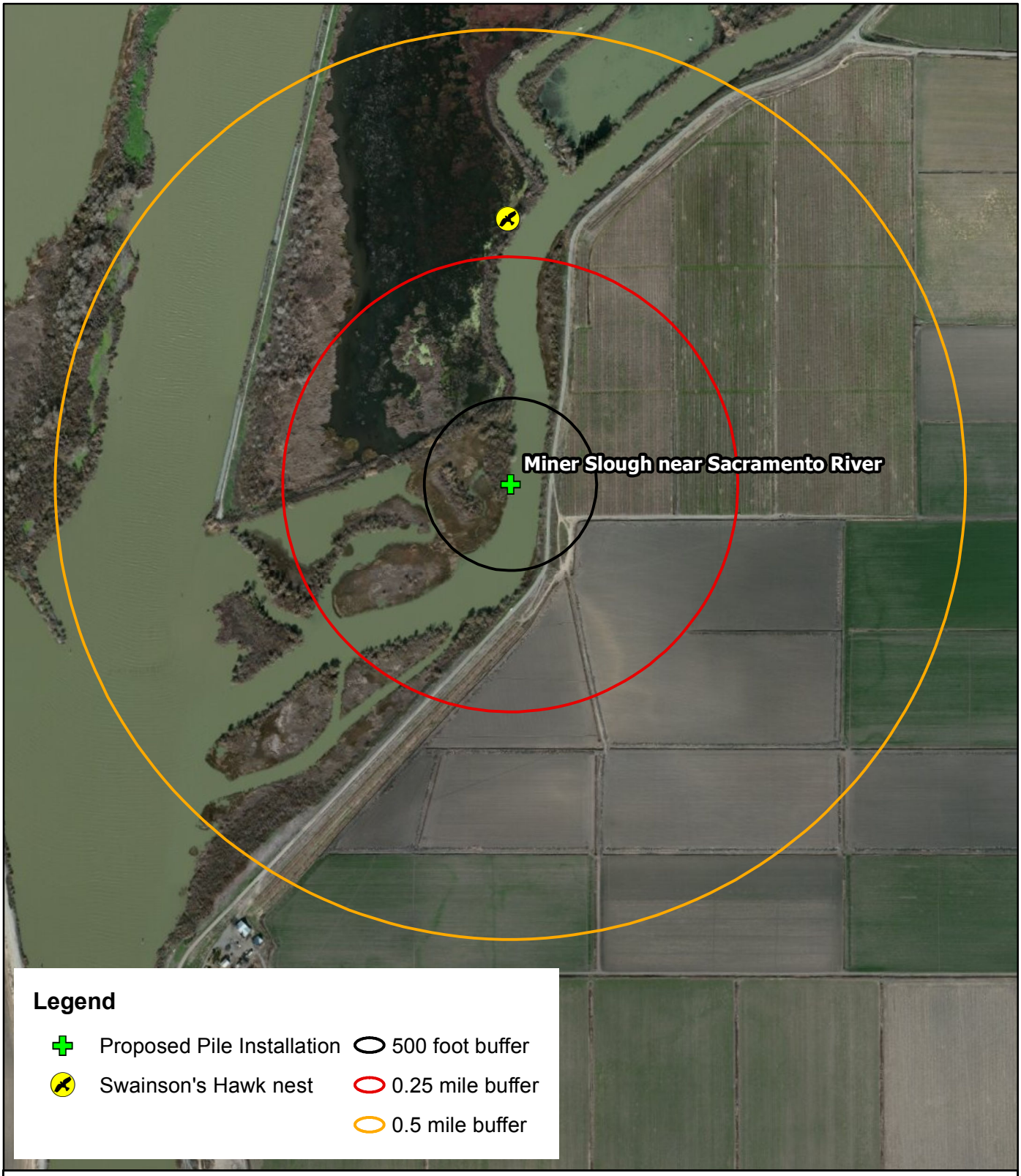

Figure 2. Emergency Drought Barrier - Proposed Miner Slough Water Monitoring Station

DEPARTMENT OF WATER RESOURCES
DIVISION OF ENVIRONMENTAL SERVICES
ENVIRONMENTAL COMPLIANCE AND EVALUATION BRANCH

N

0 0.05 0.1 0.15 0.2 0.25 Miles

0 125 250 375 500 Meters

Prepared by: Danika Tsao
Version: May 21, 2015

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Appendix C: Environmental Awareness Training

Environmental Awareness Training
Emergency Drought Barrier Project, 2015

The purpose of this information sheet is to support training on sensitive biological resources, avoidance and minimization measures, and permit obligations that are required and enforced by the U.S. Fish & Wildlife Service, National Marine Fisheries Service, California Department of Fish & Wildlife, U.S. Army Corps of Engineers, and State Water Resources Control Board.

Environmental Monitoring

- **An environmental monitor (onsite biologist) must be present during daytime construction.**
- **A water quality monitor will be onsite a few times per day to collect samples.**
- **An underwater sound monitor must be present during in-water pile driving.**

General Measures

- **All onsite personnel will participate in this environmental awareness training.**
- **A copy of all environmental permits must be on the project site at all times.**
- **Construction staging shall occur in designated areas.**
- **All vehicles shall maintain onsite speeds no greater than 15 miles per hour.**
- **All exposed surfaces will be watered two times per day, as necessary to control fugitive dust.**
- **Haul truck transporting soil, sand, or other loose material off-site will be covered.**
- **All visible mud or track-out onto adjacent public roads will be removed using wet power vacuum street sweepers.**
- **Idling time of construction equipment shall be limited to 5 minutes when not in use.**
- **All construction equipment shall be maintained in proper working condition.**
- **Land-based access routes and construction area will be limited to the minimum area necessary. Access routes restricted to established roadways.**
- **All food-related trash items will be disposed of in closed containers and removed from the site on a daily basis.**
- **All hazardous or toxic materials will be staged outside of stream channel, banks and wetland/riparian areas and shall be prevented from contaminating the soil and/or entering the Waters of the State.**

Giant Garter Snake (GGS)

- Federally and State listed as Threatened
- Dorsal background coloration varies from brownish to olive with a checkered pattern of black spots, separated by a yellow dorsal stripe and two light colored lateral stripes.
- The underside is cream to olive or brown and sometimes infused with orange, especially in northern populations.
- Found in marshes, sloughs, drainage ditches and inhabits small mammal burrows and other soil crevices above prevailing flood elevations throughout its winter dormancy.

- **Work must be initiated during May 1 – October 1, which is considered GGS active season.**
- **Exclusion fencing will be erected in the work area prior to barrier installation. Work and material storage should only occur is designated areas bounded by the exclusion fence.**
- **If a GGS is encountered during construction, activities will cease until appropriate corrective measures have been completed or it has been determined the snake will not be harmed.**
- **No snakes will be harassed, harmed, or killed, and will be allowed to leave the project site of their own volition.**
- **If any snake is observed retreating into an underground burrow within the project limits, no construction will be allowed within a 50 ft radius of that burrow until the onsite biologist can make a determination that the snake is or is not a GGS.**

Burrowing Owl

- State Species of Special Concern
- Small (8-10" tall) brown and white owl with long legs, and yellow eyes with black pupils.
- Occurs in grasslands, using CA ground squirrel burrows for nesting and refuge.
- Often seen at burrow entrance or on fence post.

Photo by Elaine R. Wilson

- **Pre-construction surveys and biologist have determined that no BUOW were identified within the vicinity of the project site. If a BUOW burrow is identified, the contractor will be notified of any additional avoidance and minimization measures to be implemented.**

Swainson's Hawk (SWHA)

- State Threatened Species
- Medium-sized hawk.
- Ranges from all dark brown to dark-backed with a white belly and reddish neck.
- Forages for insects and small mammals in ag. fields and grasslands.
- Nest in large trees in riparian oak woodland areas, oaks, eucalyptus, cottonwoods, etc. in open grasslands, and trees near ag. fields for foraging.

- **Pre-construction surveys and biologist have determined that no active SWHA nests were identified within 0.25 mile of the project site. If a nest does get established within 0.25 miles, the contractor will be notified of any additional avoidance and minimization measures to be implemented.**

Migratory Birds

- U.S. Migratory Bird Treaty Act of 1918.
- Nearly all birds in California are protected.
- Nests in trees, thistle, mustard, and on ground.
- Unlawful to "take" (harass, harm, injure or kill) birds, their nests, eggs or feathers.

- **Two Red-tailed Hawk nests and a Great Horned Owl nest have been identified in the project vicinity. Environmental monitors will be monitoring nest behavior, if specific construction activities appear to be disturbing the nesting pair, work may be stopped temporarily until corrective measures can be taken.**
- **If you see any additional nesting birds or nests, contact the onsite biologist, the contractor will be notified of any additional avoidance and minimization measures to be implemented which will include disturbance buffers.**

Western Pond Turtle

- State Species of Special Concern
- Shell is drab dark brown, olive brown or blackish turtle with a low unkeeled carapace and usually with a pattern of lines or spots radiating from the centers of the scutes.
- Between April and August, females climb onto land (up to 400 feet from water) to dig a nest, usually along stream or pond margins, where they lay a clutch of 2 - 11 eggs.

- **If a pond turtle is encountered during construction activities, a qualified biologist will move the turtle to the nearest suitable habitat outside the project area.**
- **If an active nest is found, CDFW will be consulted and the contractor will be notified of any additional avoidance and minimization measures to be implemented.**

Valley Elderberry Longhorn Beetle

- Federally listed as Threatened
- Dependent on the Elderberry shrub in riparian corridors.
- Medium-sized wood-boring, red and dark green (or black) insect with long antennae.

- **A pre-construction survey was conducted and no Elderberry shrubs were identified in the project area.**

Special Status Plants

- Protected through fish and game code.
- Delta tule pea (LAJE, *Lathyrus jepsonii*), Mason's lilaeopsis (LIMA, *Lilaeopsis masonii*), and Suisun marsh aster (ASLE, *Aster lentus*) have been identified in the project area and avoidance areas have been marked.

- **Special-status plants shall be "flagged" and avoided.**

SPECIAL STATUS FISH

Delta Smelt

- Federally and State listed as Threatened
- Migrate from SF Bay to the Delta to spawn from January to July.
- Eat microscopic crustaceans.

Chinook Salmon

- Spring run: Federally Threatened; Winter run: Federally Endangered.
- Delta is migratory path for spawning upstream in fresh water.
- Juveniles migrate through the Delta year round.

Central Valley Steelhead

- Federally listed as Endangered.
- Spawn in fresh water from December to April.
- Utilize delta for migration from fresh water to salt water and back.

Green Sturgeon

- Federally listed as Threatened.
- Long-lived, slow-growing, mostly marine fish that spawn in fresh water.
- Adults and juveniles utilize Delta waters for migration.

- **An erosion control plan, spill prevention and control program, and hazardous materials management program will be prepared prior to construction activities that will cause ground disturbance.**
- **Real-time turbidity and water quality monitoring will be conducted and construction activities shall be adjusted according to monitoring results.**
- **During in-water pile driving, underwater sound monitoring will take place and if the established thresholds are exceeded, sound reduction measures shall be used which may include an impact hammer cushion block, gradually increasing energy and frequency until full force is achieved, pipe caissons, and/or a bubble curtain.**

TAKE OF A FEDERLLY OR STATE LISTED SPECIES CAN RESULT IN PROJECT DELAYS, FINES, OR CRIMNAL PENALTIES.

REPORT SIGHTINGS OF ANIMALS (LIVE/DEAD) THAT HAVE POTENTIAL TO BE ANY SPECIES LISTED IN THIS TRAINING TO THE ONSITE BIOLOGIST IMMEDIATELY. IF POSSIBLE, TAKE A PHOTO. DO NOT HANDLE ANY WILDLIFE!

For questions on any biological issues, please contact the Onsite Biologist or Katherine Marquez (916) 376-9785 (work) or (916) 402-7559 (cell).

Only workers who have attended this environmental awareness session are allowed to work at the construction site with the exception of the truck drivers who haul in supplies only.

By signing below, I affirm that I understand the work conditions identified by the project's Environmental Scientist.

Print Name	Signature	Affiliation	Date
Richard Pearl	Richard Pearl	Dutra Safety	
John Bylin	[illegible]	Dutra	
Bud Rodarte	Bud Rodarte	DUTRA	5-4-15
Garrett Mana	Garrett Mana	Dutra	
SAMUEL TAVARE	[illegible]	DUTRA	5/4/15
David Lumeda	[illegible]	Dutra	5/4/15
STEVE PRYOR	[illegible]	DUTRA	5/4/15
Sean Lumsden	[illegible]	Dutra	5/4/15
Jason Barragan	[illegible]	Dutra	5-4-15
ROBERT UTLEY	ROBERT UTLEY	DUTRA	5-4-15
JEREMY BIGGS	[illegible]	DUTRA	5-4-15
JASON VITALE	Jason Vitale	DUTRA	5-4-15
Tim Back	T. A. Back	Dutra	5/4/15
Billy Burch	[illegible]	DUTRA	5/4/15
VADIM STETSENKO	[illegible]	DWR	05/04/15
BONNIE CROZIER	[illegible]	DWR	5/4/15
Christina Becker	Christina L. Becker	DWR	5-4-15
Chris Erickson	Christine Erickson	DWR	5-4-15
Sara Paiva-Lowry	Sara Paiva-Lowry	DWR	5/4/15

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By signing below, I affirm that I understand the work conditions identified by the project's Environmental Scientist.

Print Name	Signature	Affiliation	Date
Tom Cobarrubin		DWR/SPH	5/4/2015
John Personeni		DWR/SPH	5/4/2015
Monique Meyer		AECOM	5/4/15
Jim Lyons		DWR/Desk	5/4/15
JASON BACHER		DWR/SPH	5/4/15
DENNIS GATCHALIAN		DWR/DOE	"
ARIC SCHUETER		DUTRA	5/4/2015
SCOTT BROOKS		DUTRA	5/4/15
TODD BRUCE		Dutra	5/4/15
ISAIAS PEREZ		DUTRA	5/4/15
Pedro Hernandez		Dutra	5/4/15
DAMIEN MAGALONI		"	5/4/5
GENE HENDERSON		"	"
DEREK Edwards		"	5/4/15
John Krenecki		Dutra	5/4/15
KYLE S. MORSE		DUTRA	5-4-15
TONY MEDINA		DUTRA	5-4-201
RYAN ABSO		DUTRA	5/4/15
Chuck Walker		DUTRA	5/4/15
Steven M Ekroos		DUTRA	" "

STAN RATKOWSKI	DUTRA	CB-8	5-4-15
Cody Mann	Dutra	CB-3	5-4-15

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By signing below, I affirm that I understand the work conditions identified by the project's Environmental Scientist.

Print Name	Signature	Affiliation	Date
Joseph Martinez	Joseph Martinez	Dutra	5-4-15
Anthony Mana	[illegible]	Dutra	5/4/15
Sean Westbrook	[illegible]	Dutra	5/04/15
Chuck Walker	[illegible]	Dutra	5-4-15
Steven A Frost	[illegible]	" "	" "
Karen maples	Karen Maples	Dutra	5-4-15
Oscar Loya	[illegible]	DWR	5-4-15
Greg Alexa	[illegible]	DWR	5-4-15

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Print Name	Signature	Affiliation	Date
Gabe Flora		B&B Hughes Const Inc	5-6-15
MATT. McCurdy	Matthew McCurdy	B+B Hughes Const, Inc	5-6-15
TED HUGHES	Ted Hughes	B&B Hughes Const Inc.	5-6-15
Tim Hughes	T Hughes	B+B Hughes	5-6-15
Brian Delay	Brian Delay	DWR/SPH	5/8/15
MARK HEROLD		DWR/PSO	5/8/15
Bruce Kaminski	Bruce Kaminski	DWR/OCC	5-8-15
Bill Cirajle		DWR/EX	5/8/15
Wendy Francis	Wendy Francis	DWR/Exec	5/8/15
R Albert Madrid	RA Madrid	DWR	5/8/15
Marianne Kirkland	Marianne Kirkland	DWR	5/8/15
Maryanne Ciaraglia	Maryanne Ciaraglia	DWR	5/8/15
Daniel Teixeira		DWR	5/8/15
Doug Bertran		DWR	5/8/15
MICHAEL S. MILLER	Michael S. Miller	DWR	5/8/15
Bill Kellehan	Bill Kellehan III	DWR	5/9/15
Alex Arroyo	Alex Arroyo	DWR	5/8/15
David Ng	David Ng	DWR/AS	5/8/15
Paul A Marshall		DWR/BDO	5/8/15
ED CARLSON		DWR	5/8/15

Print Name	Signature	Affiliation	Date
Don Hroch	[illegible]	DeltraGroup	5/8/15
Cesar Garcia	[illegible]	DeltraGroup	5-8-15

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By signing below, I affirm that I understand the work conditions identified by the project's Environmental Scientist.

Print Name	Signature	Affiliation	Date
Genny Schrader	Genny Schrader	DWR	5/21/15
Ben Geske	Ben Geske	DWR	5/21/15
Michelle Wong	Michelle Wong	DWR	5/21/15
Kelly Grow	Kelly Grow	DWR	5/21/15
Khalid Amri	[illegible]	DWR	5/21/15
Ryan Reeves	[illegible]	DWR	5/21/15
Tara Smith	Tara Smith	DWR	5/21/15
Bill McLaughlin	Bill McL	DWR	5/21/15
MARK HOLDERMAN	Mark C. Hole	DWR	5/21/15
Tony MESA	Tony Mesa	DWR	5/21/15
Nathan Everson	[illegible]	DWR	5/21/15
Maribel Velazquez	Maribel Velazquez	DWR	5/21/15
Felipe Garcia	Felipe Garcia	DWR	5/21/15
REBECCA BARRÓN	[illegible]	DWR	5-21-15
Zach Jojola	[illegible]	DWR	5-21-15
WILLIAM WANG	[illegible]	DWR	5-21-15
KC Richmond	KC Richmond	DWR	5/21/15
Michelle Rafferty	Michelle Rafferty	DWR	5/21/15

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By signing below, I affirm that I understand the work conditions identified by the project's Environmental Scientist.

Print Name	Signature	Affiliation	Date
Jim Eggink		Kleinfelder	5-14-15
RAY HUNT		PilcButt	5-15-15
Joe Karmer		Pilebutt	5-15-15
Titali Tavares		Pilebutt	5-15-15
NATHAN RAMOS		Dutra	5.15.15
Craig COSTA		Dutra	5-27-15
Howard C Cooper		Dutra	5.27.15
Jim HAGOOD		DUTRA	5-27-15
Molly Jacobson		Dutra	5-27-15
Bill Dutra		Dutra	5-27-15
Mila McFarland		Dutra	5/27/15
Scott Olling		DWR PAO	05/29/15
Zach Cunningham		DWR PAO	5/29/15
May Khang		DWR Exe	5/29/15

Emergency Drought Barriers Project

Only workers who have attended this environmental awareness session are allowed to work at the construction site with the exception of the truck drivers who haul in supplies only.

By signing below, I affirm that I understand the work conditions identified by the project's Environmental Scientist.

Print Name	Signature	Affiliation	Date
Mike Neptune		USACE	28 May 15
Kathryn Marques		DWR	5/28/15
Jacob McQuirk		DWR	5/28/15
Oscar Bionoi		SWRCB	5/28/15
MARIN GREENWOOD		ICF	5/28/15
Yu Zhou		DWR	5/28/15
ELI ATELJEVICH		DWR	5/28/15
LAN LIANG		DWR	5/28/15
KIJIN NAM		DWR	5/28/15
Subir Saha		DWR	5/28/15
Kim Squires		FWS	5/28/15
ERIN C GLEASON		FWS	05/28/15
Jackie Yahne		Dutra	5/28/15
Cindy Cella		Dutra	5-28-15
Doris Laul		Dutra	5-28-15
CRAIG Atwood		DUTRA	5/28/15
DOUG HAMPTON		NMFS	5/28/15
Larry Montana		DWR	6-4-15
Anthony Chu		DWR	6/4/15

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Appendix D: Biological Monitoring Logs

	Department of Water Resources Biological Monitoring Field Report Project: Emergency Drought Barriers Project			
Biologist Name	Jeffrey Tkach		Date	May 5, 2015
	Start Time	0600	End Time	1330

Comments for all Concerns Noted Above/Species Observed/ General Comments:

- Arrived on site @ 6 and conducted walkthru of the site where the exclusionary fence is to go.
- 0700 Crane barge arrived on site and dropped spuds @ 0730.
- 0900 Started erecting exclusion fencing on Jersey Island
- 0945 Skiff took 2 contractors and Chris Erickson and Sarah to Bradford Island to erect exclusion fencing

Construction Activities Performed:

- Deploy Barge, unload equipment from barge, erect exclusion fencing on Bradford Island and Jersey Island.

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**			
Biologist Name			**Date**	5/5/2015
David Bise	**Start Time**	1310	**End Time**	1740

Comments for all Concerns Noted Above/Species Observed/ General Comments:

No concerns noted. Species observed: killdeer American coot. Exclusion fencing not completed yet. will need clearance for GGS in morning. Sarah of DWR monitoring removal

Confirmed with John Personeni of DWR that pile driving in water will begin on 5/10 or 5/11

Northern harrier observed at end of the day foraging in fields to south. California sea lion observed twice in the channel.

At end of day, confirmed w/ John Personeni that monitor will clear area inside of exclusion fencing before equipment enters or is moved and until fencing is completed.

Construction Activities Performed:

Staging, placement of exclusion fencing, barge placement

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**			
Biologist Name	Sarah Zorn		**Date**	5/6/15 - AM
	Start Time	0600	**End Time**	1320

Comments for all Concerns Noted Above/Species Observed/ General Comments:

Arrived on-site at 0545 - walked entire project area and along exclusion fencing (which was not yet fully installed). No sensitive species observed. Area was cleared for work to start

0900 : GGS observed within the exclusion fencing on western most edge of staging area. Contacted environmental coordinator to notify agencies, and was instructed to lift exclusion fencing and allow GGS to move out of project area on its own. This was successful and GGS exited project area

0900 : King snake observed on Bradford Island outside of project area. Snake moved off of levee road on its own

Construction Activities Performed:

Mobilize barges, continued to work on installing exclusion fence, placement of rock/riprap into False River on both sides (Jersey/Bradford)

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**			
Biologist Name	Eva Olin		**Date**	5/6/15
	Start Time	1315	**End Time**	1845

Comments for all Concerns Noted Above/Species Observed/ General Comments:
- Arrived on site @ 1315. Walked exclusion fence near staging area on Jersey Island.
- Rock placement, in-water work only, being conducted on both sides of barrier. Lights & additional items being placed on both islands.
- 1430 - took Ferry to Bradford Island. Walked road & staging area. Continuing to instal exclusion fence. Trenching for piles started ~ 1430.
- Sometime between 1500 - 1530 Water truck arrived on Jersey.
- Left Bradford staging area ~ 1545
- Exclusion fences completed (both islands) by 1800
- No significant biological activity personally observed. Chris Erickson observed king snake on Bradford Island ~ 1700

Construction Activities Performed:
- Rock placemant, exclusion fence installation, trenching on Bradford

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**			
Biologist Name	Gina Radieve		**Date**	5-7-15
	Start Time	0600	**End Time**	1315

Comments for all Concerns Noted Above/Species Observed/ General Comments:

Arrived @ site 0545. Walked entire project site including along exclusion fencing on Jersey Island side. Fencing is secure & buried all around - looks good. No sensitive species observed. Checked under equipment & material piles. Site cleared to work.
0650 - landed on Bradford Island near eastern dredge. RTHA adult pair are showing signs of distress @ Bradford nest - calling, territorial flights near nest - likely due to my arrival walking along road very close. Walked entire stretch of levee road w/in work site on Bradford. Exclusion fencing WAS NOT closing off road on either end over night. No sensitive sp. observed. Site cleared to work. (2 CHICK)

Construction Activities Performed:

Dredges are placing rock on both sides of False River. "Scow" barges dumped 2 loads of rock into center channel. Cranes on either side dumping rock along levee. They need to make 100ft before pile driving can start → Hoping for tmrw but may be optomistic.

0945 – visit Bradford again. Exclusion fencing is being installed across road on western end of project site. RTHA adults out hunting, 1 adult seen leaving nest. ~~[illegible]~~ I <u>think</u> I see 2 chicks.

1 for sure seen sitting high in nest preening. This chick appears to be ~28 days based on RTHA devel. chart. Got great views as it spread it's wings to stretch. <u>IF</u> there is another chick it never lifted head high enough to be visible but I do think I saw another pile of gray fluff next to chick #1.

NO SENSITIVE species. Weather is cool, cloudy, intermittent ~~show~~ sprinkles & strong wind. (Not snake weather)

1045 - 3 sea lions ~~[illegible]~~ <u>near</u> dredge on north side. didn't see them again for 40 mins. hard to tell where they went. Maybe the disturbance stirs up fish? they do not seem detered by or afraid of the equipment

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**			
Biologist Name	Norm Ponferrada		**Date**	5/7/2015, Thursday
	Start Time	1300	**End Time**	1805

Comments for all Concerns Noted Above/Species Observed/ General Comments:

- Species observed*: RTHA, BASW, SCJA, CAGU, SPTO, AMRO, LEEG, MOBI, ROPI, HOFI, AMKE, CORMORANT, Sealion Cattle. A staff from Dutra mentioned that they saw a gopher snake and kingsnake in the morning.
- General Comments: Rained in the morning, temp ≈ 66°F (19°C) ~~at 1400~~ taken from NOAA weather station at 1400, ≈ 40 mph gusty winds, ≈ 90% cloud cover throughout the day. Temperature, wind, and cloud cover were consistent during the afternoon work activities (1300 - 1805)
- Concerns: None. Most bird species observed/heard were away from work activities. Sound/Noise created by heavy equipment does not seem to be loud enough to impact surrounding species.

*Most bird species listed were identified by calls

Construction Activities Performed:

1. Placed 2 trailers in the staging area as office spaces
2. Placed temporary rock barriers across West False River (both sides)
3. Water truck was active throughout the day for dust control
4. Exclusion fencing closed up at the end of work day

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**			
Biologist Name	Rhiannon Klingensmith		**Date**	5/8/15
	Start Time	0535	**End Time**	1300

Comments for all Concerns Noted Above/Species Observed/ General Comments:

0545 Walked Jersey Is. project area first thing, then got on boat to clear Breannan Is. project area. No issues found ex-fencing intact (not fully closed on B. Island). Discussed snake issues w/ workers on B. Island gave them my #.

0830 Sheet piles being driven into levee - RTHA up & active on Jersey side; observed perched in tree - Very noisey

* Checked B. Is. RTHA's, observed 2 chicks w/ adults foraging nearby

* Vibrations for sheet pilings + noise was concern for nesting hawks - all pairs seemed to still frequent & stay close to nests

* Sea lions in area; Rec boaters

Construction Activities Performed:

Barges & dredges placing rock in river on both sides
Placing sheet piles on both levee's - lots of vibration
Press Conference

	Department of Water Resources Biological Monitoring Field Report Project: Emergency Drought Barriers Project			
Biologist Name	Norm Ponferrada		Date	5/8/2015, Friday
	Start Time	1240	End Time	1830

Comments for all Concerns Noted Above/Species Observed/ General Comments:

• General Comments: Sunny & warm 68°F (20°C), cloud cover 10%
wind ≈ 5-10 mph (Source of temp: NOAA weather station)

• Species observed: RTHA, BASW, AMRO, KIDE, Cormorant, GREG, cattle
Mallard, SOSP, yellowjackets, western fence lizard, SWHA, HOFI, cottontail
Dutra laborer encountered a 4.5ft gopher snake inside the
exclusion fencing, picked it up and safely released it
outside the fencing
* @1630 hrs GGS (≈4' long) was observed outside of the fencing
between piles of dead tree branches and mudspace
• Concerns: WEF on the other side of the levee work is not a complete exclusion
water pump used to fill water truck for dust control has no 2° containment.

Construction Activities Performed: Tim Hughes mentioned that vibratory hammering does not travel under water due to soil composition in the area & distance of sheet piles to water.

note:

① Vibratory driving to stabilize levee (includes excavation of sheet pile location)
② Continue placing temporary rock barriers across West False River
③ Water truck was active for dust control - water is taken from the river, intake has screen but pump has no secondary containment.

Brian Thomas - trained on Environmental Awareness

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**			
Biologist Name	Rhiannon Klingensmith		**Date**	5/9/15
	Start Time	0535	**End Time**	1400

Comments for all Concerns Noted Above/Species Observed/ General Comments:

* Notified crew of GGS siting yesterday @ morning tailgate
↳ reminded them to drive slow & keep an eye out always
* RTHA nest on B. Is. was monitored for a while to ensure adults are still frequenting nest; 2 chicks observed + adults
* 1 SWHA observed east of barrier (dark morph) *seen hawk here before
0900 Haven't seen any activity @ RTHA nest on J. Is. side - can't see into nest
9:04 - RTHA seen in nest! Hooray!
* Lots of recreational boats passing signs and coming inside project area
* No MMS observed during shift
* fencing checked multiple times - in good shape

⇒ Worker said he "shewed" a snake of the pavement by the ferry @ about 5:
↳ so others wouldn't run it over. Not I.D.

Construction Activities Performed:

Driving of sheet piles into both levees
Barges + dredges placing rock in river
Vehicle traffic on roads
Semi delivery of more sheet piles on J. Is. side

* Water truck guy did put catch pan down for generator

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**			
Biologist Name	Rachel August		**Date**	5/9/15
	Start Time	1300	**End Time**	1830

Comments for all Concerns Noted Above/Species Observed/ General Comments:
- Arrived @ site @ 1305. Previous shift monitor Rhiannon
Klingensmith and I performed a walk around exclusion
fencing on Jersey & Bradford Islands.
- No species of concern observed

Construction Activities Performed:
- Sheet piles on Jersey Island & Bradford Island continued
placement
- Rock istallation in water.

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**		
Biologist Name		**Date**	20150510
Gina Radieva	**Start Time** ~~0545~~ 0545	**End Time**	

Comments for all Concerns Noted Above/Species Observed/ General Comments:
0545 - Arrived on site. Walked Jersey 1s exclusion
fence & checked around equipment &
sheet piles. No sensitive species observed.
Site cleared for work.
0605 - found 2 pieces of very fresh snake skin
25m west of spud barge gangplank. No
head skin. total length of both pieces. 3 feet.
0630 - boat ride to Bradford. Walked exclusion fence
& top of riprap on waterside. Checked trenches
on both sides of sheetpiles. No sensitive species.
Site cleared for work.
0645 - sea lion w/in 50m of barge on Bradford side
swimming west out of project area. Prior to work start

Construction Activities Performed:
~~0700~~ 0645 - dumping gravel on Jersey side. Bradford
a little behind.
0720 - pounding piles on Jersey side, Bradford a
little behind

0945 - check Bradford RTHA nest from boat & levee. 2 chicks active, appear to be eating. ~29 days → black leading edge of wing but body still downy gray.

★ 1105 - young ♂ sea lion playing with a ~~deer~~ bass mid channel, over the barrier site & between two active cranes placing gravel. While it's head was above H_2O sheet piles were actively being driven on Jersey & behavior seemed unaffected.

1005 - RTHA pair soaring over Jersey nest. 1 dove in towards nest (out of my view) & other continued to soar.

1030 - 1 adult RTHA soaring ~500m N of Bradford nest

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**			
Biologist Name	Jeffrey Tkach		**Date**	5/10/2015
	Start Time	1310	**End Time**	~~1610~~ 1810

Comments for all Concerns Noted Above/Species Observed/ General Comments:

- I arrived on site and had a briefing with the AM biological monitor, Gina. She let me know there were no sightings of snakes and that all was good.
- 1345 I walked the exclusion fence and saw and repaired a rip in the fence.
- 1430 I accompanied Joaquin on his water quality run to gain access to Bradford Island where I inspected the fence on that location. No issue.
- Returned to Jersey Island around 1500 hrs and work was wrapping up for the day.
- Left the site @ approximately 1800 hrs.
- Saw an approximately 4' GGS ~~on~~ on Jersey Island road in the vicinity of the marina 2.5 miles from ferry landing. AM vehicles objected and the snake moved off into the rip rap before capture could be taken.

Construction Activities Performed:

Don Guy 5/11/15

0545 arrive on site 0545
walked the site. Cleared staging area
- There were men on the barges.
- RTHA adult was near nest. Chick was moving around
2:15 monitored the nest for a while
RTHA chick is about the size of an adult RTHA wk 5
still has downy feathers
8:59 2 killdeer outside fencing south side, look like they are
setting up a nest at the edge of the toe drain, vegetation
Western Blue bird south side
9:25 Killdeer egg, smashed. 100 yds east of the fence
10 ft north of wetland toe of levee.
1050 RTHA adult was nest to the nest while pile driving

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**			
Biologist Name	Sarah Zom		**Date**	05/11/2015
	Start Time	1300	**End Time**	1815

Comments for all Concerns Noted Above/Species Observed/ General Comments:

1300- Arrived on-site and discussed day's activities with AM monitor. Walked exclusion fence on Jersey Island, No sensitive species observed.

1500- Took skiff to Bradford Isl., walked exclusion fence. No sensitive species observed RTHA did not seem to be disturbed.

1700- Went back to Jersey Island for remainder of day. Crew stopped at 1730 and cleaned up. Walked proj. boundary and no sensitive species observed

Construction Activities Performed:

Driving Sheet piles on Jersey Island and Bradford island.

Dumping Rock on Bradford side

	Department of Water Resources Biological Monitoring Field Report Project: Emergency Drought Barriers Project			
Biologist Name	Gina Radieve		Date	20150512
	Start Time	0535	End Time	

STRONG WIND ALL DAY. 30 MPH @ 8AM

Comments for all Concerns Noted Above/Species Observed/ General Comments:
0535- Arrived & cleared site by 0550. Returned to gate for safety tailgate with the crew.
0645- Cleared Bradford side
0720- checked Bradford RTHA nest. Both chicks standing on edge of nest. ~30 days old. Did not see adults
0800- sea lion westbound in center channel breached at least 5 times near the site. very cute.
0915- SWHA hovering over willows SE of parking area. dark morph. did not see ~~exit~~ land ~~off~~
1045- bull sea lion with bass midchannel
1100- NOHA w/mouse coursing over Rubus SW of trailers
1150- checked on RTHA chicks. standing in nest.

Construction Activities Performed:
0735- scow dump along Bradford levee. then 2 hours of positioning the cranes back in place on B side.
0745- pile driving on Jersey side starts
drill rig crews for RD on Jersey side

~1000 - pile driving on Bradford side

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**			
Biologist Name	Jeffrey Peach		**Date**	5/12/2015
	Start Time	1305	**End Time**	1830

Comments for all Concerns Noted Above/Species Observed/ General Comments:

- Arrived on site @ 1300 hrs and had a debriefing with on-site biological monitor (Gina), then walked the exclusion fence
- 1600 took the Ferry ~~then~~ to Bradford Island, spoke with Construction monitor. no issues, fence in good shape, no tears, holes, or rips.
- 1700 took the ferry back to Jersey Island, no issues.
- Off site around 1830 hrs.

Construction Activities Performed:

- Jersey Island finished driving sheet piles around 1630 and pile driver left site and began back filling the trench.

	Department of Water Resources Biological Monitoring Field Report Project: Emergency Drought Barriers Project			
Biologist Name	Jeffrey Ykach		Date	5/13/2015
	Start Time	0530	End Time	1350

Comments for all Concerns Noted Above/Species Observed/ General Comments:

- Arrived on site @ 0530, cleared Jersey Island site and returned for safety briefing.
- 0600 took Ferry to Bradford Island with crew to ~~clear~~ clear site.
- 0800 took Ferry back to Jersey Island and conducted second walk of exclusion fencing.
- 0830 Septic ~~extruck~~ truck arrived to pump out portable toilets
- 1130 A single engine Cessna circled to work site 7 or 8 times at a relatively low altitude. Flew off to the south.
- 1235 A bass boat sped through the work area between the ~~barge~~ Crane barges at full speed. Was turned away by Dutra patrol boat.
- Off site @ 1400 after debriefing Rachel

Construction Activities Performed:

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**			
Biologist Name	Rachel August		**Date**	5/13/15
	Start Time	1305	**End Time**	1845

Comments for all Concerns Noted Above/Species Observed/ General Comments:

- Arrived onsite at 1305 and walked exclusion fencing on Jersey Island. Drilling for RD positioned south of site that made it difficult to walk southern most portion of fencing.
- 1500 took ferry to Bradford Island. No species observed.
- Fencing checked multiple times
- Gopher snake (~2.5 ft long) observed on levee road just outside construction zone.

Construction Activities Performed:

- Trenches filled over sheet piles in levee
- rock dumped in river
- H-beams were set in place for in water pile driving tomorrow.

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**			
Biologist Name	Norm Ponferrada		**Date**	May 14, 2015, Thu
	Start Time	0515	**End Time**	1309

Comments for all Concerns Noted Above/Species Observed/ General Comments:
General Comments: T= 45°F, ~~Clear skies~~ 80% cloud cover,
calm winds. Cleared site at 0545, then cleared other
site of the river at 0650.
Species observed: AMRO, KIDE, HOFI, MOBI, SPTO, Eastern Meadowlark
GREG, ROPI, CLSW, sealion, RWBB, AMKE, RTHA, BASW,
gopher snake
Concerns: none, not very much activity occurred
during this time, just setting up for vibratory
hammering

Construction Activities Performed:
① Water truck active for dust control
② Installed H piles as template for piles prior to
vibratory hammering. No pile driving occurred in
the morning.

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**			
Biologist Name	Rhiannon Klingensmith		**Date**	5/14/15
	Start Time	12:45 pm	**End Time**	6:00 pm

Comments for all Concerns Noted Above/Species Observed/ General Comments:

* No work was taking place on Bradford Is. when I arrived. Few guys opening fencing on road for farmers.
* Windy, rain, lightning - may delay pile driving
* No species observed - very cold & rainy

* Fencing walked on Jersey Is. throughout shift
4:15 pm - Piles being driven waterside of Bradford Is.
↳ Frame piles for placement of King piles

* Karen informed me the rancher on Bradford came over to her holding a snake - she took a picture (I will send it in a email)

* Other workers said they saw snakes on paved road while coming back from lunch

Construction Activities Performed:

Barge working on leveling dropped rock in river
Set up for pile driving

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**			
Biologist Name	Eva Olin		**Date**	5/15/15
	Start Time	0530	**End Time**	

Comments for all Concerns Noted Above/Species Observed/ General Comments:
0530- Arrived & cleared site
0600- Daily Safety meeting
0620- Conducted Env Awareness Training to 4 new people
0630- work beginning -
0700- King pile driving on Jersey & H pile driving on Bradford Is.
- cleared Bradford side
0840- Sound Monitor requested bubble curtain. Sound monitor
moved from barge to skiff 10m downstream of pile.
0924- Pile driving w/ vibratory driver resumed
0942- Pile driving haulted due to noise levels. Jacob called.
1130- checked Bradford Island
1245- Approx. start of pile driving on Jersey Island. Monitored
for fish from skiff ~10m from pile.

Construction Activities Performed:
Rock Placement, H pile driving & prep for King
pile templates, King pile driving on Jersey Island.
-RD installing monitoring wells on Jersey. Chris E.
asked them to clean up spilled bentonite clay

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**			
Biologist Name	Norm Ponferrada		**Date**	Friday, 5/15/2015
	Start Time	1240	**End Time**	1810

Comments for all Concerns Noted Above/Species Observed/ General Comments:
General comments: windy ≈ 10-20mph (gusty), Temp = 58°F
clear & sunny <5% cloud cover. Relieved biological monitor
at 1345.
• observed for floating fish from vibratory hammering
but did not find any.
Species observed: RTHA, HOFI, western fence lizard

Construction Activities Performed:
① Vibratory hammering of 3 piles

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**			
Biologist Name	Norm Ponferrada		**Date**	Saturday 5/16/2015
	Start Time	0515	**End Time**	1407

Comments for all Concerns Noted Above/Species Observed/ General Comments:
General Comments: Temp: 60°F, No winds, clear skies, 5% cloud cover
Cleared worksite at 0545, cleared other side of river at 0630
Species observed: HOFI, CAGO, RTHA, NOHA, AMCO,
sealion, KIDE, BABW, CLSW, Cormorant
Concerns: Bubble curtain continued to float to surface
making its purpose ineffective. Dutra had to stop
hammering to fix bubble curtain to make sure
it's fully functional. No dead/floating fish were observed

Construction Activities Performed:
① Water truck for dust control
② Installed H piles prior to vibratory hammering
③ Placed buttress rocks in the channel
④ Vibratory hammered 2 piles (1st from 0915-1115, 2nd: 1240-1345)

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**			
Biologist Name	Rachel August		**Date**	5/16/15
	Start Time	1300	**End Time**	1830

Comments for all Concerns Noted Above/Species Observed/ General Comments:
Arrived at site at 1300
Observed pile driving on Bradford Island side
from skiff. Sound cummulative at 200. No
fish observed

Construction Activities Performed:
King Piles driven into water on Bradford Island side.
No work performed on Jersey Island side.

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project** 20150517			
Biologist Name	Gina Radieve		**Date**	~~20150517~~
	Start Time	0525	**End Time**	

sunrise = 0555 Overcast

Comments for all Concerns Noted Above/Species Observed/ General Comments:
0525 - Arrived on site & cleared Jersey Side
0530 - Adult RTHA left Jersey nest flying west (~~still~~ ~~dark~~
(prior to sunrise, still low light)
0640 - Cleared Bradford side. (Fence open)
0700 - RTHA chicks on Bradford nest are up & about
preening & standing tall. ~5 weeks. heads still
white & downy but getting buff color on chest & lots of black
0730 - Obs RTHA adult perched on snag on backside
of eucalytus stand
0830 - adult RTHA low in Jersey nest, after a
few minutes bird obs perched on edge of nest
then returned to sitting low
1120 - sealion approached floating wooden dock on Jersey →

Construction Activities Performed:
0600 - Set up on the water - barges & tugboats

cont.

King piles but then moved away

1135 - RTHA on Bradford being harassed by smaller birds

1310 - Todd Bruce (Dutra) arrived @ Jersey site having just seen a snake along gravel road w/in gate. He did not get a photo. Snake was black w/yellow stripes & he watched it leave the road to the island side. He showed me the area & I walked levee face, adjacent cleared land & along the edge of the grassy veg but did not find a snake.

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project** Sunday			
Biologist Name	Norm Ponferrada		**Date**	~~Saturday~~ 5/17/2015
	Start Time	~~0515~~ 1235	**End Time**	1602

Comments for all Concerns Noted Above/Species Observed/ General Comments:

General Comments: 95% cloud cover, Temp: 58°F, windy ≈15 mph (gusty)

Species observed: ~~HOFI~~ KIDE, BASW, RTHA, AMCR, CORA, TUVU, GREG, 3 gopher snakes were observed; 1 inside the exclusion fence and 2 on the dirt road.

Concerns: none; crew finished early for the day

Construction Activities Performed:

① Installed brackets and support beams on piles

	Department of Water Resources Biological Monitoring Field Report Project: Emergency Drought Barriers Project			
Biologist Name			Date	3/18/15
Don Guy	Start Time 0500		End Time 1830	

Comments for all Concerns Noted Above/Species Observed/ General Comments:

5:00 walked site, Barge work was under way
foreman was walking the site (John) all clear
7:30 Walked the Northside all clear
Surveyors for the property owners showed up (northside)
they wanted to place monument in the ground.
ask surveyor to stay off the toe of the levee in front
of nest and 200' of each side: gave Environmental awareness
9:20 Waiting for first piling to be placed.
9:40 Private boat entered work area, he was
stopped and agreed to turn around
10:30 On the water while they tried to set first piling
off water @ 1:30
1:30 AECOM Biologist Norm North (west) end of site by rip rap

Construction Activities Performed:

he was hold a gopher snake. asked him to
put it down a let it move out of the area
The snake was outside barrier between boat barge.

	Department of Water Resources Biological Monitoring Field Report Project: Emergency Drought Barriers Project Monday			
Biologist Name	Norm Ponferrada		Date	~~Saturday~~ 5/18/2015
	Start Time	~~0515~~ 1240	End Time	1820

Comments for all Concerns Noted Above/Species Observed/ General Comments:

General comments: windy ≈10-20 mph gusty winds, Temp=62°F and ≈ 40% cloud cover

Species observed: ~~HOFI~~ KIDE, 2 gopher snakes, western fence lizard, BASW, RTHA, NOHA, TUVU sealion

- No fish (floating/dead) were observed.
- Found a giant garter snake on the riprap approximately 3 feet outside of the exclusion fence but in between fence and pile driving activity. Notified DWR right away and was instructed to keep an eye on the GGS ~~while~~ during activities to ensure snake's safety.

Construction Activities Performed:

① Vibratory hammering sheet piles

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**			
Biologist Name	Sarah Zorn		**Date**	05/19/2015
	Start Time	0600	**End Time**	1330

Comments for all Concerns Noted Above/Species Observed/ General Comments:
Arrived on site at 0530. Did a walk-through of Jersey Isl. Did not observe GGS on riprap that was observed previous day. No sensitive sp observed in project area on Jersey side.
Did walk-through of Bradford Isl. All clear.
2 RTHA chicks observed in nest. Normal Behavior. Preening when drills started up.
0900 - Adult seal observed downstream of Bradford Isl.
1100 - 2 adult seals observed downstream of project area (where barges carrying rock and stored)
Remained on skiffs scanning for fish kills for duration of pile driving, occasionally checking on land work.
@ 1145: GGS observed in same spot on riprap (Jersey side). Appeared to be same GGS observed on 5/18/15 →

Construction Activities Performed:
In-water and on-land pile driving on Jersey & Bradford Islands.
Dumping Rock in middle of water

Same location, size, & appeared to be molting. GGS was in close proximity to pile driving activities; However, GGS was monitored closely, and was observed heading away from pile driving. PM monitor arrived at 1300, was updated on GGS status, and continued to monitor at that location.

- No fish kills were observed
- Bubble curtain was used on Jersey Isl. side during in-water pile driving

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**			
Biologist Name	Rachel August		**Date**	5/19/15
	Start Time	1305	**End Time**	1830

Comments for all Concerns Noted Above/Species Observed/ General Comments:
Arrived on site at 1305 & was notified of active GGS near construction work.
Surveyed area & observed GGS in same spot until work finished for the day. Placed cone near area for AM monitor to observe spot.
No floating fish observed in water.

Construction Activities Performed:
Sheet piles driven into water on both Jersey & Bradford sides

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**			
Biologist Name	Sarah Zorn		**Date**	05/20/2015
	Start Time	0600	**End Time**	1330

Comments for all Concerns Noted Above/Species Observed/ General Comments:

Arrived on-site at 0530 and did walk-through of Jersey Island side. No GGS observed ~~in~~ at the location it was last observed on 05/19/2015. Pieces of shed skin was observed at that location (on riprap between exclusion fence and water on Jersey Isl side) ~10' upstream of piles

Walked Bradford Isl side prior to start of work. No Sensitive Species observed

0700: Project Geology arrived to take a sample of the rock from one of the barges. Looking at grade.

0743: SEL accumulated reached 200dB on Bradford Side. Went out in skif for the next pile drive at 0840 to look for fish. Bubble curtain installed on Bradford side prior to pile driving

Construction Activities Performed:

- Proj. Geology collected rock to sample
- Drive piles in water on Bradford side

Came back on land at 1000 to monitor on-land pile driving on Jersey.

1130: AECOM site visit w/ Jacob

1145: GGS on Jersey Isl. by the on land piles was observed in the same spot as the previous 2 days. Snake was spotted aprox. 15 minutes after pile driving activity ceased. No work was going on in that area at the time of the sighting. Just on the other side of the piles, aprox. 15 feet from the GGS, a racer snake was spotted. GGS was observed until it went under the rock down by the water line, 5 feet upstream of the piles.

1300: PM monitor arrived onsite, after briefing her on days activities, GGS was observed swimming in False River in the vegetation just upstream of the in-water piles.

1330: ~~left~~ AM monitor left site

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**			
Biologist Name	Gina Radieve		**Date**	20150520
	Start Time	1255	**End Time**	2015

lowtide @ 1355 = -0.4 sunset 2013

Comments for all Concerns Noted Above/Species Observed/ General Comments:
1305 - Joaquin Garza resighted snake which AM monitor (Sarah)
had seen earlier. (see GGS form) Snake was moving east
away from immediate work area
1410 - Nate Smith DWR engineer sighted Yellow Bellied Racer
near outhouses along backside exclusion fence on Jersey.
Snake did not go under exclusion fence so it was picked
up & released in cattails south of project site
1505 - traveled to Bradford. site is clear. on land work done for day
1520 - RTHA chicks (2) on Bradford perched on nest edge
1545 - alligator lizard in riprap outside exclusion fence
1945 - CLSW nests on bow of #19 barge! Just
noticed them as birds settled for evening. Pile driving
& sparks from torch w/in ~10 ft.

Construction Activities Performed:
1330 - Pile driving resumes on Jersey
1430 - pile driving stopped for the day on Bradford - hammer is broken
1500 - 1800 - a sheet pile won't be pounded. this
delays everything on Jersey. Pile driving continues
into the evening.

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**			
Biologist Name	Eva Olin		**Date**	5/21/15
	Start Time	0550	**End Time**	1305

Comments for all Concerns Noted Above/Species Observed/ General Comments:
0550- Arrived & cleared Jersey Island.
0630- Cleared Bradford Island. De-mobilizing
equipment from Bradford. Limited pile driving.
Few raptors soaring over fields & trees on Jersey.

Construction Activities Performed:
Rock placement. Equip de-mob from Bradford.
Limited pile driving on Bradford.

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**			
Biologist Name	Rachel August		**Date**	5/21/15
	Start Time	1300	**End Time**	

Comments for all Concerns Noted Above/Species Observed/ General Comments:
- Arrived on site at 1300. EC&E branch members on site to observe GGS that has been in area. No GGS observed
- At 1400 a snake was spotted under a rock but not able to see all of head or body. Continued to watch area.
- At 1500 SEL accumulated had reached 205 decibels. went out on skiff to Bradford to observe. No sensitive species spotted. Also patrolled river for fish. Sea lion was observed with a large fish in its mouth. No other dead fish observed.
- 1600 GGS was observed on Jersey Island side near rip rap and captured by permitted EC&E branch members. It was released away from project
- 1630 a second GGS was captured and relocated from same area.

Construction Activities Performed:
- Pile driving of sheets on Bradford side
- Rock placed in river.

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**			
Biologist Name	Eva Olin		**Date**	5/22/15
	Start Time	0530	**End Time**	1300

Comments for all Concerns Noted Above/Species Observed/ General Comments:
0530- Jersey Is. cleared. 6am Safety tailgate
0630- Cleared Bradford Is.
0700- Rip rap replacement starts on Jersey. Pile driving on Bradford.
0745- Rip rap work done on Jersey.
1050- 2 RTHA chicks observed on nest on Bradford.
1115- 2 hawks (SWHA?) seen near trees on Jersey.

Construction Activities Performed:

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**			
Biologist Name	Norm Ponferrada		**Date**	Friday, 5/22/2015
	Start Time	1240	**End Time**	2030

Comments for all Concerns Noted Above/Species Observed/ General Comments:

62°F, Windy ≈ 15-20 mph & gusty, ≈ 5% cloud cover

Species observed: KIDE, RTHA, AMCR, TUVU, NOHA, Western fence lizard

Concerns: None

Construction Activities Performed:

① Continued placing rocks

② Vibratory hammering of sheet piles on Bradford Island side

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**			
Biologist Name	Rachel August		**Date**	5/23/15
	Start Time	0530	**End Time**	1245

Comments for all Concerns Noted Above/Species Observed/ General Comments:
- Arrived on site, at 0530. Cleared Jersey Island side. (
walked exclusion fencing, checked around all
machinery, etc.). No sensitive species observed.
- Cleared Bradford side (walked exclusion fencing, checked
around all machinery, etc) at 0630. No sensitive
species observed.
- No sensitive species observed.
- High public boat traffic through area

Construction Activities Performed:
- Sheet piles ~~etc~~ driven on Bradford side
- Rock placement in river.

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**			
Biologist Name	David Bize		**Date**	Saturday 5/23/2015
	Start Time	12:45	**End Time**	20:15

Comments for all Concerns Noted Above/Species Observed/ General Comments:
Partly cloudy 70°F, wind light 3-5 mph on arrival
No noise issues w/ vibratory hammering today. No noise monitoring necessary. Water truck regularly ~~does~~ performing dust control.
70°F, wind 10-15 mph, clear @ 20:15 when left site
Species
red-winged blackbird, turkey vulture, double-crested cormorant, common yellowthroat, killdeer, northern harrier, belted kingfisher, American crow, barn swallow, common raven, sea lion @ 17:40 in channel, house finch

Construction Activities Performed:
Rock placement on Jersey Island side Vibratory pile driving on Bradford side.

	Department of Water Resources Biological Monitoring Field Report Project: Emergency Drought Barriers Project			
Biologist Name	David Bix		Date	Sunday, May 24, 2015
	Start Time	05:30	End Time	1315

Comments for all Concerns Noted Above/Species Observed/ General Comments:

clear, 55°F, wind 15-20 mph on arrival

cleared area inside exclusion fence. No animals within exclusion fencing.

Fuel truck refuelled generators today

Species Observed

Double-crested cormorant, common raven, killdeer, great-blue heron, northern harrier, mourning dove, red-winged blackbird, common yellowthroat, American kestral, lesser goldfinch, turkey vulture

Construction Activities Performed:

Placing rock on Jersey & Bradford Island sides.

	Department of Water Resources Biological Monitoring Field Report Project: Emergency Drought Barriers Project			
Biologist Name	Rachel Avila		Date	5-24-15
	Start Time	1300	End Time	2000

Comments for all Concerns Noted Above/Species Observed/ General Comments:

General Comments: Windy, gusty 20-25 mph. 90% clear, temp 71°

Species observed: NOHA, Gopher snake, KIDE, DCCO, Tern, western fence Lizard, RWBB, HOFI, AMCR, MODO, WEBB, AMRO BASW

Concerns: Watched gopher snake move along east side of exclusion fence, it climbed halfway up a green stake before moving down.

Construction Activities Performed: Placing rock in water.

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**			
Biologist Name	Norm Ponferrada		**Date**	Monday, May 25, 2015
	Start Time	0509	**End Time**	1300

Comments for all Concerns Noted Above/Species Observed/ General Comments:

Temp 55°F, <5% cloud cover, calm winds ≈ 2mph

Environmentally cleared Jersey Island worksite at 0540. No work activity was performed on the Bradford Island.

Species observed: Northern harrier, gull sp., swallow sp., killdeer, cormorant, Great blue heron, American crow, red tail hawk

Concerns: Some workers are going faster than the allowed 15 mph

Construction Activities Performed:

(1) Placed rocks on Jersey Island side and towards the middle of the channel. No activities performed on the Bradford Island side

(2) Water truck ~~early~~ active throughout the day for dust control.

	Department of Water Resources Biological Monitoring Field Report Project: Emergency Drought Barriers Project			
Biologist Name	David Bise		Date	Monday, May 25
	Start Time	1300	End Time	1750

Comments for all Concerns Noted Above/Species Observed/ General Comments:

Temp 73°F, windy 15-20 mph

Species ~~[illegible]~~ Caspian tern, turkey vulture, northern harrier, common yellowthroat, osprey, common raven, barn swallow, Ca sea lion

No concerns noted. Work is progressing into the middle of the channel with limited activity on the banks.

Monitoring stopped at 5:30 PM because they were waiting for more rock that would not arrive until after 6 PM. Exclusion fence was closed & crew left work area.

Construction Activities Performed:

Rock placement in channel, dust control on Jersey Island.

No activity on Bradford side.

	Department of Water Resources Biological Monitoring Field Report Project: Emergency Drought Barriers Project			
Biologist Name	GINA RADIEVE		Date	20150526
	Start Time	0530	End Time	

Low tide 0647 - sunrise ~ 0540

Comments for all Concerns Noted Above/Species Observed/ General Comments:
0530 - Arrive on site clear Jersey side
0615 - walk rip rap on Jersey again
0630 - embark to Bradford Island
0635 - Bradford RTHA chicks branching now. Larger chick
is perched on limb ~1m from nest. Smaller on nest edge.
Both birds now displaying juvenile plumage
0650 - Bradford side clear for work
0900 - Bradford RD crew augering holes near RTHA nest!
0925 - birds are OK. Notified Conrad w/RD crew to
use care working near nest
1100 - small ♀ sea lion ~~bi~~ swimming downstream
is noticably fighting stronger current due to
barrier. She was pushed back several times →

Construction Activities Performed:
THROWING ROCK.

then I lost site of her after a few minutes.

1219 – yellow belly racer (~16") in rip rap @ NW corner of exclusion fence. My approach scared it back into rip rap

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**			
Biologist Name	Sarah Zorn		**Date**	05/26/15
	Start Time	1300	**End Time**	2020

Sunset: 2019

Comments for all Concerns Noted Above/Species Observed/ General Comments:
1300: Arrived on site and got the overview from PM monitor.
PM Monitor left site
1330: Sea lion observed swimming upstream of barrier
1500: Monitored on Bradford Island. 2 RTHA chicks sitting on
branches next to nest. Adult RTHA observed flying away
from nest and perching on nearby tree
1750: Valdir observed a gopher snake outside of exclusion fence just
east of proj. area (on Jersey Is.). Snake went into riprap. He took a photo
and sent to me. Photo sent to Katerine Marquez (KM)
1900: John Personeni found 2 copulating gopher snakes on the
level road next to the "65 speedlimit" sign just west of
ferry. One snake was dead, but did not appear to be
roadkill. Snakes were moved off of road. Photo sent to KM

Construction Activities Performed:
Placement of Rock into False River using 2 barges/cranes

1915: Exclusion fence opening on Jersey Isl. was closed ~~up~~ up and area was re-surveyed for Sensitive Species. None observed.

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**			
Biologist Name	Rhiannon Klingensmith		**Date**	5/27/15
	Start Time	0535	**End Time**	1300

Comments for all Concerns Noted Above/Species Observed/ General Comments:

arrival Temp 54°; wind 5-15, Clear sky's

Cleared Jersey Is., discussed work plans w/ crew. Anticipated no work will take place on Bradford today, likely tomorrow

- RTHA pair observed on Jersey - going to and from nest
- RTHA pair on Bradford observed foraging and going to nest
- Sea lion & WPT observed in water
- Yellow-bellied racer seen on rip-rap

Dark morph SWHA still hanging around

Construction Activities Performed:

* Barges / cranes dropping rock building up barrier

no on land work today

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**			
Biologist Name	Eva Olin		**Date**	5/27/15
	Start Time	1300	**End Time**	2021

Comments for all Concerns Noted Above/Species Observed/ General Comments:
1300- Arrived onsite. AM monitor left
1800 - Gopher snake observed near fence opening
on Jersey Is. Snake directed away from staging
area & headed down the levee along exclusion
fence toward marsh. Photo sent to K. Marquez.
1830- Exclusion fence closed.
1945- Gopher Snake still along fence.
Sea lion observed upstream of barrier. No
sensitive species observed in area.
2020- Sunset

Construction Activities Performed:
Rock placement from 2 barges.

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**			
Biologist Name	Rhiannon Klingonsmith		**Date**	5/28/15
	Start Time	0530	**End Time**	1300

Comments for all Concerns Noted Above/Species Observed/ General Comments:
arrival Temp 55°; wind 0-10 mph, sky partly cloudy
• Cleared Jersey Is. work site; had safety mtg + daily
discussion of todays work activities
• cleared Bradford side; RTHA chicks are branching
• minor holes or potential holes patched in fencing
• Conducted enviro training for visitors
• 2 dark morph SWHA observed in willows (same loc)
Observed: yellow-bellied racer, various birds, sea lion

Construction Activities Performed:
Cranes placing Rock
Barrier officially closed by 9AM!
Road grading/smoothing on Bradford

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**			
Biologist Name	Eva Dim		**Date**	5/28/15
	Start Time	1300	**End Time**	2022

Comments for all Concerns Noted Above/Species Observed/ General Comments:
1400 - Sea Lion observed upstream of barrier
1745 - Exclusion fence closed
1900 - Sea Lion observed upstream of barrier
1920 - Exclusion fence walked. Gopher snake
observed down levee on southeast end
of staging area (near opening in fence)
2021 - Sunset

Construction Activities Performed:
Rock Placement

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**			
Biologist Name	Sarah Zorn		**Date**	05/29/15
	Start Time	0600	**End Time**	1330

Comments for all Concerns Noted Above/Species Observed/ General Comments:

- Arrived on-site at 0530 and cleared Jersey Isl. No work on Bradford Isl today.
- Not much on-land work today. Put buoy line in water and placed "DANGER" signs on barrier.
- Mainly dumped rock
- Welded tops onto piles on both sides
- Rode in skiff downstream. No fish kills observed
- Press confrence @ 1200

Construction Activities Performed:

Dumped Rock
Welded tops onto round piles
Put out Buoy line upstream
Placed "DANGER" signs on Barrier

	Department of Water Resources Biological Monitoring Field Report Project: Emergency Drought Barriers Project			
Biologist Name	Jeffrey Tkach		Date	5/29/2015
	Start Time	1300	End Time	1800

Comments for all Concerns Noted Above/Species Observed/ General Comments:

- Arrived on site and had shift change debriefing with AM monitor (Sarah Zorn)
- 1340 Walked the exclusion fencing and rip rap.
- 1445 Went out into channel to look for floaters on the contractors skiff. Did not see any.
- Patrolled the access road most of the day with occassional walks of the perimeter fencing.
- All work was in-water

Construction Activities Performed:

- Dumped rock using barge crane

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**			
Biologist Name	Rachel August		**Date**	5/30/15
	Start Time	0530	**End Time**	1330

Comments for all Concerns Noted Above/Species Observed/ General Comments:
- Arrived at site at 0530.
- Cleared Jersey Island. No sensitive species observed
- Cleared Bradford Island. No sensitive species observed.
- Provided environmental awareness to new survey crew
- Heavy public traffic
- Crane barge #3 left site around 1000
- No ~~ot~~ on land work done aside from placing buoy boxes on levee.
- Left site at 1330. No work planned for 5/31/15

Construction Activities Performed:
- Crane barge #8 training employee on throwing rock w/ bucket. Not much rock thrown.

	Department of Water Resources Biological Monitoring Field Report Project: Emergency Drought Barriers Project			
Biologist Name	Gina Radieva		Date	20150601
	Start Time	0530	End Time	1545

Patchy clouds, clearing by ~9AM. Calm wind.

Comments for all Concerns Noted Above/Species Observed/ General Comments:

0545 - cleared Jersey exclusion zone.
Looked for birds @ Jersey RTHA nest but did not see
0635 - cleared Bradford.
1 RTHA juvenile branching @ Bradford nest. Bird ~~flapping wings & taking of~~ perched on dead limbs east of nest.
1129 - young sea lion approaches barrier on upstream side (this was observed multiple times thru day)
1137 - 1 RTHA juv hopping around in & out of nest, flapping wings in windy conditions
1347 - 1 RTHA juv low in nest. Another bird, possibly other juv, in lone spindly Eucalyptus to east of nest. This 2nd bird appearred slighter than a typical adult.

Construction Activities Performed:

THROWING ROCK

1432 - sea lions approach barrier regularly throughout the day on upstream side heading down. Most appear small and/or female

1541 - Caspian tern fishing along barrier on downstream side. Catches small prey items which are ~~not visible as~~ fully inside mouth & not visible when bird resurfaces. Seems to be diving at least a few feet deep. This continues as work ends for the day.

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**			
Biologist Name	SARAH ZORN		**Date**	06/02/2015
	Start Time	0600	**End Time**	1300

Comments for all Concerns Noted Above/Species Observed/ General Comments:

- Arrived on-site at 0540 and cleared site on Jersey side. No work on-land on Bradford today.
- Surveyed from water 1000-1130. No sensitive resources observed

1130: No RTHA observed in the Bradford Isl nest. Chicks were last observed branching, and are at the point where they can fly. So may be somewhere else?

Construction Activities Performed:

- Filling in template for rock barrier.
- Compacted Jersey Isl. levee road where on-land piles were installed.

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**			
Biologist Name	Tammy Lim		**Date**	June 2, 2015
	Start Time	1240	**End Time**	0820

Comments for all Concerns Noted Above/Species Observed/ General Comments:

- Dark greenish snake observed on Jersey Isld. on way in ~ 2-3 mi from EDB site. Unable to confirm ID. No other snakes obsv.

Bird list: double-crested cormorant, red-tailed hawk, northern harrier, Song sparrow, common yellowthroat, spotted towhee, barn swallow, American goldfinch, house finch, great blue heron, common raven, American crow, rock pigeon, Caspian tern, turkey vulture, mallard, white-faced ibis, mourning dove, Am. white pelican, killdeer, cliff swallow, Bullock's oriole

Construction Activities Performed:

Filling in rock barrier, spraying down road. Very little activity on south side, no activity on road to the north.

birds cont: western kingbird, blue grosbeak!, Anna's hummingbird, great egret, Pacific-slope flycatcher?

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**			
Biologist Name	GINA RADIEVE		**Date**	20150603
	Start Time	0530	**End Time**	1300

Comments for all Concerns Noted Above/Species Observed/ General Comments:
0545 - cleared Jersey Island. fish are jimping
& water is glassy. SWHA dark morph
perched in willow. Cannot see Bradford
RTHAs.
0645 - Bradford clear. RTHA not visible in or
around nest or trees, observed Eucalyptus
grove from multiple points along Bradford
levee road near nest. Alot of songbird activity
0950 - gopher snake traveling down levee slope
~~along~~ INSIDE excl fence along west edge near
trailers. snake was ushered under silt fencing
out of site & escorted into cattails. fence then
reburied @ release location.

Construction Activities Performed:
Throwing rock
Hand surveying depths
Push rock barge around Bradford
Dirt work on Jersey Island road.

1040 - fix small hole in Bradford fence

1100 - still no raptors in Bradford Eucs

1149 - returned to area where gopher snake was found & checked fence. Found very small gap near western "gate" section. closed gap & notified the crew to ensure it is secure in future.

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project** Wednesday			
Biologist Name	David Bise		**Date**	6/3/2015
	Start Time	1300	**End Time**	2015

Comments for all Concerns Noted Above/Species Observed/ General Comments:

78°F, wind 10-15 mph @ arrival. Time between activity expanded now because rock barges only have access on upstream side by navigating around Bradford Island

Species observed:
Common yellowthroat, red-winged blackbird, Song sparrow, American crow, turkey vulture, Caspian tern, California towhee, Bullock's oriole, Great blue heron, Ca sea lion @ 1500 + 1530, western kingbird, red-tailed hawk, killdeer, double crested cormorant, mourning dove, barn swallow, western bluebird

Construction Activities Performed:

Rock placement on upstream side of barrier. Water truck running. Some smoothing of Jersey Island levee. Workers stringing warning buoys on the levee for placement across channel.

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**			
Biologist Name	Sarah Zorn		**Date**	06/04/2015
	Start Time	0600	**End Time**	1300

Comments for all Concerns Noted Above/Species Observed/ General Comments:
0540: Arrived on site and cleared Jersey Isl.
no onland work on Bradford Isl today
Crew worked on setting up buoy line
on Jersey all morning, while
barge continued to place rock in
water close to Jersey shore.
Coast Guard came by to investigate
the Ferry situation (keeps getting
stuck)
1100: Dead striped bass observed floating
upstream of barrier ~ 1/4 mile away
1130: Anthony Chu and Barry Montoya did a site
visit. Gave them the env. tailgate

Construction Activities Performed:
Placement of Rock in River on Jersey Side
Set up buoy lines (on-land)

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**			
Biologist Name	Rachel August		**Date**	6/4/15
	Start Time	1300	**End Time**	1800

Comments for all Concerns Noted Above/Species Observed/ General Comments:
- Arrived at 1300 and released AM monitor.
Reckeared site. No sensitive species observed
- Reported site at 1800

Construction Activities Performed:
- Placing rock downstream of barrier

	Department of Water Resources Biological Monitoring Field Report Project: Emergency Drought Barriers Project			
Biologist Name	Tracy Walker		Date	June 5, 2015
	Start Time	0515	End Time	1305

Comments for all Concerns Noted Above/Species Observed/ General Comments:

upon arrival: 52°F, 10% cloud, ~15mph wind from W

Cleared area w/in & surrounding exclusion fence at 530, including all rigs and equipment piles for GGS

- checked area periodically for snakes

upon leaving - 75°F, 25% cloudy, ~20mph from WSW

spp observed: COYE, AMCR, SWHA, BLGR, SPTO, CLSW, GRHE, RWBL, Gull spp, KILL, SOSP, BHCO, LEGO, MODO, GRYE, LAZB, DCCO, WEBL, WEKI, SAVS, GREG, HOFI, BLPH, AMGO, signs of river otter, raccoon, jackrabbit

Construction Activities Performed:

1. water truck active for dust control
2. 1 barge/boat placing rock in thinner spots along barrier
3. Resurfacing of levee crown w/in exclusion fence zone utilizing 1 small roller, 1 small excavator, & 2 small dump trucks

	Department of Water Resources Biological Monitoring Field Report Project: Emergency Drought Barriers Project			
Biologist Name	Rachel August		Date	6/5/15
	Start Time	1300	End Time	~~0820~~ 2020

Comments for all Concerns Noted Above/Species Observed/ General Comments:
- Arrived at 1300 and relieved AM monitor.
Reviewed site - No sensitive species observed.

Construction Activities Performed:
- Placed rock downstream of barrier.
- AB placed on levee & compacted
- Crane barge & moved to upstream of barrier.

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**			
Biologist Name	GINA RADIEVE		**Date**	20150606
	Start Time	0530	**End Time**	1300

Comments for all Concerns Noted Above/Species Observed/ General Comments:
0545 - cleared Jersey. no onland work on Bradford today
0809 - dead gopher snake (~3.5') in riprap n15m east of exclusion fence on Jersey. 2 large puncture wounds, appears to have been crushed by rock movement. Moved out of riprap into marsh veg south of project site
0838 - small male sea lion did a FULL BACK FLIP near buoy line - sea world style!
1250 - RTHA been observed perched in Bradford nest tree most of day. a fledgling?

Construction Activities Performed:
Throwing rock & moving barge around Bradford. Crane is now working from downstream side.

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**			
Biologist Name	Norm Ponferrada		**Date**	Saturday, June 6, 2015
	Start Time	1255	**End Time**	2030

Comments for all Concerns Noted Above/Species Observed/ General Comments:
Temperature at 1255 is 77°F (low 57°F, high 84°F)
≈15-25 mph gusty winds, <5% cloud cover
Sunrise 0545 & Sunset 2027
Species observed: Redtail hawk, double crested cormorant,
American Kestrel, American crow, tree swallow,
Concerns: none

Construction Activities Performed:
- Placing more rocks and packing the barrier.
- Water truck for dust control

	Department of Water Resources Biological Monitoring Field Report Project: Emergency Drought Barriers Project			
Biologist Name	Norm Ponferrada		Date	Monday, June 8 2015
	Start Time	0510	End Time	1800

Comments for all Concerns Noted Above/Species Observed/ General Comments:
Cleared the work site at 0535, <5% cloud cover,
none winds, 64°F at 0510, 102°F at 1800
Species observed: northern mocking bird, killdeer, red tail hawk,
tree swallow, gull spp., great blue heron, lesser egret,
red winged blackbird, sea lion, western fence lizard,
American crow, Swainson's hawk, house finch
concerns: none

Construction Activities Performed:
• Placing more rocks
• Water truck for dust control

	Department of Water Resources Biological Monitoring Field Report Project: Emergency Drought Barriers Project			
Biologist Name			Date	6/9/15
Don Gray	Start Time 5:30	5:30	End Time	508

Comments for all Concerns Noted Above/Species Observed/ General Comments: RTH KD

Gate locked on Road

5:45 site cleared. 5:45 North side

6:20 South side site cleared for work.

hawk in end of the nest.

South side grading the road.

7:46 water truck and barge in river work. No work being done on the levees.

Marsh Hawk South side

904 Pair of dark morph red Tail Hawks, nest

Kill Deer nest just off crown of levee, placed barricade near nest

Hawk nest is in the tree just south of kill deer nest.

1010 Worked South side (clear) wind picking up. gusting to 18 mph.

1237 Gravel brought in & graded ~~begin~~ broadcast dsland. Surveyors working

Construction Activities Performed:

no more land side construction for the day.

1105 Red Tail Hawks still in the tree south side.

441 Barge work no land side work. closing up parking compound.

508 done w/ rock setting lines for tomorrow

gate

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**			
Biologist Name	Rachel August		**Date**	6/10/15
	Start Time	0545	**End Time**	

Comments for all Concerns Noted Above/Species Observed/ General Comments:
- Arrived at site at 0545. Cleared both Jersey & Bradford sides
- Cloudy / raining
- silt fencing was removed from Bradford side.
- Snake was seen on Bradford Island around 1600 by Construction crew but it is unknown what type of snake.
- A lot of in/out traffic moving equipment on Jersey Island. Site walked periodically to check for sensitive species.

Construction Activities Performed:
- Placing rock & buoy lines
- Removing silt fencing from Bradford side

	Department of Water Resources Biological Monitoring Field Report Project: Emergency Drought Barriers Project			
Biologist Name	Rhiannon Klingensmith		Date	6/11/15
	Start Time	0535	End Time	1600

Sky: clear / wind 0-15 / Temp 67°-93°

Comments for all Concerns Noted Above/Species Observed/ General Comments:

* Cleared Jersey upon arrival; then cleared Bradford @ 7:45 am.
- Bradford road work took place - finishing up there with road grading
- Installation of fencing poles in rip-rap, monitored for snakes - on both Jersey + Bradford side

RTHA nest on Bradford = chicks have fully fledged

Construction Activities Performed:

Placing Rock at Barrier
Installation of fence posts + fencing around barrier in rip-rap of levee

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**			
Biologist Name	EVA OLIN		**Date**	6/12/15
	Start Time	0540	**End Time**	1815

Comments for all Concerns Noted Above/Species Observed/ General Comments:
0540- Arrived & cleared site. No sensitive species observed.
0900- Cleared Bradford side for fence post installation

Construction Activities Performed:
Rock Placement. Fence post installation on Bradford I. Fence post repouring on Jersey Is.

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**			
Biologist Name	Jeffrey Tkach		**Date**	6/13/2015
	Start Time	0700	**End Time**	1715

Comments for all Concerns Noted Above/Species Observed/ General Comments:
-0640 Arrived on site, cleared site for the days activities. No sensitive species observed.
- Exclusion fencing has been removed so parked truck on the crown of the levee where the work was taking place.
- Trailer picked up construction office trailers.
- Buoys being moved around and signage being placed in the channel.
- Equipment being loaded into the barge.
- off site approximately 1715

Construction Activities Performed:
- Demob

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**			
Biologist Name	Rachel August		**Date**	6/15/15
	Start Time	0530	**End Time**	0530

Comments for all Concerns Noted Above/Species Observed/ General Comments:

- Arrived at site at 0530. No sensitive species observed.
- Site walked periodically as silt fence was removed.
- Site walked periodically as fencing on rip rap near barrier was installed.
- Site walked periodically as slope of levee ~~we~~ was retracked.
- observed a killdeer nest in roadway containing two eggs east of site on levee road.

Construction Activities Performed:

- silt fence removed
- levee slope retracked
- Fencing installed on Jersey site near barrier

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**			
Biologist Name	Jeffrey Thach		**Date**	6/16/2015
	Start Time	0700	**End Time**	1700

Comments for all Concerns Noted Above/Species Observed/ General Comments:

- Arrived on site at 0640 and cleared site for daily activities. No sensitive species encountered.

- Fence installers arrived approximately 0900.

- Installation of fence and gates.

- Left site at approximately 1700

Construction Activities Performed:

- Demob

	Department of Water Resources **Biological Monitoring Field Report** **Project: Emergency Drought Barriers Project**			
Biologist Name	GINA RADIEVE		**Date**	20150617
	Start Time	0650	**End Time**	1430

Comments for all Concerns Noted Above/Species Observed/ General Comments:
0650 - Arrived on site & walked general work
area, riprap edge & fencing area on
Jersey side. - No sensitive species observed.
Jersey cleared.
0733 - Bradford cleared.
0735 - Bradford RTHA nest 1 juvenile eating
1240 - No raptors in Bradford RTHA nest

Construction Activities Performed:
Fencing installation on both islands
Sign hanging on downstream side

	Department of Water Resources Biological Monitoring Field Report Project: Emergency Drought Barriers Project			
Biologist Name	Jeffrey Tkach		Date	6/24/2015
	Start Time	1200	End Time	1500

Comments for all Concerns Noted Above/Species Observed/ General Comments:

- Arrived on site @ approximately 1210.
- Walked the site to clear for work activities. No sensitive species encountered.
- 1230 Started work activities; Water truck sprayed down the land side of the levee for dust mitigation while tracked dozer went up and down the land side of the levee to compact the soil. (track walk).

Construction Activities Performed:

- Track walk levee

	Department of Water Resources Biological Monitoring Field Report Project: Emergency Drought Barriers Project			
Biologist Name	Jeffrey Tkach		Date	6/25/2015
	Start Time	0810	End Time	~~1030~~ 1100

Comments for all Concerns Noted Above/Species Observed/ General Comments:

- Arrived on site and walked site to clear for work. did not encounter any sensitive species.
- 0830 : Water truck started to fill in preparation to spray Rhino Snot on levee for soil stabilization.
- 0900 : Started spraying ~~of~~ soil stabilization on land side of levee.

Construction Activities Performed:

- Soil stabilization spray of the landside of the levee

Appendix E: CNDDB Forms and GGS Observation Forms

CNDDB Online Field Survey Form Report

California Natural Diversity Database
Department of Fish and Wildlife
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: 916.324.0475
Email: cnddb@wildlife.ca.gov
www.dfg.ca.gov/biogeodata/cnddb/

This data has been reported to the CNDDB, but may not have been evaluated by the CNDDB staff

Source code HAM15F0003
Quad code 3812116
Occ. no.
EO index no.
Map index no.

Scientific name: *Lathyrus jepsonii var. jepsonii* Common name: Delta tule pea

Date of field work: 04-21-2015

Comment about field work date(s):

Observer: Lesley L. Hamamoto

Affiliation:

Address: 119 Arbusto Circle , Sacramento, CA 95831

Email: lesley.hamamoto@water.ca.gov

Phone: (916) 376-9784

Other observers:

How identified:

Keyed in: TJMII

Compared w/ specimen at:

Compared w/ image in:

By another person:

Other:

Identification explanation: ID'ed as Lathyrus jepsonii, little to no puberulence which would indicate ssp. jepsonii rather than californica

Identification confidence: Confident

Species found: Yes

Total no. individuals: 3

Collection? No Collection no.:

Museum/Herbarium:

Plant Information

Phenology:	100 %	0 %	0 %
	vegetative	flowering	fruiting

Site Information

Habitat description: recently repaired levee with newly placed rip rap along False River

Slope: 30 degrees

Aspect: northeast

Land owner/manager: levee is owned by Reclamation District, surrounding land is privately owned.

Site condition + population viability: Fair

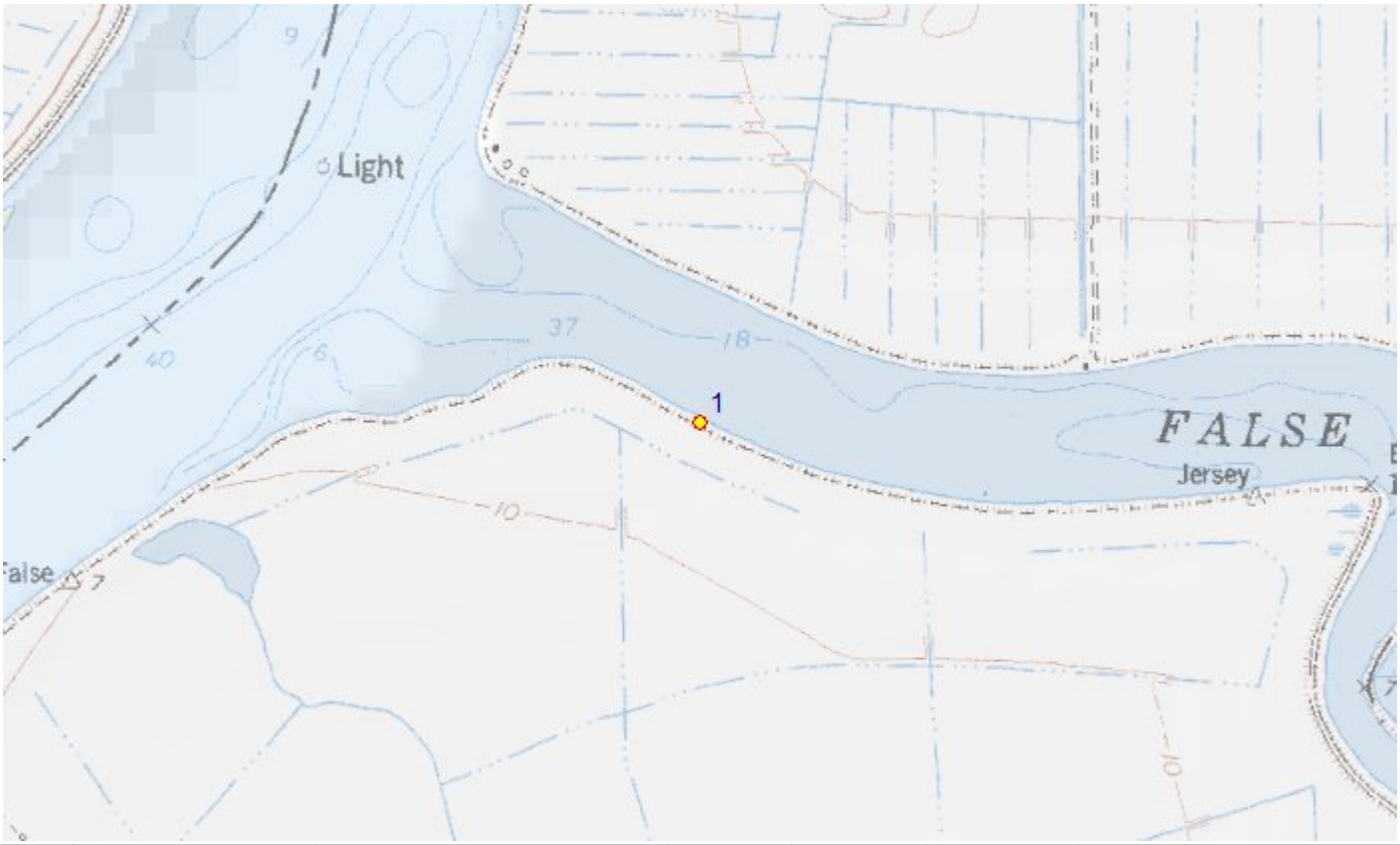
Immediate & surrounding land use: River channel and grazing lands. Recreational fishing takes place on surrounding waterways. A small car ferry operates between Jersey Island and Bradford Island.

Visible disturbances: recent levee work

Threats: installation of emergency drought barrier

General comments: drought barrier installation will avoid impacts to sensitive plant species to the extent practicable.

Image URL: https://nrm.dfg.ca.gov/fieldSurvey/File.ashx?id=1320



ID	County	24K Quadrangle	Elev. (ft)	Latitude NAD83	Longitude NAD83	UTM E NAD83	UTM N NAD83	UTM Zone
	Contra Costa	Jersey Island	3	38.05666	-121.67193	616513	4212934	10
1	Public Land Survey	Feature Comment						
	M T03N R03E 32							

The mapped feature is accurate within: 20 m

Source of mapped feature: mapped in field using Google Maps

Mapping notes:

Location/directions comments:

Attachment(s):

Photos included in pre-construction survey report in Appendix B.

CNDDB Online Field Survey Form Report

California Natural Diversity Database
Department of Fish and Wildlife
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: 916.324.0475
Email: cnddb@wildlife.ca.gov
www.dfg.ca.gov/biogeodata/cnddb/

This data has been reported to the CNDDB, but may not have been evaluated by the CNDDB staff

Source code HAM15F0004
Quad code 3812116
Occ. no.
EO index no.
Map index no.

Scientific name: *Symphyotrichum lentum* Common name: Suisun Marsh aster

Date of field work: 04-21-2015

Comment about field work date(s):

Observer: Lesley L. Hamamoto

Affiliation:

Address: 119 Arbusto Circle , Sacramento, CA 95831

Email: lesley.hamamoto@water.ca.gov

Phone: (916) 376-9784

Other observers:

How identified:

Keyed in:

Compared w/ specimen at:

Compared w/ image in:

By another person:

Other: ID'ed based on previous experience with the species.

Identification explanation: Flowers present on one plant, last year's dried flower stalks present on other plants. Plants ID'ed based on leaf morphology and venation, general growth habit and location.

Identification confidence: Very confident

Species found: Yes

Total no. individuals: approx. 25

Collection? No Collection no.:

Museum/Herbarium:

Plant Information

Phenology:	95 %	5 %	0 %
	vegetative	flowering	fruiting

Site Information

Habitat description: waterside habitat along riprapped levee toe.

Slope: Land owner/manager: levee is owned by Reclamation District

Aspect:

Site condition + population viability: Fair

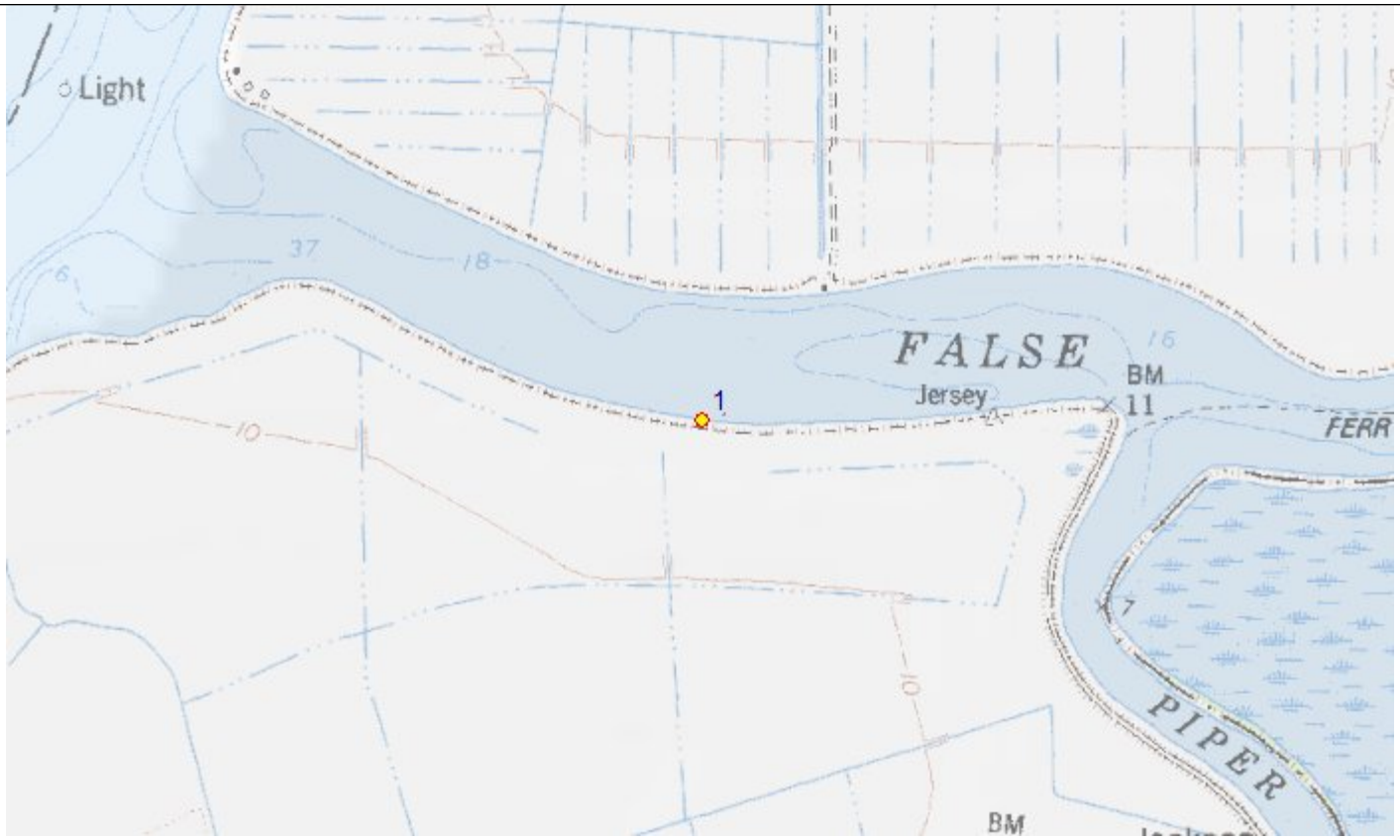
Immediate & surrounding land use:

Visible disturbances: rip rap was recently replaced during levee repairs.

Threats: installation of emergency drought barrier

General comments: drought barrier installation will avoid direct impacts to sensitive plant species to the extent practicable.

Image URL: https://nrm.dfg.ca.gov/fieldSurvey/File.ashx?id=1323



ID	County	24K Quadrangle	Elev. (ft)	Latitude NAD83	Longitude NAD83	UTM E NAD83	UTM N NAD83	UTM Zone
	Contra Costa	Jersey Island	3	38.05535	-121.66626	617013	4212797	10
1	Public Land Survey	Feature Comment						
	M T03N R03E 32							

The mapped feature is accurate within: 10 m

Source of mapped feature: location mapped on Google Maps in field

Mapping notes: polygon extends east approximately 500 feet east along shoreline

Location/directions comments:

Attachment(s):

Photos included in pre-construction survey report in Appendix B.

CNDDB Online Field Survey Form Report

California Natural Diversity Database
Department of Fish and Wildlife
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: 916.324.0475
Email: cnddb@wildlife.ca.gov
www.dfg.ca.gov/biogeodata/cnddb/

This data has been reported to the CNDDB, but may not have been evaluated by the CNDDB staff

Source code HAM15F0005
Quad code 3812116
Occ. no.
EO index no.
Map index no.

Scientific name: *Lilaeopsis masonii* Common name: Mason's lilaeopsis

Date of field work: 04-21-2015

Comment about field work date(s):

Observer: Lesley L. Hamamoto

Affiliation:

Address: 119 Arbusto Circle , Sacramento, CA 95831

Email: lesley.hamamoto@water.ca.gov

Phone: (916) 376-9784

Other observers:

How identified:

Keyed in:

Compared w/ specimen at:

Compared w/ image in:

By another person:

Other: identified based on previous experience with the species; vegetative characteristics including cross walls, and "stretchy" texture.

Identification explanation:

Identification confidence: Very confident

Species found: Yes

Total no. individuals: approx 10 sq ft

Collection? No Collection no.:

Museum/Herbarium:

Plant Information

Phenology:	100 %	0 %	0 %
	vegetative	flowering	fruiting

Site Information

Habitat description: waterside at the base of a riprapped levee along False River. Associated species include Suisun Marsh aster, Juncus effusus and Schoenoplectus.

Slope:

Aspect:

Land owner/manager: Levee is owned by the Reclamation District, adjacent lands are privately owned.

Site condition + population viability: Fair

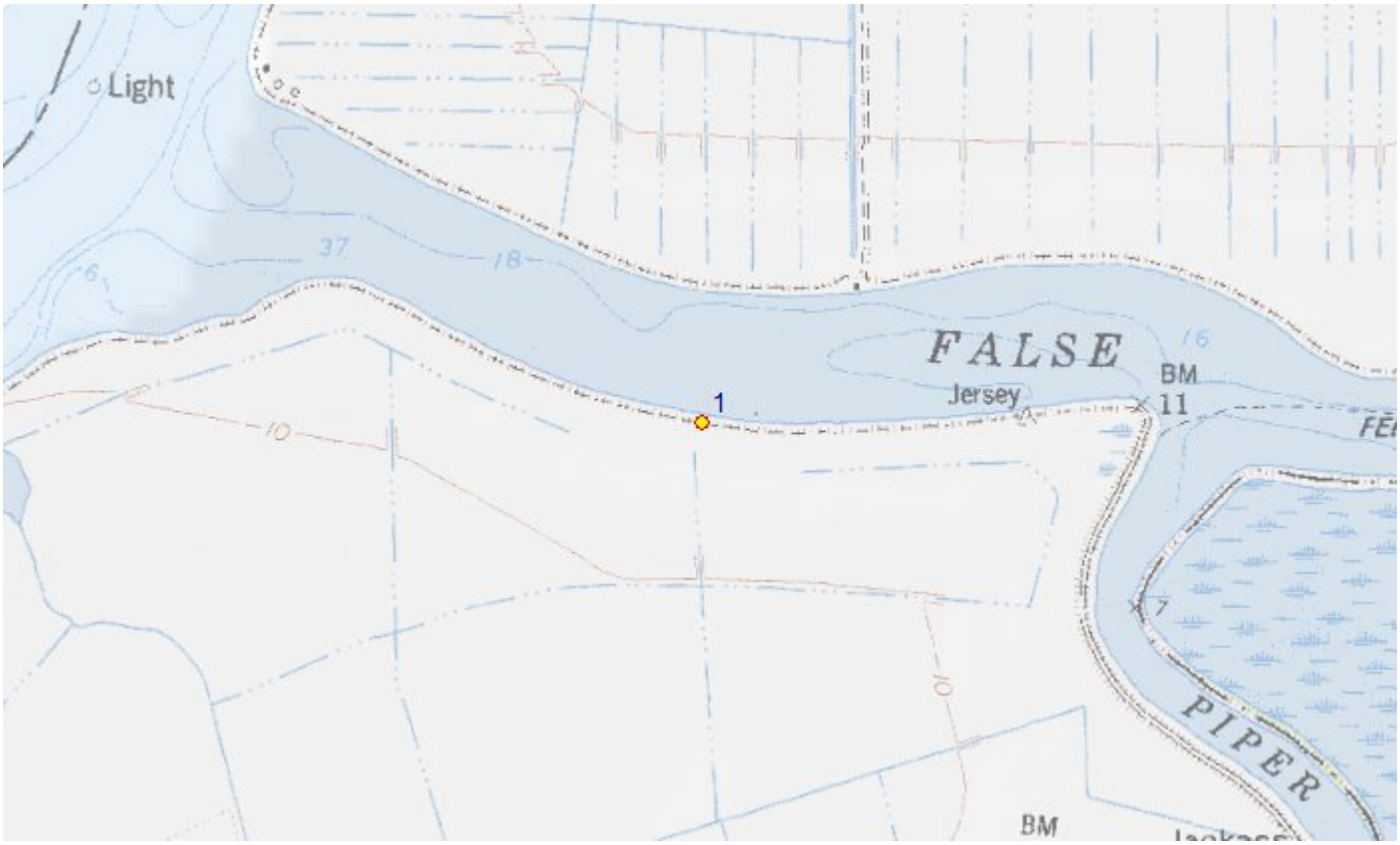
Immediate & surrounding land use: False River and surrounding waterways are used for recreational activities including fishing and boating, island interior is grazed.

Visible disturbances: recent levee work including installation of new rip rap

Threats: installation of emergency drought barrier

General comments: drought barrier will avoid direct impacts to sensitive plant species to the extent practicable.

Image URL: https://nrm.dfg.ca.gov/fieldSurvey/File.ashx?id=1324



ID	County	24K Quadrangle	Elev. (ft)	Latitude NAD83	Longitude NAD83	UTM E NAD83	UTM N NAD83	UTM Zone
	Contra Costa	Jersey Island	10	38.05530	-121.66695	616953	4212790	10
1	Public Land Survey	Feature Comment						
	M T03N R03E 32							

The mapped feature is accurate within: 20 m

Source of mapped feature: mapped in the field using Google Maps

Mapping notes:

Location/directions comments:

Attachment(s):

Photos included in pre-construction survey report in Appendix B.

CNDDB Online Field Survey Form Report

California Natural Diversity Database
Department of Fish and Wildlife
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: 916.324.0475
Email: cnddb@wildlife.ca.gov
www.dfg.ca.gov/biogeodata/cnddb/

This data has been reported to the CNDDB, but may not have been evaluated by the CNDDB staff

Source code BAN15F0001
Quad code 3812116
Occ. no.
EO index no.
Map index no.

Scientific name: *Thamnophis gigas* Common name: giant garter snake

Date of field work: 04-21-2015

Comment about field work date(s):

Observer: Katherine A. Bandy

Affiliation: CA Department of Water Resources

Address: 3500 Industrial Blvd., West Sacramento, CA 95691

Email: Katherine.Bandy@water.ca.gov

Phone: (916) 376-9793

Other observers: Danika Tsao, Lesley Hamamoto

How identified:

Keyed in:

Compared w/ specimen at:

Compared w/ image in: Calherps

By another person: Laura Patterson, Jessica Barnes, and Eric Hansen

Other:

Identification explanation: Took photos to use for keying out identifying characteristics. (i.e. upper labial scales, scale texture, relative head size to neck, distinguishing markings).

Identification confidence: Very confident

Species found: Yes

Total no. individuals: 1

Collection? No Collection no.:

Museum/Herbarium:

Animal Information

How was the detection made? Seen

Number detected in each age class:

adults	juveniles	larvae	egg mass	unknown
				1

Age class comment: Presumed subadult based on approximate body length.

Site use description: Basking.

What was the observed behavior? Basking on road, didn't move immediately upon approach. Eventually moved off to seek cover under rip-rap.

Describe any evidence of reproduction:

Site Information

Habitat description: Gravel levee road adjacent to rip-rap slope and irrigated pasture.

Slope:

Aspect:

Land owner/manager:

Site condition + population viability: Fair

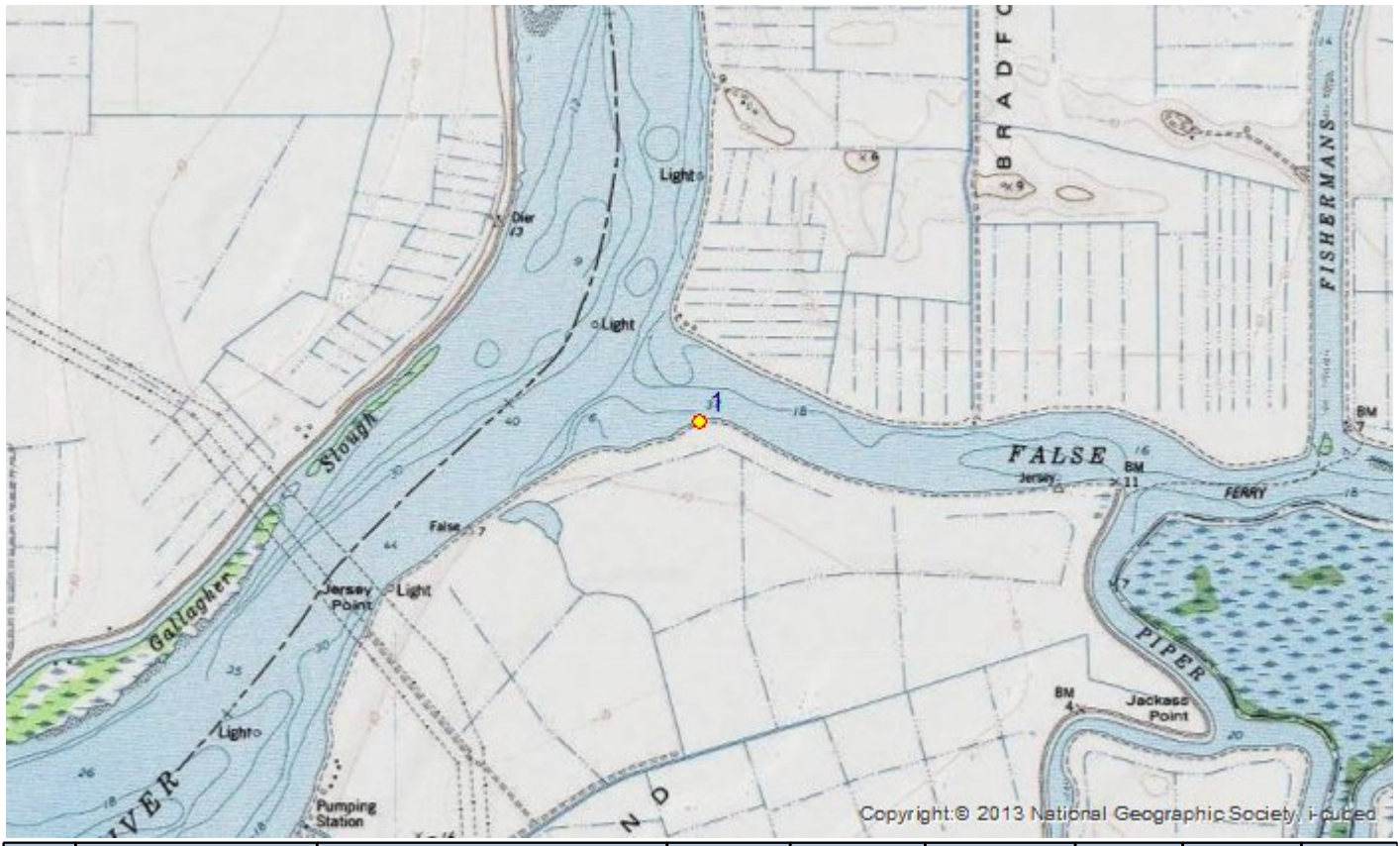
Immediate & surrounding land use: Immediate land use is gravel road. Surrounding land use includes navigable waterways to the north and irrigated pasture with ditches and some sparse riparian habitat on island interior.

Visible disturbances: Levee road travel and ongoing and planned construction projects in the area. Recent levee improvement work.

Threats: Vehicle strikes, future construction projects, habitat degradation and fragmentation.

General comments:

Image URL: https://nrm.dfg.ca.gov/fieldSurvey/File.ashx?id=1249



ID	County	24K Quadrangle	Elev. (ft)	Latitude NAD83	Longitude NAD83	UTM E NAD83	UTM N NAD83	UTM Zone
	Contra Costa	Jersey Island	10	38.05763	-121.67537	616210	4213038	10
1	Public Land Survey	Feature Comment						
	M T03N R03E 32							

The mapped feature is accurate within: 5 m

Source of mapped feature: Internet map application

Mapping notes: Pin dropped on Iphone in field. Drawn into map here.

Location/directions comments: Northern end of Jersey Island on levee road along False River.

Attachment(s): IMG_1101.JPG; , IMG_1104.JPG;

Photos included in pre-construction survey report in Appendix B.

CNDDB Online Field Survey Form Report

California Natural Diversity Database
Department of Fish and Wildlife
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: 916.324.0475
Email: cnddb@wildlife.ca.gov
www.dfg.ca.gov/biogeodata/cnddb/

This data has been reported to the CNDDB, but may not have been evaluated by the CNDDB staff

Source code HAM15F0002
Quad code 3812116
Occ. no.
EO index no.
Map index no.

Scientific name: *Thamnophis gigas* Common name: giant garter snake

Date of field work: 04-30-2015

Comment about field work date(s):

Observer: Lesley L. Hamamoto
Affiliation: CA Department of Water Resources
Address: 119 Arbusto Circle , Sacramento, CA 95831
Email: lesley.hamamoto@water.ca.gov
Phone: (916) 376-9784
Other observers: Eva Olin

How identified:

Keyed in:

Compared w/ specimen at:

Compared w/ image in: Calherps

By another person: Julia Ersan/Brian Halstead

Other:

Identification explanation: labial scale proportions and body coloration were determined to be appropriate for GGS in the field.

Identification confidence: Very confident

Species found: Yes

Total no. individuals: 1

Collection? Yes Collection no.: Lesley Hamamoto

Museum/Herbarium: Submitted to Brian Halstead at USGS Dixon Field Station

Animal Information

How was the detection made? Dead on road

Number detected in each age class:

adults	juveniles	larvae	egg mass	unknown
1				

Age class comment: Age estimated at 3-5 years by Julia Ersan at USGS Dixon Field Station based on size (56 cm snout-vent, 18 cm tail-vent, 69.95 grams), male based on probe depth, swelling posterior to vent, and tail length.

Site use description: animal found as roadkill, likely basking or crossing

What was the observed behavior?

Describe any evidence of reproduction:

Site Information

Habitat description: asphalt paved public road with a fair degree of traffic by fishermen and people traveling to the Jersey/Bradford ferry.

Slope: level road

Land owner/manager:

Aspect:

Site condition + population viability: Fair

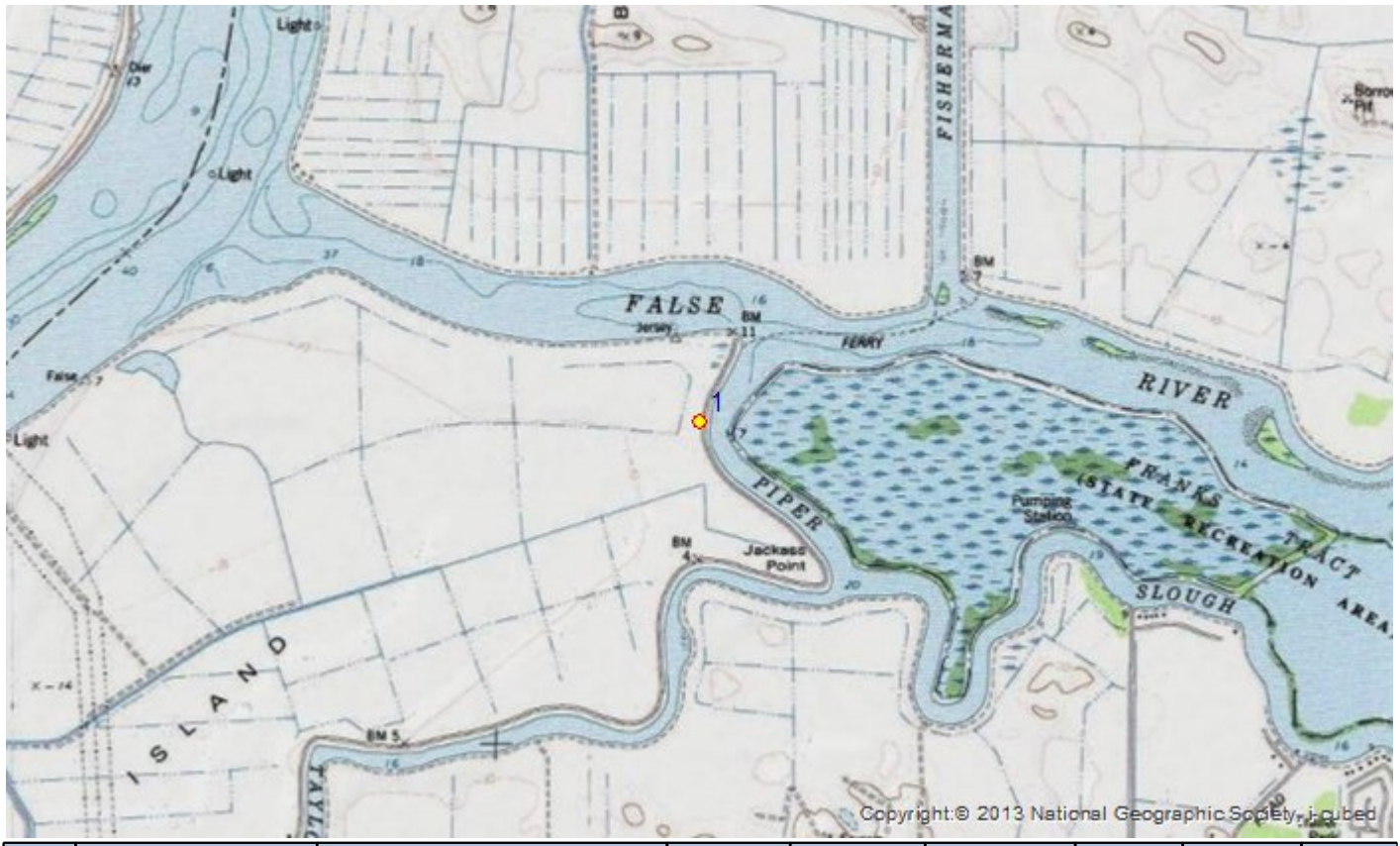
Immediate & surrounding land use: roadway is flanked by Middle River, a fairly large waterway with riprapped levee banks to the east and agriculture/grazing to the west.

Visible disturbances: traffic

Threats: traffic, levee improvements/repair

General comments:

Image URL: https://nrm.dfg.ca.gov/fieldSurvey/File.ashx?id=1300



ID	County	24K Quadrangle	Elev. (ft)	Latitude NAD83	Longitude NAD83	UTM E NAD83	UTM N NAD83	UTM Zone
	Contra Costa	Jersey Island	10	38.05251	-121.65878	617673	4212490	10
1	Public Land Survey	Feature Comment						
	M T02N R03E 4							

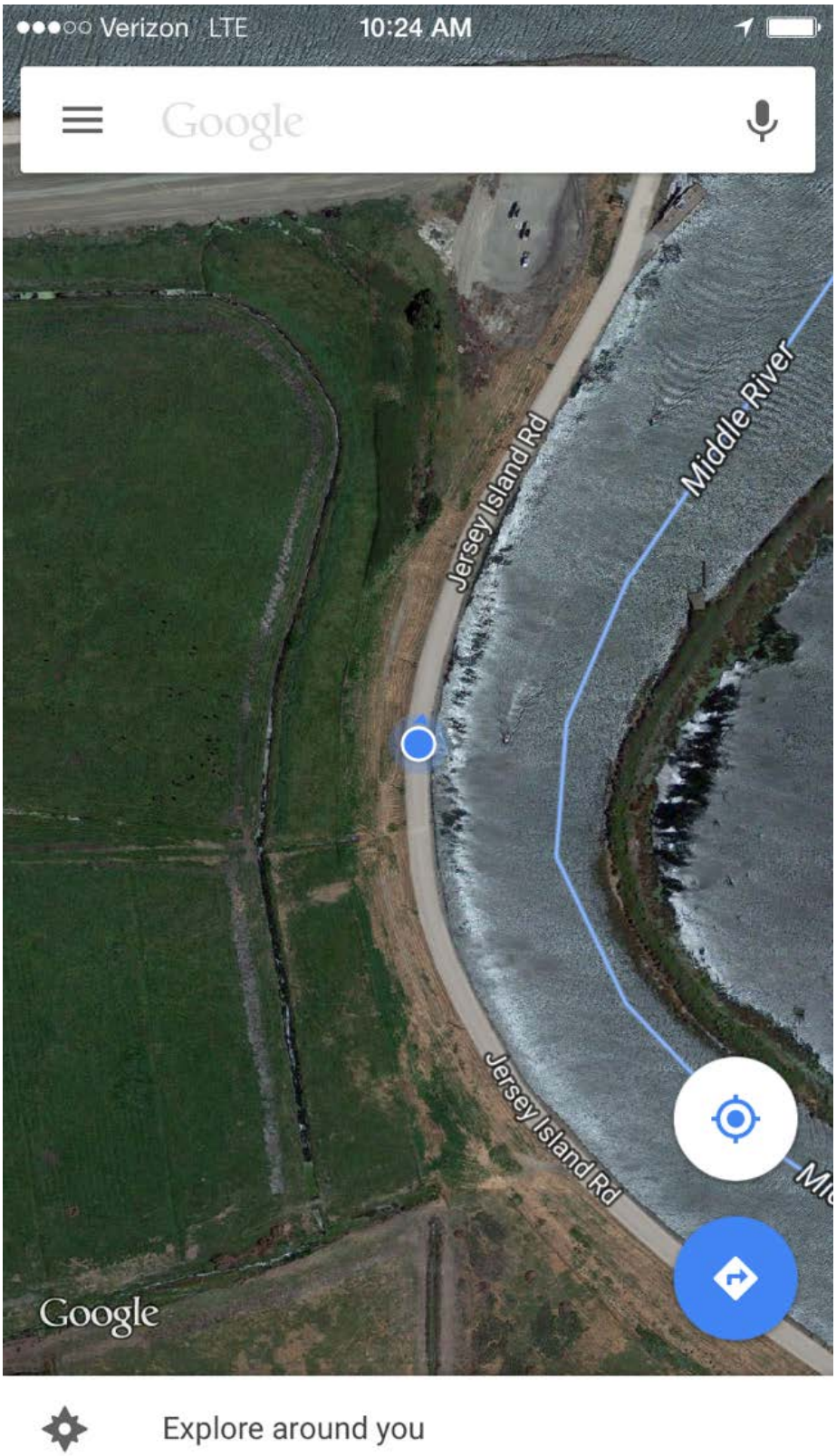
The mapped feature is accurate within: 100 m

Source of mapped feature: location mapped by using Google Maps to find location, then taking a screenshot

Mapping notes:

Location/directions comments:

Attachment(s): IMG_1169.JPG; labial scale photo, IMG_1183.JPG;



Approximate location of dead GGS found on Jersey Island April 30, 2015.

Dead GGS found on public Jersey Island road April 30, 2015.

Labial scales of dead GG found on public Jersey Island road April 30, 2015.

CNDDB Online Field Survey Form Report

California Natural Diversity Database
Department of Fish and Wildlife
1807 13th Street, Suite 202
Sacramento, CA 95811
Fax: 916.324.0475
Email: cnddb@wildlife.ca.gov
www.dfg.ca.gov/biogeodata/cnddb/

This data has been reported to the CNDDB, but may not have been evaluated by the CNDDB staff

Source code ZOR15F0001
Quad code 3812116
Occ. no.
EO index no.
Map index no.

Scientific name: *Thamnophis gigas* Common name: giant garter snake

Date of field work: 05-06-2015

Comment about field work date(s):

Observer: Sarah M. Zorn

Affiliation: California Department of Water Resources

Address: 3500 Industrial Blvd, West Sacramento, CA 95819

Email: sarah.zorn@water.ca.gov

Phone: (916) 376-9786

Other observers:

How identified:

Keyed in:

Compared w/ specimen at:

Compared w/ image in: USGS

By another person: Jessica Barnes

Other: Visual Identification by characteristics

Identification explanation: Took photos to use for keying out identifying characteristics. Species had 8 supralabial scales with the 7th supralabial scale larger than the 6th. Brown background coloration with yellow dorsal and lateral stripes.

Identification confidence: Confident

Species found: Yes

Total no. individuals: 1

Collection? Collection no.:

Museum/Herbarium:

Animal Information

How was the detection made? Seen

Number detected in each age class:

adults	juveniles	larvae	egg mass	unknown
	1			

Age class comment: Presumed juvenile based on approximate body length of 18 inches.

Site use description: Basking

What was the observed behavior? Basking, did not move upon approach.

Describe any evidence of reproduction:

Site Information

Habitat description: Graded secondary side of False River levee, void of vegetation

Slope:

Aspect:

Land owner/manager:

Site condition + population viability:

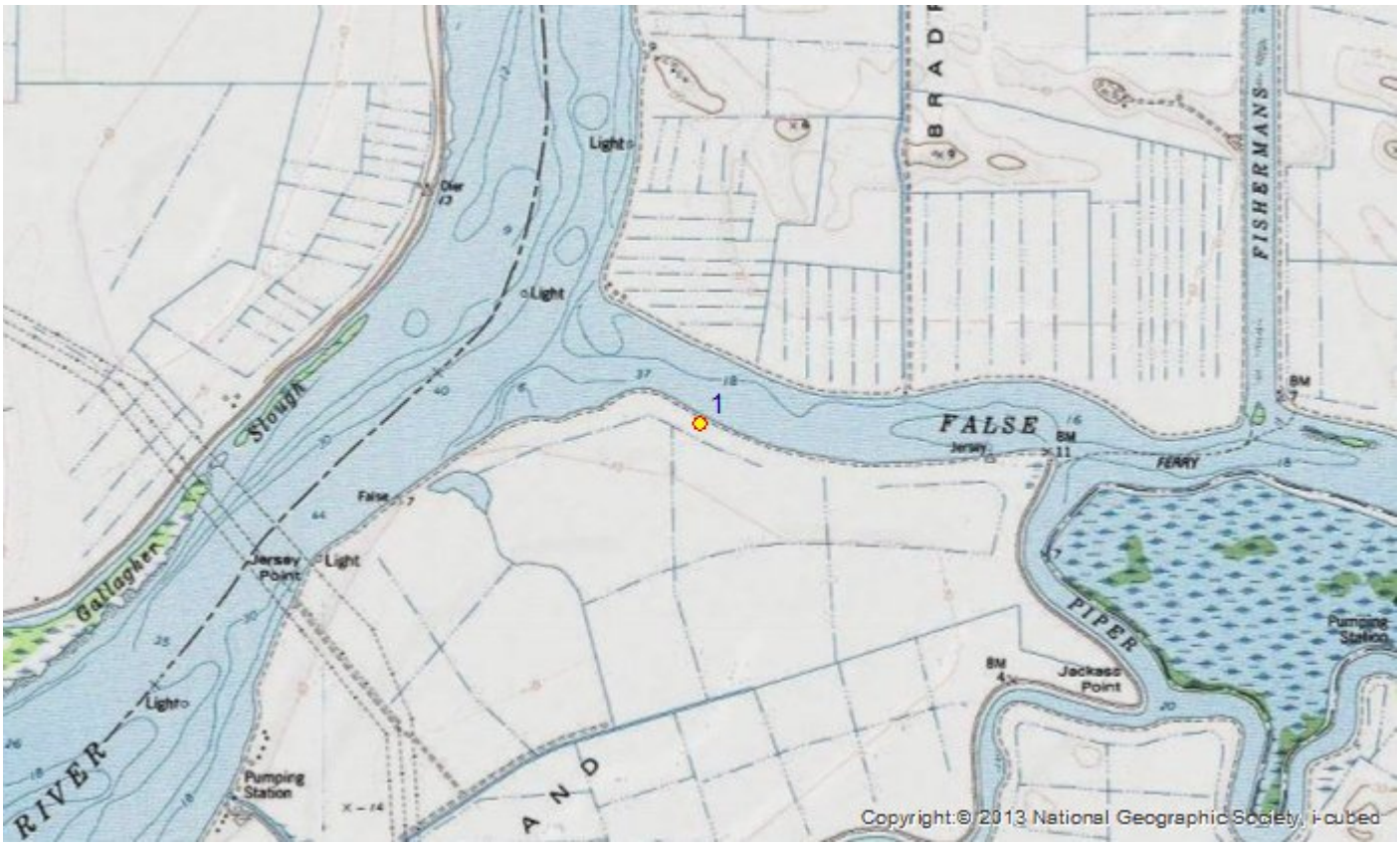
Immediate & surrounding land use: Gravel levee road, False River, staging area for Emergency Drought Barrier Project, irrigated pasture with ditches and some sparse riparian habitat on island interior

Visible disturbances: Movement of construction equipment, construction of the Emergency Drought Barrier Project, levee road traffic

Threats: Construction of the Emergency Drought Barrier Project, future levee and channel maintenance

General comments: Species was found within the exclusion fencing of the staging area of the Emergency Drought Barrier Project.

Image URL: https://nrm.dfg.ca.gov/fieldSurvey/File.ashx?id=1342



ID	County	24K Quadrangle	Elev. (ft)	Latitude NAD83	Longitude NAD83	UTM E NAD83	UTM N NAD83	UTM Zone
	Contra Costa	Jersey Island	0	38.05652	-121.67233	616479	4212918	10
1	Public Land Survey	Feature Comment						
	M T03N R03E 32							

The mapped feature is accurate within: 5 m

Source of mapped feature: CNDDB online field survey tool

Mapping notes:

Location/directions comments:

Attachment(s):

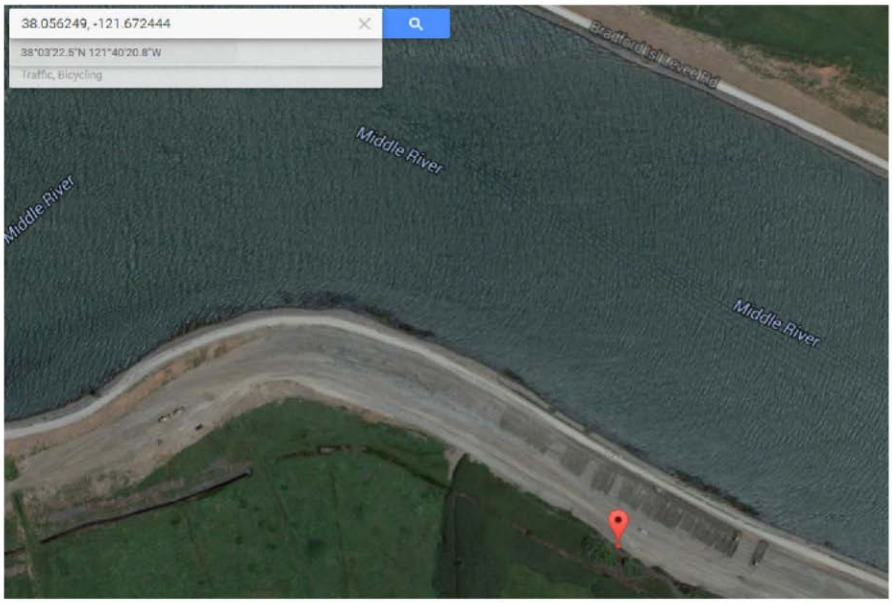
GGS found inside incomplete staging area exclusion fence on Jersey Island May 6, 2015.

Labial Scale photo of GGS found on Jersey Island May 6, 2015.

Emergency Drought Barriers
Potential GGS observation notes

Name of observer _Norm Ponferrada____ Affiliation ____AECOM Oakland____
Date _5-08-2015_
Time _1630____

Location (GPS coordinates, attach map location, a screenshot of google maps works)



Observed inside or outside of exclusion fencing?

- Outside

Habitat/location description (wetland, road, riprap):

- Wetland

Animal Behavior (basking, moving away from machinery, etc.):

- Basking, but moved towards the pile of dead trees right away.

General description of the snake

Coloration (any red visible above lateral yellow stripe?):

- Olive coloration with pale yellowish dorsal stripe and two lateral stripes.

Approximate size:

- Approximately 48 inches

Any visible injuries?

- None, the snake looked real healthy and active.

Photos (profile of head and of entire body):

- No photos were taken because the snake moved away to hide a few seconds after I spotted it.

Additional notes:

Approximate location where GGS was observed, outside of Jersey Island exclusion fencing, May 8, 2015 (no snake in photo).

Emergency Drought Barriers
Potential GGS observation notes

Name of observer Jeffrey Tkach Affiliation DWR
Date 5/10/15
Time 1830

Location (GPS coordinates, attach map location, a screenshot of google maps works)

38.041747°, -121.674383°; Approximately 2.25 miles from ferry Landing on Jersey Island.

Observed inside or outside of exclusion fencing?

Outside of exclusion fence. Outside of project site. Levee road adjacent to marina on Jersey Island.

Habitat/location description (wetland, road, riprap):

on levee road

Animal Behavior (basking, moving away from machinery, etc.):

basking

General description of the snake

Coloration (any red visible above lateral yellow stripe?):

No red stripes visible. Olive green color with yellowish stripe.

Approximate size:

3-4 feet

Any visible injuries?

None observed

Photos (profile of head and of entire body):

N/A

Additional notes:

- Snake was basking on road as trucks were driving off-site for the day. Trucks moved slowly around snake while it remained still. Then crawled into rip rap before a picture could be taken.

No photo taken of May 10, 2015 potential GGS sighting.

Emergency Drought Barriers
Potential GGS observation notes

Name of observer Rhiannon Klingonsmith Affiliation DWR - DES
Date 5/14/15
Time 5:30pm

Location (GPS coordinates, attach map location, a screenshot of google maps works)
approx. 38.059169, -121.670578 ; Located on Bradford Island

Observed inside or outside of exclusion fencing?
Found outside of project area by a rancher

Habitat/location description (wetland, road, riprap):
wetland area / upland

Animal Behavior (basking, moving away from machinery, etc.):
Farmer had in hand to show crew

General description of the snake

Coloration (any red visible above lateral yellow stripe?):
hard to see coloration in photo provided

Approximate size: roughly 3 ft.

Any visible injuries? No

Photos (profile of head and of entire body): Attached
Photo taken by Dutra inspector - not clear and poor lighting

Additional notes:

* Actual I.D. is uncertain
* Dutra Inspector said the rancher found a snake outside of the project area, but nearby, and brought it over to show crew. The inspector took a quick photo but it is of poor quality. A bio monitor was not on the Bradford Is. side at the time.

The rancher then carried the snake away and placed it in a nearby wetland.

Emergency Drought Barriers

Potential GGS observation notes

Name of observer Todd Bruce Affiliation Dutra

Date 2015-05-17

Time 1300 formed filled by Gina Radieve

Location (GPS coordinates, attach map location, a screenshot of google maps works)

38.054980° -121.663737° WGS-1984 Google Earth

Observed inside or outside of exclusion fencing?

Outside along gravel road within the gate

Habitat/location description (wetland, road, riprap):

Gravel road within the gate. Left road down levee bank to land side.

Animal Behavior (basking, moving away from machinery, etc.):

Snake was on road. As vehicle approached the snake coiled into 'cinnamon roll' but uncurled & left road after a few minutes

General description of the snake

Coloration (any red visible above lateral yellow stripe?):

~~yel~~ black with yellow stripes

Approximate size:

2.5 - 3 feet long

Any visible injuries?

No

Photos (profile of head and of entire body):

No

Additional notes:

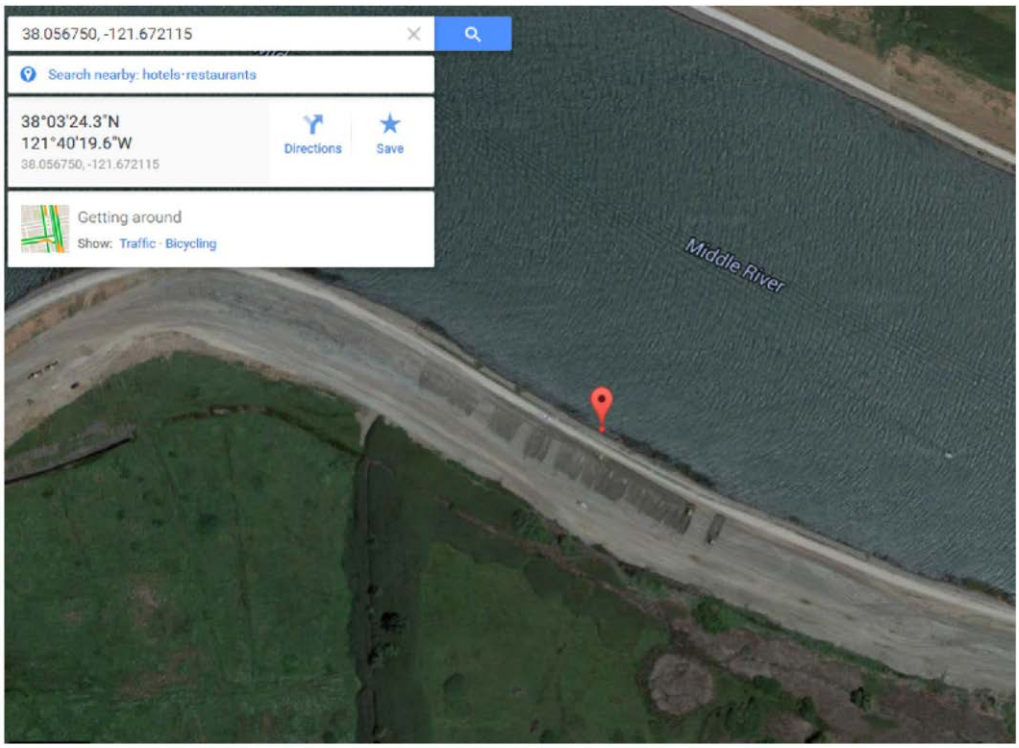
Mr. Bruce arrived on site @ Jersey Island having just seen a snake along the gravel road within the gate. ~~Hd/lt~~ Snake was black with yellow stripes. As he approached in his vehicle the snake coiled up, and he stopped the car. After a few minutes the snake uncoiled & left the road to the south, towards the land side of the levee. Mr. Bruce showed me the area as I left the site but I did not relocate the snake.

No photo taken of May 17, 2015 potential GGS sighting.

Emergency Drought Barriers
Potential GGS observation notes

Name of observer _Norm Ponferrada____ Affiliation ____AECOM Oakland____
Date _5-18-2015_
Time _1400____

Location (GPS coordinates, attach map location, a screenshot of google maps works)



Observed inside or outside of exclusion fencing?

- Outside

Habitat/location description (wetland, road, riprap):

- Riprap

Animal Behavior (basking, moving away from machinery, etc.):

- Basking

General description of the snake

Coloration (any red visible above lateral yellow stripe?):

- See photos below

Approximate size:

- Approximately 36 inches

Any visible injuries?

- None, the snake looked healthy.

Photos (profile of head and of entire body):

Additional notes:
Observed ggs outside of the exclusion fencing at approximately 1400. Work activities ended at 1800. But the ggs didn’t move from the occurrence site.

Emergency Drought Barriers
Potential GGS observation notes

Name of observer Sarah Zorn Affiliation DWR
Date 05/19/2015 Rachel August
Time 1140

Location (GPS coordinates, attach map location, a screenshot of google maps works)

Observed inside or outside of exclusion fencing?

outside

Habitat/location description (wetland, road, riprap):

riprap directly adjacent to exclusion fencing and Sheet piles on Jersey Island

Animal Behavior (basking, moving away from machinery, etc.):

basking, then moving away from pile driving

General description of the snake

Coloration (any red visible above lateral yellow stripe?):

olive body color with yellow dorsal & lateral stripes

Approximate size:

~ 3ft

Any visible injuries?

N/A

Photos (profile of head and of entire body):

Sent to KM

Additional notes:

Snake appeared to be molting and was "dirty" in appearance

GGS observed near abutment construction on Jersey Island May 19, 2015(AM).

Labial scale photo of GGS observed, near abutment construction on Jersey Island, May 19, 2015(AM).

Location of GGS in proximity to work on May 19, 2015 (PM).

Body of GGS observed May 19, 2015(PM).

Labial scale photo of GGS observed May 19, 2015(PM).

GGS observed May 19, 2015(PM).

Emergency Drought Barriers
Potential GGS observation notes

Name of observer Sarah Zorn Affiliation DWR
Date 05/20/2015
Time 1145

Location (GPS coordinates, attach map location, a screenshot of google maps works)

Observed inside or outside of exclusion fencing?

outside

Habitat/location description (wetland, road, riprap):

riprap directly adjacent to exclusion fencing and sheet piles on Jersey Island

Animal Behavior (basking, moving away from machinery, etc.):

basking, then move towards water, than swimming

General description of the snake

Coloration (any red visible above lateral yellow stripe?):

olive body color with yellow dorsal & lateral stripes

Approximate size:

~3ft

Any visible injuries?

N/A

Photos (profile of head and of entire body):

Sent to KM

Additional notes:

Snake molting. Some snake skin was found in the riprap where the GGS was last observed on 5/19/2015.

Emergency Drought Barriers
Potential GGS observation notes

Name of observer Gina Radieve Affiliation DWR
Date 20150520 Sarah Fredricks
Time 1305 Joaquin Garza DWR

Location (GPS coordinates, attach map location, a screenshot of google maps works)

50ft east of barrier on Jersey side

Observed inside or outside of exclusion fencing?

outside @ water's edge

Habitat/location description (wetland, road, riprap):

water's edge in riprap & tules (Schoenoplectus acutus)

Animal Behavior (basking, moving away from machinery, etc.):

Swimming east away from immediate work activity. Lost sight of it under wate

General description of the snake

Coloration (any red visible above lateral yellow stripe?):

Brownish with yellow stripes & black blotches btwn stripe.

Approximate size:

3ft

Any visible injuries?

No

Photos (profile of head and of entire body):

No pic. Same snake from earlier

Additional notes:

Location of GGS observed on May 20, 2015 in proximity to work on Jersey Island.

Photo zoomed to GGS observed near abutment construction on Jersey Island May 19, 2015.

Giant garter snake capture and relocation report

Emergency Drought Barrier

Prepared by

Jessica Barnes
Senior Environmental Scientist (Specialist)
California Department of Water Resources
(916) 376-9789
Jessica.barnes@water.ca.gov

INTRODUCTION

This document presents the details of the capture and relocation of two giant garter snakes at the Emergency Drought Barrier project site on May 21, 2015.

Beginning on May 18, 2015, a giant garter snake was observed at the Emergency Drought Barrier Project and was observed in the same general location for three consecutive. Due to the proximity of this snake to project activities and the potential risks to this snake, Department of Water Resources (DWR) requested and received permission from US Fish and Wildlife Service and California Department of Fish and Wildlife on May 20, 2015 to have DWR Environmental Scientists Jessica Barnes and Rhiannon Klingonsmith, who each possess a Section 10(a)(1)(A) permit, to capture the giant garter snake relocate it.

GIANT GARTER SNAKE CAPTURE AND RELOCATION

On the afternoon of May 21, 2015, a giant garter snake believed to be the one that has been seen the previous several days in the same location at the project site, was observed in the rip-rap. DWR Environmental Scientists who possess a Section 10(a)(1)(A) permits, Rhiannon Klingonsmith (TE-56733A-0) and Jessica Barnes (TE-835365-6.1), hand captured the giant garter snake, recorded morphometric data (Attachment 1), took photos (Attachment 2), and released the snake to a location approximately 0.3 miles west of the project site in an area that had similar habitat features to the capture location, including rip-rap and emergent vegetation (Figure 1). When returning to GPS the capture site, another giant garter snake was observed in the same exact location. That snake was also captured by hand and morphometric data was recorded, photos were taken, and the snake was released at the same relocation site as the first giant garter snake.

CONCLUSION

The two giant garter snakes were successfully captured and relocated to avoid impacts to these individuals due to project activities.

Figure 1: Giant garter snake capture and relocation sites a the Emergency Drought Barriers project site

Attachment 1
Morphometric Data

MORPHOMETRIC DATA

Capture Date 5/21/15 Site _____ Gen. Location/Trap No. EDB
Time: 16:02 Released: 16:40
PIT Tag No. _____ Ventral Scute Code (VSC)[1] _____

Processed by: J Barnes PIT tagged/marked by: _____ Assisted by: R Klingensmith

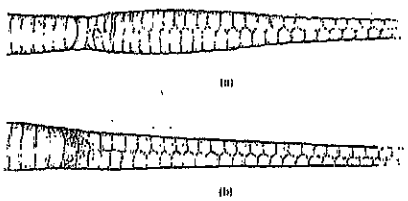
Camera/Photo numbers _____
Include at minimum: 1) close-up profile of head; 2) dorsal view of entire snake; 3) close-up of VSC and cloaca

Mass (g) 271

Snout-Vent Length (SVL) mm 735 / ____ / ____
Total Length: 1006
Vent-Tail Length (VTL) mm (if tail intact) 175

Sex[2]: M (F) Method: (Visual) / Probe

2.



A. The retracted hemipenes of male snakes may create a bulge at the base of their tail (a), which may also be longer than that of females (b).

1.

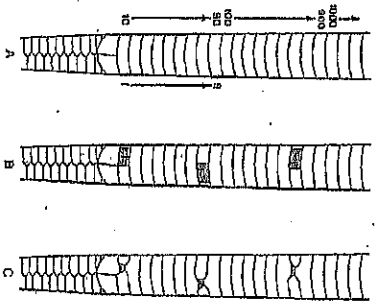


FIGURE 1. Ventral scale clipping system for marking snakes. Diagrams are ventral, posterior views. A. Enumeration of ventrals proceeding anteriorly from anal scute: 10's, 100's, and 1000's series on observer's left, units series on observer's right. B. A freshly-marked snake, No. 718 (*Coluber constrictor* ♀, May 1970). C. Same individual (No. 718, April 1973) three years after initial marking, showing appearance of scars.

Subcaudal Count (if tail intact) _____ Dorsal Scale Row Count (at mid-body) _____
(male ≥77, not ≥ 85) (female ≥ 71, not ≥ 76)

Head Measurements (by caliper to 0.01 mm)[3]

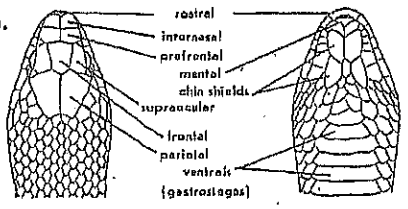
InR = 0.606 (Internasal-Rostral Contact)

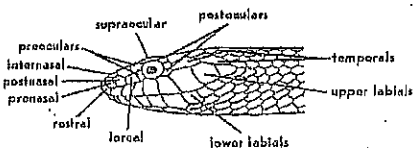
NR (right side if intact) = 2.78 (Naso-Rostral Contact)

W of S6 at mid ht (right side if intact) = 4.11 (Supralabial)

W of S7 at mid ht (right side if intact) = 5.84 (Supralabial)

3.





Direct Count (integer)[3]

No. of Supralabials	L 8	R 8	(Total) 16	
No. of Infralabials	L 10	R 10	(Total) 20	
No. of Preoculars	L 1	R 1	(Total) 2	
No. of Postoculars	L 3	R 3	(Total) 6	

{Notes}

Lumps/Lesions Present? Y (N) Number Present if Yes _____ DNA Collected? Y (N)

Notes: Missing very tip of tail. Captured in rip-rap area & relocated approximately 0.3 miles downstream to avoid potential harm to GGS due to project activities

MORPHOMETRIC DATA

Capture Date 5/21/15 Site ____ Gen. Location/Trap No. EDB
Time: 16:53 Released: 17:20
PIT Tag No. ____ Ventral Scute Code (VSC)[1] ____

Processed by: R Klingensmith PIT tagged/marked by: ____ Assisted by: J Barnes

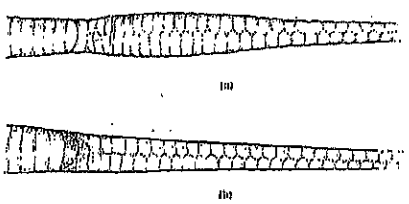
Camera/Photo numbers ____
include at minimum: 1) close-up profile of head; 2) dorsal view of entire snake; 3) close-up of VSC and cloaca

Mass (g) 89

Snout-Vent Length (SVL) mm 583 / ____ / ____

Vent-Tail Length (VTL) mm (if tail intact) 183
Total Length: 766
Sex[2]: (M) F Method: (Visual) Probe

2.



Male

Female

▲ The retracted hemipenes of male snakes may create a bulge at the base of their tail (a), which may also be longer than that of females (b).

1.

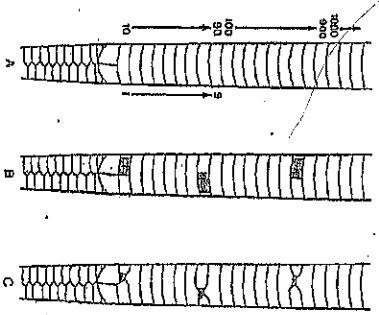


FIGURE 1. Ventral scale clipping system for marking snakes. Diagrams are ventral, posterior views. A. Enumeration of ventrals proceeding anteriorly from anal scute: 10's, 100's, and 1000's series on observer's left, units series on observer's right. B. A freshly-marked snake, No. 718 (*Coluber constrictor* ♀, May 1970). C. Same individual (No. 718, April 1973) three years after initial marking, showing appearance of scars.

Subcaudal Count (if tail intact) ____ Dorsal Scale Row Count (at mid-body) ____
(male ≥77, not ≥ 85) (female ≥ 71, not ≥ 76)

Head Measurements (by caliper to 0.01 mm)[3]

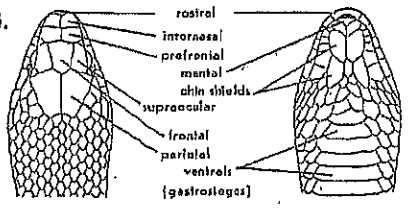
InR = 1.42 (Internasal-Rostral Contact)

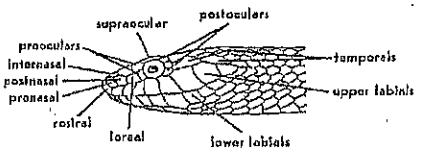
NR (right side if intact) = 1.83 (Naso-Rostral Contact)

W of S6 at mid ht (right side if intact) = 2.99 (Supralabial)

W of S7 at mid ht (right side if intact) = 3.25 (Supralabial)

3.





Direct Count (integer)[3]

No. of Supralabials	L 8	R 8	(Total) 16	
No. of Infralabials	L 10	R 10	(Total) 20	
No. of Preoculars	L 1	R 1	(Total) 2	
No. of Postoculars	L 2	R 2	(Total) 4	

{Notes}

Lumps/Lesions Present? Y (N) Number Present if Yes ____ DNA Collected? Y (N)

Notes: Captured in rip-rap area & relocated approximately 0.3 miles downstream to avoid potential harm to GGS due to project activies.

Attachment 2
Photos

Snake #1

Captured: 16:02 Released: 16:40

Snake #2

Captured: 16:53 Released: 17:20

Appendix F: Water Quality Monitoring Data

Water Quality Monitoring Results for Turbidity and Settleable Solids

State of California Department of Water Resources

TEMPORARY BARRIER SITE: False River Emergency Barrier

TURBIDITY (TURB) CRITERIA: Below 150 NTU is acceptable.

SETTLEABLE SOLIDS (SS) CRITERIA: Below 0.1 ml/L is acceptable.

DAY: Wed
DATE: 05/06/15
TECHNICIAN: Jason La Deaux

SAMPLE: Morning
TIDE: Ebb

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	-	-	-	-
NORTH - BELOW	-	-	-	-
SOUTH - ABOVE	1035	24.9	< 0.1	Shore
SOUTH - BELOW	1050	25.2	< 0.1	Shore

OBSERVATION: Placing rock in water. South Only

SAMPLE: Mid-Day
TIDE: Ebb

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	1155	19.8	< 0.1	Boat
NORTH - BELOW	1206	19.8	< 0.1	Boat
SOUTH - ABOVE	1159	26.2	< 0.1	Boat
SOUTH - BELOW	1203	25.4	< 0.1	Boat

OBSERVATION: Placing rock in water.

SAMPLE: Afternoon
TIDE: Flood

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	1507	29.2	< 0.1	Boat
NORTH - BELOW	1501	23.4	< 0.1	Boat
SOUTH - ABOVE	1505	18.6	< 0.1	Boat
SOUTH - BELOW	1457	18.2	< 0.1	Boat

OBSERVATION: Placing rock in water.

DAY: Thur
DATE: 05/07/15
TECHNICIAN: Jason La Deaux

SAMPLE: Morning
TIDE: Ebb

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	0910	26.7	< 0.1	Boat
NORTH - BELOW	0903	29.2	< 0.1	Boat
SOUTH - ABOVE	0859	24.9	< 0.1	Boat
SOUTH - BELOW	0850	25.2	< 0.1	Boat

OBSERVATION: Placing rock in water.

SAMPLE: Mid-Day
TIDE: Ebb

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	1218	23.8	< 0.1	Boat
NORTH - BELOW	1207	24.5	< 0.1	Boat
SOUTH - ABOVE	1225	26.3	< 0.1	Boat
SOUTH - BELOW	1200	28.8	< 0.1	Boat

OBSERVATION: Placing rock in water.

SAMPLE: Afternoon
TIDE: Slack

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	1510	18.7	< 0.1	Boat
NORTH - BELOW	1503	20.1	< 0.1	Boat
SOUTH - ABOVE	1507	18.0	< 0.1	Boat
SOUTH - BELOW	1500	19.2	< 0.1	Boat

OBSERVATION: Placing rock in water.

TEMPORARY BARRIER SITE: False River Emergency Barrier

TURBIDITY (TURB) CRITERIA: Below 150 NTU is acceptable.

SETTLEABLE SOLIDS (SS) CRITERIA: Below 0.1 ml/L is acceptable.

DAY: Fri
DATE: 05/08/15
TECHNICIAN: Chris Weber

SAMPLE: Morning
TIDE: Ebb

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	0840	26.9	< 0.1	Boat
NORTH - BELOW	0830	30.8	< 0.1	Boat
SOUTH - ABOVE	0850	28.6	< 0.1	Boat
SOUTH - BELOW	0835	33.1	< 0.1	Boat

OBSERVATION: Placing rock in water.

SAMPLE: Mid-Day
TIDE: Ebb

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	1205	17.4	< 0.1	Boat
NORTH - BELOW	1200	18.2	< 0.1	Boat
SOUTH - ABOVE	1210	18.3	< 0.1	Boat
SOUTH - BELOW	1215	18.9	< 0.1	Boat

OBSERVATION: Placing rock in water.

SAMPLE: Afternoon
TIDE: Ebb

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	1515	15.3	< 0.1	Boat
NORTH - BELOW	1500	13.9	< 0.1	Boat
SOUTH - ABOVE	1520	14.8	< 0.1	Boat
SOUTH - BELOW	1525	14.0	< 0.1	Boat

OBSERVATION: Placing rock in water.

DAY: Sat
DATE: 05/09/15
TECHNICIAN: Joaquin Garza

SAMPLE: Morning
TIDE: Ebb

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	0923	21.8	< 0.1	Boat
NORTH - BELOW	0930	21.1	< 0.1	Boat
SOUTH - ABOVE	0919	20.9	< 0.1	Boat
SOUTH - BELOW	0935	23.8	< 0.1	Boat

OBSERVATION: Placing rock in water.

SAMPLE: Mid-Day
TIDE: Ebb

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	1228	18.5	< 0.1	Boat
NORTH - BELOW	1222	19.6	< 0.1	Boat
SOUTH - ABOVE	1226	17.9	< 0.1	Boat
SOUTH - BELOW	1224	18.4	< 0.1	Boat

OBSERVATION: Placing rock in water.

SAMPLE: Afternoon
TIDE: Ebb

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	1505	14.4	< 0.1	Boat
NORTH - BELOW	1457	15.1	< 0.1	Boat
SOUTH - ABOVE	1503	14.7	< 0.1	Boat
SOUTH - BELOW	1459	15.5	< 0.1	Boat

OBSERVATION: Placing rock in water.

TEMPORARY BARRIER SITE: False River Emergency Barrier

TURBIDITY (TURB) CRITERIA: Below 150 NTU is acceptable.

SETTLEABLE SOLIDS (SS) CRITERIA: Below 0.1 ml/L is acceptable.

DAY: Sun
DATE: 05/10/15
TECHNICIAN: Joaquin Garza

SAMPLE: Morning
TIDE: Ebb

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	0929	22.2	< 0.1	Boat
NORTH - BELOW	0941	21.8	< 0.1	Boat
SOUTH - ABOVE	0932	33.4	< 0.1	Boat
SOUTH - BELOW	0945	22.8	< 0.1	Boat

OBSERVATION: Placing rock in water.

SAMPLE: Mid-Day
TIDE: Ebb

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	1225	18.5	< 0.1	Boat
NORTH - BELOW	1219	19.6	< 0.1	Boat
SOUTH - ABOVE	1224	20.7	< 0.1	Boat
SOUTH - BELOW	1221	20.8	< 0.1	Boat

OBSERVATION: Placing rock in water.

SAMPLE: Afternoon
TIDE: Ebb

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	1459	15.1	< 0.1	Boat
NORTH - BELOW	1456	15.8	< 0.1	Boat
SOUTH - ABOVE	1500	15.4	< 0.1	Boat
SOUTH - BELOW	1505	17.5	< 0.1	Boat

OBSERVATION: Placing rock in water.

DAY: Mon
DATE: 05/11/15
TECHNICIAN: Joaquin Garza

SAMPLE: Morning
TIDE: Flood

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	0943	24.8	< 0.1	Boat
NORTH - BELOW	0941	24.4	< 0.1	Boat
SOUTH - ABOVE	0944	23.7	< 0.1	Boat
SOUTH - BELOW	0935	19.4	< 0.1	Boat

OBSERVATION: Placing rock in water.

SAMPLE: Mid-Day
TIDE: Ebb

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	1224	20.7	< 0.1	Boat
NORTH - BELOW	1219	24.7	< 0.1	Boat
SOUTH - ABOVE	1222	22.3	< 0.1	Boat
SOUTH - BELOW	1221	24.8	< 0.1	Boat

OBSERVATION: Placing rock in water.

SAMPLE: Afternoon
TIDE: Ebb

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	1457	15.7	< 0.1	Boat
NORTH - BELOW	1455	18.8	< 0.1	Boat
SOUTH - ABOVE	1458	16.4	< 0.1	Boat
SOUTH - BELOW	1453	16.9	< 0.1	Boat

OBSERVATION: Placing rock in water.

TEMPORARY BARRIER SITE: False River Emergency Barrier

TURBIDITY (TURB) CRITERIA: Below 150 NTU is acceptable.

SETTLEABLE SOLIDS (SS) CRITERIA: Below 0.1 ml/L is acceptable.

DAY: Tues
DATE: 05/12/15
TECHNICIAN: Chris Weber

SAMPLE: Morning
TIDE: Flood

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	0900	16.9	< 0.1	Boat
NORTH - BELOW	0907	17.3	< 0.1	Boat
SOUTH - ABOVE	0902	18.7	< 0.1	Boat
SOUTH - BELOW	0905	23.0	< 0.1	Boat

OBSERVATION: Placing rock in water.

SAMPLE: Mid-Day
TIDE: Slack

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	1200	21.6	< 0.1	Boat
NORTH - BELOW	1210	24.6	< 0.1	Boat
SOUTH - ABOVE	1204	22.8	< 0.1	Boat
SOUTH - BELOW	1215	24.2	< 0.1	Boat

OBSERVATION: Placing rock in water.

SAMPLE: Afternoon
TIDE: Ebb

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	1510	20.1	< 0.1	Boat
NORTH - BELOW	1505	20.1	< 0.1	Boat
SOUTH - ABOVE	1515	19.6	< 0.1	Boat
SOUTH - BELOW	1500	27.6	< 0.1	Boat

OBSERVATION: Placing rock in water.

DAY: Wed
DATE: 05/13/15
TECHNICIAN: Jason La Deaux

SAMPLE: Morning
TIDE: Ebb

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	0925	20.2	< 0.1	Boat
NORTH - BELOW	0915	19.0	< 0.1	Boat
SOUTH - ABOVE	0945	20.4	< 0.1	Shore
SOUTH - BELOW	0933	20.4	< 0.1	Shore

OBSERVATION: Placing rock in water.

SAMPLE: Mid-Day
TIDE: Ebb

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	1310	23.9	< 0.1	Boat
NORTH - BELOW	1305	25.7	< 0.1	Boat
SOUTH - ABOVE	1325	31.6	< 0.1	Shore
SOUTH - BELOW	1315	26.2	< 0.1	Shore

OBSERVATION: Placing rock in water.

SAMPLE: Afternoon
TIDE: Flood

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	1505	23.7	< 0.1	Boat
NORTH - BELOW	1500	22.6	< 0.1	Boat
SOUTH - ABOVE	1525	27.8	< 0.1	Shore
SOUTH - BELOW	1515	28.4	< 0.1	Shore

OBSERVATION: Placing rock in water.

TEMPORARY BARRIER SITE: False River Emergency Barrier

TURBIDITY (TURB) CRITERIA: Below 150 NTU is acceptable.

SETTLEABLE SOLIDS (SS) CRITERIA: Below 0.1 ml/L is acceptable.

DAY: Thur
DATE: 05/14/15
TECHNICIAN: Joaquin Garza

SAMPLE: Morning
TIDE: Ebb

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	0936	21.2	< 0.1	Boat
NORTH - BELOW	0939	27.7	< 0.1	Boat
SOUTH - ABOVE	0934	20.6	< 0.1	Boat
SOUTH - BELOW	0930	25.5	< 0.1	Boat

OBSERVATION: Placing rock in water.

SAMPLE: Mid-Day
TIDE: Flood

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	1205	23.3	< 0.1	Boat
NORTH - BELOW	1203	21.0	< 0.1	Boat
SOUTH - ABOVE	-	-	-	-
SOUTH - BELOW	-	-	-	-

OBSERVATION: Placing rock in water.
North only

SAMPLE: Afternoon
TIDE: Ebb

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	-	-	-	-
NORTH - BELOW	-	-	-	-
SOUTH - ABOVE	1515	26.3	< 0.1	Shore
SOUTH - BELOW	1508	27.4	< 0.1	Shore

OBSERVATION: Placing rock in water.
South only

DAY: Fri
DATE: 05/15/15
TECHNICIAN: Jason La Deaux

SAMPLE: Morning
TIDE: Ebb

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	0935	22.0	< 0.1	Boat
NORTH - BELOW	0930	26.2	< 0.1	Boat
SOUTH - ABOVE	0940	34.3	< 0.1	Shore
SOUTH - BELOW	0945	34.1	< 0.1	Shore

OBSERVATION: Placing rock in water.

SAMPLE: Mid-Day
TIDE: Flood

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	1245	24.4	< 0.1	Boat
NORTH - BELOW	1240	24.3	< 0.1	Boat
SOUTH - ABOVE	1255	24.3	< 0.1	Shore
SOUTH - BELOW	1250	22.8	< 0.1	Shore

OBSERVATION: Placing rock in water.

SAMPLE: Afternoon
TIDE: Flood

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	-	-	-	-
NORTH - BELOW	-	-	-	-
SOUTH - ABOVE	1510	21.6	< 0.1	Shore
SOUTH - BELOW	1505	23.6	< 0.1	Shore

OBSERVATION: Placing rock in water.
South only

TEMPORARY BARRIER SITE: False River Emergency Barrier

TURBIDITY (TURB) CRITERIA: Below 150 NTU is acceptable.

SETTLEABLE SOLIDS (SS) CRITERIA: Below 0.1 ml/L is acceptable.

DAY: Sat
DATE: 05/16/15
TECHNICIAN: Joaquin Garza

SAMPLE: Morning
TIDE: Ebb

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	1028	16.4	< 0.1	Shore
NORTH - BELOW	1040	16.6	< 0.1	Shore
SOUTH - ABOVE	0933	15.0	< 0.1	Shore
SOUTH - BELOW	0920	18.8	< 0.1	Shore

OBSERVATION: In-water work near levee toes. North & South

SAMPLE: Mid-Day
TIDE: Flood

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	1247	21.2	< 0.1	Boat
NORTH - BELOW	1249	19.4	< 0.1	Boat
SOUTH - ABOVE	1245	21.5	< 0.1	Boat
SOUTH - BELOW	1220	17.6	< 0.1	Boat

OBSERVATION: Positioning equipment in water.

SAMPLE: Afternoon
TIDE: Flood

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	1519	21.3	< 0.1	Boat
NORTH - BELOW	1517	21.6	< 0.1	Boat
SOUTH - ABOVE	1521	18.4	< 0.1	Boat
SOUTH - BELOW	1515	21.3	< 0.1	Boat

OBSERVATION: Positioning equipment in water.

DAY: Sun
DATE: 05/17/15
TECHNICIAN: Joaquin Garza

SAMPLE: Morning 0900
TIDE: Ebb

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	-	-	-	-
NORTH - BELOW	-	-	-	-
SOUTH - ABOVE	-	-	-	-
SOUTH - BELOW	-	-	-	-

OBSERVATION: No observable water work.

SAMPLE: Mid-Day 1200
TIDE: Slack

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	-	-	-	-
NORTH - BELOW	-	-	-	-
SOUTH - ABOVE	-	-	-	-
SOUTH - BELOW	-	-	-	-

OBSERVATION: No observable water work.

SAMPLE: Afternoon 1500
TIDE: Flood

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	-	-	-	-
NORTH - BELOW	-	-	-	-
SOUTH - ABOVE	-	-	-	-
SOUTH - BELOW	-	-	-	-

OBSERVATION: No work at site.

TEMPORARY BARRIER SITE: False River Emergency Barrier

TURBIDITY (TURB) CRITERIA: Below 150 NTU is acceptable.

SETTLEABLE SOLIDS (SS) CRITERIA: Below 0.1 ml/L is acceptable.

DAY: Mon
DATE: 05/18/15
TECHNICIAN: Chris Weber

SAMPLE: Morning 0900
TIDE: Ebb

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	-	-	-	-
NORTH - BELOW	-	-	-	-
SOUTH - ABOVE	-	-	-	-
SOUTH - BELOW	-	-	-	-

OBSERVATION: No observable water work.

SAMPLE: Mid-Day
TIDE: Ebb

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	1200	15.7	< 0.1	Boat
NORTH - BELOW	1205	14.6	< 0.1	Boat
SOUTH - ABOVE	-	-	-	-
SOUTH - BELOW	-	-	-	-

OBSERVATION: Grading rock below water surface.
North only

SAMPLE: Afternoon
TIDE: Flood

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	-	-	-	-
NORTH - BELOW	-	-	-	-
SOUTH - ABOVE	1515	16.2	< 0.1	Boat
SOUTH - BELOW	1500	16.6	< 0.1	Boat

OBSERVATION: Grading rock below water surface.
South only

DAY: Tues
DATE: 05/19/15
TECHNICIAN: Jason La Deaux

SAMPLE: Morning
TIDE: Ebb

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	0940	21.3	< 0.1	Boat
NORTH - BELOW	0935	21.6	< 0.1	Boat
SOUTH - ABOVE	0950	18.4	< 0.1	Shore
SOUTH - BELOW	0945	21.3	< 0.1	Shore

OBSERVATION: North: Placing rock in water
South: Driving piles near shore.

SAMPLE: Mid-Day
TIDE: Slack

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	1210	14.8	< 0.1	Boat
NORTH - BELOW	1205	15.3	< 0.1	Boat
SOUTH - ABOVE	1220	13.6	< 0.1	Shore
SOUTH - BELOW	1215	13.7	< 0.1	Shore

OBSERVATION: North: Placing rock in water
South: Driving piles near shore.

SAMPLE: Afternoon
TIDE: Flood

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	1500	20.1	< 0.1	Boat
NORTH - BELOW	1455	16.4	< 0.1	Boat
SOUTH - ABOVE	1510	14.7	< 0.1	Shore
SOUTH - BELOW	1505	16.9	< 0.1	Shore

OBSERVATION: North: Placing rock in water
South: Driving piles near shore.

TEMPORARY BARRIER SITE: False River Emergency Barrier

TURBIDITY (TURB) CRITERIA: Below 150 NTU is acceptable.

SETTLEABLE SOLIDS (SS) CRITERIA: Below 0.1 ml/L is acceptable.

DAY: Wed
DATE: 05/20/15
TECHNICIAN: Joaquin Garza

SAMPLE: Morning
TIDE: Ebb

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	0924	21.2	< 0.1	Boat
NORTH - BELOW	0928	23.9	< 0.1	Boat
SOUTH - ABOVE	0922	22.3	< 0.1	Boat
SOUTH - BELOW	0930	23.9	< 0.1	Boat

OBSERVATION: Placing rock in water.

SAMPLE: Mid-Day
TIDE: Ebb

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	1206	16.4	< 0.1	Boat
NORTH - BELOW	1202	18.3	< 0.1	Boat
SOUTH - ABOVE	1209	15.7	< 0.1	Boat
SOUTH - BELOW	1200	18.9	< 0.1	Boat

OBSERVATION: Placing rock in water.

SAMPLE: Afternoon
TIDE: Flood

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	1511	14.5	< 0.1	Boat
NORTH - BELOW	1515	12.7	< 0.1	Boat
SOUTH - ABOVE	1509	11.4	< 0.1	Boat
SOUTH - BELOW	1516	13.8	< 0.1	Boat

OBSERVATION: Placing rock in water.

DAY: Thur
DATE: 05/21/15
TECHNICIAN: Joaquin Garza

SAMPLE: Morning
TIDE: Ebb

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	0913	20.0	< 0.1	Boat
NORTH - BELOW	0908	23.2	< 0.1	Boat
SOUTH - ABOVE	0917	21.1	< 0.1	Boat
SOUTH - BELOW	0904	24.2	< 0.1	Boat

OBSERVATION: Placing rock in water.

SAMPLE: Mid-Day
TIDE: Ebb

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	1206	24.2	< 0.1	Boat
NORTH - BELOW	1201	17.8	< 0.1	Boat
SOUTH - ABOVE	1208	15.5	< 0.1	Boat
SOUTH - BELOW	1217	17.0	< 0.1	Boat

OBSERVATION: Placing rock in water.

SAMPLE: Afternoon
TIDE: Ebb

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	1512	12.7	< 0.1	Boat
NORTH - BELOW	1509	14.8	< 0.1	Boat
SOUTH - ABOVE	1515	11.1	< 0.1	Boat
SOUTH - BELOW	1505	13.4	< 0.1	Boat

OBSERVATION: Placing rock in water.

TEMPORARY BARRIER SITE: False River Emergency Barrier

TURBIDITY (TURB) CRITERIA: Below 150 NTU is acceptable.

SETTLEABLE SOLIDS (SS) CRITERIA: Below 0.1 ml/L is acceptable.

DAY: Fri
DATE: 05/22/15
TECHNICIAN: Jason La Deaux

SAMPLE: Morning
TIDE: Slack

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	0906	23.8	< 0.1	Boat
NORTH - BELOW	0902	24.7	< 0.1	Boat
SOUTH - ABOVE	0913	25.9	< 0.1	Boat
SOUTH - BELOW	0911	26.9	< 0.1	Boat

OBSERVATION: Placing rock in water.

SAMPLE: Mid-Day
TIDE: Flood

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	1212	24.3	< 0.1	Boat
NORTH - BELOW	1210	23.3	< 0.1	Boat
SOUTH - ABOVE	1214	24.5	< 0.1	Boat
SOUTH - BELOW	1219	23.7	< 0.1	Boat

OBSERVATION: Placing rock in water.

SAMPLE: Afternoon
TIDE: Flood

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	1502	20.8	< 0.1	Boat
NORTH - BELOW	1455	15.9	< 0.1	Boat
SOUTH - ABOVE	1510	18.3	< 0.1	Boat
SOUTH - BELOW	1506	29.3	< 0.1	Boat

OBSERVATION: Placing rock in water.

DAY: Sat
DATE: 05/23/15
TECHNICIAN: Jason La Deaux

SAMPLE: Morning
TIDE: Ebb

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	0916	29.5	< 0.1	Boat
NORTH - BELOW	0912	30.4	< 0.1	Boat
SOUTH - ABOVE	0925	30.3	< 0.1	Shore
SOUTH - BELOW	0920	33.4	< 0.1	Shore

OBSERVATION: Placing rock in water.

SAMPLE: Mid-Day
TIDE: Ebb

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	1236	26.3	< 0.1	Boat
NORTH - BELOW	1230	29.6	< 0.1	Boat
SOUTH - ABOVE	1225	34.1	< 0.1	Shore
SOUTH - BELOW	1220	25.8	< 0.1	Shore

OBSERVATION: Placing rock in water.

SAMPLE: Afternoon
TIDE: Flood

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	1509	19.6	< 0.1	Boat
NORTH - BELOW	1503	30.1	< 0.1	Boat
SOUTH - ABOVE	1521	23.4	< 0.1	Shore
SOUTH - BELOW	1515	27.3	< 0.1	Shore

OBSERVATION: Placing rock in water.

TEMPORARY BARRIER SITE: False River Emergency Barrier

TURBIDITY (TURB) CRITERIA: Below 150 NTU is acceptable.

SETTLEABLE SOLIDS (SS) CRITERIA: Below 0.1 ml/L is acceptable.

DAY: Sun
DATE: 05/24/15
TECHNICIAN: Joaquin Garza

SAMPLE: Morning
TIDE: Flood

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	0905	24.8	< 0.1	Boat
NORTH - BELOW	0903	25.1	< 0.1	Boat
SOUTH - ABOVE	0906	22.3	< 0.1	Boat
SOUTH - BELOW	0902	21.1	< 0.1	Boat

OBSERVATION: Placing rock in water.

SAMPLE: Mid-Day
TIDE: Ebb

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	1159	19.4	< 0.1	Boat
NORTH - BELOW	1157	21.5	< 0.1	Boat
SOUTH - ABOVE	1200	19.5	< 0.1	Boat
SOUTH - BELOW	1202	22.0	< 0.1	Boat

OBSERVATION: Placing rock in water.

SAMPLE: Afternoon
TIDE: Ebb

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	1458	13.8	< 0.1	Boat
NORTH - BELOW	1501	16.3	< 0.1	Boat
SOUTH - ABOVE	1457	13.5	< 0.1	Boat
SOUTH - BELOW	1504	15.3	< 0.1	Boat

OBSERVATION: Placing rock in water.

DAY: Mon
DATE: 05/25/15
TECHNICIAN: Joaquin Garza

SAMPLE: Morning
TIDE: Flood

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	0905	17.8	< 0.1	Boat
NORTH - BELOW	0903	17.8	< 0.1	Boat
SOUTH - ABOVE	0907	18.0	< 0.1	Boat
SOUTH - BELOW	0910	17.3	< 0.1	Boat

OBSERVATION: Placing rock in water.

SAMPLE: Mid-Day
TIDE: Ebb

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	1159	16.5	< 0.1	Boat
NORTH - BELOW	1156	17.0	< 0.1	Boat
SOUTH - ABOVE	1201	15.0	< 0.1	Boat
SOUTH - BELOW	1204	18.8	< 0.1	Boat

OBSERVATION: Placing rock in water.

SAMPLE: Afternoon
TIDE: Ebb

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	1523	13.2	< 0.1	Boat
NORTH - BELOW	1520	15.2	< 0.1	Boat
SOUTH - ABOVE	1525	12.6	< 0.1	Boat
SOUTH - BELOW	1518	16.3	< 0.1	Boat

OBSERVATION: Placing rock in water.

TEMPORARY BARRIER SITE: False River Emergency Barrier

TURBIDITY (TURB) CRITERIA: Below 150 NTU is acceptable.

SETTLEABLE SOLIDS (SS) CRITERIA: Below 0.1 ml/L is acceptable.

DAY: Tues
DATE: 05/26/15
TECHNICIAN: Chris Weber

SAMPLE: Morning
TIDE: Flood

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	0904	14.1	< 0.1	Boat
NORTH - BELOW	0908	15.1	< 0.1	Boat
SOUTH - ABOVE	0901	15.7	< 0.1	Boat
SOUTH - BELOW	0913	13.4	< 0.1	Boat

OBSERVATION: Placing rock in water.

SAMPLE: Mid-Day
TIDE: Slack

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	1209	25.0	< 0.1	Boat
NORTH - BELOW	1205	24.5	< 0.1	Boat
SOUTH - ABOVE	1212	22.1	< 0.1	Boat
SOUTH - BELOW	1203	19.0	< 0.1	Boat

OBSERVATION: Placing rock in water.

SAMPLE: Afternoon
TIDE: Ebb

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	1511	16.8	< 0.1	Boat
NORTH - BELOW	1508	17.4	< 0.1	Boat
SOUTH - ABOVE	1515	15.6	< 0.1	Boat
SOUTH - BELOW	1504	14.0	< 0.1	Boat

OBSERVATION: Placing rock in water.

DAY: Wed
DATE: 05/27/15
TECHNICIAN: Jason La Deaux

SAMPLE: Morning
TIDE: Flood

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	0941	14.6	< 0.1	Boat
NORTH - BELOW	0937	14.6	< 0.1	Baat
SOUTH - ABOVE	0946	13.9	< 0.1	Shore
SOUTH - BELOW	0943	10.3	< 0.1	Shore

OBSERVATION: Placing rock in water.

SAMPLE: Mid-Day
TIDE: Slack

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	1214	15.1	< 0.1	Boat
NORTH - BELOW	1210	13.3	< 0.1	Boat
SOUTH - ABOVE	-	-	-	-
SOUTH - BELOW	-	-	-	-

OBSERVATION: Placing rock in water.
North Only

SAMPLE: Afternoon
TIDE: Ebb

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	1511	14.6	< 0.1	Boat
NORTH - BELOW	1507	15.3	< 0.1	Boat
SOUTH - ABOVE	-	-	-	-
SOUTH - BELOW	-	-	-	-

OBSERVATION: Placing rock in water.
North Only

TEMPORARY BARRIER SITE: False River Emergency Barrier

TURBIDITY (TURB) CRITERIA: Below 150 NTU is acceptable.

SETTLEABLE SOLIDS (SS) CRITERIA: Below 0.1 ml/L is acceptable.

DAY: Thur
DATE: 05/28/15
TECHNICIAN: Joaquin Garza

SAMPLE: Morning
TIDE: Ebb

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	-	-	-	-
NORTH - BELOW	-	-	-	-
SOUTH - ABOVE	0930	17.1	< 0.1	Boat
SOUTH - BELOW	0922	14.4	< 0.1	Boat

OBSERVATION: Placing rock in water.
South Only

SAMPLE: Mid-Day
TIDE: Flood

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	-	-	-	-
NORTH - BELOW	-	-	-	-
SOUTH - ABOVE	1215	17.1	< 0.1	Boat
SOUTH - BELOW	1205	14.4	< 0.1	Boat

OBSERVATION: Placing rock in water.
South Only

SAMPLE: Afternoon
TIDE: Flood

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	1515	13.7	< 0.1	Boat
NORTH - BELOW	1511	14.4	< 0.1	Boat
SOUTH - ABOVE	1517	14.4	< 0.1	Boat
SOUTH - BELOW	1519	14.7	< 0.1	Boat

OBSERVATION: Placing rock in water.

DAY: Fri
DATE: 05/29/15
TECHNICIAN: Jason La Deaux

SAMPLE: Morning
TIDE: Closure Complete

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	-	-	-	-
NORTH - BELOW	-	-	-	-
SOUTH - ABOVE	0916	14.0	< 0.1	Shore
SOUTH - BELOW	0910	12.8	< 0.1	Shore

OBSERVATION: Placing rock on barrier.
South Only

SAMPLE: Mid-Day
TIDE: Closure Complete

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	-	-	-	-
NORTH - BELOW	-	-	-	-
SOUTH - ABOVE	1215	12.3	< 0.1	Shore
SOUTH - BELOW	1223	9.5	< 0.1	Shore

OBSERVATION: Placing rock on barrier.
South Only

SAMPLE: Afternoon
TIDE: Closure Complete

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	-	-	-	-
NORTH - BELOW	-	-	-	-
SOUTH - ABOVE	1508	27.7	< 0.1	Shore
SOUTH - BELOW	1500	22.5	< 0.1	Shore

OBSERVATION: Placing rock on barrier.
South Only

TEMPORARY BARRIER SITE	False River Emergency Barrier
TURBIDITY (TURB) CRITERIA	Below 150 NTU is acceptable.
SETTLEABLE SOLIDS (SS) CRITERIA	Below 0.1 ml/L is acceptable.

DAY	Sat
DATE	05/30/15
TECHNICIAN	Jason La Deaux

SAMPLE	Morning 0900
TIDE	Closure Complete

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	-	-	-	-
NORTH - BELOW	-	-	-	-
SOUTH - ABOVE	-	-	-	-
SOUTH - BELOW	-	-	-	-

OBSERVATION	No observable water work.

SAMPLE	Mid-Day
TIDE	Closure Complete

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	1207	16.0	< 0.1	Shore
NORTH - BELOW	1202	13.5	< 0.1	Shore
SOUTH - ABOVE	-	-	-	-
SOUTH - BELOW	-	-	-	-

OBSERVATION	Placing rock on barrier. North Only

SAMPLE	Afternoon - 1400
TIDE	Closure Complete

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	-	-	-	-
NORTH - BELOW	-	-	-	-
SOUTH - ABOVE	-	-	-	-
SOUTH - BELOW	-	-	-	-

OBSERVATION	All work done for the day.

DAY	Sun
DATE	05/31/15
TECHNICIAN	-

No work at site.

TEMPORARY BARRIER SITE: False River Emergency Barrier

TURBIDITY (TURB) CRITERIA: Below 150 NTU is acceptable.

SETTLEABLE SOLIDS (SS) CRITERIA: Below 0.1 ml/L is acceptable.

DAY: Mon
DATE: 06/01/15
TECHNICIAN: Jason La Deaux

SAMPLE: Morning
TIDE: Closure Complete

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	-	-	-	-
NORTH - BELOW	-	-	-	-
SOUTH - ABOVE	0936	10.1	< 0.1	Shore
SOUTH - BELOW	0930	6.8	< 0.1	Shore

OBSERVATION: Placing rock on barrier. South Only

SAMPLE: Mid-Day
TIDE: Closure Complete

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	-	-	-	-
NORTH - BELOW	-	-	-	-
SOUTH - ABOVE	1215	13.0	< 0.1	Shore
SOUTH - BELOW	1210	6.8	< 0.1	Shore

OBSERVATION: Placing rock on barrier. South Only

SAMPLE: Afternoon
TIDE: Closure Complete

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	-	-	-	-
NORTH - BELOW	-	-	-	-
SOUTH - ABOVE	1517	11.1	< 0.1	Shore
SOUTH - BELOW	1511	9.6	< 0.1	Shore

OBSERVATION: Placing rock on barrier. South Only

DAY: Tues
DATE: 06/02/15
TECHNICIAN: Chris Weber

SAMPLE: Morning
TIDE: Closure Complete

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	-	-	-	-
NORTH - BELOW	-	-	-	-
SOUTH - ABOVE	-	-	-	-
SOUTH - BELOW	-	-	-	-

OBSERVATION: All work done for the day.

SAMPLE: Mid-Day
TIDE: Closure Complete

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	-	-	-	-
NORTH - BELOW	-	-	-	-
SOUTH - ABOVE	1207	11.0	< 0.1	Shore
SOUTH - BELOW	1200	8.6	< 0.1	Shore

OBSERVATION: Placing rock on barrier. South Only

SAMPLE: Afternoon
TIDE: Closure Complete

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	-	-	-	-
NORTH - BELOW	-	-	-	-
SOUTH - ABOVE	1510	11.3	< 0.1	Shore
SOUTH - BELOW	1501	9.4	< 0.1	Shore

OBSERVATION: Placing rock on barrier. South Only

TEMPORARY BARRIER SITE: False River Emergency Barrier

TURBIDITY (TURB) CRITERIA: Below 150 NTU is acceptable.

SETTLEABLE SOLIDS (SS) CRITERIA: Below 0.1 ml/L is acceptable.

DAY: Wed
DATE: 06/03/15
TECHNICIAN: Joaquin Garza

SAMPLE: Morning
TIDE: Closure Complete

	TIME	TURB	SS	TAKEN
ABOVE	0933	9.8	< 0.1	Boat
BELOW	0927	10.4	< 0.1	Boat

OBSERVATION: Placing rock in water.

SAMPLE: Mid-Day 1200
TIDE: Closure Complete

	TIME	TURB	SS	TAKEN
ABOVE	-	-	-	-
BELOW	-	-	-	-

OBSERVATION: No observable water work.

SAMPLE: Afternoon 1500
TIDE: Closure Complete

	TIME	TURB	SS	TAKEN
ABOVE	-	-	-	-
BELOW	-	-	-	-

OBSERVATION: No observable water work.

DAY: Thur
DATE: 06/04/15
TECHNICIAN: Jason La Deaux

SAMPLE: Morning
TIDE: Closure Complete

	TIME	TURB	SS	TAKEN
ABOVE	0915	7.1	< 0.1	Shore
BELOW	0910	11.4	< 0.1	Shore

OBSERVATION: Placing rock in water.

SAMPLE: Mid-Day
TIDE: Closure Complete

	TIME	TURB	SS	TAKEN
ABOVE	1210	8.5	< 0.1	Shore
BELOW	1205	12.4	< 0.1	Shore

OBSERVATION: Placing rock in water.

SAMPLE: Afternoon
TIDE: Closure Complete

	TIME	TURB	SS	TAKEN
ABOVE	1455	8.5	< 0.1	Shore
BELOW	1450	12.4	< 0.1	Shore

OBSERVATION: Placing rock in water.

TEMPORARY BARRIER SITE: False River Emergency Barrier

TURBIDITY (TURB) CRITERIA: Below 150 NTU is acceptable.

SETTLEABLE SOLIDS (SS) CRITERIA: Below 0.1 ml/L is acceptable.

DAY: Fri
DATE: 06/05/15
TECHNICIAN: Joaquin Garza

SAMPLE: Morning
TIDE: Closure Complete

	TIME	TURB	SS	TAKEN
ABOVE	0910	10.4	< 0.1	Boat
BELOW	0920	19.8	< 0.1	Boat

OBSERVATION: Placing rock in water.

SAMPLE: Mid-Day
TIDE: Closure Complete

	TIME	TURB	SS	TAKEN
ABOVE	1215	8.3	< 0.1	Boat
BELOW	1150	8.6	< 0.1	Boat

OBSERVATION: Placing rock in water.

SAMPLE: Afternoon
TIDE: Closure Complete

	TIME	TURB	SS	TAKEN
ABOVE	1508	10.0	< 0.1	Boat
BELOW	1515	8.4	< 0.1	Boat

OBSERVATION: Placing rock in water.

DAY: Sat
DATE: 06/06/15
TECHNICIAN: Jason La Deaux

SAMPLE: Morning
TIDE: Closure Complete

	TIME	TURB	SS	TAKEN
ABOVE	0910	10.1	< 0.1	Shore
BELOW	0920	12.3	< 0.1	Shore

OBSERVATION: Placing rock in water.

SAMPLE: Mid-Day
TIDE: Closure Complete

	TIME	TURB	SS	TAKEN
ABOVE	1210	14.5	< 0.1	Shore
BELOW	1205	14.1	< 0.1	Shore

OBSERVATION: Placing rock in water.

SAMPLE: Afternoon
TIDE: Closure Complete

	TIME	TURB	SS	TAKEN
ABOVE	1505	11.0	< 0.1	Shore
BELOW	1520	12.0	< 0.1	Shore

OBSERVATION: Placing rock in water.

TEMPORARY BARRIER SITE: False River Emergency Barrier

TURBIDITY (TURB) CRITERIA: Below 150 NTU is acceptable.

SETTLEABLE SOLIDS (SS) CRITERIA: Below 0.1 ml/L is acceptable.

DAY: Sun
DATE: 06/07/15
TECHNICIAN: -

No work at site.

DAY: Mon
DATE: 06/08/15
TECHNICIAN: Joaquin Garza

SAMPLE: Morning
TIDE: Closure Complete

	TIME	TURB	SS	TAKEN
ABOVE	0908	13.7	< 0.1	Shore
BELOW	0937	14.1	< 0.1	Shore

OBSERVATION: Placing rock in water.

SAMPLE: Mid-Day
TIDE: Closure Complete

	TIME	TURB	SS	TAKEN
ABOVE	1236	7.8	< 0.1	Shore
BELOW	1220	8.3	< 0.1	Shore

OBSERVATION: Placing rock in water.

SAMPLE: Afternoon
TIDE: Closure Complete

	TIME	TURB	SS	TAKEN
ABOVE	1510	7.4	< 0.1	Shore
BELOW	1500	8.3	< 0.1	Shore

OBSERVATION: Placing rock in water.

TEMPORARY BARRIER SITE: False River Emergency Barrier

TURBIDITY (TURB) CRITERIA: Below 150 NTU is acceptable.

SETTLEABLE SOLIDS (SS) CRITERIA: Below 0.1 ml/L is acceptable.

DAY: Tues
DATE: 06/09/15
TECHNICIAN: Joaquin Garza

SAMPLE: Morning
TIDE: Closure Complete

	TIME	TURB	SS	TAKEN
ABOVE	0916	8.7	< 0.1	Shore
BELOW	0920	13.0	< 0.1	Shore

OBSERVATION: Placing rock in water.

SAMPLE: Mid-Day
TIDE: Closure Complete

	TIME	TURB	SS	TAKEN
ABOVE	1210	9.6	< 0.1	Shore
BELOW	1222	14.0	< 0.1	Shore

OBSERVATION: Placing rock in water.

SAMPLE: Afternoon
TIDE: Closure Complete

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	1444	9.3	< 0.1	Shore
NORTH - BELOW	1440	12.4	< 0.1	Shore

OBSERVATION: Placing rock in water.

DAY: Wed
DATE: 06/10/15
TECHNICIAN: Jason La Deaux

SAMPLE: Morning
TIDE: Closure Complete

	TIME	TURB	SS	TAKEN
ABOVE	0925	9.5	< 0.1	Shore
BELOW	0920	10.2	< 0.1	Shore

OBSERVATION: Placing rock in water.

SAMPLE: Mid-Day
TIDE: Closure Complete

	TIME	TURB	SS	TAKEN
ABOVE	1215	8.7	< 0.1	Shore
BELOW	1210	9.3	< 0.1	Shore

OBSERVATION: Placing rock in water.

SAMPLE: Afternoon
TIDE: Closure Complete

	TIME	TURB	SS	TAKEN
NORTH - ABOVE	1505	11.3	< 0.1	Shore
NORTH - BELOW	1500	11.9	< 0.1	Shore

OBSERVATION: Placing rock in water.

TEMPORARY BARRIER SITE: False River Emergency Barrier

TURBIDITY (TURB) CRITERIA: Below 150 NTU is acceptable.

SETTLEABLE SOLIDS (SS) CRITERIA: Below 0.1 ml/L is acceptable.

DAY: Thur
DATE: 06/11/15
TECHNICIAN: Joaquin Garza

SAMPLE: Morning
TIDE: Closure Complete

	TIME	TURB	SS	TAKEN
ABOVE	0929	10.4	< 0.1	Shore
BELOW	0938	11.8	< 0.1	Shore

OBSERVATION: Placing rock in water.

SAMPLE: Mid-Day
TIDE: Closure Complete

	TIME	TURB	SS	TAKEN
ABOVE	1214	9.6	< 0.1	Shore
BELOW	1210	14.0	< 0.1	Shore

OBSERVATION: Placing rock in water.

SAMPLE: Afternoon
TIDE: Closure Complete

	TIME	TURB	SS	TAKEN
ABOVE	1502	11.3	< 0.1	Shore
BELOW	1514	10.9	< 0.1	Shore

OBSERVATION: Placing rock in water.

DAY: Fri
DATE: 06/12/15
TECHNICIAN: Jason La Deaux

SAMPLE: Morning
TIDE: Closure Complete

	TIME	TURB	SS	TAKEN
ABOVE	0925	12.1	< 0.1	Shore
BELOW	0920	12.5	< 0.1	Shore

OBSERVATION: Placing rock in water.

SAMPLE: Mid-Day
TIDE: Closure Complete

	TIME	TURB	SS	TAKEN
ABOVE	1210	12.2	< 0.1	Shore
BELOW	1205	9.2	< 0.1	Shore

OBSERVATION: Placing rock in water.

SAMPLE: Afternoon
TIDE: Closure Complete

	TIME	TURB	SS	TAKEN
ABOVE	1500	13.1	< 0.1	Shore
BELOW	1455	12.8	< 0.1	Shore

OBSERVATION: Placing rock in water.

TEMPORARY BARRIER SITE	False River Emergency Barrier
TURBIDITY (TURB) CRITERIA	Below 150 NTU is acceptable.
SETTLEABLE SOLIDS (SS) CRITERIA	Below 0.1 ml/L is acceptable.

DAY	Sat
DATE	06/13/15
TECHNICIAN	Joaquin Garza

SAMPLE	Morning 0900
TIDE	Closure Complete

	TIME	TURB	SS	TAKEN
ABOVE	-	-	-	-
BELOW	-	-	-	-

OBSERVATION	No observable water work.

SAMPLE	Mid-Day and Afternoon

No work at site.

DAY	Sun
DATE	06/14/15
TECHNICIAN	-

No work at site.

TEMPORARY BARRIER SITE: False River Emergency Barrier

TURBIDITY (TURB) CRITERIA: Below 150 NTU is acceptable.

SETTLEABLE SOLIDS (SS) CRITERIA: Below 0.1 ml/L is acceptable.

DAY: Mon
DATE: 06/15/15
TECHNICIAN: Jason La Deaux

SAMPLE: Morning 0900
TIDE: Closure Complete

	TIME	TURB	SS	TAKEN
ABOVE	-	-	-	-
BELOW	-	-	-	-

OBSERVATION: No observable water work.

SAMPLE: Mid-Day
TIDE: Closure Complete

	TIME	TURB	SS	TAKEN
ABOVE	1205	8.0	< 0.1	Shore
BELOW	1200	8.3	< 0.1	Shore

OBSERVATION: Placing buoys/anchors in water.

SAMPLE: Afternoon
TIDE: Closure Complete

	TIME	TURB	SS	TAKEN
ABOVE	1505	8.9	< 0.1	Shore
BELOW	1500	7.9	< 0.1	Shore

OBSERVATION: Placing buoys/anchors in water.

DAY: Tues
DATE: 06/16/15
TECHNICIAN: Chris Weber

SAMPLE: Morning 0900
TIDE: Closure Complete

	TIME	TURB	SS	TAKEN
ABOVE	0910	6.9	< 0.1	Shore
BELOW	0900	7.8	< 0.1	Shore

OBSERVATION: Placing buoys/anchors in water.

SAMPLE: Mid-Day
TIDE: Closure Complete

	TIME	TURB	SS	TAKEN
ABOVE	1205	8.0	< 0.1	Shore
BELOW	1200	8.3	< 0.1	Shore

OBSERVATION: Placing buoys/anchors in water.

SAMPLE: Afternoon - 1300
TIDE: Closure Complete

ALL WATER WORK COMPLETE.
BARRIER INSTALLATION COMPLETE.

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Appendix G: Water Quality Monitoring Plan

WATER QUALITY MONITORING PLAN

EMERGENCY DROUGHT BARRIER

Version April 24, 2015

California Department of Water Resources

Problem Statement

The Department of Water Resources (DWR) determined that data from a network of water quality and flow stations is needed to assess how the emergency drought barrier (Barrier) shown on Figure 1 will affect flow, water quality, and biological constituents in the west, central, and north Delta. DWR staff created a GIS map (accessible at: http://bit.ly/1kPdKtI) that shows all of the current monitoring locations in the Delta, along with what constituents are monitored at each location. The map shows there is an extensive network of DWR and United States Geological Survey (USGS) continuous water quality and flow stations in the central and north Delta. After assessing the current monitoring programs in the Delta, DWR staff determined there were gaps in the existing monitoring network with respect to the proposed drought barrier location, especially in the west and north Delta. New water quality and flow stations, and additional parameter monitoring is needed to augment the existing network. Figure 2 shows the existing and proposed stations that will be used to monitor the drought barrier effects on water quality and flow conditions (see table 1 for station names). Data from these stations will also be used to assess compliance with permit requirements and to refine hydrodynamic and water quality models that can be used to improve planning for future drought responses. DWR and USGS plan to monitor the flow and water quality constituents outlined in this plan from May 1, 2015 through May 1, 2016. A new monitoring plan will be drafted next year if drought conditions continue beyond May 1, 2016 and monitoring would be beneficial.

Background - Hydrodynamics

Flows into the Sacramento-San Joaquin Delta are dominated by four main influences: Sacramento River/Yolo Bypass, San Joaquin River, eastside rivers (mainly the Mokelumne and Cosumnes Rivers) and the Pacific Ocean (tides). Tidal/seawater flow under the Golden Gate Bridge averages a peak of about 2.3 million cubic feet per second but this tidal energy quickly reduces as it funnels through the Carquinez Strait and disperses into the Delta channels. To counter this energy flow, the Sacramento River and Yolo Bypass, which provides over 75% of the fresh inflow into the Delta, pushes against this tidal force to help repel seawater or salinity intrusion into the Delta. Therefore the Sacramento River plays a significant role in maintaining a high level of water quality in the Delta. Efficiently using the Sacramento River flow to maintain good water quality and a healthy Delta ecosystem year-round are two of DWR's primary goals.

As the Sacramento River flows past Freeport, some of the flow is diverted into several sloughs before flowing past Rio Vista to converge with the San Joaquin River at Antioch. During normal or below normal water years, there is enough Sacramento River flow throughout the year that natural diversions into Sutter and Steamboat Sloughs will not negatively impact overall Delta water quality. However during successive dry years such as the current situation, significant diversions into Sutter and Steamboat Sloughs from the Sacramento River reduces the amount of fresh water flows entering into the central Delta to repel salinity intrusion from the Bay. The preferred flow path for Sacramento River water is into either the Delta Cross Channel or Georgiana Slough towards the central Delta. Computer model runs have shown that keeping the central Delta as fresh as possible is an effective way to maintain the freshwater/seawater interface west of Antioch. Computer runs have also shown that allowing saline water to make up the majority of water flowing through Franks Tract would drastically reduce the Department's ability to maintain adequate water quality throughout the Delta.

Figure 1. Emergency Drought Barrier Location

Figure 2. Existing and Proposed Water Quality Monitoring Stations

Installing a drought barrier in the central Delta is an extremely important option available to the Department to address the current drought situation. The West False River barrier would provide a significantly longer path for saline seawater to mix with freshwater before entering into Franks Tract, which will also help keep the central Delta water fresher.

Monitoring Objective

Installing the West False River barrier is projected to maintain overall Delta water quality to acceptable levels. However, this barrier may also produce localized impacts that our computer models may not be able to predict. Therefore DWR believes it is prudent to establish a network of temporary water quality, flow, and water level stations to quantify potential changes near the barrier. This network will:

1. Document changes to local or regional water quality conditions that may be due to the barrier
2. Assist in calibrating and improving computer models
3. Meet monitoring requirements specified in environmental permits

Monitoring – Sampling Locations

DWR will install new temporary water quality monitoring stations as well as augment existing stations in areas that may be impacted by the emergency drought barrier. Water quality and water level instruments will be installed at sites upstream and downstream of the False River barrier to define any localized impacts. (Note: The San Joaquin River at Jersey Point (SJJ) station is about 8/10 of a mile downstream from where the West False River barrier will be installed. SJJ will be used to define conditions immediately downstream of the barrier.) DWR has also proposed a number of new sites in the west, central, and north Delta to monitor the spatial extent of salinity intrusion and the effectiveness of the barrier. The water quality monitoring plan will consist of two components: 1) continuous water quality and flow monitoring, and 2) discrete sampling for chlorophyll and nutrients. See Figures 2 through 4 for the approximate location of the existing and proposed west, central, and north Delta monitoring stations. Tables 1 through 3 provide the name of each monitoring station and the constituents that will be monitored.

Table 1. Existing (1-11) and proposed (12-21) monitoring stations

#	Station Name	Continuous Data (15-minute data)	Discrete data (monthly)	CA Data Exchange Center (CDEC ID)
1	Miner Slough at HWY 84	Flow, stage, water velocity, water temperature, specific conductance, turbidity, and dissolved oxygen	N/A	HWB
2	Steamboat Slough below Sutter Slough	Water temperature, specific conductance	***Chlorophyll, nutrients, bromide, organic carbon***	***Station will be telemetered***
3	Liberty Island	Flow, stage, water velocity, water temperature, specific conductance, turbidity, and dissolved oxygen	N/A	LIB

4	Cache Slough at Ryer Island	Flow, stage, water velocity, water temperature, specific conductance, turbidity, and dissolved oxygen	N/A	RYI
5	Three Mile Slough at San Joaquin River	Flow, stage, water velocity, water temperature, specific conductance, turbidity, and dissolved oxygen	Chlorophyll, nutrients, bromide, organic carbon	TSL
6	Old River at Franks Tract near Terminous	Flow, stage, water velocity, water temperature, specific conductance, turbidity, chlorophyll, and dissolved oxygen	Chlorophyll, nutrients, bromide, organic carbon	OSJ
7	San Joaquin River at Jersey Point	Flow, stage, water velocity, water temperature, specific conductance, and turbidity	N/A	SJJ
8	False River	Flow, stage, water velocity, water temperature, specific conductance, turbidity, chlorophyll, and dissolved oxygen	Chlorophyll, nutrients, bromide, organic carbon	FAL
9	Bethel Island near Piper Slough	Water temperature, specific conductance, turbidity, and dissolved oxygen	Chlorophyll, nutrients, bromide, organic carbon	BET
10	Dutch Slough at Jersey Island	Flow, stage, water velocity, water temperature, specific conductance, turbidity	N/A	DSJ
11	Holland Cut near Bethel Island	Flow, stage, water velocity, water temperature, specific conductance, turbidity, and *dissolved oxygen*	Chlorophyll, nutrients, bromide, organic carbon	HOL
12	***Miner Slough***	***Water temperature, specific conductance, turbidity, and dissolved oxygen***	***Chlorophyll, nutrients, bromide, organic carbon***	***Proposed Station – Data will be telemetered***
13	***Steamboat Slough***	***Flow, stage, water velocity, water temperature, specific conductance, turbidity, and dissolved oxygen***	***Chlorophyll, nutrients, bromide, organic carbon***	***Proposed Station – Data will be telemetered***
14	***Sacramento River at Steamboat Slough***	***Flow, stage, water velocity, water temperature, specific conductance, turbidity, and dissolved oxygen***	***Chlorophyll, nutrients, bromide, organic carbon***	***Proposed Station – Data will be telemetered***

15	***Lower San Joaquin River***	***Water temperature, specific conductance, turbidity, chlorophyll, pH, and dissolved oxygen***	***Chlorophyll, nutrients, bromide, organic carbon***	***Proposed Station – Data will be telemetered***
16	***Franks Tract, mid tract***	***Water temperature, specific conductance, turbidity, chlorophyll, pH, and dissolved oxygen***	***Chlorophyll, nutrients, bromide, organic carbon***	***Proposed Station – Data will be telemetered***
17	***Fisherman's Cut***	***Flow, stage, water velocity, water temperature, specific conductance, turbidity, and dissolved oxygen***	***Chlorophyll, nutrients, bromide, organic carbon***	***Proposed Station – Data will be telemetered***
18	***Sacramento River near Sherman Island***	***Water temperature, specific conductance, turbidity, and dissolved oxygen***	***Chlorophyll, nutrients, bromide, organic carbon***	***Proposed Station – Data will be telemetered***
19	***Honker Bay***	***Water temperature, specific conductance, turbidity, and dissolved oxygen***	***Chlorophyll, nutrients, bromide, organic carbon***	***Proposed Station – Data will be telemetered***
20	***Grizzly Bay***	***Water temperature, specific conductance, turbidity, and dissolved oxygen***	***Chlorophyll, nutrients, bromide, organic carbon***	***Proposed Station – Data will be telemetered***
21	***Suisun Bay – Cutoff near Ryer***	***Water temperature, specific conductance, turbidity, and dissolved oxygen***	***Chlorophyll, nutrients, bromide, organic carbon***	***Proposed Station – Data will be telemetered***

Monitoring – Continuous Methods

DWR and USGS will collect data for the following constituents in 15-minute intervals at a one meter depth by deploying Yellow Spring Instrument (YSI) 6600 sondes and Acoustic Doppler Current Profilers:

- Water temperature (ºC)
- Dissolved oxygen (mg/L)
- Specific conductance (µS/cm)
- Turbidity (NTU)
- Flow (cfs)
- Stage (ft)
- Velocity (m/s)

YSI 6600 sondes are approximately two feet long and 3-1/2 inches in diameter. They are completely submersible and self-contained, operating on a minimum of nine volts of battery power from eight C-cell alkaline batteries. Deployment data are logged in each sonde's internal memory. For detailed information on YSI instrumentation, visit http://www.ysi.com/index.php.

In addition to the YSI 6600 sondes, field staff will use at least three other field instruments to test the validity of the sonde data:

- YSI-63 handheld unit that measures water temperature, pH, and specific conductance
- YSI Pro-ODO Luminescent Dissolved Oxygen handheld unit to check dissolved oxygen concentrations
- HACH 2100P turbidimeter to measure turbidity

Staff will perform the following two procedures to check whether the sondes are still operating properly and measuring accurately:

- A post-deployment accuracy check on the day the sondes are removed and before the instruments are cleaned.
- A comparison between the data measured by the handheld field instruments and the data collected by the sonde at the closest 15 minute time interval.

The accuracy of sonde probes while deployed in the field can be negatively affected by probe malfunction, drift away from initial calibration, and/or fouling caused by biological growth on the probe reading surface. DWR and USGS staff will perform the post-deployment accuracy check by the following procedure prior to cleaning the sonde probes:

- Placing the sonde probes in fresh calibration standards with known values
- Operating the sondes in the standards and recording the values the sondes are reading
- Rating the values collected during the accuracy check for each constituent as excellent, good, fair, or poor based on their deviation from the calibration standard according to the USGS technical report "Guidelines and Standard Procedures for Continuous Water Quality Station Operation, Record Computation, and Data Reporting"

The ratings obtained from the accuracy check indicate the quality, accuracy, and reliability of the data that the sonde collected while in the field. In addition to the post-deployment accuracy check, DWR and USGS staff will compare the water temperature, specific conductance, dissolved oxygen, and turbidity data measured in the field by the handheld instruments (the YSI-63, YSI Pro-ODO, and HACH 2100P) to the sonde data that is closest in time. While taking the field measurements, DWR and USGS staff will attempt to collect the field readings at the same depth that the sonde probes are measuring at (1 meter) and as close to the sonde pipe as possible. Because the field instruments are calibrated regularly, a large difference between the sonde and field readings could indicate inaccuracy of the sonde data during the deployment period. DWR and USGS staff considers these comparisons between the field and sonde readings and the ratings obtained from the post-deployment accuracy check while assessing data quality when entering the continuous data into a database.

Monitoring – Discrete Methods for Chlorophyll and Nutrients

Sampling of the following constituents will be conducted monthly at the stations listed in Tables 1:

- chlorophyll *a* (µg/L)
- pheophytin *a* (µg/L)
- dissolved ammonia (mg/L as Nitrogen)

- dissolved bromide (mg/L)
- dissolved nitrite + nitrate (mg/L as Nitrogen)
- dissolved organic carbon (mg/L as Carbon)
- dissolved organic nitrogen (mg/L as Nitrogen)
- dissolved orthophosphate (mg/L as Phosphorous)
- total kjeldahl nitrogen (mg/L as Nitrogen)
- total organic carbon (mg/L as Carbon)
- total phosphorus (mg/L as Phosphorus)

DWR staff (only) will collect samples for all the constituents listed above at a 1-meter depth using a Van Dorn water sampler. Water from the container will be used to fill two plastic sampling containers at each site. One of the containers will be used for analysis of chlorophyll *a* and pheophytin *a*, and the other container for the analysis of ammonia, nitrite + nitrate, organic nitrogen, and orthophosphate. All sample bottles must be stored in a cooler that contains ice to preserve the samples at 4 ºC and to keep them out of the sunlight.

After the samples are collected, staff must transport them to a site for water filtration. For the chlorophyll *a* and pheophytin *a* samples, approximately 500 mL of sample water is passed through a 47 mm diameter glass fiber filter with a 1.0 µm pore size at a pressure of 10 inches of mercury. After filtration, the filters are immediately frozen to preserve them for future analysis. The ammonia, nitrite + nitrate, organic nitrogen, bromide, and orthophosphate samples are filtered through a 0.45 µm pore size membrane filter into a half-pint polyethylene bottle. The filtered samples and frozen filters will then be transported to DWR's Bryte Laboratory for analysis. A summary of the lab methods for the nutrients measured are shown in Table 2.

Table 2. Summary of lab methods for the discrete water quality constituents

Constituent	Lab Method[1]
Chlorophyll *a*	Standard Method 10200 H, Spectrometric Determination of Chlorophyll
Pheophytin *a*	Standard Method 10200 H, Spectrometric Determination of Chlorophyll
Dissolved Ammonia	EPA 350.1
Dissolved Bromide	EPA 300.0
Dissolved Nitrite+Nitrite	Modified Standard Method 4500-NO3-F
Dissolved Organic Carbon	EPA 415.1 (D)
Dissolved Organic Nitrogen	EPA 351.2
Dissolved Orthophosphate	Modified EPA 365.1
Total Kjeldahl Nitrogen	EPA 351.2
Total Organic Carbon	EPA 415.1 (T)
Total Phosphorus	EPA 365.4

Additional Discrete Monitoring During Barrier Installation and Removal

Settleable solids and turbidity samples will be collected during the installation and removal of the drought barrier. The purpose of this sampling is to document and monitor changes in suspended particles that may occur during in-water construction activities. Monitoring will occur twice daily, morning and afternoon to document Grab samples from the shore are captured approximately 300 feet upstream and 300 feet downstream of the active construction site.

Settleable Solids – For each test a technician will ensure (1) the sediment is suspended in the sample before transferring 1.00 liters into a graduated lmhoff cone and (2) the cone remains fixed, level, and undisturbed for one hour. The technician will record on a field sheet (1) the time when the sample was captured and (2) the amount of sediment in milliliters that has settled out of suspension.

Turbidity – The technician will use the remaining sample water to take a turbidity meter reading using a Hach 2100P instrument. The technician will ensure (1) the sample bottles are rinsed out at least three times with DI water and (2) the sample bottles are made clear by carefully wiping with a lint free cloth (included in the instrument kit) and two or three drops of oil (also in the instrument kit). The technician will record on a field sheet: (1) the time when the sample was captured (2) the level of turbidity in units NTU (<>) read from the instrument.

RETESTING PROTOCOL

If either test exceeds the following criteria, the field technician will immediately conduct a follow-up test.

Settleable Solids – An accumulation greater than one milliliter per liter

Turbidity – A difference greater than 15 NTU between upstream and downstream samples

If the results of the follow-up test do not meet these criteria, the field technician will notify the Contractor and on-site Project Manager.

Data Availability and Reporting

The continuous data from each central and north Delta station will be posted on the California Data Exchange Center (CDEC): http://cdec.water.ca.gov/. The CDEC codes for new stations will be listed on DWR's Emergency Drought Barrier webpage after the sites are established. DWR staff plan to post monthly water quality data summaries on the webpage. The summaries will be archived when a new summary is posted. Interested parties will have access to all the monthly summaries, so they can view how water quality conditions are changing over time. Chlorophyll and nutrient data will be posted on the webpage as soon as the results are available. Since chlorophyll and nutrient data must be analyzed at a lab, it could take up to a month to get results back. Requests for water quality and flow data that have been checked for accuracy can be emailed to Shaun Philippart at Shaun.Philippart@water.ca.gov.

DWR will complete a final report detailing the localized and regional effects of the drought barrier on water quality. Specific research questions will be postulated in the report, such as "how effective was

the barrier in repelling salt water intrusion into the central Delta?” The final version of the report will be complete by January 2017.

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Appendix H: Pile Driving and Noise Monitoring Data*

*Prepared by Marin Greenwood of ICF International for the Biological Assessment of Potential Effects on Listed Fishes from the West False River Emergency Drought Barrier Project, July 10, 2015

Pile Driving and Noise Monitoring Data

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Methods

As described in the Project Description section of this BA, the West False River Emergency Drought Barrier Project involved in-water pile driving at the West False River barrier site in order to install two king pile-supported sheet pile walls forming the barrier abutments, which extend out from each levee into the channel for a distance of 75 feet. The analysis presented below refers to the king and sheet piles as 'barrier piles'. In addition to the barrier piles, steel pipe piles were driven for attachment of water quality monitoring instruments.

All pile driving was conducted with a vibratory driver. Bubble curtain attenuation was provided, although the integrity of the bubble curtain was often compromised by the swift tidal currents in False River. Sound was monitored at 10 m during driving of the barrier piles and the water quality monitoring piles. It was not possible to monitor all pile driving noise because pile driving occurred simultaneously at both sides of the False River channel on some days; when this occurred, monitoring was undertaken for the piles likely to generate greater noise effects.

An interagency working group including NMFS has established interim criteria for evaluating underwater noise impacts from pile driving on fish. These criteria are defined in the document entitled "Agreement in Principal for Interim Criteria for Injury to Fish from Pile Driving Activities" dated June 12, 2008 (Fisheries Hydroacoustic Working Group 2008). This agreement identifies a peak sound pressure level of 206 decibels (dB) and an accumulated sound exposure level (SEL)[9] of 187 dB as thresholds for injury to fish. For fish less than 2 g, the accumulated SEL threshold is reduced to 183 dB. Although there has been no formal agreement on a "behavioral" threshold, NMFS uses 150 dB-RMS as the threshold for adverse behavioral effects.

However, the interim criteria adopted by the Fisheries Hydroacoustic Working Group (2008) apply only to impact pile driving. There are no accepted sound criteria for vibratory driving (see, for example, the recent NMFS [2015] biological opinion on the Woodward Island Bridge Project over Middle River). In comparison to impact pile driving, vibratory pile driving is acknowledged to minimize the amount of noise and turbidity and to substantially reduce or avoid the potential to cause take of the listed species (USFWS 2015). Proposed criteria for vibratory driving suggest considerably higher threshold levels than for impact pile driving (Hastings 2010):

- Non-auditory tissue damage
    - Mass ≤ 0.6 g = 191 dB cumulative SEL
    - For fish between 0.6 and 102 g mass, cumulative SEL = 195.28 + 19.28*log10(mass)
    - Mass ≥ 102 g = 234 db cumulative SEL

[9] Sound exposure level (SEL) is defined as the constant sound level acting for one second, which has the same amount of acoustic energy as the original sound. Expressed another way, the sound exposure level is a measure of the sound energy in a single pile driver strike. Cumulative SEL results from successive pile strikes. Cumulative SEL is based on the number of pile strikes and the SEL per strike; the assumption is made that all pile strikes are of the same SEL.

- Auditory tissue damage
    - Hearing generalists (e.g., salmonids): > 234 dB cumulative SEL
    - Hearing specialists (e.g., carp): 222 dB cumulative SEL
- Temporary threshold shift (hearing loss)
    - Hearing generalists: 234 dB cumulative SEL
    - Hearing specialists: 185 dB cumulative SEL

The analysis below estimated the distance from the pile driving to where non-auditory tissue damage would no longer occur, based on the proposed thresholds of Hastings (2010). The calculations were made for four representative species/sizes of listed fish:

- Larval delta smelt (≤ 0.6 g): 191 dB SEL
- Adult delta smelt (4.0 g for 70-mm standard length [Kimmerer et al. 2005]): 206.9 dB SEL
- Juvenile Chinook salmon (9.5 g for 90-mm standard length juvenile Chinook salmon [Kimmerer et al. 2005]): 214.1 dB SEL
- Juvenile and adult steelhead, adult Chinook salmon (≥ 102 g): 234 db cumulative SEL

The cumulative SEL was provided for each pile driving session (Mahmodi, pers. comm.), with a session consisting of a continuous period of driving of the same pile. For the barrier piles, driving on any given day was only undertaken on one type of pile (king or sheet) and on one side of the channel (north or south). To simplify the calculations, it was assumed that all pile driving sessions on a given day occurred at the same location. The cumulative sound energy for all sessions in a given day was calculated by summing the cumulative sound energy from each individual session:

$$\text{Cumulative sound energy per session} = 10^{(\text{Cumulative SEL/Distance to pile driving})}$$

The distance to pile driving from the acoustic monitoring equipment was always 10 m.

The summed cumulative sound energy was then converted to the daily cumulative SEL:

$$\text{Daily cumulative SEL: } 10*\log(\text{summed cumulative sound energy across sessions})$$

The daily cumulative SEL was then used to estimate the distance up to which the proposed thresholds of Hastings (2010) would have extended, based on the formula from the NMFS calculator spreadsheet[10]:

$$\text{Distance to threshold} = \text{Distance to pile driving}*10^{((\text{Cumulative SEL} - \text{threshold})/\text{transmission loss constant}))}$$

[10] Downloaded from http://www.dot.ca.gov/hq/env/bio/files/NMFS%20Pile%20Driving%20Calculations.xls on 3/20/2014.

As stated above, the distance to pile driving was always 10 m; per the NMFS calculator spreadsheet, the transmission loss constant was assumed to be 15.

The above calculations were repeated for the water quality monitoring piles, although note that each pile was driven in a single session, and the piles were not located in close proximity to each other; therefore, the distance from the pile driving to the extent of the injury thresholds was calculated separately for each pile. The only exception to this was for the two piles driven in Liberty Island, which were only around 5 ft apart: for these piles, the same method of calculation for the barrier piles was used, i.e., summing accumulated sound energy under the assumption that the piles were in essentially the same location.

Results

Barrier Piles

In-water pile driving was undertaken on 8 days from May 14 to May 22 (Table A1). The number of pile driving sessions per day that was monitored ranged from 3 to 8, with the total duration spent pile driving ranging from just under an hour on May 14 (king piles, south side) to around 4.5 hours on May 20 (sheet piles, north side). The mean cumulative SEL per session that was monitored for sound was 193.8 dB (range 178.7 to 205.1 dB). As previously noted, pile driving on some days occurred simulataneously at both abutments and it was not possible to monitor both locations.

The calculated distance up to which the proposed non-auditory tissue injury thresholds of Hastings (2010) would have extended, based on daily cumulative SEL, varied by species/size. For larval delta smelt, the mean distance affected was 79.9 m (range 4.2 to 171.0 m), or approximately262 feet (range 14 to 560 feet) (Table A1). For adult delta smelt, the mean distance affected was 7.0 m (range 0.4 to 14.9 m), or approximately23 feet (range 1 to 49 feet). For juvenile Chinook salmon, the mean distance affected was 2.3 m (range 0.1 to 2.3 m), or approximately 8 feet (range 0 to 16 feet). For juvenile/adult steelhead and adult Chinook salmon, the mean distance affected was 0.11 m (range 0.0 to 0.2 m), or well below one foot (Table A1). These distances represent the distance from the locations that were monitored; as noted previously, pile driving occurred at both abutments simultaneously on some days, so the area of potential effect would have been greater than suggested by monitoring on those days.

Table A1. Summary of In-Water Pile Driving at West False River Barrier with Sound Monitoring Data, May 2015, Including Cumulative Sound Exposure Level (SEL).

Date	Start	Stop	Pile Type (Location[1])	Duration Driven (Hr: Min:Sec)	Cum. SEL (dB)	Daily Distance Exceeding Proposed Non-Auditory Tissue Damage Threshold (Hastings 2010), Meters[2]			
						191 dB (larval delta smelt)	206.9 dB (adult delta smelt)	215.6 dB (juvenile Chinook salmon)	234 dB (juvenile/adult steelhead; adult Chinook salmon)
14-May-15	7:06	7:18	King (South)	0:12:19	180.9	4.17	0.36	0.12	0.01
	16:20	16:45	King (South)	0:24:46	181.5				
	16:57	17:16	King (South)	0:19:02	178.7				
15-May-15	7:29	8:01	King (South)	0:31:59	202.1	85.44	7.45	2.45	0.12
	8:35	8:40	King (South)	0:05:06	190.2				
	9:28	9:42	King (South)	0:14:06	189.8				
	9:49	10:07	King (South)	0:18:04	179.4				
	12:34	12:37	King (South)	0:02:48	181				
	12:49	13:32	King (South)	0:43:01	200.9				
	14:36	15:19	King (South)	0:42:51	185.2				
	15:51	16:18	King (South)	0:26:59	185.7				
16-May-15	9:17	11:03	Sheet (North)	1:46:04	192.8	48.35	4.21	1.39	0.07
	12:42	13:18	Sheet (North)	0:36:17	195.6				
	14:04	14:35	Sheet (North)	0:31:09	187.8				
	15:17	15:51	Sheet (South)	0:33:53	198.6				
18-May-15	10:58	11:22	Sheet (South)	0:24:05	198.9	136.87	11.93	3.93	0.19
	11:50	12:17	Sheet (South)	0:26:27	202.3				
	13:34	14:02	Sheet (South)	0:27:55	201.1				
	15:19	16:07	Sheet (South)	0:48:17	203				
	17:03	17:20	Sheet (South)	0:16:51	197.9				
19-May-15	7:58	8:17	Sheet (North)	0:19:00	189.8	39.46	3.44	1.13	0.05
	8:18	9:25	Sheet (North)	1:07:33	196.5				
	11:40	11:50	Sheet (North)	0:09:21	186.3				
	12:50	12:58	Sheet (North)	0:08:23	188.1				

Date	Start	Stop	Pile Type (Location[1])	Duration Driven (Hr: Min:Sec)	Cum. SEL (dB)	Daily Distance Exceeding Proposed Non-Auditory Tissue Damage Threshold (Hastings 2010), Meters[2]			
						191 dB (larval delta smelt)	206.9 dB (adult delta smelt)	215.6 dB (juvenile Chinook salmon)	234 dB (juvenile/adult steelhead; adult Chinook salmon)
	13:37	14:10	Sheet (North)	0:32:30	193				
	14:36	15:45	Sheet (North)	1:09:03	191.4				
20-May-15	7:28	8:12	Sheet (North)	0:44:44	203.3				
	10:12	10:38	Sheet (North)	0:26:15	202.4				
	12:04	12:41	Sheet (North)	0:36:59	200.6	171.04	14.91	4.91	0.23
	13:22	13:27	Sheet (North)	0:05:21	192.5				
	15:54	17:46	Sheet (North)	1:52:20	205.1				
	19:01	19:50	Sheet (North)	0:49:20	196.7				
21-May-15	9:20	9:40	Sheet (South)	0:19:57	197.8				
	12:52	14:27	Sheet (South)	1:34:49	204.2	90.67	7.90	2.60	0.12
	15:21	16:16	Sheet (South)	0:54:37	193.1				
22-May-15	7:25	7:50	Sheet (North)	0:25:29	196.3				
22-May-15	8:33	8:56	Sheet (North)	0:22:40	198.6				
	10:19	10:25	Sheet (North)	0:06:10	193.5	63.13	5.50	1.81	0.09
	13:11	13:24	Sheet (North)	0:13:13	194.4				
	15:16	15:35	Sheet (North)	0:19:23	195.4				

Notes:

1 South = Jersey Island side; north = Bradford Island side.

2 Based on proposed thresholds of Hastings (2010) for a) mass ≤ 0.6 g (191 dB, e.g., larval delta smelt); b) for fish between 0.6 and 102 g mass: cumulative SEL = 195.28 + 19.28*log10(mass), where mass is 4.0 g for a 70-mm delta smelt and 11.4 g for a 90-mm juvenile spring-run Chinook salmon; and c) mass ≥ 102 g (234 dB, e.g., for juvenile and adult steelhead, and for adult Chinook salmon).

Source: Mahmodi, pers. comm. (pile driving data); daily distances exceeding thresholds developed by ICF.

Water Quality Monitoring Piles

Pile driving was undertaken on 6 days from June 4 to June 9 (Table A2). The number of piles driven per day was 2 to 3, with a mean total duration spent pile driving at each site of around 7 minutes (range 2 to 13 minutes). The mean cumulative SEL per session was 171.8 dB (range 149.0 to 202.5 dB), although note that one relatively high value (202.5 dB at Miner Slough near Cache Slough on June 6) skewed the mean upwards. The pile in Grizzly Bay was not actually driven, but simply pushed into the soft muddy bottom.

The calculated distance up to which the proposed non-auditory tissue injury thresholds for vibratory driving of Hastings (2010) would have extended, based on cumulative SEL at each location, was generally minimal: 3.6 m or less for larval delta smelt; around 30 cm or less for adult delta smelt; and 10 cm or less for juvenile Chinook salmon, juvenile/adult steelhead and adult Chinook salmon (Table A2). The exception was the aforementioned site with high cumulative SEL, where the distance was considerably greater: for larval delta smelt, the distance affected at that site was 58.4 m (192 feet), and for adult delta smelt, the distance affected was 5.1 m (17 feet) (Table A2).

Table A2. Summary of Pile Driving at Water Quality Monitoring Piles, June 2015, Including Cumulative Sound Exposure Level (SEL).

Date	Start	Stop	Location	Duration Driven (Minutes: seconds)	Cum. SEL (dB)	Distance Exceeding Proposed Non-Auditory Tissue Damage Threshold (Hastings 2010), Meters[1]			
						191 dB (larval delta smelt)	206.9 dB (adult delta smelt)	215.6 dB (juvenile Chinook salmon)	234 dB (juvenile/adult steelhead; adult Chinook salmon)
4-Jun-15	8:52	9:00	Fisherman's Cut	0:08:00	150.4	0.02	0.00	0.00	0.00
	12:30	12:36	Franks Tract	0:06:00	149	0.02	0.00	0.00	0.00
5-Jun-15	7:12	7:20	Twitchell Island	0:08:00	171.7	0.52	0.05	0.01	0.00
	11:30	11:42	Sacramento River No. 1	0:12:00	178.2	1.40	0.12	0.04	0.00
6-Jun-15	8:00	8:11	Liberty Island No. 1 (Left)[2]	0:11:00	180.2	2.36	0.21	0.07	0.00
	8:30	8:43	Liberty Island No. 2 (Right)[2]	0:13:00	176				
	12:03	12:10	Miner Slough	0:07:00	202.5	58.43	5.09	1.68	0.08
8-Jun-15	7:11	7:14	Steamboat Slough	0:02:09	172.9	0.62	0.05	0.02	0.00
	8:54	8:59	Sacramento River No. 2	0:05:08	184.3	3.58	0.31	0.10	0.00
9-Jun-15	7:25	7:31	Honker Bay	0:05:42	167.4	0.27	0.02	0.01	0.00
	9:52	9:59	Ryer Island	0:06:18	157	0.05	0.00	0.00	0.00
10-Jun-15[3]	7:56	8:01	Grizzly Bay	0:04:48	147.4	Pile was pushed into muddy bottom rather than driven			

Notes:

[1] Based on proposed thresholds of Hastings (2010) for a) mass ≤ 0.6 g (191 dB, e.g., larval delta smelt); b) for fish between 0.6 and 102 g mass: cumulative SEL = 195.28 + 19.28*log10(mass), where mass is 4.0 g for a 70-mm delta smelt and 11.4 g for a 90-mm juvenile spring-run Chinook salmon; and c) mass ≥ 102 g (234 dB, e.g., for juvenile and adult steelhead, and for adult Chinook salmon).

[2] The pile was a double pile , with the individual piles approximately 5 ft apart (treated as the same location for the pile-driving analysis)

[3] Pile did not require driving and was simply pushed into the muddy bottom.

Source: Mahmodi, pers. comm. (pile driving data); distances exceeding thresholds developed by ICF.

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Appendix I: Compensatory Mitigation Proof of Purchase

SUTTER BASIN CONSERVATION BANK
AGREEMENT FOR SALE OF CONSERVATION CREDITS
Permit No. 2081-2014-026-03

This Agreement is entered into this 15th day of June, 2015 by and between **WESTERVELT ECOLOGICAL SERVICES** (Bank Owner) and **CALIFORNIA DEPARTMENT OF WATER RESOURCES** (Project Applicant), jointly referred to as the "Parties," as follows:

RECITALS

A. The Bank Owner has developed the Sutter Basin Conservation Bank located in Sutter County, California; and

B. The Bank was approved by the U. S. Fish and Wildlife Service on **May 16th, 2008**, and California Department of Fish and Wildlife on **October 26th, 2011** (jointly referred to as "Agencies") and is currently in good standing with these agencies; and

C. The Bank has received approval from the Agencies to offer *giant garter snake* credits for sale as compensation for the loss of giant garter snake (*Thamnophis gigas*) through the *Sutter Basin Conservation Bank Agreement* (Bank Agreement); and

D. The minimum credit unit for purchase at the bank is no less than one hundredth of a credit; and

E. Project Applicant is seeking to implement the **Emergency Drought Barrier Project** described on Exhibit "A" attached hereto (Project), which would unavoidably and adversely impact giant garter snake habitat, and seeks to compensate for the loss of giant garter snake habitat by purchasing 1.0 Conservation Credits from the Bank; and

F. 1.0 Conservation Credit equals 1.0 acre of giant garter snake habitat; and

G. Project Applicant has been authorized by the California Department of Fish and Wildlife (CDFW), **Permit No. 2081-2014-026-03,** to purchase from the Bank **1.0 Conservation Credit** upon confirmation by the Bank Owner of credit availability/adequate balance of credits remaining for sale; and

H. Project Applicant desires to purchase from Bank and Bank desires to sell to Project Applicant **1.0 Conservation Credit;**

NOW, THEREFORE, THE PARTIES AGREE AS FOLLOWS:

1. Bank hereby sells to Project Applicant and Project Applicant hereby purchases from Bank **1.0 Conservation Credit** for the purchase price of **$55,000**. The Bank will then deliver to Project Applicant an executed Bill of Sale in the manner and form as attached hereto and marked Exhibit "B". The purchase price for said credits shall be paid by check, cashier's check or, at the option of Bank, wire transfer of funds according to written instructions by Bank to Project Applicant.

2. The sale and transfer herein is not intended as a sale or transfer to Project Applicant of a security, license, lease, easement, or possessory or non-possessory interest in real property, nor the granting of any interest of the foregoing.

3. Project Applicant shall have no obligation whatsoever by reason of the purchase of the Conservation Credits, to support, pay for, monitor, report on, sustain, continue in perpetuity, or otherwise be obligated or liable for the success or continued expense or maintenance in perpetuity of the credits sold, or the Bank. Pursuant to the Bank Agreement and any amendments thereto, Bank shall monitor and make reports to the appropriate agency or agencies on the status of any Conservation Credits sold to Project Applicant. Bank shall be fully and completely responsible for satisfying any and all conditions placed on the Bank or the Conservation Credits by all state or federal jurisdictional agencies.

4. The Conservation Credits sold and transferred to Project Applicant shall be non-transferable and non-assignable, and shall not be used as compensatory mitigation for any other Project or purpose, except as set forth herein.

5. Project Applicant hereby commits to purchase the Credits and in association therewith shall tender payment for the Credits no later than 30 days from the date of this Agreement.

6. Upon purchase of the credits specified in paragraph D above, the Bank shall submit to the parties listed in the Notices section of the Bank Agreement / Bank Enabling Instrument, copies of the: a) Agreement for Sale of Conservation Credits; b) Bill of Sale; c) Payment Receipt; and d) an updated ledger. The updated inventory / ledger must detail: i) Project Applicant; ii) Project Name; iii) Status (sale complete/sale not complete); iv) Credit Sale Date; v) Incidental Take Permit No.; vi) U.S. Army Corps of Engineers File Number (if applicable); vii) Total Number of Credits Authorized to Sell; viii) Total Number of Credits Sold to Date (inclusive); and ix) Balance of all Credits Available. The inventory / ledger should include all sales data from bank opening/establishment to the present.

IN WITNESS WHEREOF, the parties have executed this Agreement the day and year first above written.

BANK:

SUTTER BASIN CONSERVATION BANK
WESTERVELT ECOLOGICAL SERVICES, LLC

By: _____ Date: 6/10/2015

PROJECT APPLICANT:

CALIFORNIA DEPARTMENT OF WATER RESOURCES

By: _____ Date: 6/15/15

Paul A. Marshall, Chief, Bay Delta Office

Exhibit "A"

DESCRIPTION OF PROJECT TO BE MITIGATED

The Emergency Drought Barrier Project is limited to the installation and removal of one rock barrier weir structure, and as necessary geologic exploration. Once the barrier material has been removed from the West False River location, it will be stockpiled at a site in Rio Vista.
The Project is located at West False River, which is a tributary to the San Joaquin River; Latitude 38.057057 N, Longitude 121.670432 W, Township 3N, Range 3E, U.S. Geological Survey map Jersey Island; Contra Costa County. The barrier site is located approximately 0.4 mile east of the confluence of West False River and the San Joaquin River, between Jersey Island and Bradford Island in Contra Costa County.

Exhibit "B"

BILL OF SALE

Permit No. 2081-2014-026-03

In consideration of **$55,000**, receipt of which is hereby acknowledged, WESTERVELT ECOLOGICAL SERVICES, LLC does hereby bargain, sell and transfer to CALIFORNIA DEPARTMENT OF WATER RESOURCES (Applicant), **1.0 Conservation Credit**, in the *Sutter Basin Conservation Bank* in Sutter County, California, developed, and approved by the U. S. Fish and Wildlife Service and the California Department of Fish and Wildlife.

Westervelt Ecological Services, LLC (Owner) represents and warrants that it has good title to the credits, has good right to sell the same, and that they are free and clear of all claims, liens, or encumbrances.

Westervelt Ecological Services, LLC (Owners) covenants and agrees with the buyer to warrant and defend the sale of the credits hereinbefore described against all and every person and persons whomsoever lawfully claiming or to claim the same.

DATED: 6/22/2015

Sutter Basin Conservation Bank,
Westervelt Ecological Services, LLC

By: _____

Exhibit "C"

Sutter Basin Conservation Bank
GIANT GARTER SNAKE CONSERVATION CREDITS: PAYMENT RECEIPT

PARTICIPANT INFORMATION

Name: California Department of Water Resources, Bay-Delta Office

Address: 1416 9th St., Rm 215-28
Sacramento, CA 95814

Telephone: (916) 653-9795

Contact: Michelle Wong

PROJECT INFORMATION

Project Description: Emergency Drought Barrier Project

Permit No.: 2081-2014-026-03

Species/Habitat Affected: Giant garter snake habitat

Credits to be Purchased: 1.0 Conservation Credit

Payment Amount: $55,000

Project Location: Approximately 0.4 miles east of the confluence of West False River and the San Joaquin River, between Jersey Island and Bradford Island.

County/Address: Contra Costa County

PAYMENT INFORMATION

Payee: Westervelt Ecological Services, LLC

Payer: California Department of Water Resources

Amount: Fifty-Five Thousand Dollars ($55,000)

Method of payment: Cash Check No. 417-623274 Money Order No.

Received by: _____ Date: 7/15/2015
(Signature)

Name: TRAVIS Hemmen Date: 7/15/2015

AGREEMENT FOR SALE OF CONSERVATION CREDITS
LIBERTY ISLAND CONSERVATION BANK
CDFW ITP No. 2081-2014-026-03

This Agreement is entered into this 12th day of June, 2015, by and between LIBERTY ISLAND HOLDINGS I, LLC (Bank Owner) and CALIFORNIA DEPARTMENT OF WATER RESOURCES (Project Applicant), jointly referred to as the "Parties," as follows:

RECITALS

A. Bank Owner has developed the Liberty Island Conservation Bank (Bank) located in Yolo County, California; and

B. The Bank was approved by the National Marine Fisheries Service (NMFS), the United States Fish and Wildlife Service (USFWS) and the California Department of Fish and Wildlife (CDFW) (collectively referred to as the "Agencies") on July 29, 2010 and is currently in good standing with the Agencies; and

C. The Bank has received approval from the Agencies to offer Chinook salmon, Central Valley steelhead, delta smelt, and longfin smelt conservation credits for sale as specified in the Liberty Island Conservation Bank Agreement (Bank Agreement). One conservation credit is equivalent to one acre of habitat as specified in the Bank Agreement; and

D. Project Applicant is seeking to implement the project described on Exhibit "A" attached hereto (Project), which would unavoidably and adversely impact habitat thereon, and seeks to compensate for the loss of habitat by purchasing conservation credits from Bank; and

E. Project Applicant has been authorized by CDFW under Incidental Take Permit (ITP) No. 2081-2014-026-03 to purchase 4.9 acres of smelt/salmonid credits from a CDFW-approved mitigation or conservation bank to mitigate for the impact on delta smelt, longfin smelt and Chinook salmon associated with the Project; and

F. Project Applicant desires to purchase from Bank Owner and Bank Owner desires to sell to Project Applicant 4.9 acres of smelt/salmonid conservation credits.

NOW, THEREFORE, THE PARTIES AGREE AS FOLLOWS:

1. Bank Owner hereby agrees to sell to Project Applicant and Project Applicant hereby purchases from Bank Owner 4.9 acres of smelt/salmonid conservation credits (Conservation Credits) for the purchase price of $735,000.00 (Purchase Price), in accordance with the terms hereof. The Purchase Price for the Conservation Credits shall be paid by wire transfer of funds or by check payable to "Liberty Island Holdings I, LLC." Upon receipt of the Purchase Price, Bank Owner will deliver to Project Applicant an executed Bill of Sale in the form attached hereto as Exhibit "B."

2. The sale and transfer of the Conservation Credits described herein is not intended as a sale or transfer to Project Applicant of a security, license, lease, easement, or possessory or non-possessory interest in real property, nor the granting of any interest of the foregoing.

3. Project Applicant shall have no obligation whatsoever by reason of the purchase of the Conservation Credits, to support, pay for, monitor, report on, sustain, continue in perpetuity, or otherwise

be obligated or liable for the success or continued expense or maintenance in perpetuity of the Conservation Credits sold, or the Bank. Pursuant to the Bank Agreement and any amendments thereto, Bank Owner shall monitor and make reports to the appropriate agency or agencies on the status of any Conservation Credits sold to Project Applicant. Bank Owner shall be fully and completely responsible for satisfying any and all conditions placed on the Bank or the Conservation Credits by all state or federal jurisdictional agencies.

4. The Conservation Credits sold and transferred to Project Applicant shall be non-transferable and non-assignable, and shall not be used as compensatory mitigation for any other Project or purpose, except as set forth herein.

5. Project Applicant must deliver the Purchase Price to Bank Owner within 60 days of the date of this Agreement. After the 60 day period this Agreement be considered null and void and Bank Owner shall have no further obligations hereunder.

6. Upon purchase of the Conservation Credits specified above, Bank Owner shall complete The Payment Receipt form attached hereto as Exhibit "C", and shall submit the completed Payment Receipt to the Agencies.

IN WITNESS WHEREOF, the parties have executed this Agreement the day and year first above written.

BANK OWNER:	PROJECT APPLICANT:
LIBERTY ISLAND HOLDINGS I, LLC	STATE OF CALIFORNIA DEPARTMENT OF WATER RESOURCES
By: _____	By: _____
Name: **Wildlands, Manager**	Name: Paul A. Marshall
Its: **Mark Heintz, Manager**	Its: Chief, Bay Delta Office
Date: 6/12/2015	Date: 6/15/15

Exhibit “A”

DESCRIPTION OF PROJECT
TO BE
MITIGATED

The Emergency Drought Barrier Project is limited to the installation and removal of one rock barrier weir structure, and as necessary geologic exploration. Once the barrier material has been removed from the West False River location, it will be stockpiled at a site in Rio Vista.

The Project is located at West False River, which is a tributary to the San Joaquin River; Latitude 38.057057 N, Longitude 121.670432 W, Township 3N, Range 3E, U.S. Geological Survey map Jersey Island; Contra Costa County. The barrier site is located approximately 0.4 mile east of the confluence of West False River and the San Joaquin River, between Jersey Island and Bradford Island in Contra Costa County.

*****

Exhibit "B"

BILL OF SALE

Contract # LICB-15-33

CDFG ITP No. 2081-2014-026-03

In consideration of $735,000.00, receipt of which is hereby acknowledged, LIBERTY ISLAND HOLDINGS I, LLC (Bank Owner) does hereby bargain, sell and transfer to CALIFORNIA DEPARTMENT OF WATER RESOURCES 4.9 acres of Salmonid/Smelt Restoration Conservation Credits in the Liberty Island Conservation Bank in Yolo County, California, developed, and approved by the National Marine Fisheries Service, the U.S. Fish and Wildlife Service, and the California Department of Fish and Game.

Bank Owner represents and warrants that it has good title to the credits, has good right to sell the same, and that they are free and clear of all claims, liens, or encumbrances.

Bank Owner covenants and agrees with the buyer to warrant and defend the sale of the credits hereinbefore described against all and every person and persons whomsoever lawfully claiming or to claim the same.

DATED: June 22, 2015

LIBERTY ISLAND HOLDINGS I, LLC

By: _____
Name: **Wildlands, Manager**
Its: **Mark Heintz, Manager**

Exhibit "C"

LIBERTY ISLAND CONSERVATION BANK
CONSERVATION CREDITS: PAYMENT RECEIPT

PARTICIPANT INFORMATION

Name: CALIFORNIA DEPARTMENT OF WATER RESOURCES

Address: Bay-Delta Office
1416 Ninth Street, Rm 215-28
Sacramento, CA 95814

Telephone: (916) 653-9795

Contact: Michelle Wong, Engineer, Water Resources

PROJECT INFORMATION

Project Description: Emergency Drought Barrier Project

CDFG File Number: 2081-2014-026-03

Species/Habitat Affected: Salmonids, delta smelt and longfin smelt

Credits to be Purchased: 4.9 acres of Conservation Credits

Payment Amount: $735,000

Project Location: West False River, Contra Costa County (Lat 38.057057N, Long 121.670432W)

PAYMENT INFORMATION

Payee: LIBERTY ISLAND HOLDINGS I, LLC

Payer: CALIFORNIA DEPARTMENT OF WATER RESOURCES

Amount: Seven Hundred Thirty-Five Thousand and No/100ths Dollars ($735,000.00)

Method of payment: Cash _____ Check No. 06-003541 Money Order No._____

Received by: _____ Date: 7-9-2015
Name: **Wildlands, Manager**
Title: **Mark Heintz, Manager**

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Revised: 06/22/2015

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