

RECLAMATION


Managing Water in the West

Categorical Exclusion Checklist

Mechanical Harvesting of Non-Native Invasive Aquatic Weeds at the Rock Slough Fish Screen 2017

CEC-17-035

Prepared by:


Rain L. Emerson
Supervisory Natural Resources Specialist
South-Central California Area Office

Date:

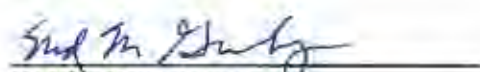
12/04/2017

Concurred by:

See Attachment A
Scott Williams, Archaeologist
Mid-Pacific Regional Office
Regional Archeologist concurred with Item 8. Their determination has been placed within the project file.

Date: See Attachment A

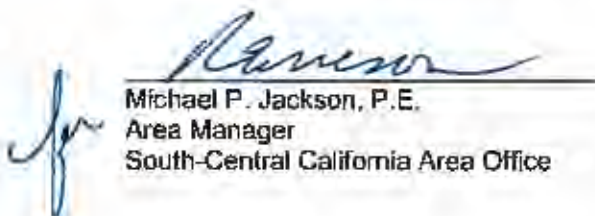
Concurred by:


Ned M. Gruenhagen
Wildlife Biologist
South-Central California Area Office

Date:

12/04/2017

Approved by:


Michael P. Jackson, P.E.
Area Manager
South-Central California Area Office

Date:

12/04/2017



Background

The Rock Slough Fish Screen (RSFS) facility is located at the junction Bureau of Reclamation's (Reclamation) unlined Contra Costa Canal (Canal) and Rock Slough, approximately four miles southeast of the town of Oakley, California (see Figure 1). Construction on the RSFS by Reclamation began in 2009 in order to comply with requirements of the Central Valley Project Improvement Act and the Los Vaqueros Biological Opinion issued by the U.S. Fish and Wildlife Service in 1993. The purpose of the RSFS facility is to provide protection to the federally threatened Delta smelt (*Hypomesus transpacificus*), threatened spring-run Chinook salmon (*Oncorhynchus tshawytscha*), threatened Central Valley steelhead (*O. mykiss*), endangered winter-run Chinook salmon (*O. tshawytscha*), and threatened North American green sturgeon (*Acipenser medirostris*), while allowing diversions to serve Contra Costa Water District's (CCWD's) water users. Major construction work at the RSFS is now substantially complete; however, mechanical, safety and operational issues with the facility remain unresolved and are currently being evaluated by Reclamation and CCWD. Consequently, the RSFS is not considered fully operational.

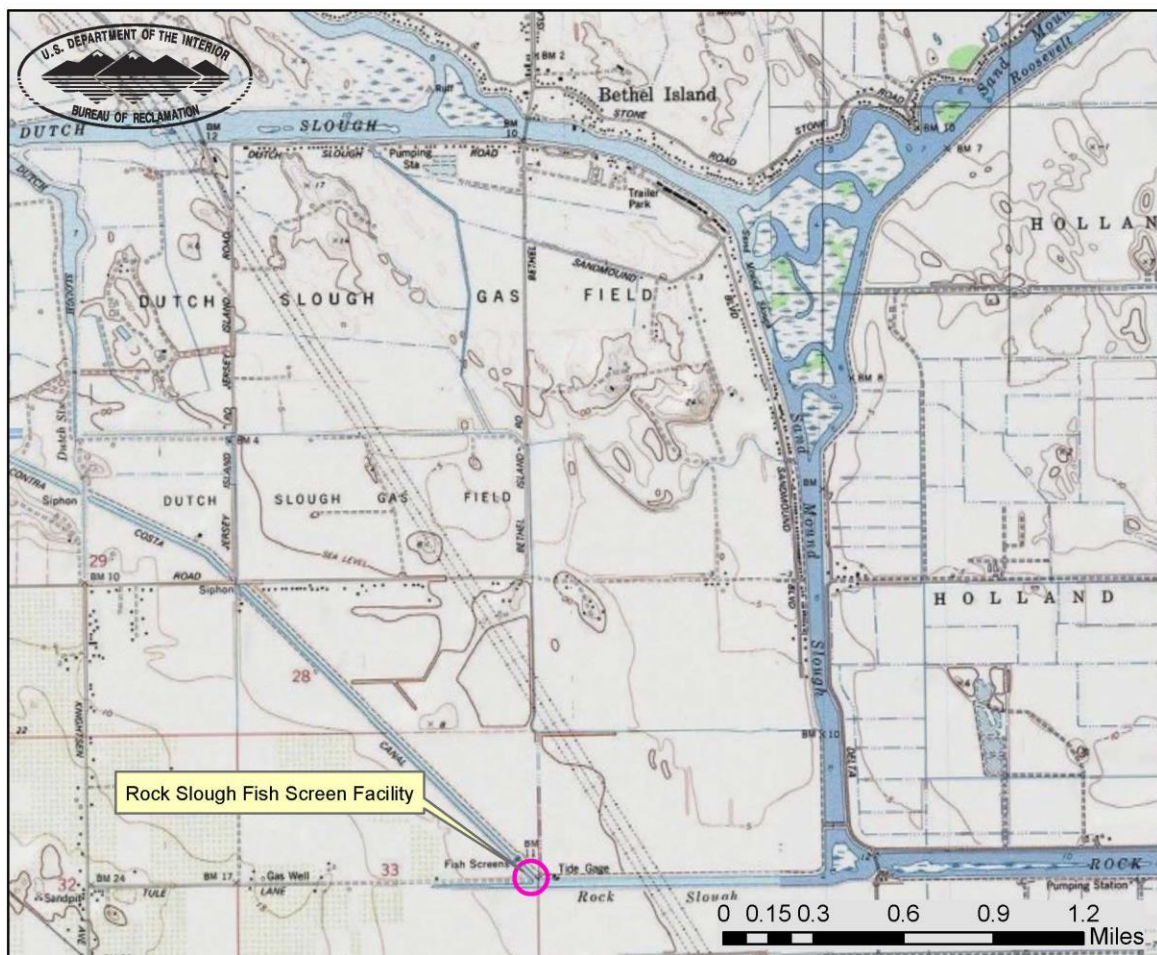


Figure 1 Proposed Action Area

On November 10, 2015, Reclamation completed Categorical Exclusion Checklist (CEC)-15-041 and authorized CCWD to use a mechanical harvester in order to remove a large mass of aquatic invasive weeds in front of the RSFS and within the Rock Slough extension.

On May 11, 2016 CCWD observed a differential at the RSFS in excess of 3 feet. To try and lower the differential CCWD sought to operate the rake system and found that it was unable to commence operations due to a mass of weeds that prevented the rakes from entering the water. To avoid damage to the fish screen, the block panel was lifted and differential at the screen was reduced. In order to be able to re-install the block panel the large mass of weeds that had built up since the end of November 2015 had to be removed. As the situation compromised the structural integrity of the fish screen needed to protect listed fish species, Reclamation declared an emergency and completed emergency consultation with the U.S. Fish and Wildlife Service (FWS) and the National Marine Fisheries Service (NMFS). FWS and NMFS acknowledged Reclamation's request for emergency consultation and requested implementation of environmental commitments and monitoring for listed species. The environmental commitments were implemented and monitoring was conducted during mechanical harvesting. No federally listed species were encountered during the mechanical harvesting.

Reclamation is currently completing separate NEPA review on the CCWD RSFS Facility Improvement Project which is designed to address mechanical failures, hydraulic fluid releases, excessive maintenance, and other deficiencies and to allow RSFS to be operated more safely, effectively, and efficiently. Mechanical harvesting of aquatic weeds is included as one of the activities for the Improvement Project; however, weed growth is currently compromising the operation of the RSFS and mechanical harvesting to prevent a differential at the screen is needed. On June 29, 2017, Reclamation received a non-jeopardy biological opinion (NMFS File Number WCR-2017-6161) from NMFS for the RSFS Facilities Improvement Project (Attachment B). On November 2, 2017, Reclamation received a memorandum from FWS amending the 2005 biological opinion for operation and maintenance on Reclamation lands within the South-Central California Area Office (Service File Number 08FBDT00-2017-F-0072) to include the RSFS Facilities Improvement Project (Attachment C). However, as the NEPA review for the Improvement Project is not anticipated to be completed until early 2018, Reclamation is preparing this CEC to address the need for mechanical harvesting right now.

Nature of the Action

CCWD, pursuant to their operating agreement (Contract No. 14-06-200-6072A), proposes to mechanically harvest aquatic weeds from the area in front of the RSFS, the Rock Slough Extension, and from the area downstream of the fish screen and upstream of the Rock Slough Headworks (Figure 2). No ground disturbance would occur in order to complete the Proposed Action.

CCWD will contract out for mechanical harvesting of the aquatic weeds. Since there are no boat ramps at the RSFS, the harvester will be deployed in the river by a crane placed in front of and behind the RSFS. The harvester (see Figure 3 for an example of a mechanical harvester) will cut the weeds at a depth of approximately 5 feet below the water surface. In shallower areas (six feet deep or less), the harvester will cut the weeds as close to the bottom of the slough or Canal

as practicable. No disturbance of the river's bottom would occur. Cut weeds will then be pulled up onto the harvester via conveyor belt until the harvester is full. Once full, the weeds will be pulled off the harvester by the crane at the RSFS. The aquatic weeds will be dried on site within the drying area that is currently used to dry aquatic weeds removed by the RSFS rakes (see Figure 2). Once the weeds have dried out sufficiently, they will either be removed or composted on site.

The proposed harvesting area in front of the RSFS and Rock Slough extension is estimated at approximately 4 acres and the area within the Contra Costa Canal downstream of the fish screen but upstream of the headworks is estimated at 2 acres. Since the amount of materials is significantly less than what has been around the RSFS in 2015 and 2016, CCWD anticipates that the total time to harvest is expected to take approximately two to three days to complete.

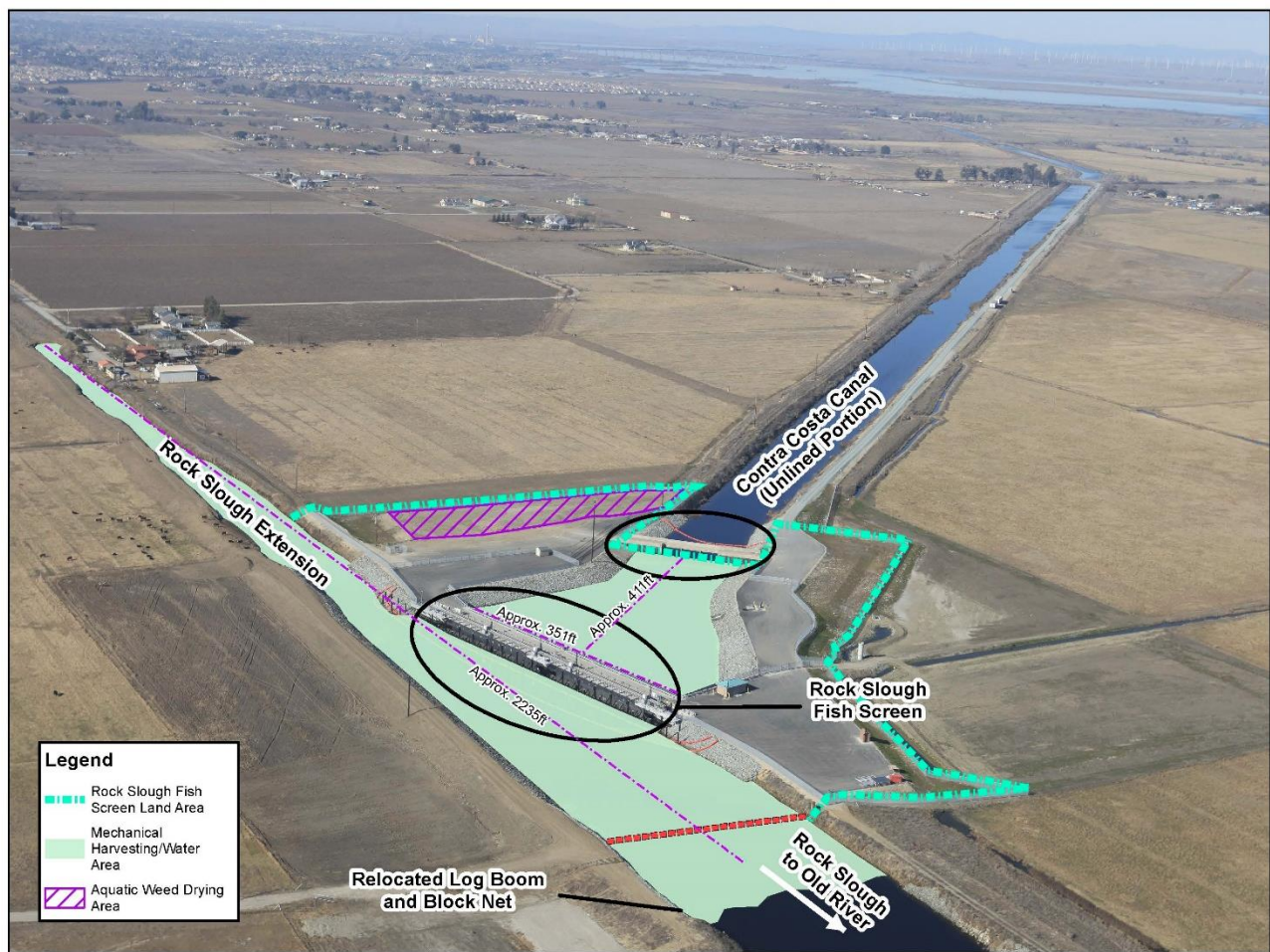


Figure 2 Proposed Mechanical Harvesting Action Area



Figure 3 Example of a Mechanical Harvester

Environmental Commitments

CCWD shall implement the following as part of the Proposed Action:

- All applicable conservation measures, reasonable and prudent measures, and terms and conditions in NMFS' Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the RSFS Facilities Improvement Project (WCR-2017-6161).
- All applicable conservation measures, reasonable and prudent measures, and terms and conditions in FWS' amendment to the 2005 Biological Opinion for the RSFS Facilities Improvement Project (08FBDT00-2017-F-0072).

Environmental consequences for biological resources assume the measures specified will be fully implemented.

Exclusion Category

516 DM 14.5 C (3). *Minor construction activities associated with authorized projects which correct unsatisfactory environmental conditions or which merely augment or supplement, or are enclosed within existing facilities.*

Evaluation of Criteria for Categorical Exclusion

Below is an evaluation of the extraordinary circumstances as required in 43 CFR 46.215.

Extraordinary Circumstance	No	Uncertain	Yes
1. This action would have a significant effect on the quality of the human environment (40 CFR 1502.3).	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. This action would have highly controversial environmental effects or involve unresolved conflicts concerning alternative uses of available resources (NEPA Section 102(2)(E) and 43 CFR 46.215(c)).	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. This action would have significant impacts on public health or safety (43 CFR 46.215(a)).	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. This action would have significant impacts on such natural resources and unique geographical characteristics as historic or cultural resources; parks, recreation, and refuge lands; wilderness areas; wild or scenic rivers; national natural landmarks; sole or principal drinking water aquifers; prime farmlands; wetlands (EO 11990); flood plains (EO 11988); national monuments; migratory birds; and other ecologically significant or critical areas (43 CFR 46.215 (b)).	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. This action would have highly uncertain and potentially significant environmental effects or involve unique or unknown environmental risks (43 CFR 46.215(d)).	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. This action would establish a precedent for future action or represent a decision in principle about future actions with potentially significant environmental effects (43 CFR 46.215 (e)).	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. This action would have a direct relationship to other actions with individually insignificant but cumulatively significant environmental effects (43 CFR 46.215 (f)).	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Extraordinary Circumstance	No	Uncertain	Yes
8. This action would have significant impacts on properties listed, or eligible for listing, on the National Register of Historic Places as determined by Reclamation (LND 02-01) (43 CFR 46.215 (g)).	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. This action would have significant impacts on species listed, or proposed to be listed, on the List of Endangered or Threatened Species, or have significant impacts on designated critical habitat for these species (43 CFR 46.215 (h)).	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. This action would violate a Federal, tribal, State, or local law or requirement imposed for protection of the environment (43 CFR 46.215 (i)).	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. This action would affect ITAs (512 DM 2, Policy Memorandum dated December 15, 1993).	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. This action would have a disproportionately high and adverse effect on low income or minority populations (EO 12898) (43 CFR 46.215 (j)).	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. This action would limit access to, and ceremonial use of, Indian sacred sites on Federal lands by Indian religious practitioners or significantly adversely affect the physical integrity of such sacred sites (EO 13007, 43 CFR 46.215 (k), and 512 DM 3)).	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. This action would contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area or actions that may promote the introduction, growth, or expansion of the range of such species (Federal Noxious Weed Control Act, EO 13112, and 43 CFR 46.215 (l)).	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

NEPA Action: Categorical Exclusion

The Proposed Action is covered by the exclusion category and no extraordinary circumstances exist. The Action is excluded from further documentation in an EA or EIS.

Attachment A: Cultural Resources Determination

CULTURAL RESOURCES COMPLIANCE
Division of Environmental Affairs
Cultural Resources Branch (MP-153)

MP-153 Tracking Number: 17-SCAO-237

Project Name: Mechanical Harvesting of Non-Native Invasive Aquatic Weeds at the Rock Slough Fish Screen 2017

NEPA Document: CEC-17-035

NEPA Contact: Rain Emerson, Natural Resource Specialist

MP 153 Cultural Resources Reviewer: Scott Williams, Archaeologist



Date: August 7, 2017

Reclamation proposed mechanically harvest aquatic weeds from the area in front of the Rock Slough Fish Screen (RSFS), the Rock Slough Extension, and from the area downstream of the fish screen and upstream of the Rock Slough Headworks. This is the type of undertaking that does not have the potential to cause effects to historic properties, should such properties be present, pursuant to the NHPA Section 106 regulations codified at 36 CFR § 800.3(a)(1). Reclamation has no further obligations under NHPA Section 106, pursuant to 36 CFR § 800.3(a)(1).

Contra Costa Water District, pursuant to their operating agreement (Contract No. 14-06-200-6072A), will mechanically harvest aquatic weeds from the area in front of the Rock Slough Fish Screen (RSFS), the Rock Slough Extension, and from the area downstream of the fish screen and upstream of the Rock Slough Headworks. No ground disturbance would occur in order to complete the Proposed Action.

This document is intended to convey the completion of the NHPA Section 106 process for this undertaking. I concur with item 8 that this action would not have significant impacts on properties listed, or eligible for listing, on the National Register of Historic Places as determined by Reclamation (LND 02-01) (43 CFR 46.215 (g)). Please retain a copy in the administrative record for this action. Should changes be made to this project, additional NHPA Section 106 review, possibly including consultation with the State Historic Preservation Officer, may be necessary. Thank you for providing the opportunity to comment.

**Attachment B: National Marine Fisheries Service
Biological Opinion for the RSFS Improvement Project
(File Number WCR-2017-6161)**

RECEIVED

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BUREAU OF RECLAMATION
SCCAO, FRESNO, CA



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
650 Capitol Mall, Suite 5-100
Sacramento, California 95814-4700

Refer to NMFS No: *WCR-2017-6161*

June 29, 2017

Rain L. Emerson
Supervisory Natural Resources Specialist
U.S. Bureau of Reclamation
Mid-Pacific Region
South-Central California Area Office
1243 N Street
Fresno, California 93721-1813

Re: Endangered Species Act Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the *Rock Slough Fish Screen Facilities Improvement Project* located in Contra Costa County, California.

Dear Ms. Emerson:

Thank you for your letter and biological assessment of December 21, 2016, requesting initiation of formal consultation with NOAA's National Marine Fisheries Service (NMFS) pursuant to section 7 of the Endangered Species Act of 1973 (ESA) (16 U.S.C. 1531 *et seq.*) for the proposed *Rock Slough Fish Screen Facilities Improvement Project* (Project). The facilities are owned by the U.S. Bureau of Reclamation and currently operated under an Assistance Agreement with the Contra Costa Water District.

In the enclosed biological opinion, NMFS concludes that the Project is not likely to jeopardize the continued existence of federally listed species. Critical habitat is not designated within the action area, therefore, consultation on designated critical habitats is not warranted. Additionally, NMFS has included an incidental take statement with non-discretionary terms and conditions is included.

This letter also transmits the results of the Essential Fish Habitat (EFH) consultation under the provisions of the Magnuson-Stevens Fishery Conservation and Management Act as amended (16 U.S.C. 1801 *et seq.*). NMFS has reviewed the likely effects of the proposed action on EFH and concluded that the action would adversely affect the EFH of Pacific Coast Salmon, therefore, we have included the results of that review in Section 3 of this document.



Please contact Bruce Oppenheim at the California Central Valley Office at 916-930-3603, or via e-mail at bruce.oppenheim@noaa.gov if you have any questions concerning this consultation, or if you require additional information.

Sincerely,

A handwritten signature in black ink, appearing to read "Barry A. Thom", followed by a small flourish.

Barry A. Thom
Regional Administrator

Enclosure

cc: California Central Valley Office
File: ARN 151422-WCR2014-SA00018

Kaylee Allen, U.S. Fish and Wildlife Service, Bay-Delta Office, 650 Capitol Mall, Suite 8-300, Sacramento, CA 95814-4700

Elizabeth Vasquez, U.S. Bureau of Reclamation, Central Valley Operations Office, 3310 El Camino Ave., Suite 300, Sacramento, CA 95821

J. Carl Dealy, U.S. Bureau of Reclamation, Tracy Office, 16650 Kelso Road, Byron, CA 94514-1909

Mark Seedall, Contra Costa Water District, P.O. Box H20, Concord, CA 94524-2099

Jim Starr, California Department of Fish and Wildlife, 2109 Arch Airport Rd, Stockton, CA 95206



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
650 Capitol Mall, Suite 5-100
Sacramento, California 95814-4700

**Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion and Magnuson-Stevens
Fishery Conservation and Management Act Essential Fish Habitat (EFH) Response**

Rock Slough Fish Screen Facilities Improvement Project

NMFS Consultation Number: ARN 151422WCR2014-SA00018 / PCTS# WCR-2017-6161

Action Agency: U.S. Bureau of Reclamation

Affected Species and NMFS's Determinations:

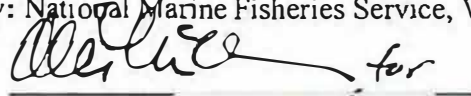
ESA-Listed Species	Status	Is Action Likely to Adversely Affect Species?	Is Action Likely to Jeopardize the Species?	Is Action Likely to Adversely Affect Critical Habitat?	Is Action Likely to Destroy or Adversely Modify Critical Habitat?
Sacramento River winter-run Chinook (<i>Oncorhynchus tshawytscha</i>)	Endangered	Yes	No	N/A	N/A
Central Valley spring-run Chinook (<i>O. tshawytscha</i>)	Threatened	Yes	No	N/A	N/A
California Central Valley steelhead (<i>O. mykiss</i>)	Threatened	Yes	No	N/A	N/A
Southern distinct population segment of North American green sturgeon (<i>Acipenser medirostris</i>)	Threatened	Yes	No	N/A	N/A

N/A = not applicable

Fishery Management Plan That Identifies EFH in the Project Area	Does Action Have an Adverse Effect on EFH?	Are EFH Conservation Recommendations Provided?
Pacific Coast Salmon	Yes	No

Consultation Conducted By: National Marine Fisheries Service, West Coast Region

Issued By:


Barry A. Thom
Regional Administrator

Date: June 29, 2017



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List of Acronyms

BA	Biological Assessment
BCF	Bioconcentration Factor
BMPs	Best Management Practices
Cal-EPA	California Environmental Protection Agency
CCWD	Contra Costa Water District
CDBW	California Division of Boating and Waterways
CDFG	California Department of Fish and Game (through 2012)
CDFW	California Department of Fish and Wildlife (beginning in 2013)
CDPR	California Department of Pesticide Regulation
cfs	cubic feet per second
cm	centimeters
CWT	coded wire tag
CVP	Central Valley Project
CY	cubic yards
DPS	distinct population segment
EFH	essential fish habitat
ESA	Endangered Species Act
ESU	evolutionarily significant unit
FL	Fork Length
FMP	Fishery Management Plan
IPMP	Integrated Pest Management Program
LC50	Lethal concentration where 50% tested die in a specified period of time
m	meter
mm	millimeter
mg/L	milligrams/liter
MSA	Magnuson-Stevens Fishery Conservation and Management Act
MSL	mean sea level
NGDV	National Geodetic Vertical Datum
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
PFMC	Pacific Fisheries Management Council
ppt	parts per thousand (unit)
ppm	parts per million (unit)
ppb	parts per billion (unit)
Reclamation	U.S. Bureau of Reclamation
RSFS	Rock Slough Fish Screen
SCADA	Supervisory Control and Data Acquisition stations
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VSP	viable salmonid population
WAPA	Western Area Power Administration

1. INTRODUCTION

This Introduction section provides information relevant to the other sections of this document and is incorporated by reference into Sections 2 and 3 below.

1.1 Background

The National Marine Fisheries Service (NMFS) prepared the biological opinion (opinion) and incidental take statement (ITS) portions of this document in accordance with section 7(b) of the Endangered Species Act (ESA) of 1973 (16 USC 1531 et seq.), and implementing regulations at 50 CFR 402.

We also completed an essential fish habitat (EFH) consultation on the proposed action, in accordance with section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act (MSA) (16 U.S.C. 1801 et seq.) and implementing regulations at 50 CFR 600.

We completed pre-dissemination review of this document using standards for utility, integrity, and objectivity in compliance with applicable guidelines issued under the Data Quality Act (DQA) (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001, Public Law 106-554). The document will be available through NMFS' Public Consultation Tracking System (<https://pcts.nmfs.noaa.gov/pcts-web/homepage.pcts>). A complete record of this consultation is on file at NMFS California Central Valley Office in Sacramento, California.

Contra Costa Water District (CCWD) conducts operations and maintenance (O&M) activities upstream of the Rock Slough Fish Screen (RSFS), along the unlined portion of the Contra Costa Canal (Canal) in the vicinity of the RSFS Facility, and in the surrounding area. The Canal was built by the U.S. Bureau of Reclamation (Reclamation) in 1937 as the first part of the Central Valley Project (CVP). The Canal runs from the Rock Slough Intake/RSFS in the Delta about 30 miles west to the San Francisco Bay area where it provides water to the cities of Martinez, Concord, Walnut Creek, and Pleasant Hill. The RSFS Facility (*i.e.*, fish screen, Headworks, afterbay, Flood Isolation Structure, Bridge, and maintenance building) is located at the junction of Reclamation's unlined Canal and Rock Slough, approximately four miles southeast of the first pumping plant (PP1) and the City of Oakley (Figure 1).

Reclamation began construction on the RSFS in 2009 in order to comply with requirements of the 1992 Central Valley Improvement Project Act (CVPIA) and the Los Vaqueros Project biological opinions (NMFS 1993, USFWS 1993). Major construction work at the RSFS was deemed by Reclamation to be substantially complete in 2011; however, mechanical, safety, and operational issues with the facility remain unresolved. Consequently, the RSFS is not considered by Reclamation and CCWD to be fully operational. Since 2011, NMFS has consulted on O&M activities as separate actions (*e.g.*, rake system improvements, mechanical weed control, and log boom placement). In order to facilitate the consultation process, Reclamation combined the improvements and O&M activities of the RSFS into one project, called the Rock Slough Fish Screen Facilities Improvement Project (Project).

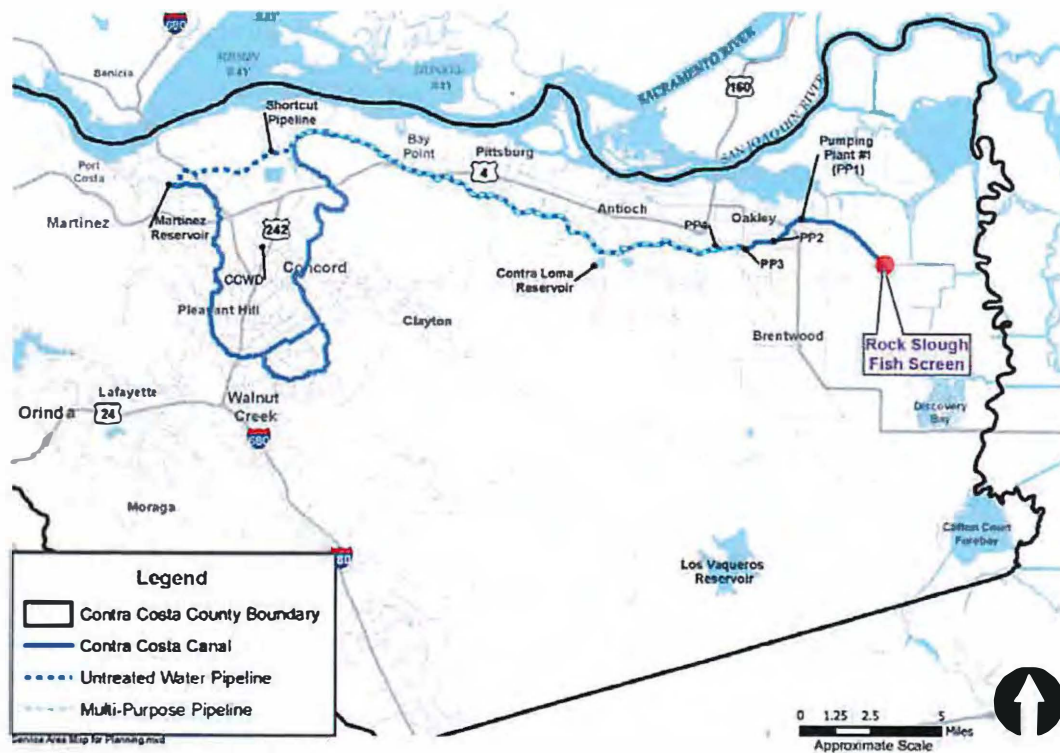


Figure 1. Vicinity map showing location of the RSFS in the Delta, Contra Costa Canal, and Pumping Plants (Reclamation 2016).

1.2 Consultation History

- June 4, 2009. NMFS issued a biological opinion to Reclamation on the long-term operations of the CVP and SWP (NMFS 2009). Annual incidental take was included for the Rock Slough intake for: 5 juvenile winter-run, 10 juvenile CV spring-run, 10 juvenile California Central Valley steelhead (CCV steelhead), and 0 Southern distinct population segment of North American green sturgeon (sDPS green sturgeon) until the RSFS was constructed. Once the RSFS became operational, the authorized incidental take would no longer apply.
- October 28, 2010. Reclamation requested an amendment to the Los Vaqueros Reservoir Project biological opinion (NMFS 1993) to bring it up to date and coordinate operations of CCWD's four diversions in the Delta with the operations of the CVP and SWP contained in USFWS (2008) and (NMFS) 2009. CCWD was the applicant.
- September 1, 2011. NMFS issued an insufficiency letter (NMFS 2011a) responding to Reclamation's October 28, 2010, requested amendment to the Los Vaqueros Reservoir Project biological opinion (NMFS 1993). NMFS recommended that O&M activities for CCWD's four screened diversions (*i.e.*, Old River, Rock Slough, Middle River, and Mallard Slough) be consolidated into one ESA section 7 consultation, to cover maintenance such as: cleaning of the fish screens, aquatic weed control, periodic desilting (dredging), and other activities not considered in previous biological opinions.

- February 17, 2012. NMFS received Reclamation's draft biological assessment (Reclamation 2012a) titled: *Transfer of Operations and Maintenance of the RSFS to CCWD*, and provided comments on February 24, 2012.
- May 22, 2015. NMFS receives Draft Project Description for the Rock Slough Fish Screen Facilities Improvement Project.
- May 29, 2015. Site visit and meeting at the RSFS Facility. The site visit was attended by USFWS, NMFS, CCWD, Reclamation, and Tenera Environmental, Inc. (Tenera). The purpose of the site visit and meeting was to discuss the proposed RSFS Facilities Improvement Project and to observe the operation of the RSFS rake cleaning system.
- September 24, 2015. NMFS provided comments on the Draft Project Description for the Project.
- December 1, 2016. RSFS site visit with Tenera and CCWD. The purpose of the site visit was to observe improvements in the rake cleaning system and efficiency of the block net under the re-deployed log-boom across Rock Slough.
- December 21, 2016. Reclamation requested initiation of formal consultation with NMFS for the Project and provided a BA (Reclamation 2016). Reclamation determined that the Project may affect ESA-listed species.
- January 18, 2017. Reclamation sends NMFS a supplemental letter to clarify that the Project is likely to adversely affect all NMFS species. In addition, Reclamation determined that there are no effects to designated critical habitat in the action area, and minimal adverse effects to EFH under the MSA.
- January 23, 2017. NMFS letter determined that the information provided in the BA is sufficient to initiate formal consultation.
- June 9, 2017. Reclamation modifies the project description in response to questions from NMFS (emails dated 5/15/17, 5/19/17, and 6/2/17). CCWD agrees to the changes and the addition of monitoring requirements during a conference call on June 7, 2017.
- June 21, 2017. The U.S. Corps of Engineers designated Reclamation as the lead Federal action agency to conduct the ESA section 7 consultation.

1.3 Proposed Federal Action

“Action” means all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies (50 CFR 402.02). The proposed Project contains the following main components:

- 1) improvements to the RSFS, as well as various site improvements and adjustments designed to address mechanical failures, hydraulic fluid releases, excessive maintenance, and other deficiencies to allow RSFS to be operated more safely, effectively, and efficiently;
- 2) administrative actions: such as the transfer of O&M activities from Reclamation to CCWD, land acquisition, and/or the issuance of land use authorizations; and
- 3) O&M activities of the RSFS and associated appurtenances.



Figure 2. Rock Slough Fish Screen showing facility structures (headworks, afterbay, canal, debris pits), aquatic weeds in 2015, and approximate location of re-located log boom in 2016.

1.3.1 Rock Slough Fish Screen Facility Improvements

A description of the RSFS Facility improvements, site access, equipment to be used, irrigation system improvements, and land encroachment repairs are provided below.

A. RSFS Rake Improvements

To ensure that screen approach velocities are uniform across the entire screen and do not exceed NMFS and USFWS screen criteria of 0.2 feet per second for protection of delta smelt (*Hypomesus transpacificus*), CCWD will replace the existing rakes (Figure 3) with new automated hydraulic rakes/heads, including four rakes/heads that will empty onto the debris conveyance system. The fully-automated rake cleaning system is controlled remotely from CCWD's office¹ through a series of water level sensors. The rake repairs include the following modifications: (1) replacement of the rake head with a re-designed head (see prototype rake, Figure 4) that will more effectively capture and remove debris, and clean the screen; (2) installation of hydraulic seal containment/cooling/alarm systems to return fluid to the hydraulic reservoir in the event of a hydraulic cylinder seal failure; and (3) re-programming of the rake head to provide multiple cleaning modes that will improve cleaning and enable testing of various debris removal and brush-only cycles. Although these modifications are anticipated to correct deficiencies in the current facilities, subsequent, iterative modifications may be required to achieve functional operation meeting the intended goals set for the RSFS Facility. Improvement of the rakes will not require any in-water work within Rock Slough.

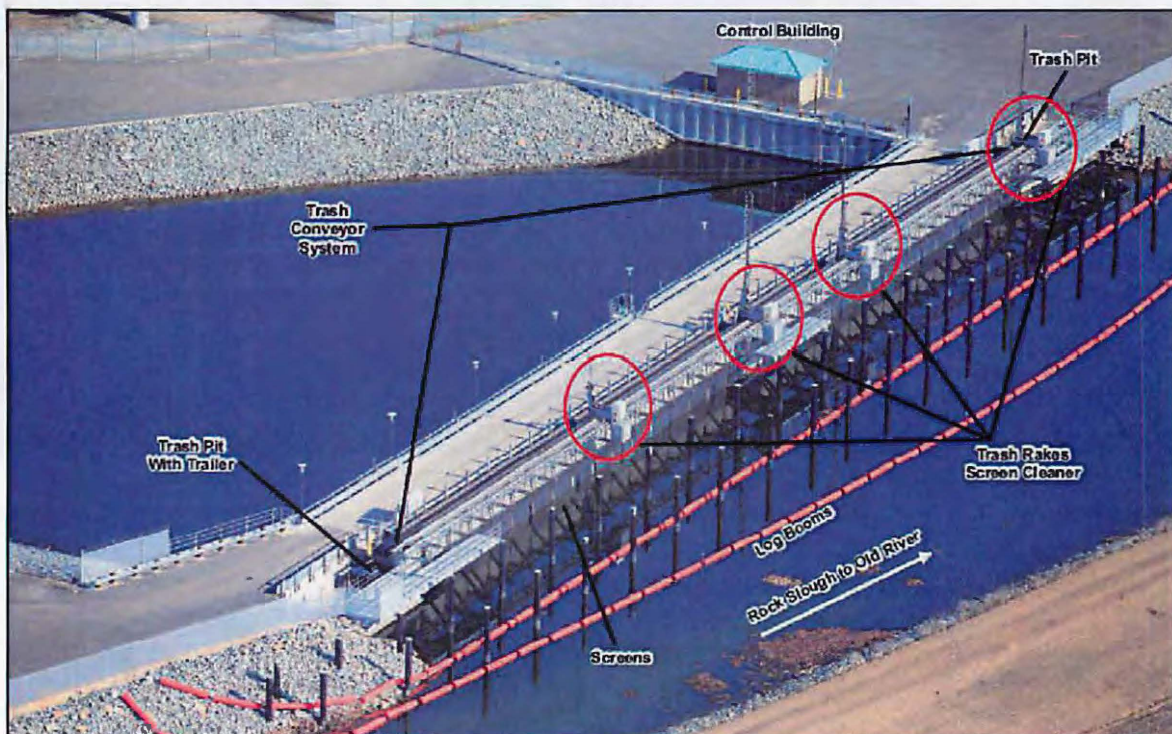


Figure 3. The existing RSFS Facility showing 4 automated hydraulic rakes (circled in red), trash pits, conveyor belt, and original log booms (Reclamation 2016).

The rake heads will be fabricated off-site and installed onto the RSFS. Installation will involve manual labor, movement of heavy loads with a crane or boom truck, and the use of hand tools. Installation of the new rakes is not anticipated to require more than 3 months.

¹ CCWD Operations Control Office is located at the Bollman Water Treatment Plant in Concord, California.



Figure 4. New prototype rake bucket (upper) and hydraulic arm (lower) operating at RSFS (May 29, 2015 site visit).

B. Debris Conveyance System Improvements

The existing concrete debris pits will be modified so that small tractors can be used to safely remove debris and carry debris to the drying area at the site. Improvements would consist of filling in an open concrete area under the conveyor belt where it discharges into the existing pit. The open area under the conveyor is lined with concrete. It will be filled with gravel and covered with concrete, and a bulkhead wall will be installed at the base of the conveyor belt where it discharges into the pit. The area to be filled is approximately 8 feet long, 5 feet in height, and approximately 12 feet wide. The bulkhead wall within the smaller debris pit will allow small tractors to pick up the debris that could build up in the open area under the conveyor belt that was otherwise not reachable with equipment. Improvements to the debris conveyance system will be completed in approximately 2 months.

C. Platform Extension

The existing platform system (which is segmented in three pieces, one on each side of Rock Slough, and a third in the middle to span across the full length of the screen) will be extended outward, away from the screen's face, to provide safe access to the rake system for maintenance in the event the rakes either stop operation or they need to be serviced at locations other than where the existing platforms currently provide access. Figure 5 shows the existing safety deck on the northeast side of the RSFS. The open-grated platform extensions will be fabricated off-site and installed at the RSFS. The work will be accomplished with hand tools and welding equipment. Movement of heavy loads will be accomplished with a crane or boom truck. Construction of the platform extensions will be completed in approximately 2 months. Installation of the platform extensions will not require any in-water work within Rock Slough.



Figure 5. Existing safety deck and hydraulic rakes on the northeast side of the RSFS (Reclamation 2016).

D. Boat Ramp Construction

CCWD will install two boat ramps (upstream and downstream of the RSFS) from July 1 through October 31; this time period includes both in-water work and land work. The ramps will provide access for inspection and maintenance of the in-water components of the RSFS. The boat ramps will also be used to launch vessels to deploy booms if there is an accidental release of fluids, to launch vessels for mechanical weed harvesting, application of aquatic herbicides, or for other procedures where water access may be needed. A silt curtain will be installed prior to in-water work in order to minimize the amount of turbidity during construction. The sites for the two boat ramps will be prepared by removing overlying rip rap and excavating into existing soils of levee banks to create ramps down to elevation minus 4 feet mean sea level (elevation referenced to NGDV 29). The site plan and the location of the boat ramps are shown in Figure 6.

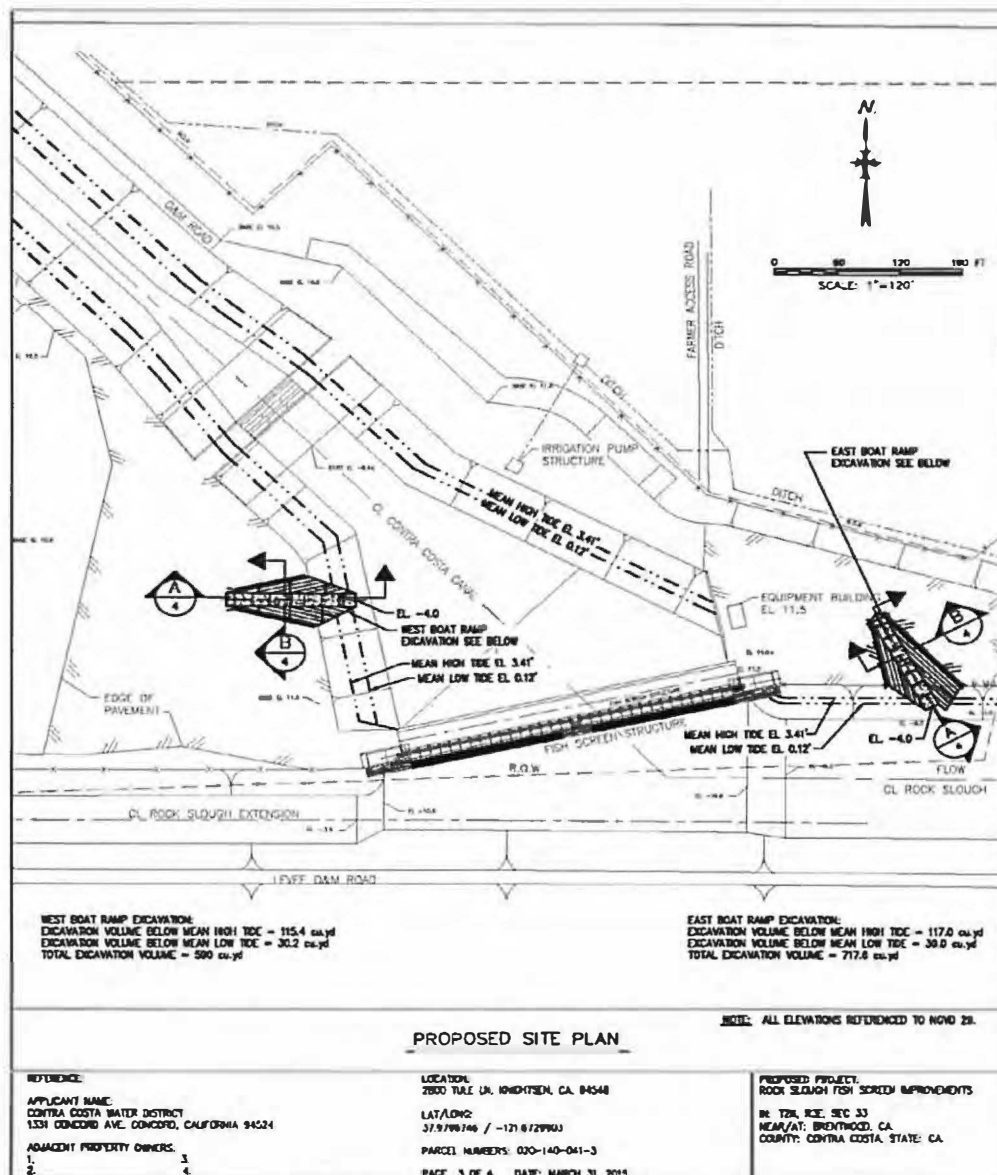


Figure 6. RSFS proposed boat ramp design and site plan (Reclamation 2016).

The west boat ramp (located in the afterbay, downstream of the RSFS) excavation volume below mean high tide is 115.4 cubic yards (CY), 30.2 CY below mean low tide, and total excavation volume is 590 CY. The east boat ramp (located in Rock Slough, upstream of the RSFS) excavation volume below mean high tide is 117.0 CY, 39.0 CY below mean low tide, and total excavation volume is 717.6 CY. The ramp surfaces will be precast reinforced concrete of an interlocking design that allows for settling and requires no concrete casting in or near the water. Construction of the boat ramps will involve cutting and removal of pavement, excavation of soils with conventional earth moving equipment, and a workboat. Construction is anticipated to require an excavator, wheeled front-end loader, and dump trucks for hauling excess material offsite for disposal. A workboat will be required for placement of silt curtains. Excavation will be followed by compaction of the subgrade using a plate or roller compactor. A layer of drain rock will be placed beneath the side slope rip rap and boat ramp precast concrete; this material will be placed with a combination of an excavator, front-end loader, and hand raking. Rip rap on the side slopes will be placed with an excavator and by some hand work. The precast sections of concrete may be placed using an excavator, front-end loader, fork lift, or mobile crane depending upon the type of equipment the contractor has on-site. Dewatering to construct the boat ramps will not be required. The material placement will be accomplished during low tide periods and only the boom of an excavator will enter the water. Before the use of any vehicles or equipment on-site, the vehicles and equipment will be thoroughly cleaned and inspected for fuel and oil leaks, and Reclamation's decontamination procedures will be followed (Reclamation 2012b). No leaking vehicles or equipment will be allowed on-site at any time.

E. Log Boom Placement

A log boom is positioned approximately 600 feet upstream of the RSFS and spans the width (approximately 165 feet) of Rock Slough. The log boom in this location could be modified in the near future to include a gate so that the downstream property owners can enter and exit the area via a boat. CCWD is monitoring the performance of the temporary anchor blocks monthly to ensure that no shifting has occurred. If shifting occurs, CCWD will adjust the blocks and/or install additional anchor blocks. A flatbed truck, dump truck, and a backhoe would be used to move or place new blocks. Previous placement of the temporary anchors was completed within 1 week and it would be expected to require the same amount of time to move or place new anchors.

These temporary anchors may remain for up to 5 years or until such time as the proposed Rock Slough Bridge is constructed by Caltrans (see NMFS 2016c). Once the Rock Slough Bridge is constructed, the log boom will likely be relocated and anchored upstream of the new bridge so that it is visible to boaters. At that time, CCWD will replace the temporary ecology blocks with more permanent pilings in order to anchor the log boom. The permanent log boom anchoring system will be installed in existing rip rap placed on the levee bank of the south side of Rock Slough and in an earthen sloped bank on the north side of Rock Slough. Construction of the pilings will take place above the mean high tide level within Rock Slough, on the stream side of the banks within Rock Slough. The piling anchors will require excavation to approximately 2 feet below ground surface to install a 6 foot by 6 foot concrete pad, 1 foot thick anchor pad, and a 2 foot diameter boring 7 feet below ground surface. Approximately 94 CY of levee material, consisting of silt, clay, and sand will be removed for each anchor; however, approximately 36

CY will be placed back over the top of the 36 square feet anchor pad and the material will be compacted.

Each anchor will permanently remove 58 CY of levee material for disposal off site. Where existing rip rap has been moved to facilitate construction of the anchors, the rip rap will be stored on site and moved back over the anchor pad after construction. Construction of the anchors may require access for a well drilling rig, concrete truck, small backhoe, and/or pickup trucks. Construction of the anchors will take up to 4 weeks to excavate, set forms, pour concrete, and to ensure that concrete has reached maximum strength prior to attaching the log boom to the anchors. The equipment for this work would be staged inside the fenced RSFS Facility, preferentially on paved areas.

Installation or movement of the log boom will be accomplished using a boat for in-water portions of the work and a skid steer or boom truck for shore operations. Once the log boom has been relocated to the new anchors, CCWD will inspect and maintain the log boom and anchors up to two times per year, or additionally should unexpected events occur that could affect the boom or supports (*e.g.*, large storm tides, earthquakes, *etc.*). If the proposed new location for the log boom proves to be problematic, then CCWD will consider either removing the log boom completely and/or installing the pilings in the current location of the relocated log boom. Considerations for the eventual final placement of the log boom will include navigational safety, requirements to maintain a block net long term, landowner permission to access the south side of Rock Slough, and maintenance activities associated with mechanical harvesting. CCWD expects that during the initial period of deployment it will gain a better understanding of the above considerations.

F. Irrigation System Improvements

When the RSFS was constructed, it was necessary to relocate the adjacent ranchers' irrigation system that had been located upstream of the Canal. The ranchers' irrigation system was relocated downstream of the fish screen and created a benefit to fish by screening an otherwise unscreened intake. However since the irrigation system was relocated there have been numerous issues related to the pumps, freshwater irrigation intake, and irrigation valves that will be addressed, as follows.

1. Pump Replacement:

As part of the Project, two existing pumps will be replaced by the neighboring ranchers. The existing 40 horse power (hp) two-stage bowl assembly will be replaced with a 25 hp single bowl assembly. The existing 5 hp mixed-flow bowl assembly will be replaced with a 10 hp axial-flow bowl assembly.

2. Freshwater Irrigation Intake Improvements:

When the relief panel at the RSFS was lifted in May and June of 2016, the ranchers installed a chain link fence around the freshwater intake in the afterbay as a means of limiting the amount of weeds that can directly impact the submerged water intake (Figure 7). However, the ranchers still must clean the debris from the submerged fence. In order to minimize safety concerns due to the cleaning of the submerged fence, CCWD will allow the ranchers access to the afterbay boat ramp so that the ranchers can use a small boat to clean the submerged fence around the intake.

3. Irrigation Valves:

There are two existing valves used to withdraw water from downstream of the RSFS to irrigate a private landowner's agricultural field. As shown in Figure 7, the two existing valves will be replaced and one new valve installed by the ranchers. All ditches and wetted areas will be avoided during access to the work sites. Each valve will require a 10 foot deep excavation over a 10 foot by 10 foot area. The spoils will be placed immediately next to the excavation site. Once the valve work is completed, the spoils will be placed back into the excavated area and any remaining spoils will be spread around the work area. All work will be conducted from May 1 through October 31. Once the valve work is completed, it is expected all O&M activities associated with the valve work will be conducted by the landowner (ranchers) pursuant to a Reclamation issued land use authorization. Reclamation will ensure that all the requirements from this ESA consultation will be included in agreements with landowners.

A. Site Access

The primary route to the Project area is from East Cypress Road in the City of Oakley (Figure 11). Construction crews and equipment will enter the Reclamation right-of-way on the existing northeast aggregate (gravel) maintenance road along the unlined portion of the Canal. Equipment and construction crews will travel approximately 1.5 miles along the northeast maintenance road towards the start of the unlined portion of the Canal near the confluence with Rock Slough where the fish screen is located. CCWD will likely need to access the south side of the log boom from Delta Road along an existing private gravel road (future Bethel Island Road Extension Right of Way).

B. Staging Areas & Parking

The RSFS Facility site includes substantial paved and unpaved areas that can be used for temporary construction and staging to accommodate construction equipment, materials, fuels, lubricants, and solvents. Petroleum products will be stored in areas with secondary containment and will be handled according to a spill prevention plan to be developed for the construction work before work begins.

C. Equipment

Excavators, backhoes, loaders, fork lifts, compaction equipment, work boats, welders, pavers, and dump trucks will be required for construction of the improvements. A crane or boom truck will be needed to maneuver the rakes into place and to set the precast sections of the boat ramps.

D. Fencing

The perimeter property boundary surrounding the Canal and the RSFS Facility has been secured by installation of a 6-foot tall chain link fence. In the event that a settlement is not made with the property owner on the encroachment land area matter described above, CCWD intends to place a temporary fence (three-strand barbed wire) or fiberglass markers on the correct property line approximately 50 feet from the existing fence. This will ensure that all future work and maintenance remains within the RSFS Facility property boundary. CCWD will likely continue to use and maintain this property until the land area encroachment issue is resolved.

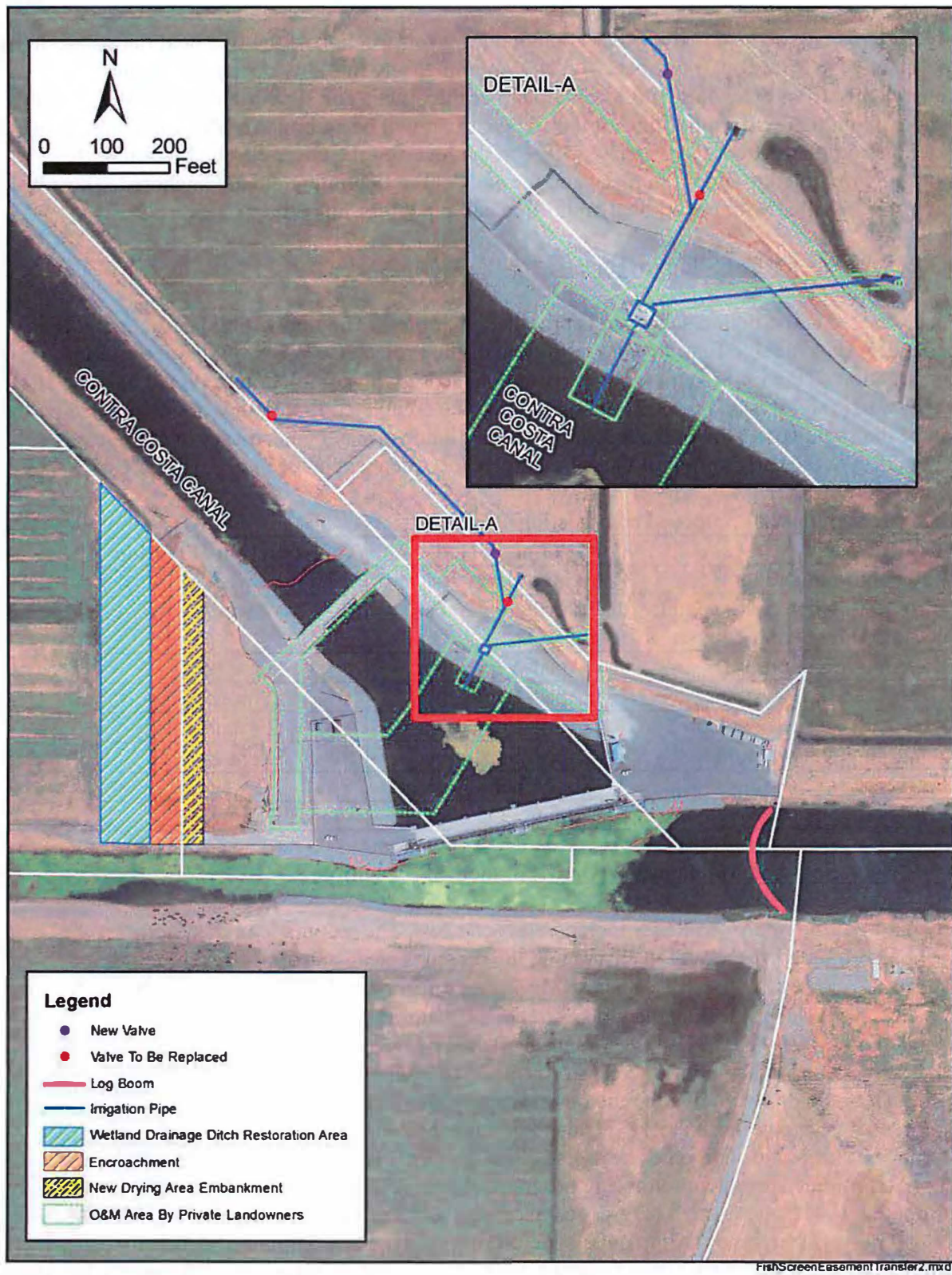


Figure 7. Proposed Irrigation System Improvements and log boom location (Reclamation 2016).

E. Silt Curtains

Silt curtains will be installed in Rock Slough during construction of the two boat ramps, desilting the Canal, and bridge maintenance. This will minimize any turbidity during boat ramp construction from extending into Rock Slough or the Canal. The silt curtain will have a floating plastic boom that will support the curtain. The curtain will be an impermeable membrane that extends from the float at the water's surface to the invert of the channel. The bottom of the curtain is weighted to hold it in place and the ends of the floating boom are anchored. The silt curtain is installed with a workboat and lifting equipment for unloading.

1.3.2 Schedule for RSFS Improvements:

An estimated construction sequence is provided in Table 1. The timing of construction will be dependent on available funding and permitting of the Project. CCWD would like to start construction of the improvements as early as July 2018, with completion expected by June 2019. Land, water, and wetland impacts are expected to be completed first with work completed by the fall of the same year. However, depending on the timing it may be necessary to complete restoration in the early spring of the following year (Gruenhagen 2017).

Table 1. Summary of proposed construction sequence.

Type of Activity	Time Period	Construction Duration
Log boom relocation	June	2 weeks
Bird nesting deterrents; paint, netting, and spiking	April–September	4 weeks
Rake modifications	April–September	3 months
Debris handling systems	April–September	2 months
Access Platform extension	April–September	2 months
Boat ramp construction	April–September	2–5 months
Prototype rake testing	November – March	2 years
Miscellaneous improvements	May – October	2 months

1.3.3 Operations and Maintenance (O&M) of the RSFS Facility

Operation of the improved RSFS includes several tasks. The automatic rake system will be operated remotely by CCWD to ensure that the screen is clean and approach velocities are achieved consistent with USFWS and NMFS screen criteria (0.2 feet per second approach velocity). CCWD will test the new rakes to ensure that they can be reliably and effectively operated once installed. CCWD will manage the debris that is removed by the operation of the rakes and also from behind the screens or is otherwise removed to maintain the operation of RSFS. Debris will be removed to the on-site drying area as necessary. The location of the on-site drying area is shown in Figure 11. Fish and debris monitoring data will be used to assess the presence of salmonids and other ESA-listed fish species. Fish data will be collected during CCWD's routine sieve net monitoring program, either weekly (mid-December through mid-July) or monthly (late-July through early-December) and also during debris monitoring while the rakes are operating. Debris monitoring entails identifying the type and amount of debris (and any fish) removed by the rakes during their cleaning operation. Visual observations of the intake forebay area are also conducted during debris monitoring.

Proposed O&M Activities

CCWD has been maintaining the RSFS since Reclamation completed construction of the facility in 2011 consistent with O&M activities covered in the USFWS biological opinion (USFWS 2005). The Project considers the ongoing O&M activities described in USFWS (2005), as well as additional actions not previously covered for the RSFS Facility. The Project includes 41 O&M activities proposed for the RSFS Facility that could occur in the vicinity of the RSFS Facility. The identified O&M activities are based on CCWD's experience at the RSFS, within the Canal system and at its other screened Delta intakes, and could be subject to change as specific experience maintaining the RSFS Facility is obtained. The O&M activities will apply to both land and water area owned by Reclamation between the Canal Headworks/Flood Isolation structures and the area in front of and around the RSFS Facility up to the property line where the relocated log boom was placed across Rock Slough (some of these areas are on private property).

The 41 O&M activities are described individually below. These O&M activities are numbered as they were in USFWS (2005) biological opinion, and therefore are not numbered sequentially.

1. Aquatic Weed Contact Herbicide Application

Invasive aquatic weeds have been a problem at the RSFS Facility since construction was completed in 2011 (Figure 8). Since that time, Tenera has documented the types and quantities of aquatic weeds collected by the screen cleaning system. Additionally, during fish monitoring events at RSFS, Tenera has visually inspected and documented the composition of aquatic weeds located in front (upstream) of the fish screen. During these visual surveys, water hyacinth (*Eichhornia crassipes*) has had the largest presence among the aquatic weeds at the RSFS. Water primrose (*Ludwigia peploides*) has occasionally emerged among the floating flora, however, to a lesser extent than water hyacinth. Submerged aquatic weeds in front of the RSFS include Brazilian elodea (*Egeria densa*), coontail (*Ceratophyllum demersum*), and filamentous algae, with Brazilian elodea being the dominant species. Of the quantities of weeds collected by the rakes at the RSFS, Brazilian elodea has dominated, followed by water hyacinth and coontail. The percent composition of aquatic weeds collected by the screen cleaning system is provided in Reclamation (2016).



Figure 8. View upstream (east) of aquatic weeds in Rock Slough (Reclamation 2016).

The extent of the area where herbicide will be applied varies and will depend on the distribution of aquatic weeds, but is generally the area from downstream of the RSFS to Headworks/Flood Isolation structures (intake afterbay) and the area upstream of the RSFS from the Rock Slough Extension to the current location of the log boom (approximately 800 feet upstream of the RSFS). Herbicide application will occur in the same area as mechanical harvesting (Figure 11). The proposed application area in front of the RSFS and Rock Slough Extension is estimated at approximately 4 acres and the area within the Canal downstream of the RSFS and upstream of the Headworks Structure is estimated at 2 acres.

Herbicides will be delivered from pressurized tanks and sprayed from vehicle and/or boat-mounted booms, via backpack sprayers, or other application rig, or by manually wicking herbicides directly onto vegetation. Aerial spraying using aircraft will not be conducted. Applications will be made following the herbicide label instructions and are timed to occur when weeds are most susceptible, which is usually when plants are young or are actively growing (commonly as early as March or as late as October). The best time to treat the weeds is generally when the plants are just beginning to grow (during the spring). Treatment during this period will minimize the amounts of herbicides required for adequate control; mature plants require more product to ensure effective treatment. However, the application schedule depends on the mode of action of the herbicide and plant phenology. The majority of herbicide application is expected to occur from June through October following CCWD's approved Integrated Pest Management Plan (IPMP; Reclamation 2016, Appendix B), and Reclamation's requirements while applying herbicides within Rock Slough or the RSFS intake afterbay (Reclamation Manual, undated). IPMP Plans are reviewed annually by the California Environmental Protection Agency's (Cal-EPA) Department of Pesticide Regulation and are modified as new compounds become available. Aquatic pesticide use in the Canal and raw water reservoirs is regulated under the Statewide General National Pollutant Discharge Elimination System (NPDES) for the Discharge of Aquatic Pesticides for Aquatic Weed Control in Waters of the United States (general permit). The current NPDES general permit identifies specific monitoring and reporting requirements on pesticide use which became effective December 1, 2013, and will expire on November 30, 2018.

CCWD evaluated several strategies for applying aquatic herbicides in order to avoid and minimize effects to listed species to the extent possible while still meeting needs for controlling weeds that compromise the operation of the RSFS Facility. CCWD proposes to conduct mechanical harvesting and aquatic herbicide application from June 1 through October 31, a period when listed fish species are least likely to occur in the vicinity (see discussion below). CCWD chose the least toxic herbicides out of a suite of herbicides approved for use in California. It is important to keep the area in front of RSFS clear of weeds: (1) to ensure that the rakes can operate effectively so that velocities remain at or below fish screen requirements; (2) to prevent high differentials (*i.e.*, difference in water levels behind the screens) that can damage the screen panels or structures; and (3) to allow monitoring of adult Chinook salmon that generally appear at the RSFS in mid-November, which may require adjusting rake operations in order to prevent salmon entrapment.

In addition to the established August through October in-water work window allowed for delta smelt, CCWD proposes to apply aquatic herbicides and mechanically harvest in June and July, or earlier, if necessary. June and July were included in the period of proposed herbicide application based on CCWD and CDFW fish monitoring data (Table 2).

Table 2. Total number by species and months listed species were collected by sieve net from 1999–2009 at the Rock Slough Headworks prior to construction of the fish screen (Reclamation 2016).

Listed Species	Total Number collected	Year, (Month collected), and Total/Year
Winter-run	0	None collected
CV Spring-run	11	2004 (Mar, Apr) 3 total 2005 (May) 4 total 2006 (May) 3 total 2008 (Feb) 1 total
CCV steelhead	15	2005 (Feb, Mar, Apr) 4 total 2006 (Jan, Mar) 2 total 2007 (May) 1 total 2008 (Feb, Mar) 8 total
sDPS green sturgeon	0	None collected

In order to apply herbicides in June and July, CCWD proposes to conduct ichthyoplankton monitoring three times a week regardless of the results of CDFW’s surveys that either initiate or end CCWD’s ichthyoplankton sampling. Samples will be processed immediately and results reported to CCWD and Reclamation. If larval/post larval smelts are found, CCWD will not conduct herbicide applications until such time that larval smelts are not collected during three consecutive sampling events.

During some years, there could be situations that occur outside of the June through October time period when large quantities of weeds may threaten the integrity of the screen. CCWD proposes to use aquatic herbicides to alleviate the issues in front of the screen. CCWD would advise Reclamation’s Engineer and Biologist (Fresno Office) before any work commences. Work would not be initiated without authorization from the Engineer. If further environmental review is required, CCWD would comply with the requirements. CCWD will coordinate any herbicide application upstream of the RSFS with California Division of Boating and Waterways (CDBW) to avoid over application and to review dosage and post application monitoring procedures. Under an existing Memorandum of Understanding (MOU) between CDBW and CCWD, CDBW is prohibited from applying aquatic herbicides within Rock Slough, or within one mile of the confluence of Rock Slough and Old River, without the prior consent of CCWD.

CCWD compiled a list of the problematic aquatic plants at RSFS using data collected during debris tracking. The majority of plants are the non-native water hyacinth, Brazilian elodea, and water primrose, the native coontail, and filamentous algae. CCWD proposes to use the following herbicides to help control the presence and spread of aquatic plant species at RSFS: Clearcast®,

Roundup Custom™ GreenClean® Liquid 2.0, and Phycomycin® SCP. The 4 herbicides and the aquatic plants they control are listed in Table 3.

Table 3. Proposed herbicides and application rates in the vicinity of the RSFS (Reclamation 2016). mg/L = milligrams/liter, ppm = parts per million, ppb = parts per billion, µg = microgram.

Brand Name	Active Ingredient	Target Species	Degrades	Application Rates	Label Warnings	Toxicity
Clearcast®	Ammonium salt (imazamox 12.1%)	hyacinth, primrose, coontail, elodea	50% in 4-49 days	Broadcast Hyacinth: 16-32 oz/acre; 50-200 ppb Primrose: 32-64 oz/acre; 50-200 ppb Coontail: 200-500 ppb Elodea: 200-500 ppb	Water not drinkable for 6 days	<i>Bluegill</i> : 96 hr LC50>119 mg/L; 119,000 ppb <i>Trout</i> : 96 hr LC50 > 122 mg/L=122,000 ppb <i>Bees</i> : LD50>100 µg/bee
GreenClean® Liquid 2.0	Hydrogen dioxide (27.1%)	algae	100% at 24 hours	Spray from boat or shore, inject via pipes into water, 2.4-24.0 gal/acre or 0.5-5 ppm, depending on density	Apply during calm, sunny conditions in early spring	<i>Trout</i> : 48 hr LC50 > 40mg/L; >40ppm <i>Crustacean</i> : 48-hr EC50; 126.8 mg/L <i>Bees</i> : highly toxic
Phycomycin® SCP	Sodium carbonate peroxhydrate (SCP 85%)	algae	100% at 24 hours	Broadcast or mechanical spreader, 3-100 lb/acre, 0.3-10.2 ppm	Apply after growth starts, allow 8-10 hours daylight, depletes DO	<i>Bluegill</i> : 96 hr LC50=320 mg/L; 320 ppm <i>Fathead minnow</i> : 96 hr LC50=70.7 mg/L; 71 ppm
Roundup Custom™	Glyphosate (53.8%)	hyacinth, primrose	50% 12 days-10 weeks	Broadcast 3-7 pints/acre, 1.5% solution by volume for spray, requires surfactant (nonionic at 2 qts/100 gal)	Water not drinkable for 48 hours unless < 0.7 ppm	<i>Trout</i> : Acute, 96 hr, static, LC50 >1000 mg/L <i>Daphnia</i> : Acute, 48 hr static, EC 50: 930 mg/L <i>Bees</i> : 38 hrs, LD50 oral 100 ug, contact > 100 µg/bee

a. Clearcast®

Clearcast® is a systemic herbicide used to control/suppress certain submerged, floating, and aquatic vegetation. It may be broadcast-applied to the water surface or injected below the water surface under surface-matted conditions. It may also be applied aerially by both fixed-wing aircraft and helicopter. Its active ingredient is ammonium salt of imazamox (12.1%) (Clearcast® Specimen Label). At RSFS, Clearcast® will be effective at controlling water hyacinth, and to a lesser extent coontail and Brazilian elodea. Clearcast® also is effective at controlling pondweed, watermilfoil, hydrilla, and water stargrass (Clearcast® Specimen Label). It is a systemic herbicide which acts by moving throughout the plant tissue, preventing plants from producing a necessary enzyme (acetolactate synthase) which is not found in animals. Treated plants will stop growing after treatment, and plant death and decomposition will occur over several weeks [Wisconsin Department of Natural Resources (WDNR) 2012a]. Water treated with Clearcast® is considered potable six days after treatment. Imazamox has a half-life ranging from 4 to 49 days in lakes, however breakdown does not occur in deep, poorly oxygenated water with no light. In this case, imazamox will bind to sediment rather than breaking down, resulting in a half-life of 2

years. Its breakdown products are nicotinic acid and di- and tricarboxylic acids, none of which are herbicidal or suggest concerns for aquatic organisms (WDNR 2012a). Imazamox is classified by the U.S. Department of Agriculture (USDA) as practically non-toxic to fish and aquatic invertebrates, and it does not bioaccumulate in fish. Toxicity (LC50, 96 hr) for rainbow trout (*Oncorhynchus mykiss* [*O. mykiss*]) is greater than 122 mg/L and is greater than 119 mg/L for bluegill (*Lepomis macrochirus*) [Clearcast® Material Safety Data Sheet (MSDS)]. Laboratory tests using rainbow trout, bluegill, and water fleas (*Daphnia*) indicate that imazamox is not toxic to these species at labeled application rates (USDA and CDBW 2012b).

Imazamox is not acutely harmful to terrestrial organisms, and is toxic to birds only at dosages exceeding approved application rates. Honeybees are affected at application rates, so application should be in a manner that does not allow for drift into blooming crops or weeds while bees are actively visiting the treatment area (Clearcast® Specimen Label). Toxic impacts to amphibians and reptiles resulting from the application of imazamox are highly unlikely (USDA and CDBW 2012b). CCWD will apply the product according to labeled application rates (Reclamation 2016, Table 7).

b. GreenClean® Liquid 2.0

GreenClean® Liquid 2.0 is a broad spectrum algaecide/bactericide used to treat filamentous algae and cyanobacteria. Its active ingredients are hydrogen dioxide (27.1%) and peroxyacetic acid (2.0%). It acts by oxidizing the algae, destroying algal cell membranes and chlorophyll (GreenClean® Specimen Label). GreenClean® Liquid 2.0 is listed as toxic to birds, fish, and bees on its label. CCWD will apply GreenClean® Liquid 2.0 according to the labeled rates (Reclamation 2016, Table 8). GreenClean® Liquid 2.0 toxicity (LC50, 48 hr) to rainbow trout is greater than 40 mg/L and its toxicity to crustaceans (EC, 48 hr) is 126.8 mg/L. Its half-life is very short with nearly 100% degradation within 24 hours (GreenClean® MSDS). The end product from breakdown is hydrogen and oxygen (WDNR 2012b). It is highly toxic to bees exposed to direct contact on blooming crops or weeds, so application should be in a manner that does not allow for drift into blooming crops or weeds while bees are actively visiting the treatment area (GreenClean® Specimen Label). Treatment can result in oxygen loss from decomposition of dead or decaying algae; treatment should begin along the shore and proceed outward in bands to allow fish to move into untreated areas. Treatment of algae with GreenClean® Liquid 2.0 will be conducted through water application, either by surface injection, or by spot treatment. For spot treatment, GreenClean® Liquid 2.0 is applied directly over the infested area (GreenClean® Specimen Label). Retreatment is required when heavy growth appears; CCWD will allow 48 hours between consecutive treatments. Control is most effective when algae are not yet established and water temperatures are warm. Therefore, CCWD will apply the herbicide in the summer during the morning under calm, sunny conditions when the water temperature is at least 60°F.

c. Phycomycin® SCP

Phycomycin® SCP is an algaecide and oxidizer used to treat filamentous algae and blue-green algae (cyanobacteria), as well as coontail at higher application rates. Phycomycin® SCP is similar to GreenClean® Liquid 2.0; however, it is granular in form. Its active ingredient is sodium carbonate peroxyhydrate (85%) (Phycomycin® SCP Specimen Label). Sodium carbonate peroxyhydrate (SCP) acts by oxidizing algae, destroying algal cell membranes and

chlorophyll (WDNR 2012b). It is toxic to birds and fish, but is considered nontoxic to birds and fish when used at the labeled rates (Phycomycin® SCP Specimen Label). CCWD will apply the herbicide at label rates (Reclamation 2016, Table 9). Its toxicity (LC50) to fathead minnow (*Pimephales promelas*) is 70.7 mg/L and is 320 mg/L to bluegill (Phycomycin® SCP Fact Sheet). Its half-life is very short with nearly 100% degradation within 24 hours (Phycomycin® SCP Specimen Label, WDNR 2012b). The end product from breakdown is hydrogen and oxygen (WDNR 2012b). It is highly toxic to bees exposed to direct contact on blooming crops or weeds, so application should be in a manner that does not allow for drift into blooming crops or weeds while bees are actively visiting the treatment area. Treatment of algae with Phycomycin® SCP is conducted by broadcasting or use of a mechanical spreader. Control is most effective when water temperatures are warm, so CCWD will apply early in the day under calm, sunny conditions when the water temperature is at least 60°F (Phycomycin® Specimen Label). CCWD will apply the herbicide from shallow water and proceed towards deeper waters to allow fish and mobile biota the opportunity to move away from the treatment area.

d. Roundup Custom™

Roundup Custom™ is a systemic herbicide used to treat aquatic plants growing above water. Its active ingredient is glyphosate (53.8%), and it acts by inhibiting an important enzyme needed for multiple plant processes, including growth [Michigan Department of Natural Resources (MDNR) 2015]. At the RSFS, it will be effective in controlling water hyacinth and water primrose. It is applied at the surface either aerially, via broadcast equipment, or by handheld equipment (Roundup Custom™ Specimen Label). A surfactant approved for aquatic sites must be used in conjunction with Roundup Custom™ to help the herbicide stick to the plant surfaces and to increase the rate of absorption (MDNR 2015). Reclamation proposes to use two nonionic surfactants with Roundup Custom™: R-11 Spreader-Activator and Prospreader Activator. For controlling water hyacinth, the ideal herbicide treatment time is when the plant is in the early growth phases, which in the Delta has historically occurred from early May to the end of June (USDA and CDBW 2012a). After application, plants will gradually wilt, appear yellow, and die in approximately 2 to 7 days (MDNR 2015). Roundup Custom™ cannot be applied within ½ mile upstream of an active potable water intake. If application is made within ½ mile upstream of a potable water intake, intakes must remain off for 48 hours after treatment, unless assay determines glyphosate level is below 0.7 ppm. CCWD's pumps are nearly 4 miles from RSFS treatment area. In water, glyphosate has a half-life between 12 days to 10 weeks, depending on water conditions (Tu *et al.* 2001). Concentration of glyphosate is reduced through rapid dispersal by water movement, by binding to sediments, and through breakdown by microorganisms. The primary breakdown product is aminomethylphosphonic acid, which is further broken down by microbes in the water and soil, and is considered not to pose any hazards distinct from glyphosate (MDNR 2015). Laboratory testing indicates that Roundup Custom™ is toxic to fish only at dosages well above label application rates (MDNR 2015). CCWD will apply according to label application rates. Acute toxicity (96 hr, LC50) to both rainbow trout and bluegill is greater than 1,000 mg/L. Roundup Custom™ is no more than slightly toxic to birds and is practically non-toxic to bees. It is relatively non-toxic to domestic animals, however ingestion of large amounts of freshly sprayed vegetation may result in temporary gastrointestinal irritation (Roundup Custom™ Specimen Label). The use of glyphosate can result in oxygen depletion by decomposition of dead plants, therefore in order to prevent fish kills caused by dissolved oxygen

(DO) depletion, only one-third to one-half of any water body should be treated at any one time (Tu *et al.* 2001).

2. Blading and Disking of Rights-of-Way

A grader or tractor with mounted blade or disc is used to scrape or shallowly till the soil to kill, prevent, or retard growth or spread of weeds, to reduce cover for pests, and to limit vegetation fuel load while providing fire breaks. Blading is practiced, in part, to reduce reliance on chemical herbicides and minimize development of herbicide resistance in weeds. Blading and disking is conducted along rights-of-way (following canals and pipelines or conduits and their access routes) and around support facilities and structures. Blading and disking may be conducted at any time of year, but is concentrated in the dry period (March through November). The action may be conducted once to several times a year, as needed to control weeds.

3. Blading of O&M Roads

A grader or tractor with a mounted blade is used to scrape unpaved roadways and road shoulders to remove weedy vegetation, ruts, and to level and maintain the surface for access to the Project. Blading occurs during the dry season, primarily from May through November. Machinery disturbs soil on the roadway and on the shoulders.

4. Canal Bank Revegetation

Revegetation with native non-weedy plants is conducted to stabilize slopes and prevent erosion, retain support of the Canal, exclude weeds, and also provide wildlife habitat. Prior to revegetation, plots are scarified either by a gradall, loader, or klodbuster if they are on slopes, or by a disc if on level terrain. Large flat plots are drilled, and hilly terrain is hydro-seeded. Small (approximately 30 feet by 60 feet) test plots are hand broadcast. Plots may be mulched with straw, which may be tackified with wood fiber and a mulch tackifier to hold it in place. CCWD will use hydroseeding to control erosion on slopes both inside and outside of the levee.

5. Canal/Tunnel/Conduit Liner Repair

Liners, tunnels, and conduits are typically constructed of reinforced concrete. Cracked or broken liner panels, damaged sections on canals, or areas on wasteways and the aprons or outlets from canals are patched with concrete, grout compound, shotcrete, or other similar material that is pumped, blown, or fed from a mixer by gravity.

A damaged liner that cannot be repaired is overlaid with shotcrete or removed with heavy equipment and a new panel is fashioned in place. When panels are removed, the soil behind the panel may be excavated and then re-compacted. Rebar is installed before concrete is poured in place. Repairs usually are made when facilities are dewatered or water delivery is minimal, often in the fall and winter. However, repairs may be conducted from winter through the end of March on the Canal.

6. Contact Terrestrial Herbicide Applications

Contact herbicides are applied to control vegetation on canal banks, on rights of way, around water intakes and other structures, and at facilities compounds. Herbicides approved for use in California by the United States Environmental Protection Agency (USEPA) and the California Department of Pesticide Regulation (CDPR) are applied to check growth of vegetation that could

threaten the integrity of facilities or foul its operation, maintain access to facilities, enable facilities inspections, reduce fire hazards, and to reduce the spread of noxious or invasive weeds.

Additionally, contact herbicides are sprayed to reduce or eliminate habitat for pests, enhance security surveillance, and provide for a well-kept appearance at facilities. Herbicides are delivered from pressurized tanks and sprayed from vehicle mounted booms, via backpack sprayers or other application rig, bean gun, wand, or by manually wicking herbicides directly onto vegetation; aerial applications using aircraft are not conducted. Applications are made following instructions on the label and are timed to occur when weeds are most susceptible, usually when plants are young or are actively growing (February–October), although this depends on the mode of action of the herbicide and plant phenology. One or more applications are made annually as needed, depending on weed pressure and need for control. A typical regimen for weed control around the RSFS Facility includes pre-emergent applications for control of winter annuals, followed by one to several applications of contact herbicides for control of other annuals, which may be integrated with mechanical controls. CCWD will follow its approved IPMP (Reclamation 2016, Appendix B) and Reclamation's requirements (Reclamation Manual, undated) when applying contact herbicides.

Two contact terrestrial herbicides are used by CCWD: Capstone® and Roundup Custom™. Capstone® is used for control of annual and perennial broadleaf weeds, woody plants, and vines. It is labeled for use on rangeland, permanent grass pastures, forests, non-cropland areas (airports, communication transmission lines, electrical power and utility rights-of-way, industrial sites, roadsides, railroads, etc.), natural areas, and Conservation Reserve Program sites. Capstone's® active ingredients are Triisopropanolammonium salt of 2-pyridine carboxylic acid, 4-amino-3, 6-dichloro- (2.2%) and Triethylamine salt of [(3, 5, 6-trichloro-2-pyridinyl) oxy]acetic acid (16.22%). It will be applied either through ground broadcast, or by handheld equipment for foliar or spot application. Roundup Custom™ is a broad-spectrum post-emergence herbicide used for aquatic, crop, nonagricultural crop, industrial, turf, ornamental, forestry, roadside, and utility rights-of-way weed control. Roundup Custom™ active ingredient is glyphosate (53.8%). It provides control of annual weeds, perennial weeds, woody brush, and trees. Roundup Custom™ works by inhibiting the production of an enzyme that is essential to the formation of specific amino acids.

7. Canal Dewatering

Dewatering is done to facilitate maintenance of canal facilities, including repair or replacement of liner or inspecting or repairing siphons. During the process, water to one or more sections of the Canal is "cut off." In some cases, water may be pumped "upstream" behind a check or control structure. The action is conducted when demand for Canal use is lowest (usually October through March).

8. Drain, Ditch and Channel Maintenance

This maintenance is conducted to ensure conveyance of water through facilities or away from facilities. Surface (e.g., ditches, flumes, and overchutes) and subsurface (e.g., downdrains, pipes, and underchutes) drains, as well as the main channels of canals are maintained. Maintenance includes cleaning debris (both large and small), trash, soil, sediment, and vegetation from open ditches, canals, and areas in front of the RSFS, reshaping them with heavy equipment if

necessary. Debris and vegetation that periodically accumulates in collecting basins or pipe is removed by hand or with a shovel. If piping is cracked, soil may be excavated and piping replaced. Backhoes, gradalls, excavators, dredges, draglines, tractors, and hand shovels may be used to remove material in surface areas.

Cleared soil and vegetation may be piled on adjacent land or, when extensive, may be transported in trucks to a spoil site. Activities occur primarily in fall and spring, but are concentrated during the end of the dry season (especially August through October) and before fall rains begin. Soil on ditch banks and soil and vegetation that occurs along banks and in depressions is disturbed or removed.

9. Hand and Mechanical Control of Vegetation

Hand control is used to remove small amounts of nuisance or weedy vegetation at facilities or around structures where use of equipment or herbicides is impractical, such as where the extent of the problem is small. Removal is done by hand pulling vegetation, or removing it with aid of stringed weed cutters, spades, hoes, shovels, adzes, saws, or other hand implements. Disturbance occurs from cutting and removal of vegetation.

CCWD and/or its designee will mechanically harvest aquatic weeds from the area in front of the RSFS from the Rock Slough Extension to approximately 100–200 feet beyond the log boom, and from the area downstream of the fish screen and upstream of the Rock Slough Headworks Structure (Figure 11). The harvester will cut the weeds at a depth of approximately 5 feet below the water surface. In shallower areas (6 feet deep or less), the harvester will cut the weeds as close to the bottom as practicable. No disturbance of the bottom of Rock Slough or the Canal would occur. Cut aquatic weeds will then be pulled up onto the harvester via conveyor belt until the harvester is full. Once full, the aquatic weeds will be pulled off the harvester by a crane at the RSFS. It may be necessary to use an excavator to scoop out the weeds using the bucket and the thumb. The aquatic weeds will then be loaded onto trucks or other equipment and transported to the drying area (Figure 11). Once the weeds have dried sufficiently, they will either be removed or composted on site. Mechanical harvesting is proposed to occur from June through October.

During some years, there could be situations that occur outside of the June through October time period caused by large amounts of aquatic weeds offshore of the screen that threaten the integrity of the screen. CCWD proposes to use mechanical harvesting, and other mechanical equipment including excavators, cranes, pontoon boats, *etc.*, to alleviate the issues offshore of the screen. CCWD would advise Reclamation's Engineer and Biologist before any work commences. Work would not be initiated without authorization from the Engineer. If further environmental review is required, CCWD would comply with any and all requirements.

The proposed harvesting area in front of the RSFS and Rock Slough Extension is estimated at approximately 4 acres and the area within the Canal downstream of the fish screen and upstream of the Headworks Structure is estimated at 2 acres. Total time to harvest is expected to take approximately 1 week to complete (1 acre/day at approximately 2 miles per hour).

10. Insecticidal Sprays

Arthropod pests can present a human health hazard for people allergic to stings or bites. Pesticides registered for use in California by the USEPA and the CDPR are applied to control bees, wasps, spiders, ants, cockroaches, fleas, termites, mosquitoes, and other arthropods. Insecticides are applied year round, as needed, but primarily from spring through fall, according to the product label. They are applied in and around remote sensing Supervisory Control and Data Acquisition (SCADA) stations at RSFS, at inspection stations, and other structures along conveyance facilities and appurtenant structures. Insecticide application varies, but often those with quick knock-down are dispensed directly from canisters. These may be applied by applicators or hired structural pest control specialists. Insecticide spray applied at recorder houses, vaults, and outbuildings before precipitation events could lead to pesticide runoff. However, CCWD procedures ensure that no insecticidal sprays will enter the Canal or Rock Slough. All application of insecticidal sprays will follow the guidelines and procedures specified in CCWD's IPMP (Reclamation 2016, Appendix B) and Reclamation's requirements (Reclamation Manual, undated).

11. Mudjacking and/or Injecting Grout

Grout or fill (liquefied clay) is used to fill cracks in the canal liner and/or rip rap and voids behind the liner and/or rip rap. When leaks appear on the outside of the prism of the Canal, or are associated with liner voids or cracks, holes are bored behind the liner with an auger and grout or fill is gravity fed from a mixer through tubes or hole borings into the void. When no additional material is accepted into borings and leakage stops, the leak is assumed to be patched and additional borings are unnecessary. The grout or fill restores physical support to the Canal liner, rip rap, and levee, which otherwise could fail due to the force on the liner and/or rip rap from water inside the Canal. Failure could result in a "blowout" that would flood surrounding land. Repairs are conducted when defects are discovered, with work preferentially conducted during dewatering. If required, this work would be conducted on a small section of concrete liner upstream of the Headworks Structure.

12. Pre-emergent Herbicide Applications

These applications are made as part of weed control programs that deal with nearly year-round weed problems that exist in much of the San Joaquin CVP project area. Where weeds are not tolerated, such as on the inner prism of canal banks adjacent to the liner, weed germination is suppressed with pre-emergent herbicides to limit the spread of noxious or invasive weeds, reduce habitat for pests, help maintain access to facilities, enable inspections, check growth that could threaten facility integrity, limit fuel load and reduce fire hazards, and to provide for a well-kept appearance of facilities. Like contact herbicides, pre-emergent herbicides are applied around water intakes, on canal banks (particularly inner banks), on rights-of-way, around structures, and at facilities compounds. Applications are made following the herbicide label instructions and are timed to occur when weeds are most susceptible. Unlike contact herbicides which are applied directly to foliage, pre-emergents are applied to soil before seeds germinate, usually once annually in fall or early winter. Applications are made from pressurized spray tanks with a vehicle mounted boom sprayer, a backpack sprayer, or for granular formulations, with spreaders. CCWD will follow its approved IPMP (Reclamation 2016, Appendix B) and Reclamation's requirements (Reclamation Manual, undated) when applying pre-emergent herbicides. Herbicides reduce vegetative cover that may be used by ESA-listed species or their prey.

Three pre-emergent terrestrial herbicides are used by CCWD: (1) Dimension® 2 EW, (2) Dimension® Ultra 40WP, and (3) Capstone®. Capstone® specialty herbicide is used for control of annual and perennial broadleaf weeds, woody plants, and vines. It is labeled for use on rangeland, permanent grass pastures, forests, non-cropland areas (e.g., airports, communication transmission lines, electrical power and utility rights-of-way, industrial sites, roadsides, railroads, etc.), natural areas, and Conservation Reserve Program sites. Capstone's® active ingredients are Triisopropanolammonium salt of 2-pyridine carboxylic acid, 4-amino-3,6-dichloro- (2.2%) and Triethylamine salt of [(3, 5, 6-trichloro-2-pyridinyl) oxy]acetic acid (16.22%). It may be applied either through ground broadcast, or by handheld equipment for foliar or spot application.

Dimension® Ultra 40 WP provides control of annual grasses and broadleaf weeds. Its active ingredients (40%) are dithiopyr: 3, 5-pyridinedicarbothioic acid, 2-(difluoromethyl)-4-(2-methylpropyl)-6-(trifluoromethyl)-S, S-dimethyl ester.

Dimension® 2EW is a specialty herbicide provides pre-emergence and early post-emergence control of crabgrass, goosegrass, foxtail, spurge, and Poa annua grass. It comes in liquid, granular, and wettable powder formulations. Dimension 2EW's® active ingredients are dithiopyr (24.0%), cyclohexanone (13%), 2- ethylhexanol (1.9%), and toluene (0.1%).

13. Rights-of-Way Dust Abatement

Dust abatement is conducted to minimize fugitive dust where the unpaved (non-operational) roadway or outer Canal bank is graded and where construction is occurring or spoils soil is being hauled during work operations at the RSFS Facility. Typically, a water truck traverses the roadway or work area and sprays water directly onto the soil surface during single or multiple passes. Flooding also may be used to limit dust. Dust abatement will occur in the construction laydown areas for the installation of the boat ramps.

14. Rights-of-Way Mowing

Mowing is conducted with a rotary, sickle bar, or other mower blade attached to a tractor. Mowing is conducted primarily in spring to control weeds and reduce or eliminate the need for herbicide applications. Mowing equipment disturbs sites and reduces vegetative cover used by listed species or their prey.

15. Rip Rap

Rip rap is comprised of large rocks and boulders of varying sizes that are placed at dams, spillways, and canal or levee banks, especially near bridges and canal undercrossings, or water control structures, to prevent erosion of shorelines or embankments, and to strengthen the channel. The work is conducted when needed to protect banks, but it is preferentially performed during the dry season. Rock is delivered to the site by truck and trailer; dumped rock is piled with the aid of backhoes and excavators.

16. Squirrel Baiting

Rodenticides are applied to control ground squirrels that burrow into embankments, canal levees, at earthen fill dams, around buildings, at pumping stations and other facilities, on canals, or waterways. Burrowing is a nuisance, creates hazards, and can undermine the integrity of roadways and structures, by creating voids that weaken the integrity of conveyance structures or

that lead to “piping” (water leakage). Toxic grain baits are made available by broadcast or in bait stations. CCWD uses the edible grain bait treated with Diphacinone. When not in use, traps are closed or bait removed. All baits will be applied according to the guidelines and procedures specified in CCWD’s IPMP (Reclamation 2016 Appendix B,) and Reclamation’s requirements (Reclamation Manual, undated). CCWD will take steps to ensure that rodenticides do not enter the Canal or Rock Slough.

17. Bargate/Fence Installations

Gate and fence installations and repairs are made to limit access to facilities, to provide security and where safety or the protection of resources is a concern or encroachment is a problem. Barbed wire fencing is strung at perimeters of Reclamation rights-of-way. Chain link fence is installed where the public has access to facilities and it is necessary to protect public health and safety, or where it is necessary to protect the Canal or facilities from dumping or vandalism.

Bargates are installed where Canal rights-of-way intersect public roadways, such as at corners of bridges, on secondary and primary roads, and on parallel fences at or near structures. Holes for support structures for fencing and bargates are dug by hand tools, power auger, or backhoes. Barbed wire is attached to steel t-posts that are driven with a post driver; wooden braces and corners may be set as anchors if the fence is constructed around uneven terrain. Pipe rods are set in the ground with concrete to which chain link fencing is attached. Installations or repairs are made as needed. Gates are cleaned and painted when needed.

18. Bridge Maintenance (running pad replacement)

This activity applies to both the Canal Headworks/Flood Isolation structures and RSFS bridge structures. Bridge surfaces, including railings, are pressure washed with water, and when necessary, painted by hand with brush or roller. Support pillars that have rotted or been damaged are removed with a crane or hoist and replaced with new pillars that are driven into place. Concrete decking would replace any existing concrete or metal decking when needed. Support pillars are prepared with re-bar and concrete is poured in place in forms. Steel cross beam under-decking is lowered onto pillars and prefabricated concrete pads are lowered onto the cross beams using a crane. Maintenance is usually conducted in the spring or fall.

19. Cableway Maintenance (painting/cleaning/repair)

These activities will occur at the RSFS’s relief panel pulley system and at the four rakes, which utilize a cable and pulley system for operation. Cables and pulleys are checked for wear, pulleys are lubricated and baskets are or painted with brushes. Drip or spills may occur during painting and lubricating the facilities. Where cables enter structures, debris, and animal nesting material is removed.

20. Drainage Improvements (ditches or pipe)

Heavy equipment, including dozers, tractors, backhoes, longsticks, and graders, *etc.*, are used to excavate drainage trenches and install drain pipe or to fill low spots to improve drainage. Additionally, trenches and drains are cleared of vegetation and silt with heavy equipment or by hand. Excavated material is piled on levees or rights-of-way, or is transported by truck to an offsite location. Drainage improvements are made as needed, although most occur annually. Work occurs preferentially during dry conditions, usually in the fall, before rains begin.

Removal of accumulated vegetation, debris, and soil from existing drains (downdrains, lateral drains, overchutes, or underchutes, *etc.*) is accomplished by using heavy equipment or by hand.

21. Electrical Repairs by Utility Companies (PG&E, WAPA, or others).

Repairs are made at all utility serviced facilities, as needed, year-round, and primarily at buildings. Repairs to, or replacement of, transformers, power poles, and severed underground utility lines are made occasionally by utility line crews operating from service vehicles. Pole replacement and underground line repair requires soil excavation.

22. Embankment Maintenance (filling washes and gullies).

Fill embankments from the sides of canals or intakes where the canal or intake is higher than the surrounding terrain. Protective and training embankments occur along the uphill side of Rock Slough; the former function to reduce runoff and erosion of soil into the Canal, and the latter to divert water toward underdrains or overchutes. Backhoes, graders, excavators, or hand implements are employed to fill gullies, burrows, compact soil and grade slopes as needed; however, work occurs primarily during the dry season. Trucks are used to haul fill.

23. Facilities Inspection

All facilities are inspected at least once annually. Mechanical (gates, pumps, *etc.*) and electrical equipment (communications, monitoring, and computer systems, *etc.*) is visually examined and operated to test functionality. Inspection may occur from both land and water. Conveyance and storage facilities (*i.e.*, canals, screens, bridges, *etc.*) and other physical facilities are visually inspected for integrity. The RSFS Facility will be inspected once or twice per year in late winter and/or early spring.

24. Graffiti Removal from Concrete Structures

Graffiti is painted over by hand with a brush or roller, or is removed by sandblasting. Waste materials from sandblasting is collected and disposed of at an appropriate waste disposal site.

25. Guardrail Installation/Repair

Damaged railings and support pillars are removed, repaired, and replaced as needed. Backhoes or other excavators, or shovels are used to excavate and fill pilot holes for support pillars. Vehicle mounted hoists may be used to remove damaged rails or reposition railings. Guardrail locations to be determined in coordination with CCWD project engineer.

26. Valve Rehabilitation

Valve function is checked on pumps and when they do not operate, they are removed and repaired or replaced. Work may be conducted within and/or outside of Reclamation property in both paved and unimproved areas. Valves, if buried, would require excavation with heavy equipment such as a backhoe or front-end loader.

27. Ladders/Safety Nets/Float/Log Boom Repair and Replacement

Ladders, nets, floats, and log booms are inspected at least annually and repaired or replaced when damaged. The RSFS log boom and block net is inspected twice per year for tears or holes using underwater SCUBA gear. Some minor site disturbance may occur from re-locating the log booms or repairing the block net.

28. Pull and Check Pumps

Pumps are checked annually. Pumps enclosed in casings are raised with a hoist or winch, or for smaller units, by hand using a tether. Pump seals, bearings, impellers, motors, and electrical connections are visually inspected or tested and replaced as needed.

29. Instrument Recorder House Maintenance (door repair, painting, cleaning, etc.)

The RSFS buildings are swept, and doors are washed and painted by hand with a brush or roller, as necessary.

30. Removal of Trash or Debris

Trash, debris, and waste are removed from virtually all of the Project area, including the Canal, debris pits, laydown areas, and drainage channels on an ongoing basis. Small items are collected by hand and disposed of properly. Where needed, trained hazardous waste handlers are enlisted to handle removal and waste disposal. Large debris and trash (including trees, vehicles, refrigerators and other large appliances) in front of the RSFS are removed with the aid of hoists, excavators, or work boats. Aquatic weeds are moved from the RSFS via conveyor belts and from the debris pits via trucks. Aquatic weeds are dried on site and removed with the aid of heavy equipment and trucks for transporting off-site when necessary.

31. Right-of-Ways Trash Removal

Tires, plastics, lumber, bedding, scrap metal and other trash and garbage are removed by hand from right-of-ways and hauled by truck to appropriate waste disposal site. Larger items such as vehicles and appliances are removed with the aid of service trucks with hoists or winches. Where needed, trained hazardous waste handlers are used to collect and dispose of hazardous materials.

32. SCADA System Repair and Upgrade

The SCADA equipment is located at control structures at the RSFS Facility. Security systems, level transmitters, water quality equipment, and auxiliary systems are all monitored remotely by SCADA equipment. Repair includes removal and replacement of electrical, computer, or communications equipment, primarily modular components or panels.

33. Sign Repair/Replacement/Installation

New signs may be installed, and damaged sign faces or supports are repaired. Faces of signs are repainted or replaced. Pilot holes for support posts are dug with an auger, shovel, or equipment such as a backhoe. Repairs or replacement of signs occurs at most Project facilities, on an as needed basis.

34. Stilling Well Maintenance (pumping/backflush, etc.)

Stilling wells are concrete or metal pipes placed vertically in Rock Slough, both in front and behind the fish screens. Movement of water into the well permits accurate measurement of the height of water in the Canal. Debris and silt that collects in the connector pipe or the well is back flushed with a pump to clear the system of debris as frequently as monthly at some locales, but more commonly annually, or as needed.

35. Utility Trenching (SCADA stations/power/misc.)

Work is done with a trencher, backhoe or excavator to lay underground utilities to facilities and upgrade the systems in place. Most utility infrastructure has already been provided and the need for trenching is infrequent.

36. Wash and Paint Turnouts and Check Structures (includes Headworks/Flood Isolation and RSFS Structures)

Structures are pressure washed with water or cleaned with a wire brush and painted with rollers or brushes using epoxy paint during dewatering. CCWD proposes to paint certain structures (e.g., the Headworks Structure and the underside of the RSFS) with nesting bird-deterrent coating to prevent birds from nesting on structures. Structures are generally washed annually and painted either annually or as needed. Accidental spill of paint could contaminate waterways.

37. Wash Bridges and Fish Screens

Dirt is removed from bridges, railings, and the RSFS screen panels with a portable pressure washer using water. Bridges, such as the one at the Headworks Structure, and the RSFS are washed annually. Railings on bridges are hand or spray painted after being washed.

38. Canal Desilting Operations

Desilting is done at turnouts, wasteways, and in the canals or their lateral drains. Suction cleaning and desilting is planned along the concrete apron in front of and behind the fish screens at the RSFS. Desilting is done as needed; as frequently as monthly or infrequently as canals are dewatered on main canals. Silt is flushed by opening gates or checks at wasteways and turnouts to remove sediment. Additionally, heavy equipment such as a longstick, draglines, or backhoes also may be used to physically remove accumulated sediments from the bottoms of canals or basins. Flushed sediment may be washed further down conveyance. Accumulated sediment will be either; piled on a canal bank adjacent to the RSFS Facility, loaded in a truck and transported to either temporary or permanent spoil piles, or be hauled to a site where it is used as fill. Sediment spoil piles may or may not be seeded to prevent erosion.

39. Minor Road Construction/Rehabilitation

Road rehabilitation or construction is done to provide new access to facilities or to recondition existing roads along and around the RSFS Facility. It can involve ripping and removal of existing asphalt, regrading of roadbed, compaction of the new bed and underlying soil. Sand is spread by truck, along with crushed rock, and new asphalt that is compressed. Road construction is done irregularly or on a limited scale annually. When needed, major road construction/rehabilitation would be addressed under a separate environmental review.

40. Small Structure Construction (blockhouses, stilling wells, etc.)

Structures are constructed on an as-needed basis when new operational facilities are added. Sites are graded and forms set for pouring concrete pads. Framing may use concrete block, metal, or wood with metal siding. Trenching may be done to provide underground utilities to the site.

41. Utility and Facilities Repair

These repair activities include irregularly implemented minor repairs. Major repairs are done after completing separate environmental review. Utility companies may send service vehicle(s)

to repair electrical connections or replace transformers. There is a limited chance for impacts to listed species when repairs require soil disturbance. Repairs may occur anywhere along the RSFS Facility but are primarily conducted inside structures. The entire area was filled in 2011; any future trenching would occur in non-native soil.

The actual O&M activities may vary from the above list and will be limited by the 41 proposed maintenance activities within USFWS (2005) that are adopted for the RSFS Facility.

1.3.4 Land Acquisition and/or Land Use Authorizations

There are land acquisition and/or land use authorization activities that Reclamation may implement as part of this Project that Reclamation has determined will have no effect on ESA-listed species as they are administrative in nature (*e.g.*, transferring of land from CCWD to Reclamation, from Reclamation to private landowners, *etc.*). Therefore, they not discussed further. Those activities associated with land acquisition and/or land use authorizations that may affect ESA-listed species are described below:

A. Irrigation System Improvements

As described in Section 2.2.1, there are several irrigation system improvements proposed to fix ongoing issues with existing infrastructure (Figure 7). Reclamation will provide land use authorization for the improvements as well as landowner access for ongoing O&M of the irrigation facility. Ongoing O&M of the existing pipelines will continue to be done in this area by the owners of the pipelines which may involve removing dirt around the pipelines for access as well as working within the afterbay area behind the RSFS.

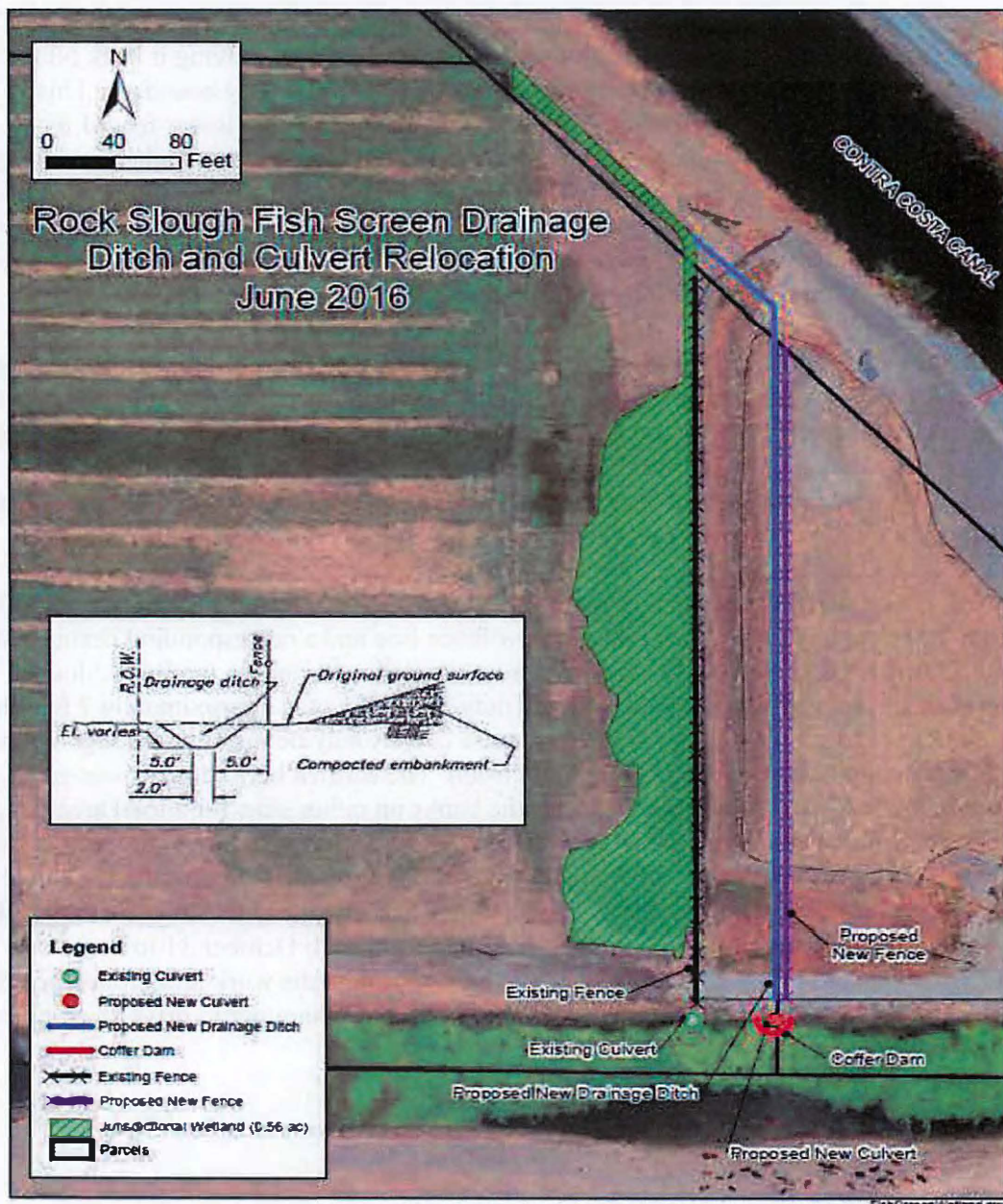
B. Land Encroachment Repairs

The northwestern fence boundary originally installed for the RSFS Facility was placed 50 feet beyond the actual RSFS Facility property line (referred to as “Encroachment Area” in Figure 7). The area east of the northwestern fence (approximately 500 feet by 85 feet, or approximately one acre) was covered with approximately 10 feet of soil to form a debris drying area and has been kept free of vegetation (referred to as “Aquatic Weed Drying Area” in Figure 11). There is also a jurisdictional ditch [U.S. Army Corps of Engineers (USACE) Permit Number: SPK-2009-00600, Sacramento District Office] located in an area approximately 5 to 12 feet west of the northwestern fence that terminates into an 18-inch concrete culvert that extends through the northern berm to drain into the Rock Slough Extension. The ditch has not performed as intended and much of the ditch has filled in with sediment. In addition, the area around the ditch has transformed into a wetland area due to poor drainage.

Reclamation is in ongoing negotiations with the landowner to resolve the encroachment issue. Possibilities for resolution include leaving the fence where it is or moving the fence to its correct alignment. If the fence was left in place, property utilization is expected to remain the same. If the fence is moved to its correct alignment, the following would be required (Figure 9), and therefore, proposed as part of the Project:

- Restoration of the encroached areas to RSFS Facility pre-construction conditions. This would entail removing and re-contouring an embankment by moving it back 50 feet from the current location of the fence line to the correct RSFS Facility boundary. This would require removing about 10,000 CY of material and shifting 500 linear feet of fence. Approximately 2,777 square yards of the earth beneath the existing embankment would need to be restored. This may include reseeding and/or planting vegetation in addition to earth contouring work. The approximate 10,000 CY of spoil may be spread on the adjoining property owner lands or Reclamation lands, likely within the unlined portion of the Canal, or on a portion of the RSFS Facility property to expand the drying area.
- The jurisdictional ditch would be reconstructed to drain the adjoining RSFS Facility property and the area around the ditch would be reconstructed so that it drains better. The adjoining property, where the ditch was initially constructed, may need improved grading as, absent such grading, it is subject to ponding. A portion of the fill material to be removed may be used for this grading. Approximately one-half acre of wetlands has been identified in this area. This may also be done even if the fence is not moved.

The culvert located west of the northwestern fence at the base of the earthen berm may also need to be relocated to the area along the new fence line and a corresponding drainage ditch would be installed to connect the toe drain from the unlined Canal to the Rock Slough Extension. The new 500-foot drainage ditch may be constructed approximately 7 feet from the correct property line and an 18-inch diameter culvert may be installed through the berm to drain this ditch into the Rock Slough Extension. The earthen berm dimensions are approximately a 2 foot crest with 5 feet for the banks on either side, for a total area of 12 feet. The estimated area of restoration and reconstruction for the encroachment property may be as large as 1.85 acres. Installation of the new culvert will require placement of a U-shaped 40-foot long coffer dam around the culvert within the Rock Slough Extension. The coffer dam will be installed during the work window of August 1 through October 31 to avoid or minimize exposure to listed fish. The coffer dam will isolate the work area from Rock Slough for the culvert installation. A contractor will use a vibratory hammer to drive sheet piles for the coffer dam.



C. Western Area Power Association (WAPA) Access Road Easements

Reclamation would acquire three existing access road easements purchased by CCWD in 2009 with Reclamation funding. These would then be transferred to WAPA to facilitate ongoing maintenance of the existing 69 kilovolt (kV) power lines that are used by CCWD for Pumping Plants 1 through 4 on the Canal.