San Joaquin River Restoration Program

Fiscal Year 2015/2016 Annual Report

California Department of Fish and Wildlife

Central Region

1234 East Shaw Avenue
Fresno, California 93710

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1 EXECUTIVE SUMMARY

This report details California Department of Fish and Wildlife (CDFW) activities during the state fiscal year (FY) 2015/2016, from July 2015 through June 2016.

The San Joaquin River Restoration Program (SJRRP or Program) is the culmination of 18 years of litigation between the Natural Resources Defense Council (NRDC) and the United States and Friant Division contractors of the Central Valley Project (CVP). This lawsuit, known as *NRDC, et al., v. Kirk Rodgers, et al.,* reached a Stipulation of Settlement (Settlement) on September 13, 2006. The Settlement includes both Restoration and Water Management goals. The state's participation in the Program, via the Department of Water Resources (DWR) and CDFW, is directed by the terms in the Memorandum of Understanding (MOU) between the Settling Parties and the state, effective for the duration of the Settlement and terminating on December 31, 2026.

CDFW participates in the SJRRP at nearly all levels as described in the Program Management Plan (SJRRP 2007). The core CDFW team of nine permanent employees and thirteen temporary employees are engaged in salmon reintroduction actions and planning, fish facility operations, research, and monitoring efforts supporting population and habitat goals, site-specific projects, recreation, drought actions, environmental compliance and permitting, and public outreach.

Key accomplishments in Fiscal Year 2015/2016:

- The final phase of Salmon Conservation and Research Facility (SCARF) construction was approved and should be initiated in late 2016. The facility is anticipated to be operational no later than early 2018.

- Drought conditions severely impacted Program implementation with high temperatures and reduced flows affecting Interim Facility (a temporary salmon conservation and research facility) operations and fishery studies. Drought funding made it possible to install permanent chillers and recirculation equipment at the Interim Facility and pursue enhancements to increase space and water quality to mitigate drought impacts at the Interim Facility and Satellite Incubation and Rearing Facility (SIRF). Funding also enabled CDFW to enhance monitoring activities and move fish around unsuitable reaches. Final equipment installation and acquisition of fish transports were complete in March 2016. Data collection and drought monitoring continues.

- The Interim Facility continued operations (which began in 2010) at the proposed SCARF site adjacent to the San Joaquin River State Fish Hatchery (SJRH). The Interim Facility continued to raise three brood years (BY) of spring-run Chinook: BYs 2012, 2013, and 2014. BY 2015 was brought to the facility during the spring of 2016. The first BY was successfully spawned in the fall of 2015 and produced

approximately 50,000 juveniles that were released in the San Joaquin River in the spring of 2016.

- The third year of juvenile spring-run translocation took place when 54,000 juveniles were transported from Feather River Hatchery (FRH), acclimated, and released to the river in March. Additional measures were taken to ensure survival in drought conditions by limiting holding periods and releasing at the most suitable downstream location within the Restoration Area.

- CDFW collaborated with Program partners to hold the annual Salmon Fest at Lost Lake Recreation Area near Fresno in December 2015 and the fourth annual Sycamore Island Fishing Derby in March 2016. Both events were well-attended with a favorable public response.

- CDFW continued sport-fishing outreach and recreation enhancements by coordinating with the San Joaquin River Conservancy (Conservancy), the San Joaquin River Parkway and Conservation Trust (Parkway), and DWR to plan access improvements at the Sycamore Island Trout Pond.

- A Revised Framework for Implementation (SJRRP 2015) was finalized in July 2015 with CDFW assistance to establish a realistic schedule for the implementation of the SJRRP based upon the best available technical, biological, schedule, and funding information. This effort updated and refined the schedule and associated future funding needs.

- CDFW staff continued to assist with and independently carry out monitoring activities and studies including: Chinook Salmon (*Oncorhynchus tshawytscha)* survival, trap and haul of adults from Reach 5 to Reach 1, artificial spawning of trapped adults and rearing of their offspring for release at the SIRF, stream temperature monitoring, habitat mapping, egg survival, and spawning habitat studies.

    - The 2015 trap and haul effort moved 933 adults to Reach 1, compared to 510 in the fall of 2014 and 367 in the fall of 2013.

    - Artificial spawning yielded approximately 66,000 fall-run juveniles for studies, compared to 18,000 in 2014 and 37,000 in 2013.

    - Surveys detected 202 redds and 238 adult carcasses in the fall of 2015, an increase from the 2013 and 2014 surveys.

    - Fry emergence traps estimated in-river fall-run juvenile production to be approximately 111,302 compared to 80,757 in 2014.

    - Evaluation of outmigrating juveniles and survival continued by assessing suitable site selection for traps and operational conditions.

    - Temperature data collection continued from 2002 and expanded to include site-specific measurements and careful tracking of drought conditions.

- Site-specific planning coordination continued for restoration actions.

    - The Mendota Pool Bypass and Reach 2B Improvements Project Environmental Impact Statement/Report (EIS/R) continued development with an anticipated Final public draft in July 2016.

    - The Reach 4A, Water Year 2016-2026 Transfer and Exchange from Madera Irrigation District to the Red Top Area Draft Environmental Assessment/Mitigated Negative Declaration were completed in February 2016.

    - Reach 4A Kangaroo Rat surveys began in May of 2016.

    - Reach 4B, Eastside and Mariposa Bypass Channel Structural Improvements planning continued.

- CDFW staff continued to participate in various technical and program management working groups, attended and supported numerous public workshops, interagency meetings, and public tours. CDFW staff also assisted with and completed appropriate environmental disclosure documents and permits necessary for site-specific actions and monitoring activities.

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3 ACRONYMS AND ABBREVIATIONS

ACOE	United States Army Corps of Engineers
ATR	Annual Technical Report
BA	Biological Assessment
BO	Biological Opinion
BY	brood year
California HSRG	California Hatchery Scientific Review Group
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CTS	California Tiger Salamander
CVFPB	Central Valley Flood Protection Board
CVP	Central Valley Project
CWA	Clean Water Act
CWT	coded wire tag
Delta	Sacramento-San Joaquin Delta
DMI	deep matrix incubator
DGS	Department of General Services
DOF	Department of Finance
DWR	California Department of Water Resources
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
ESA	(Federal) Endangered Species Act
FMP	SJRRP Fisheries Management Plan
FMWG	Fisheries Management Work Group
FRH	Feather River Hatchery
FRRT	Fisheries Reintroduction Regulatory Team
FY	Fiscal Year
FWUA	Friant Water Users Authority now Friant Water Authority
HCT	Hatchery Coordination Team

HFB	Hills Ferry Barrier
HGMP	Hatchery and Genetic Management Plan
Interim Facility	Interim Salmon Conservation and Research Facility
ITP	Incidental Take Permit
LED	Law Enforcement Division
LSAA	Lake and Streambed Alteration Agreement
MAP	Monitoring and Analysis Plan
MOU	Memorandum of Understanding
NMFS	National Marine Fisheries Service
NPDES	National Pollution Discharge Elimination System
NWP	Nationwide Permit
NOAA	National Oceanic and Atmospheric Administration
NRDC	Natural Resources Defense Council
OHV	Off-highway Vehicles
PIT	passive integrated transponder
PMP	Program Management Plan
RA	Restoration Administrator
Reclamation	U.S. Bureau of Reclamation
RST	Rotary Screw Trap
RWQCB	Regional Water Quality Control Board
SCARF	Salmon Conservation and Research Facility
Settlement	Stipulation of Settlement in *NRDC, et al., v. Kirk Rodgers, et al.*
SIG	Small Interdisciplinary Group
SIRF	Satellite Incubation and Rearing Facility
SLC	(California) State Lands Commission
SJH	San Joaquin State Trout Hatchery
SJRRP or Program	San Joaquin River Restoration Program
TAC	Technical Advisory Committee
USFWS	U.S. Fish and Wildlife Service

4 INTRODUCTION

This report summarizes fiscal-year actions from July 2015 through June 2016 by the California Department of Fish and Wildlife (CDFW) in collaboration with the San Joaquin River Restoration Program (SJRRP or Program) participants. This report also provides the background setting driving all SJRRP actions towards meeting the Restoration and Water Management goals outlined in the Stipulation of Settlement (Settlement) and the Memorandum of Understanding (MOU) between the state and the Settling Parties.

4.1 San Joaquin River Settlement

In 1988, a coalition of environmental groups led by the Natural Resources Defense Council (NRDC) filed a lawsuit challenging the renewal of long-term water service contracts between the United States and Friant Division contractors of the Central Valley Project (CVP) Friant Division contractors. After more than 18 years of litigation of this lawsuit, known as *NRDC, et al., v. Kirk Rodgers, et al.,* a Stipulation of Settlement (Settlement) was reached. On September 13, 2006, the Settling Parties reached agreement on the terms and conditions of the Settlement, which was subsequently approved by the Court on October 23, 2006. The Settling Parties include the NRDC, Friant Water Users Authority (FWUA, now Friant Water Authority [FWA]), and the U.S. Departments of the Interior (through the Bureau of Reclamation [Reclamation] and the Fish and Wildlife Service [USFWS]), and Commerce (through the National Marine Fisheries Service [NMFS]).

4.1.1 Settlement Goals

The Settlement identifies two primary goals:

Restoration Goal – To restore and maintain fish populations in "good condition" in the main stem of the San Joaquin River below Friant Dam to the confluence of the Merced River, including naturally reproducing and self-sustaining populations of salmon and other fish

Water Management Goal – To reduce or avoid adverse water supply impacts to all of the Friant Division long-term contractors that may result from the Interim Flows and Restoration Flows provided for in the Settlement

4.1.2 Memorandum of Understanding with the State

The Settling Parties agreed that implementing the Settlement will require participation of the State of California. Therefore, concurrent with execution of the Settlement, the Settling Parties entered into a MOU with the State of California—by and through the California Natural Resources Agency, the California Department of Water Resources (DWR), CDFW, and the California Environmental Protection Agency—on September 13, 2006.

Consistent with the MOU, the state plays a major, collaborative role in the planning, design, funding, and implementation of the actions called for in the Settlement. The state agencies assist the Settling Parties in implementing the Settlement consistent with the state Agencies' authorities, resources, and broader regional natural resource management strategies.

Under the MOU, CDFW and DWR further pledge to assist the Settling Parties in identifying state funding sources that may be available to implement the Restoration and Water Management goals, the level of state funding to be contributed towards specific projects required by the Settlement, and the level of funding required for extended operation of the Hills Ferry Fish Barrier (HFB). The terms of this MOU terminate on December 31, 2026, unless extended by written agreement of all of the Parties.

4.2 San Joaquin River Restoration Program Organization

The Settlement states that the Secretary of the Interior will implement the terms and conditions of the Settlement. The Implementing Agencies responsible for implementing the Settlement and managing the Program include Reclamation, USFWS, NMFS, DWR, and CDFW.

Court approval of the Settlement initiated a series of actions resulting in a program structure that provides for effective oversight, management and transparency of Program implementation. Key to management and oversight of Settlement implementation are several working groups that meet regularly, develop products, and implement actions that further the Restoration and Water Management goals.

4.2.1 San Joaquin River Restoration Program Team

The SJRRP Team is a multi-tiered group that includes staff from the Implementing Agencies. Organizational roles and responsibilities of this group are as follows:

Program Management Team – Includes leadership from the Implementing Agencies and is responsible for the overall direction and coordination of the SJRRP and consistency with respective agency policies and programs.

Technical Working Groups – The SJRRP features several Technical Work Groups, each supported by various subject-matter specific sub-groups.

4.2.2 Restoration Administrator and Technical Advisory Committee

The Settlement specifies the roles and responsibilities for a Restoration Administrator (RA) who is supported by a Technical Advisory Committee (TAC). The structure of the TAC is intended to provide for timely input on technical issues related to the Restoration and Water Management goals.

Restoration Administrator – The RA is selected jointly by the NRDC and FWA and in consultation with the TAC, provides recommendations to the Secretary of the Interior regarding specific elements of the Settlement and certain issues related to the Program's Restoration and Water Management goals.

Technical Advisory Committee – The TAC features six voting members selected by and representing FWA and NRDC. Voting members of the TAC assist and advise the RA regarding areas outlined in the Settlement, have relevant technical or scientific background or expertise in fields related to river restoration or fishery restoration, and serve for three-year terms. There are two nonvoting members of the TAC representing the state (from DWR and CDFW) and three Federal agency liaisons (from Reclamation, NFMS, and the USFWS) to ensure coordination and information-sharing with the Implementing Agencies.

4.2.3 Third Party Stakeholders

Third parties represent some of the entities or individuals located in the San Joaquin River Basin that are not directly involved in the Settlement but could be affected by its implementation. These include landowners adjacent to the San Joaquin River and Eastside Bypass, water rights holders on downstream tributaries to the San Joaquin River, and other CVP water users that rely on water conveyed from the Sacramento-San Joaquin Delta.

4.3 CDFW Coordination and Support

CDFW coordination and support for implementation of the SJRRP began in 2006 and continues under a growing program that has required increased staffing resources. Activities pursued by CDFW staff include participation in multiple Program technical and management work groups (Table 1), implementation of restoration and reintroduction actions, research and monitoring, regulatory actions, and project planning and oversight. The ambitious nature of SJRRP implementation requires regular meetings with the Implementing Agencies, Settling Parties, and stakeholder groups. While new work teams frequently form to manage near term projects and evolving issues, some are also consolidated over time to better manage resources as priorities evolve. There are a number of core teams that meet on a regular basis and some that meet less frequently.

4.4 CDFW Staffing

For FY 2015/2016, CDFW dedicated staff involved in the SJRRP consisted of several full-time and part-time positions, including:

Full-Time (9):
One (1) Environmental Program Manager
One (1) Senior Environmental Scientist Supervisor
One (1) Senior Environmental Scientist (Specialist)
Five (5) Environmental Scientists
One (1) Associate Government Program Analyst

Part-Time (13):
One (1) Office Technician
Twelve (12) Scientific or Seasonal Aides

CDFW also provided support to the SJRRP through numerous non-dedicated administrative, technical, regulatory, legal, and management staff. Additional support was provided by two volunteer assistants under the Americorps Watershed Stewards Project of the California Conservation Corps who worked closely with and received mentorship from CDFW staff while serving with the San Joaquin River Partnership.

Table 1: CDFW staff participated in the following core groups during Fiscal Year 2015/2016

Management and Oversight • Program Management Team • Technical Advisory Committee • Settling Party Consultation Team • Agency Policy Team • Monitoring and Analysis Plan Oversight Panel • Public Affairs Team	**Regulatory and Permitting Teams** • Environmental Compliance and Permitting Workgroup Fisheries Reintroduction Regulatory Team • NFMS Spring-run Technical Memo Team
Technical Teams • Fisheries Management Work Group • Reach 2B Coordination Team • Reach 4B Coordination Team • Flow Scheduling Subgroup • Small Interdisciplinary Groups o Spawning and Incubation Habitat o Juvenile Rearing Habitat o Predation Protection o Adult Migration • Spring-Run Management and Monitoring Team • Fisheries Monitoring Subgroup • Restoration Goal Technical Feedback Group	**Hatchery Related Teams** • SCARF Coordination Team • SCARF Construction Planning Team • Genetics Subgroup • Conservation Facility Subgroup • Hatchery Coordination Team (HCT) • Central Valley HCT • Hatchery Scientific Review Policy Team • Anadromous Hatchery Committee

4.5 Project Area

The geographic area for the SJRRP includes California's Central Valley from the Sacramento-San Joaquin Delta (Delta) to the base of the Tehachapi Mountains

south of Bakersfield. This area includes the San Joaquin River from Friant Dam to the Delta, the Friant Division of the CVP, other water service areas potentially affected by changes in water deliveries or restoration of the San Joaquin River, and tributaries to the San Joaquin River downstream of the Restoration Area.

The Restoration Area is 153 miles long, from Friant Dam downstream to the confluence with the Merced River. This stretch of river crosses the counties of Fresno, Madera, and Merced. For the purposes of the Program, the Restoration Area has been divided into five primary reaches (Figure 1). The Program is also evaluating sections of the Eastside and Mariposa flood bypasses as potential alternatives to the river for carrying Restoration Flows and providing fish habitat.

The five designated reaches in the Restoration Area include:

- **Reach 1** – Friant Dam to Gravelly Ford. This reach is further divided into sub-Reaches 1A and 1B with the Highway 99 crossing serving as the dividing line.
- **Reach 2** – Gravelly Ford to Mendota Dam. This reach is further divided into sub-reaches 2A and 2B with the Chowchilla Bypass control structure serving as the dividing line.
- **Reach 3** – Mendota Dam to Sack Dam.
- **Reach 4** – Sack Dam to the confluence of Bear Creek and the Eastside Bypass. This reach is further divided into sub-Reaches 4A and 4B with the Sand Slough control structure serving as the dividing line.
- **Reach 5** – Eastside Bypass/Bear Creek confluence to the Merced River confluence.

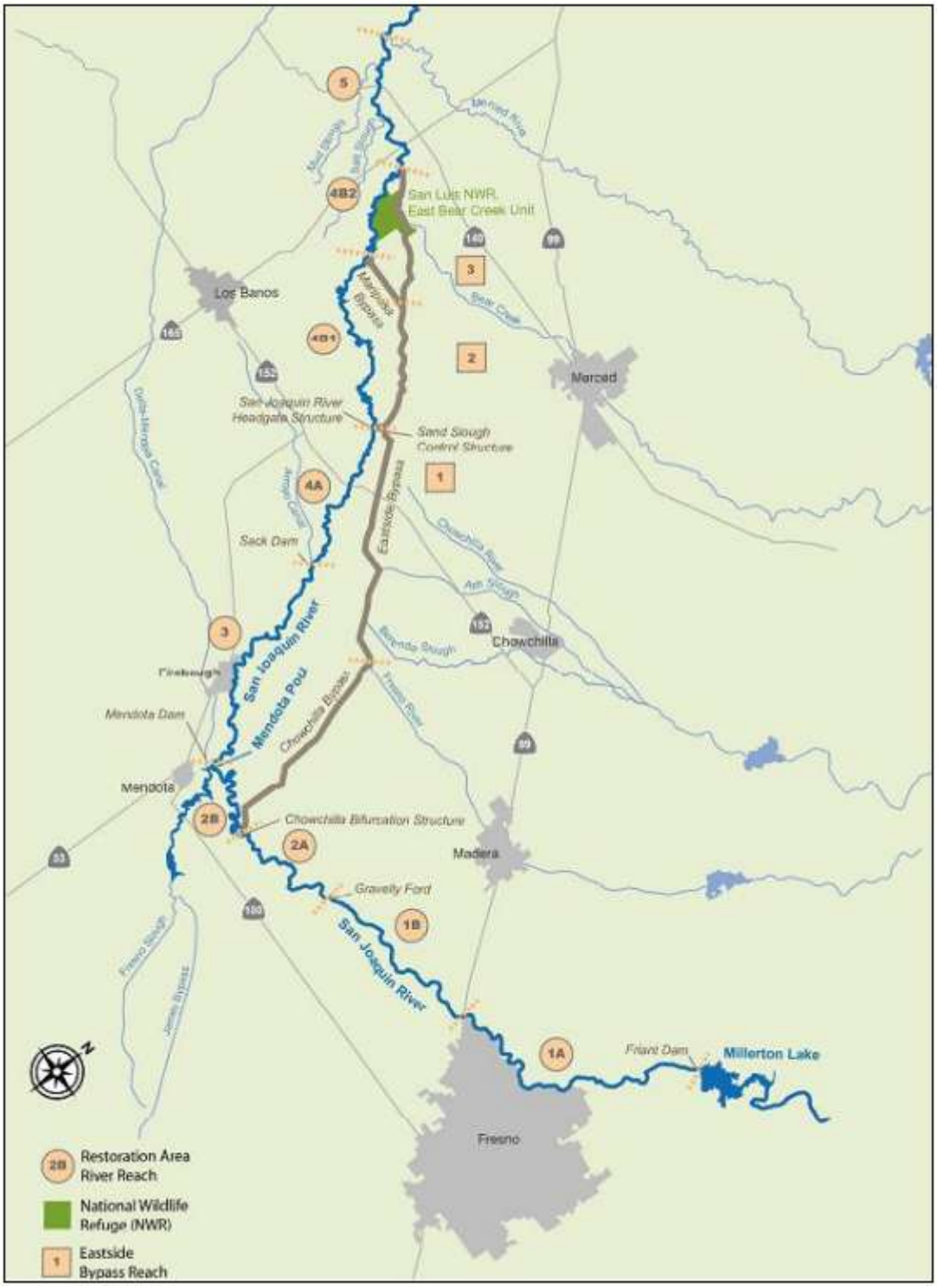

Figure 1: San Joaquin River (Source: USBR)

4.6 Program Schedule and Milestones

The proposed actions in the Settlement outline how the Implementing Agencies will achieve the Restoration and Water Management goals. As part of the Settlement, the Settling Parties developed a staged timeline for developing and implementing restoration actions. The following information highlights significant milestones in the three stages of SJRRP implementation as well as a revised schedule to achieve the goals of the Settlement.

4.6.1 Implementation Staging

The SJRRP developed a three-stage implementation strategy in the Program Management Plan (SJRRP 2007) representing significant implementation milestones consistent with Settlement.

Stage 1 - Stage 1 focuses on program-level planning and environmental review, including formulating and evaluating reasonable alternatives for accomplishing the Restoration and Water Management Goals with a focus on implementing system-wide aspects. Stage 1 was initiated and included developing environmental and planning documents and identifying the significant data needs required to complete Stage 2.

Stage 2 - Stage 2 commenced in October 2009 with the release of Interim Flows and would have concluded in December 2013 with the completion of Phase 1 improvements and agreement on operational guidelines. During Stage 2, an Interim Flows program was implemented to support relevant data collection concerning flows, temperature, fish needs, seepage losses, recirculation, recapture, and reuse. Stage 2 also includes reintroducing spring-run and fall-run Chinook Salmon and implementing all Phase 1 channel improvements. Phase 1 channel improvements include:

- Creating a bypass channel around Mendota Pool to convey at least 4,500 cubic feet per second (cfs);
- Modifying Reach 2B in order to convey at least 4,500 cfs;
- Modifying Reach 4B in order to convey at least 475 cfs;
- Modifying the Sand Slough control structure to ensure fish passage;
- Screening the Arroyo Canal diversion to prevent anadromous fish entrainment;
- Modifying Sack Dam to ensure fish passage;

- Modifying structures in the Eastside and Mariposa Bypass channels to provide anadromous fish passage on an interim basis until completion of Phase 2 improvements;

- Constructing, if needed, low-flow channels in the Eastside and Mariposa Bypass channels suitable to support anadromous fish migration; and

- Constructing seasonal barriers in the area of Mud and Salt Sloughs to prevent adult anadromous fish from entering these false migration pathways.

Stage 3 - The primary activities in Stage 3 include the release of full Restoration Flows from Friant Dam, continued implementation of the Fisheries Management Plan, construction of the remaining Program features that were not a Phase 1 priority, and operation and maintenance of project facilities. The full Restoration Flows were to commence no later than January 1, 2014.

4.6.2 Framework for Implementation

Realizing that SJRRP implementation was unavoidably behind schedule, a *Third Party Working Draft Framework for Implementation*, dated June 19, 2012 ("Framework"; SJRRP 2012), was developed by the SJRRP to establish a realistic schedule for implementation based upon the best available technical, biological, schedule, and funding information. The Framework has been treated as a living document with initiation of a Revised Framework in 2014 to update and refine the schedule and associated future funding needs. The Revised Framework for Implementation (SJRRP 2015) was finalized in July 2015. The Framework process will continue to be updated as additional information is gained and milestones are reached, focusing on activities necessary to plan, permit, design, and construct major physical project elements of the SJRRP.

Key elements of the revised schedule seek to sequentially implement actions that provide clear, realistic, and accomplishable steps towards meeting the Restoration and Water Management goals. The proposed schedule is provided in Table 2.

Table 2: Schedule of Key Construction Actions (from SJRRP 2015)

2015-2019	2020-2024	2025-2029	2030+
Goal: 1,300 cfs Capacity in all Reaches	Goal: Increased Capacity	Goal: Phase 1 Projects Complete	Goal: All Remaining Projects
• Friant-Kern Canal Capacity Restoration • Madera Canal Capacity Restoration • Mendota Pool Bypass • Temporary Arroyo Canal Screen and Sack Dam Passage • SCARF Completion • Seepage Projects to 1,300 cfs	• Financial Assistance for Groundwater Banks • Reach 2B • Arroyo Canal and Sack Dam • Reach 4B Land Acquisition • Seepage Projects to 2,500 cfs • Levee Stability to 2,500 cfs	• Reach 4B • Salt and Mud Sloughs • Chowchilla Bifurcation Structure Modifications • Highest Priority Gravel Pits • Seepage Projects to 4,500 cfs • Levee Stability to 4,500 cfs	• Ongoing Operations and Maintenance

4.7 CDFW Objectives

Key objectives for CDFW support and assistance with implementation of the Settlement include the following:

- Support the Settling Parties in achieving the SJRRP Restoration Goal, consistent with CDFW's authorities, resources, and broader regional resource strategies.

- Fulfill the other commitments identified in the State Agency MOU pertaining to the Settlement.

- Produce a spring-run Chinook Salmon stock on the San Joaquin River that is genetically diverse, while minimizing impacts to source populations.

- Design, construct, and operate a conservation-style hatchery facility to augment the natural population in order to achieve spring-run population objectives identified in the SJRRP's Fish Management Plan.

- Provide a controlled laboratory environment for conducting fish research.

- Manage Chinook Salmon runs in the Restoration Area and, specifically, the potential for hybridization between runs.

- Monitor and conduct research that will direct Chinook Salmon management within the Restoration Area.

- Fulfill CDFW's mission to manage California's diverse fish, wildlife, and plant resources, and the habitats on which they depend, for their ecological values and for their use and enjoyment by the public.

- Fulfill CDFW's obligation to conserve, protect, and manage fish, wildlife, native plants, and habitats necessary for biologically sustainable populations of those species and as a trustee agency for fish and wildlife resources pursuant to Fish and Game Code section 1802.

5 SALMON REINTRODUCTION

As part of the planning process for implementing the Settlement, the Implementing Agencies created a SJRRP Fisheries Management Plan (FMP) (SJRRP 2010a). This document laid out an approach to adaptively manage the reintroduction of Chinook Salmon to the San Joaquin River, a key element to the Restoration Goal. The FMP also identified specific fish population and habitat goals to guide the vision of the SJRRP and measurable objectives to evaluate program success.

Fisheries Management Plan (SJRRP 2010a) Population Goals include:

- Establishing natural populations of spring and fall-run that are specifically adapted to San Joaquin River conditions;
- Establishing populations of spring and fall-run that are genetically diverse;
- Establishing populations of spring and fall-run that are demographically diverse;
- Minimizing hybridization between runs and hatchery stocks; and
- Establishing a fish community that would be expected in the Sacramento-San Joaquin Province.

The FMP adopted spring- and fall-run reintroduction strategies as described by the TAC and RA (TAC 2007, 2008). To ensure that the reintroduced spring-run Chinook Salmon population is genetically diverse, the FMP recommended full implementation of conservation practices via artificial propagation of Chinook Salmon. CDFW proposed the Salmon Conservation and Research Facility (SCARF), a conservation-style hatchery which will produce Chinook Salmon for reintroduction to the San Joaquin River and also serve as a research facility for studies related to Chinook Salmon in the Restoration Area. The SCARF would provide CDFW with the ability to produce adult broodstock from small numbers of eggs and juveniles collected from various donor populations in order to produce a genetically diverse population in the San Joaquin River while minimizing impacts to source populations.

The Hatchery and Genetics Management Plan (HGMP) for the San Joaquin River Salmon Conservation and Research Program adopts the population goals from the FMP and establishes two additional genetics goals (SJRRP 2010b):

- Promote and protect genetic diversity within the reestablishing populations while safeguarding against negative genetic effects to out-of-basin source and nontarget populations; and
- Reestablish self-sustaining San Joaquin River spring- and fall-run salmon populations.

5.1 Hatchery Scientific Review

A California Hatchery Scientific Review Project was initiated 2010 to address an identified need to reform hatchery practices. The goal of this initiative is to: (1) help recover and conserve naturally spawning salmon and steelhead populations, and (2) support sustainable fisheries with little or no deleterious consequence to natural populations. A California Hatchery Scientific Review Group (California HSRG) was appointed to weigh available scientific information so as to produce consensus recommendations for changes in hatchery practices which should provide guidance to policy makers who will be responsible for implementing changes in how California hatcheries are operated. The California HSRG reported its findings and recommendations in the California Hatchery Review Report (California HSRG 2012).

To evaluate and implement recommendations in the California Hatchery Review Report, CDFW and USFWS began facilitating coordination of a Hatchery Policy Team and Hatchery Coordination Teams (HCTs). Though not identified in the California Hatchery Review Report (owing to the fact that a hatchery has yet to be developed for the SJRRP), a HCT for the SCARF was formed in 2013.

The role of the HCT is to evaluate and prioritize recommendations in the California Hatchery Review Report for implementation that have the greatest impact, taking into consideration relevance, feasibility, costs and technical considerations.

Specific tasks of the HCT include:

- Reviewing and evaluating statewide standards and hatchery-specific recommendations;
- Reviewing program reports (Appendix VIII of the California Hatchery Review Report) for accuracy;
- Prioritizing hatchery-specific recommendations for implementation;
- Providing recommendations on hatchery improvements to the Hatchery Policy Team;
- Identifying and categorizing recommendations into those that should be accomplished within one year, within one to five years, and greater than five years;
- Developing an implementation plan including timelines, responsibilities and annual reviews to ensure successful implementation; and
- Providing an implementation plan to the Hatchery Policy Team.

The HCT completed its Charter and Purpose Statement for the SCARF, evaluated membership, shared planning and technical documents, and provided updates on ongoing activities at the Interim Facility and progress in development of the SCARF. A liaison from the SCARF HCT also participated in Hatchery Policy Team and Central Valley Hatchery Coordination Team meetings. Staff are in the process of developing the facility's Implementation Plan which sets forth its strategies for implementing the HSRG's standards and guidelines.

5.2 Interim Salmon Conservation and Research Facility Operations

A pilot-scale Interim Salmon Conservation and Research Facility (Interim Facility) has been in operation since 2010 to provide experience and to help refine rearing techniques and protocols while the SCARF is being constructed. The facility is guided by multi-agency technical teams that provide direction for operations to ensure consistency with Program goals and objectives and compliance with various regulatory and guidance documents. Roles and products of the technical teams are provided in Table 3, below.

Table 3: Interim Facility/SCARF Operations Coordination Teams and Work Groups

Tech Team or Workgroup	Role(s)	Documents Prepared or Used for Guidance
Hatchery Coordination Team (HCT)	Ensures facility operations are consistent with HSRG recommendations and with the facility's HGMP	Program's Draft Hatchery and Genetic Management Plan (HGMP; SJRRP 2010)
Fisheries Management Workgroup (FMWG)	Ensures facility operations are consistent with Program goals and objectives	Donor Stock Collection Plan
Conservation Facility Subgroup	A subgroup of the FMWG; develops a broodstock collection plan for the FMWG Donor Stock Collection Plan	Conservation Facility Broodstock Collection Recommendations
Genetics Subgroup	Reviews proposed donor stock collections and makes recommendations to ensure population genetic diversity	Contributes to development of, and ensures consistency with the Program's HGMP

Each year, the SJRRP prepares a Donor Stock Collection Plan and Annual Report pursuant to the NMFS 10(a)(1)(A) permits 17781 and 14868. Included in the Donor Stock Collection Plan are broodstock collection recommendations developed by the Program's Conservation Facility Subgroup. The subgroup considers Interim Facility and SCARF capacity limitations, coordinates with the Genetics Subgroup and HCT,

and makes recommendations to the Fisheries Management Workgroup (FMWG) for inclusion in the Donor Stock Collection Plan. The 2016 Conservation Facility Subgroup recommendations were completed and included in the Donor Stock Collection Plan.

The 2016 Recommendations include both the collection of the Brood Year (BY) 2016 broodstock from Feather River Hatchery (FRH) and the spawning of the BYs 2012 and 2013 broodstock that are currently held at the Interim Facility. The 2016 recommendations also prescribed mating protocols to use up to a 2:1 male to female spawning ratio for spawning the BY 2012/13 adults at the Interim Facility in order to increase genetic diversity as well as allowing up to 20%early maturing two-year-old males in crosses, depending on final recommendations of the parent groups.

5.3 Genetics Subgroup

The Genetics Subgroup is composed of state and federal personnel who specialize in fish genetics management. The group meets as needed to discuss fish genetics topics for the Program. Its members also contribute, where needed, to the Fish Management Workgroup and the Hatchery Coordination Team.

The Genetics Subgroup met in June 2016 in conjunction with the Conservation Facility Subgroup meeting to provide an update on hatchery activities and to discuss the following topics:

- Results of the genetic analysis of the 2015 brood fish
- Results of research into precocious maturation and proposed future research on the topic
- The proposed release of adult broodstock to the San Joaquin River and possible genetic concerns
- The status of the molecular genetics analysis contract which ends in December 2016
- Review and discussion of the 2016 Conservation Facility Subgroup Recommendations

The Genetics Subgroup also reviewed the Draft 2016 HGMP which is under final internal review within CDFW.

5.4 Hatchery and Genetic Management Plan (HGMP)

Staff worked towards revising the 2010 Draft HGMP. Substantive changes to the document included the following:

- The Program's intention to collect spring-run Chinook juveniles from the Butte Creek Population no earlier than 2018
- Information regarding the recent drought response improvements at the Salmon Incubation and Rearing Facility (SIRF) at Friant Dam
- Changes to hatchery and fisheries protocols and practices
- Changes to fish collection procedures, numbers, and locations

5.5 Broodstock Collections

Each year, a sufficient number of eggs must be collected to satisfy both broodstock needs and to meet other reintroduction objectives (i.e. direct translocation) as allowed by 10(a)1(A) Permit 17781. Between 2012 and 2014, the Program collected 560 eggs annually from FRH for broodstock (Figure 2) in order to meet the fish production goal of spawning 50-100 adult pairs each year at the Interim Facility. Collections included an extra 60 eggs to provide juveniles for pathogen testing.

Figure 2: Spawning at Feather River Hatchery

In 2015, collections increased to 1,935 eggs in preparation for transferring fish production to the full-scale SCARF. Table 4 lists the number of eggs collected for broodstock collection over the past four years.

Table 4: Number of eyed eggs collected annually from Feather River Hatchery for broodstock development

Collection Year	Number of Adult Pairs Mated for Egg Production	Number of Eyed Eggs Collected
2012	90	560
2013	90	560
2014	105	560
2015	360	1935

Eggs were collected from a sufficient number of mated pairs to allow rejection of some crosses without negatively impacting genetic variability. In 2015, spawning at FRH for the Program occurred on the first four spawning dates of the season: September 17, 22, 23, and 28. Individual fish data were tracked for each cross, including tag number, tagging date, adipose fin status (presence or absence), head tag number, coded wire tag (CWT) number, sex, fork length, ovarian fluid and kidney tissue sample number, volume of flaccid eggs per female, daily egg expansion factor, female fecundity, tissue sample number, and corresponding genetic analysis data. During incubation, the data were compiled to determine which crosses met the following criteria:

- FRH production goal—The FRH spring-run egg collection goal was met
- Genetic variability—At least 350 pairs were spawned
- Disease status—The parental ovarian fluid and kidney tissue tested negative for infectious hematopoietic necrosis virus (IHNV) and Bacterial Kidney Disease (BKD)
- Run-timing
    - Both parents possessed a tag
    - Coded wire tags (if present) identifying the spring-run phenotype
- Age of maturity—Age-2 males and females comprised 2% or less of the parental crosses unless necessary to meet Program goals

The age class of 2015 adult returns used for the Program was comprised of 74% age-3, 24% age-4, and 0.3% age-5 fish. No age-2 males were spawned. Most of the

adults spawned were of hatchery FRH origin; however, 14 fish (2%) had intact adipose fins (i.e. presumed wild origin spring-run). During spawning, ovarian fluid was collected from each female and batched into groups of four. Each batch was screened for viruses and bacteria, including IHNV and BKD. Eggs from the first 30 crosses each day were placed into individual egg trays, after which eggs from two females were combined to allow sufficient incubation space for FRH egg production.

In October 2015, 1,935 eyed eggs were hand selected from the crosses that met the Program criteria by counting near-equal numbers from each cross (Table 5). Eggs were then transported to the Silverado Fisheries Base (SFB) (Yountville, CA) for hatching, quarantine, fish health inspection and coded wire tagging. After fish were tagged and passed fish health inspection, they were transferred to the Interim Facility for rearing.

Table 5: Summary data for 2015 broodstock collection at Feather River Fish Hatchery

Lot Number	Lot 1	Lot 2	Lot 3	Lot 4	Total
Spawn Date	9/17	9/22	9/23	9/28	-
Total crosses segregated for collection	59	120	199	41	360
Total crosses selected for Program	48	110	132	41	331
Total eggs separated for translocation	11,412	24,684	32,863	11,041	80,000
Total eggs separated for broodstock	342	612	816	165	1,935
Number with intact adipose fins	2	5	6	1	14
Number of BKD^{+} crosses rejected	11	10	8	0	29

In December 2015, after FRH spawning, egg segregation, collection, and transport was complete, the 2016 Conservation Subgroup Recommendation was developed and submitted to the FWS. The plan recommended collecting up to 2,760 eggs for broodstock in preparation of transferring fish production upon completion of the full-scale SCARF at the end of 2017, which will accommodate the spawning of up to 450 adult pairs each year. Until the SCARF becomes operational, the Interim Facility Program will continue to be used as a surrogate facility for fish production.

5.6 Broodstock Management

Staff continued to rear broodstock at the Interim Facility, including fish from four brood years. Regular duties at the Interim Facility during FY 2015/2016 included:

- Daily temperature and dissolved oxygen monitoring;
- Growth modulation to prevent early maturation through targeted feeding schedules;
- Monthly inventory and activity reports to NMFS;
- Quarterly reporting of water quality analysis of influent and effluent;
- Quarterly invasive species monitoring and reporting; and
- Regular weight and length data collections for growth monitoring.

Other significant activities during the period included:

- Coordination with the CDFW Fish Health Lab for fish health assessments, disease monitoring, and fish transfer approvals;
- Coordination with the Tissue Archive Lab and NMFS Southwest Fisheries Science Center for genetic tissue processing and analysis;
- Development of various contracts for facility operation; and
- Participation in several Program workgroups.

5.6.1 Early Maturation

Preventing early maturation in broodstock has been an ongoing priority at the Interim Facility. Chinook Salmon captive broodstock programs often experience high levels of early sexual maturation of males. These “precocious” fish are sometimes reduced or totally eliminated from breeding programs in order to prevent passing the trait on to successive generations. However, these early maturing individuals possess other traits that may prove beneficial in allowing the population to adapt to the natural environment. In an effort to maximize genetic diversity, it is preferntial to raise these individuals to adulthood and spawn them such that they contribute their genes to the population.

Several factors reportedly influence early maturation in Chinook Salmon, including genetics, emergence timing (Larsen et al. 2013), photoperiod (Berrill et al. 2003), energy stores (Shearer et al. 2006), and size and/or growth rate at specific times of year (Larsen et al. 2004). The decision to begin the physiological onset of maturation occurs annually and is reported to occur 8-12 months prior to spawning, and for yearlings the decision is reported to occur shortly after emergence (Shearer et al. 2006). Reducing growth rates by restricting the amount of feed between September and January has been shown to lower the incidence of early male maturation (Larsen et al. 2013). For this program, that initial decision window occurs while the fish are in quarantine at Silverado Fisheries Base, prior to being transferred to the

Interim Facility. In other river systems and consistent with our findings, the second decision window is reported to begin at age-one in September, lasts through January, and influences maturation at age-2 when the males (in California) are referred to as “jacks”.

The Program has adopted a strategy to reduce growth rates during the first two maturation decision windows. For the first decision window, growth rates are reduced by lowering water temperatures and reducing feed rations while at Silverado Fisheries Base. Temperatures are reduced to near 50° F during egg incubation and emergence (October - November) through use of water chillers and fry are fed a reduced ration through March. During the second decision window (age 12-16 months), only the feed ration is reduced.

The feed rate is determined using a Microsoft Excel based program, developed by the University of Oregon, which calculates the feed ration based on species, water temperature, body weight, feed conversion, and desired Allowable Growth Rate (AGR). The goal is to achieve and maintain a consistent condition factor[1] during this period amongst changing water temperatures and associated metabolic requirements. Actual feed conversion rates are calculated regularly and input into the program for accuracy. Maintaining a condition factor near 1.0 during the decision window appears to be adequate for reducing early maturation. To attain the targeted condition factor, males are offered a quarter ration (i.e., 25% of AGR) for a given weight and temperature during the maturation decision window. Females, which are apparently less sensitive to early maturation, are generally fed a full ration (i.e. 100 - 160% AGR).

To implement this feeding strategy, juvenile fish are tissue-sampled and PIT tagged once they arrive at the Interim Facility and have attained at least a 55 mm fork length. Tissue samples are then used for both molecular-based sex identification and genotyping. Data for individual fish are then entered into a Microsoft Access database for PIT tag number, fish ID, length, weight, sex, and tissue sample ID, and are assigned a condition factor. Once the sex has been determined, typically by July or August, males and females are separated just prior to the onset of the second maturation decision window (i.e. September). Sexes are held in separate tanks from age 10-19 months, after which they are combined and fed a normal ration in preparation to mature at age-three or later.

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[1] Condition Factor: For salmonids, is determined by: $K = (10^N W)/L^3$; where N = 5, W = weight in grams, and L = fork length in millimeters. This is a method for assigning a numerical value to visual assessments of condition for salmonids. A K value of 1.0 is poor, whereas a K value of 1.6 indicates a salmonid in excellent condition.

During the spring of 2015, a feeding trial study was conducted in an attempt to more narrowly define the edges of the maturation decision window. Having the ability to do so would enable hatchery managers to minimize restricted feeding and maximize fish growth in an effort to achieve growth rates more similar to those observed in wild fish.

Early Maturation Study

A research trial was conducted to further understand early maturation and the nature and timing of the spring-run Chinook Salmon maturation decision window, which reportedly occurs between September and January of each year. In September 2014, all BY 2013 males (a total of 182 fish) were provided with a feed ration of 25% AGR. The entire ration for the week was spread over 3 consecutive days in an effort to maximize meal size and reduce the competition for feed.

At the end of January 2015, these males were separated into three individual 6-ft tanks. The first group ([sample size] N=56) was fed the reduced ration (25% AGR) until the beginning of February. The second group (N=60) was fed a reduced ration until the beginning of March, and a third group (N=60) was fed a reduced ration until the beginning of April. Each group was weighed and measured monthly. Once each group reached the 100% AGR feed rate, they were rejoined with the 2013 BY females. A fourth small group of males (N=7) were never separated from the females and were fed a full ration before and during the entire study. In August 2015, after maturing males were exhibiting both primary and secondary sexual characteristics, the males were examined using ultrasound to verify maturation.

Group 1 (which received the restricted diet for the shortest amount of time) exhibited the highest level of early maturation (21% precocious). This was followed by Group 2 (12% precocious) and Group 3 (7% precocious) (Figure 3). More than half (58%) of the fish that were never fed the reduced ration matured early. The study appears to validate the strong influence of feed rate on precocity levels and also indicates that the end of the decision window does not appear to have a strict temporal limit but rather appears to have a decreasing influence over time.

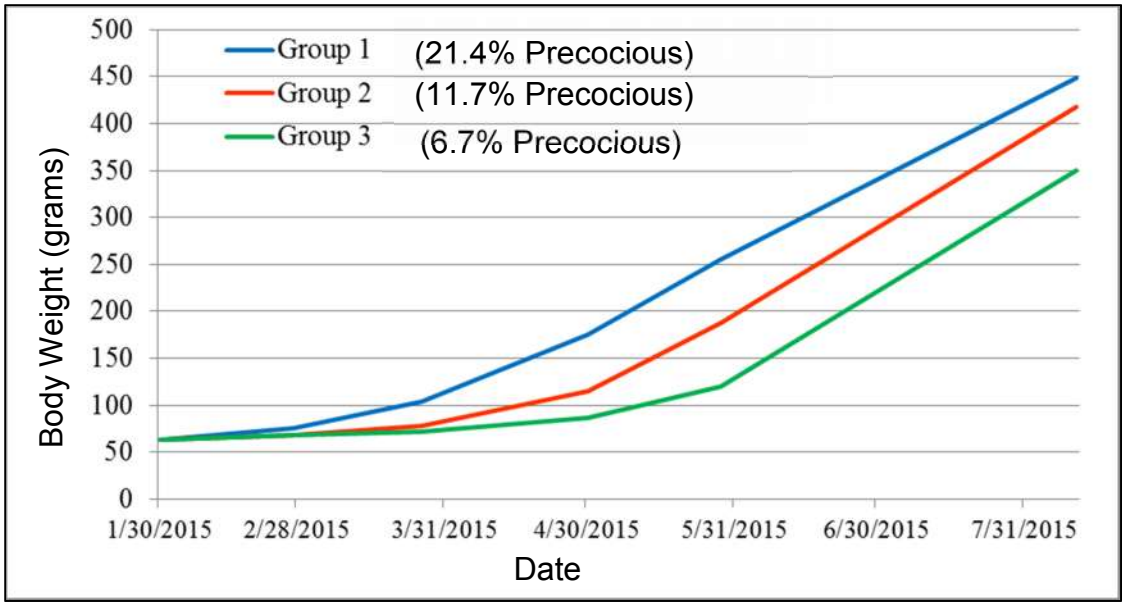

Figure 3: Weight gain and resulting early maturation of age-2 experimental 2013 brood year male spring-run Chinook Salmon that were fed different feeding regimes

5.6.2 2012 Brood Year Summary

Program staff continued to rear the 2012 BY broodstock at the Interim Facility. This cohort was collected as eggs in September of 2012 at FRH and is the first group of spring-run broodstock raised at the Interim Facility. Water temperature, dissolved oxygen and fish health were monitored daily. Fish growth and condition were measured and assessed regularly.

In June 2015, ultrasound was used in attempt to identify early stages of sexual maturity in BY 2012 females and males by looking for the onset of the development of ovaries and testicles. This information would indicate which fish would likely spawn in the fall. The June examination identified early developing gonads (eggs/sperm) in 43 of 100 age- 3 females and 36 of 105 age-3 males. It was later determined that the exam was able to correctly identify 92% of the females and 72% of the males that would eventually mature in the fall. The exam also identified sexually maturing BY 2012 males and females to be included in a Spring-run Chinook Salmon Acoustic Telemetry Study, which entailed releasing adult spring-run Chinook to the river to study in-river holding and spawning habitat.

Pre-spawning Activities

At the beginning of the spawning season, the BY 2012 population consisted of 100 females and 106 males. Based on data obtained from BY 2010 experimental fall-run Chinook raised at the facility, of which 90% the females matured in year-3, the number of BY 2012 adults was expected to be sufficient to achieve the goal of spawning 60 females to produce approximately 120,000 juveniles. However, as it turned out, only 51% of BY 2012 females matured, resulting in successful spawning

of only 43 females which produced approximately 80,000 eggs. The lower rate of maturation may reflect the natural age distribution of adults returning to FRH (Table 6).

Table 6: Age-class of adults returning to Feather River Hatchery, 2000 – 2004 (Cavallo et al. 2012)

Percent by Age of Spawning Run to Returning to Hatchery				
Year	Age2	Age 3	Age4	Age 5
2000	10.4	48.0	41.5	0.01
2001	3.1	70.3	26.3	0.03
2002	4.9	48.8	45.5	0.05
2003	5.9	17.7	76.0	0.04
2004	30.2	49.7	16.9	3.3

As the spawning season progressed, staff continued to use ultrasound to monitor egg development. In June of 2015, ovum diameters were measured at an average of 2.8 mm, which increased to 5.4 mm by August and to 6.8 mm when spawned. By August, mature broodstock were readily identifiable using ultrasound as well as visual observation of secondary sexual characteristics. Sexually mature fish included 27 precocious BY 2013 males (jacks). No females had matured, in contrast to the 10% maturation of two-year-old BY 2010 fall-run females observed in the fall of 2012. BY 2012 and 2013 broodstock were placed into separate tanks, each containing either mature fish or immature fish. The list of mature broodstock was sent to the NMFS Southwest Fisheries Science Center and a mating matrix was developed based on genetic data obtained from tissue sample analysis. In order to maximize genetic diversity, the least related individuals are selected to mate together. Ripe females were mated with ripe males that possessed a relatedness value less than 0.125 (which would be first cousins).

Beginning in September, male sexual maturity was increasingly monitored. Ripeness (degree of readiness to spawn) was assessed by gently palpating the abdomen in an attempt to express milt[2]. Milt, if present, was placed on a glass slide and quickly viewed by microscope to assess motility. Approximately 10 microliters µL of 0.09% saline solution was placed on the slide to activate the sperm. Sperm are active for only seconds after activation and because spawning occurred while air temperatures

[2] Milt: The sperm-containing fluid of a male fish.

were warm, the activation solution and microscope slide had to be chilled to accurately identify motility.

Figure 4: Segregation cages used during spawning to separate ripe males and females

Spawning

Spawning occurred between September 22 and October 29, 2015. Each of the 43 females were mated with four of the most distantly-related males as determined using the NMFS-developed breeding matrix. Males selected for breeding were taken from a pool of 66 males from BY 2012, and 27 early maturing males from BY 2013. Of these, 56 broodstock were used from BY 2012 and 10 from BY 2013. In between spawning days, fish were checked for ripeness once or twice per week. Females were found to be ripe using ultrasound to determine when the developing eggs had hydrated (Figure 5); and through visual observation: i.e., the skin color had darkened, the vent/oviduct[3] was protruded, and upon gentle palpation, eggs are expressed from the vent.

[3] Oviduct: A tube through which eggs pass from the roe sacs (or skeins) to the outside.

Figure 5: Ultrasound images of developing eggs as they increase in water content (i.e. hydration) observed by a darkening that occurs during the final days of maturation

Spawning was initiated by sedating selected females then euthanizing them. The fish are then washed to minimize the potential for infecting the extracted eggs with disease. While preparing the females, 4 males (plus 1 or 2 backup males) were similarly sedated but not euthanized. Once the males were ready, the abdomen of the female was palpated to collect a sample of ovarian fluid for virology and bacteriology. Eggs were expelled into a colander to drain and discard the remaining ovarian fluid, rinsed with a saline solution, divided equally into four plastic containers and combined with roughly a half cup of saline solution. Milt from each male was then expressed into each container of eggs and allowed to fertilize for one to two minutes. The fertilized eggs were then placed back in the colander and treated with an iodine solution to destroy any potential pathogens. Eggs were then segregated into subdivided vertical stack incubator trays for water hardening and incubation.

Fecundity (number of eggs produced/female) averaged 1,980 eggs and a total of approximately 80,400 eggs were spawned (Table 7). Egg survival to the eyed-stage was 77%, despite ongoing drought conditions which resulted in ambient water temperature reaching 67°F. Water recirculation equipment was used to successfully reduce temperatures between 55-58°F. Egg survival was 63% from spawn to emergence and 60% from spawn to release.

Several observations were noted during the spawn: BY 2013 males expressed milt approximately two weeks before BY 2012 males and, overall, the peak of spawning was about three weeks later than spring-run Chinook Salmon spawning at FRH. However, adjacent tributary reported similar delays in the fall-run Chinook Salmon returns, which may have been due to the ongoing drought.

Fecundity (1,980) was also substantially lower than what was observed with the BY 2010 experimental fall-run Chinook (2,435). This was likely because of the lower body weight of the BY 2012 (1,692 g) compared to BY 2010 (1,987 g). However, BY 2012 eggs (123 eggs/oz) were comparable in size to BY 2010 eggs (127 eggs/oz) (Table 7).

Juvenile Production

BY 2015 juveniles, spawned (primarily) from BY 2012 stock, were reared at the Interim Facility until March. Between February 23 and March 7, 2015, all juveniles were adipose fin clipped and coded wire tagged. On March 15, 48,341 juveniles were transported and held in net pens near Hills Ferry from until March 17, 2016 and then released. Survival from spawn to release was 60.1%. Post release, a total of 147 coded wire tags (CWTs) were recovered during out migration at the USBR Tracy Fish Collection Facility, the CDFW Mossdale Trawl and seine sites, and at Chipps Island.

5.6.3 2013 Brood Year Summary

BY 2013 continued to be reared at the Interim Facility. Water temperature, dissolved oxygen and fish health were monitored daily. As mentioned above, 27 of the BY 2013 males matured early at age-2, of which 10 were used in spawning. A research trial, using BY 2013 males, was conducted in an effort to further understand the nature and timing of the spring-run Chinook Salmon maturation decision window that has been reported to occur in other systems between September and January of each year. The results from this activity are discussed in Section 5.6.1. The remaining BY 2013 broodstock will continue to be reared with the remaining BY 2012 broodstock, and mature adults will be spawned in the fall of 2016.

Table 7: Summary of spring-run Chinook Salmon spawn at the Interim Facility in Fall 2015

Total Eggs Spawned	80,435
Total Eggs to eyed stage	61,833
Total Survival to Emergence	50,507
Percent Survival to eyed stage	76.9%
Percent Survival from Eyed to Emergence	81.7%
Percent Survival from Spawn to Emergence	62.8%
Average Weight per Female (grams)	1,692
Average Length per Female (mm)	487
Average Fecundity	1,980
Egg Size (eggs per Ounce)	123
Egg Size 2015 FRH Spring-run Chinook (eggs/ounce)	106
Total Number of Females Spawned	43
Total Number of Males Spawned	65
Number of BY 2012 Males Spawned	56
Number of BY 2013 Males Spawned	10
M:F Ratio	1.51

Percent 2013 BY Males Spawned	15.4%
Target Number of Spawns per Male	3
Average Relatedness Value between Matings (SD ±0.07)	-0.13
Highest/Lowest Relatedness Value between Matings	-0.01/-0.34

5.6.4 2014 Brood Year Summary

BY 2014 broodstock were collected in September 2014 at the Feather River Hatchery when a total of 105 spring-run Chinook crosses were separated for the Program. At the Interim Facility, all BY 2014 broodstock were weighed, measured, PIT tagged, and tissue sampled for sex identification and genetic relatedness. The tissue samples were sent to the NMFS Southwest Science Center for genetic analysis. On July 31, 2015 after receiving sex ID data from analysis conducted by the NMFS Southwest Fisheries Science Center, BY 2014 males and females were separated by sex. In August, the males were fed a decreasing ration so that by September 1, they were fed a 25% AGR feed ration in effort to reduce precocity. The sexes remained separated through May of 2016 to allow targeted feeding rations for each sex.

5.6.5 2015 Brood Year Summary

In September 2015, 1,935 eggs from BY 2015 were collected at FRH. The collection increased from previous years in preparation for transferring fish production to the full-scale SCARF.

5.7 Salmon Conservation and Research Facility (SCARF)

Federal funding for SCARF/Interim Facility operations began in FY 2012/2013 and is currently planned to continue through FY 2021/2022 via an Operations and Maintenance Agreement (O&M Agreement) with Reclamation. The objectives of the Interim Facility and SCARF are described below.

1. Development and maintenance of a genetically diverse broodstock of spring and potentially fall-run Chinook to support the restoration of Chinook Salmon to self-sustaining levels per the Settlement and Act and in accordance with applicable Program guidance.

2. Production of juvenile spring-, and fall-run Chinook, with an emphasis on spring-run Chinook production, to support the restoration of Chinook Salmon runs to self-sustaining levels per the Settlement and Act and in accordance with applicable Program guidance. 2012

3. Achieve production targets set by the SJRRP to the maximum extent practicable given the limitations of tank space and water supply at the Interim Facility, until the full-scale Conservation Facility becomes operational.

4. Support and provide research needs associated with restoring spring- and/or fall-run Chinook populations to self-sustaining levels per the Settlement and Act and in accordance with applicable Program guidance.

CDFW will be limited in production capabilities until the full-scale SCARF is operational. Production estimates through 2021 are provided in Table 8.

Table 8: Schedule and Numbers of Broodstock Collection and Juvenile Releases

Brood Year of Collected Donor Stock	Offspring Release Year	Target Number of Juveniles Released	Number of Adults Needed for Production	Estimated Female Fecundity	Estimated Survival from Juvenile to Adult	Estimated Survival from Egg to Juvenile	Number of Eggs Needed To Collect as Broodstock to Produce Necessary Number of Adults
2012	2016	120,000	240 (60 females)	2,500 eggs/female	0.8 survival	0.8 survival	375 (plus 60 for Pathology) = 435
2013	2017	151,875	304 (76 females)	2,500 eggs/female	0.8 survival	0.8 survival	475 (plus 60 for Pathology) = 535
2014	2018	200,000	400 (100 females)	2,500 eggs/female	0.8 survival	0.8 survival	625 (plus 60 for Pathology) = 685
2015	2019	600,000	1200 (300 females)	2,500 eggs/female	0.8 survival	0.8 survival	1,875 (plus 60 for Pathology) = 1,935
2016	2020	700,000	1400 (350 females)	2,500 eggs/female	0.8 survival	0.8 survival	2,188 (plus 60 for Pathology) = 2,248
2017	2021	960,000	1,920 (480 females)	2,500 eggs/female	0.8 survival	0.8 survival	3,000 (plus 60 for Pathology) = 3,060*

* Assumes 2:1 male to female ratio crosses to increase genetic diversity, and the uncertainty of sex of collected individuals but also assumes 50:50 chance of selected eggs being male or female. NMFS 10(a)(1)(A) Permit 14868 allows a maximum of 2760 eggs to be collected, so the number of eggs necessary for collection to produce the number of adults would need to be increased in the permit renewal, or the maximum number of eggs would be collected, but the 960,000 juveniles may not be produced for release.

Operation of the facility will be conducted to support research that furthers conservation of Chinook Salmon in the SJRRP Restoration Area, such as the Early Maturation Study and 2016 Spring-run Chinook Salmon Acoustic Telemetry Study.

5.8 SCARF Construction Planning and Design

CDFW is in the process of planning and design for construction of the SCARF adjacent to the San Joaquin River near Friant, California (Figure 6). The SCARF is scheduled to be constructed no later than early 2018, when it will serve an important role in achieving the SJRRP spring-run Chinook Salmon population objectives. The facility will produce large numbers of smolts for release from relatively small numbers of eggs and juveniles, collected as broodstock from one or more donor populations, which will enable CDFW to produce a conservation stock that is genetically diverse while minimizing impacts to source populations.

The Department of General Services (DGS) is the state lead for planning and developing the construction project. DGS has subcontracted HDR Engineering, which has proven fish hatchery design expertise, to design the components and layout of the SCARF. Staff have been meeting and coordinating with DGS and HDR on developing the architectural working drawings which were submitted for final review in October 2015. The state Department of Finance gave final approval to proceed with construction in June 2016. The bidding process for the construction contract is anticipated to begin in August of 2016 and construction is anticipated to begin before the end of the calendar year.

Figure 6: Salmon Conservation and Research Facility Project Location

5.9 Genetics Contract

Genetic analysis for the Program is being conducted through an Inter-Agency Agreement between Reclamation and the NMFS Southwest Fisheries Science Center in Santa Cruz (Science Center). The agreement was finalized in September 2014. Samples from the Interim Facility and from Feather River Hatchery were analyzed through the contract and submitted first to the CDFW Tissue Archive Lab for processing then forwarded to the Science Center for analysis. Tissue samples from the 2015/2016 fall-run Trap and Haul adults and juveniles were also analyzed to complete parentage relationships between parents and offspring. Samples for the Interim Facility included both pedigree analysis and sex identification of juveniles. The Science Center also provided a mating matrix for the 2015 broodstock spawn at the Interim Facility to maximize the genetic diversity of their offspring by crossing the least related individuals. Science Center staff also attended Program related meetings and provided valuable technical advice on matters related to genetic management. The current agreement with the Science Center ends in December 2016 but is anticipated to be renewed for an additional 2-3 years.

5.10 Wild Stock Selection

The SJRRP Stock Selection Strategy (SJRR 2010c) and HGMP (SJRRP 2010b) recommend the founding population in the San Joaquin River consist of spring-run Chinook Salmon from Butte Creek, Mill and Deer Creeks, and both wild and

hatchery stocks from the Feather River. These source populations were chosen based on genetic signature, population status, and habitat similarities to the SJRRP Restoration Area. Under this strategy, collection of donor stocks would come, over time, from all of the identified source populations, including the potential for opportunistic collections of spring-run Chinook Salmon in other watersheds (e.g., Clear and Battle creeks).

In September 2014, USFWS drafted a document outlining the information needed for the new 10(a)(1)(A) Enhancement of Species permit application. The document identified additional information needs for the new application, potential donor stocks, proposed collection numbers, collection methods, and collection criteria. Based on that document, CDFW drafted a refined proposal for collections from natural populations that included future collection of a relatively small number of juveniles from Butte Creek. The proposal was written in coordination with USFWS and NMFS. The proposed strategy was incorporated into a new 10(a)(1)(A) permit application for broodstock collection, which should be submitted to NMFS in 2016 for a permit term beginning in 2018. The new permit term is timed to align with the first year of operations of the full-scale SCARF.

5.11 Spring-run Direct Translocation and Juvenile Releases

Permit 17781 allows the SJRRP to conduct direct releases of juvenile spring-run Chinook Salmon into the San Joaquin River from 2014 through 2019. These releases are intended to contribute to near-term reintroduction efforts while also providing an opportunity to fill data gaps in the Program's body of knowledge. Accordingly, approximately 54,000 juvenile spring-run Chinook Salmon originating from the FRH are collected annually by USFWS and CDFW staff, acclimated to San Joaquin River water, and released via net pens into Reach 5 of the Restoration Area.

The third juvenile spring-run release took place in March 2016 when approximately 54,000 juveniles were translocated from FRH and released to Reach 5 of the Restoration Area. This release was coordinated to occur concurrently with the juvenile release from the Interim Facility discussed in Section 5.6.3. Additional measures were taken to ensure survival due to drought conditions by limiting holding periods and electing to release juveniles at the lowest point possible in the Restoration Area.

6 RESEARCH AND MONITORING

Research and monitoring activities are critical to resolving uncertainties, guiding restoration actions, and ascertaining the scope and breadth of intervention necessary to achieve the Restoration Goal. These efforts seek to achieve an ecologically functional river system that will support a self-sustaining and naturally reproducing fishery. As restoration proceeds, it is necessary to monitor habitat conditions and reintroduction success and identify any actions that may be required to grow and sustain fish populations.

Without established salmon populations in the Restoration Area, a significant portion of research and monitoring is focused on assessing existing and potential future habitat conditions in the San Joaquin River. Key habitat restoration objectives as described in the FMP (SJRRP 2010a) and supported by research and monitoring efforts include:

- Restore flows that optimize downstream rearing and outmigration temperatures and year-round habitat connectivity throughout the Restoration Area;
- Provide flows and structural modifications to ensure adult and juvenile migration;
- Provide habitat that will support holding, rearing and outmigration under a variety of water year types;
- Reduce predation; and
- Restore habitat complexity, floodplains and riparian forests that will provide spawning and rearing habitat for native resident species during the winter and spring period.

SJRRP research and monitoring is a significant collaborative effort between the Implementing Agencies, with tasks broadly shared between the state and federal entities. Planning documents, work products, and agency oversight are guided and developed through various technical teams, management teams and oversight panels with CDFW participation. In addition to the information provided in this section, study plans and reports are available on the Program website at:

http://www.restoresjr.net/monitoring-data/

6.1 Adult Fall-run Chinook Salmon Trap and Haul

In the fall of 2012, CDFW and Reclamation initiated a trap and haul program for adult fall-run Chinook Salmon after a 2010 monitoring study indicated a portion of

fall-run Chinook Salmon evaded the Hills Ferry Barrier (HFB) and entered into Reach 5 of the Restoration Area (Portz et al. 2011). The HFB is a fish migration barrier located approximately 150 yards upstream of the mouth of the Merced River on the San Joaquin River that is intended to redirect upstream migrating adult fall-run Chinook Salmon away from downstream reaches of the Restoration Area, where no suitable spawning habitat is accessible, and into the Merced River. Consequently, Chinook Salmon entering Reach 5 of the Restoration Area are considered lost to the basin population as they soon encounter dewatered reaches of the Restoration Area, false pathways such as Mud and Salt Sloughs, and agricultural ditches.

During FY 2015/2016, CDFW and Reclamation conducted opportunistic trapping of fall-run Chinook Salmon using fyke nets in the mainstem river and Mud and Salt Sloughs and dip netting in nearby agricultural ditches. Captured adults were measured, tagged with acoustic transmitters, and relocated to Reach 1 of the Restoration Area (Figures 7 and 8) where they were either: (1) released to the river to assess migration, spawning success, and habitat use/quality or (2) artificially spawned and incubated streamside to produce juveniles for Program studies.

During the 2015 trap and haul effort, 933 fall-run Chinook Salmon (244 females and 689 males) were salvaged above the HFB. Of those, 199 females were implanted orally with acoustic tags (VEMCO V13, 69kHz transmitter) and tracked via receivers. CDFW deployed and operated 23 stationary receivers throughout Reach 1 of the Restoration Area which allowed staff to track migration and spawning site selection. Staff also conducted weekly mobile tracking by drift boat to establish habitat use between stationary receivers. Mobile tracking was coordinated with redd and carcass surveys, described in Section 6.3.

6.2 Streamside Spawning

CDFW currently operates the Satellite Incubation and Rearing Facility (SIRF), a mobile spawning trailer and rearing tanks, on a portion of Reclamation property located immediately below Friant Dam. Initially conducted as a proof-of-concept for the incubation of spring-run eggs, artificial spawning of fall-run Chinook Salmon captured during the Program's trap and haul effort has occurred at the SIRF since the fall of 2012 and provides various Program studies with juvenile study fish. Studies to date that have used SIRF-produced juveniles include collection weir and rotary screw trap efficiency tests, marking and tagging evaluations, and juvenile migration studies (acoustic telemetry and PIT tags).

Figure 7: CDFW staff transporting captured fish

Figure 8: Fall-run Chinook Salmon released in Reach 1

Crosses taking place at the SIRF are spawned at a 1:1 female to male ratio. Eggs are extracted from the female and placed into a mixing tub, then milt from the male is added to fertilize the eggs. After fertilization, eggs are disinfected with a treatment

of free iodine and placed into vertical incubation trays. When eggs hatch (approximately 30 days post-spawn depending on water temperatures), alevin and any remaining eggs are moved into deep matrix incubators (DMI) filled with either gravel or artificial substrate (e.g., Redd Zone brand bio-balls). As fry emerge from the DMIs, approximately 20 days post-hatch, they volitionally swim out into 3-ft rearing tanks where they are counted daily. Fry are reared in the 3-ft tanks for approximately one week while they are started on feed and then moved to 6-ft tanks were they are reared until release. Juveniles are reared until they reach a size suitable for tagging (e.g., CWT, adipose-clip, PIT), at which point they are held and released for various Program studies.

During 2015-2016 streamside spawning, fourteen females and fourteen males were spawned which resulted in just over 73,000 eggs. The average fecundity per female was 5,220 eggs. The average survival to the eyed egg stage was 83%, and survival from the eyed stage to swim-up fry was 90%. This resulted in the production of close to 55,000 fry. In addition, 5 separate pairs were spawned and eggs incubated on site as part of a California State University Fresno graduate research project that produced approximately 10,000 additional juveniles. In total, approximately 66,000 juveniles were produced at the SIRF for the year.

6.3 Salmon Redd and Carcass Surveys

In coordination with Adult Fall-run Chinook Salmon Trap and Haul in November and December 2015, CDFW and USFWS, with assistance from AmeriCorps Watershed Stewards Project members, conducted weekly surveys of Reach 1A to quantify and spatially characterize Chinook Salmon spawning within the San Joaquin River. The survey team recorded location, timing, and morphological features of each Chinook Salmon redd observed (Figure 9). These data provide insight into factors affecting spawning site selection on the San Joaquin River (e.g., water temperature, depth and velocity, incubation habitat quality, amount of nearby cover present).

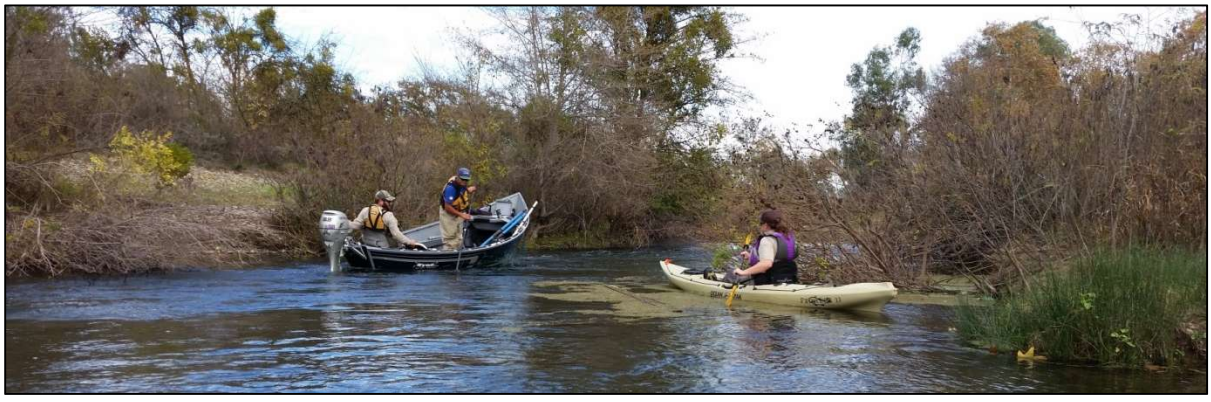

Figure 9: CDFW and USFWS staff retrieving a fall-run Chinook Salmon carcass within Reach 1A of the San Joaquin River

Since Pacific salmon are semelparous, meaning they all die after their first spawn, adult Chinook Salmon carcasses encountered during the redd surveys were measured and sampled for subsequent lab analysis (Figure 10). In addition, this provides baseline data for evaluating the success of future river rehabilitation, adaptation of the reintroduced population, and other management actions such as changes in flow timing and magnitude.

During the 2015 redd and carcass surveys, 202 redds and 238 carcasses were sampled. This was a large increase from both the 2013 and 2014 surveys (Figure 11) due to more adults being trapped above HFB and released in Reach 1. A summary of 2013 and 2014 survey efforts are summarized and documented in Castle et. al. (2016).

Figure 10: CDFW and USFWS staff sample fall-run Chinook Salmon carcass on Reach 1A on the San Joaquin River

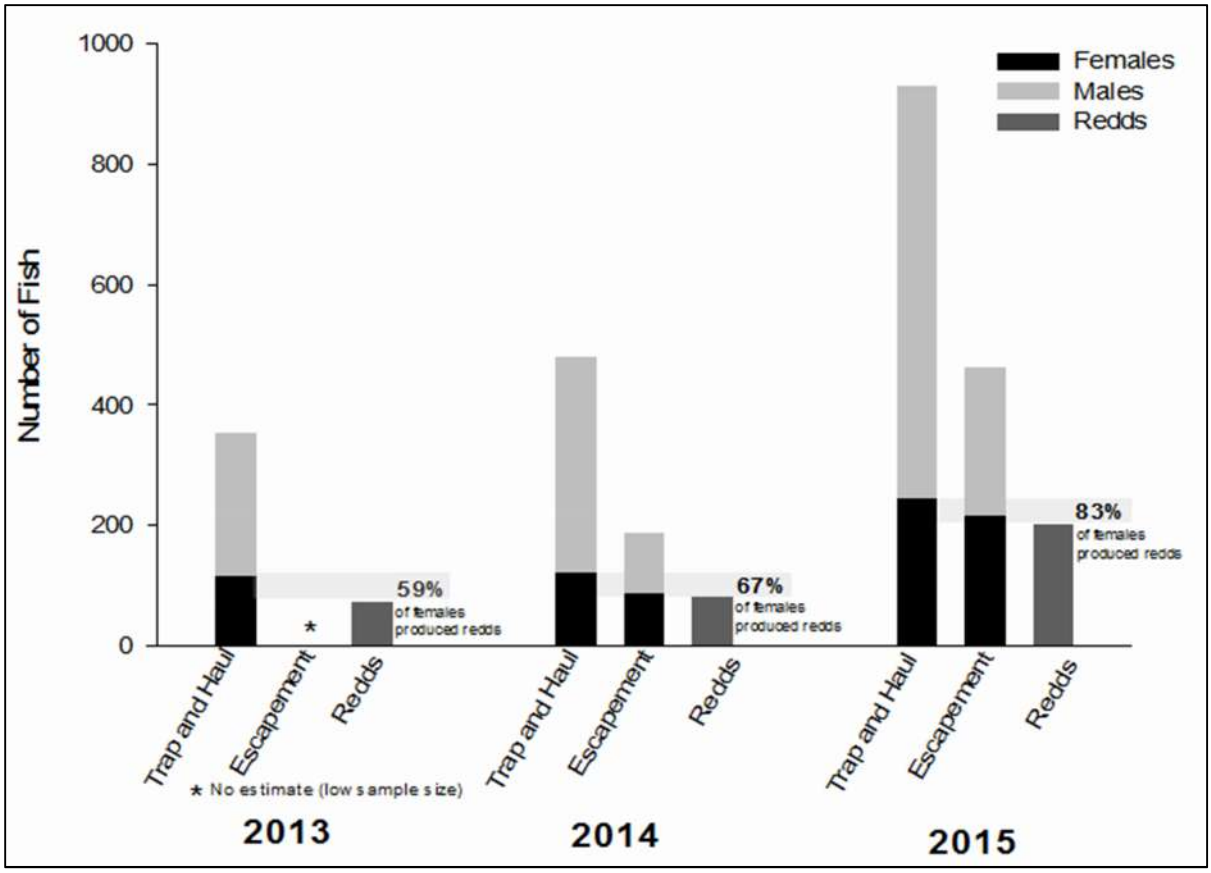

Figure 11: Escapement estimates and number of redds during 2013, 2014, and 2015 survey years (draft, subject to revision). Escapement estimates were calculated by USFWS using both mark-recapture and a modified Comrack-Jolly-Seber estimator

6.4 Incubation Habitat Quality Assessment

Spring- and fall-run Chinook Salmon were extirpated from the Restoration Area shortly after construction of Friant Dam. In the absence of a naturally spawning population, this study utilized physical measurements in the planned restoration spawning reach (i.e. below Friant Dam downstream to Skaggs Bridge) to measure components of incubation habitat quality and assess egg survival to emergence and potential fry production.

CDFW and USFWS installed emergence traps (Figure 12) to monitor fry emergence from fall-run Chinook Salmon redds mapped during redd and carcass surveys. Fifteen emergence traps were installed in January 2016, as compared to ten in 2015. A total of 8,252 and 9,969 fry were counted in the traps in 2016 and 2015, respectively, a portion of which were sampled for fork length, weight, life stage, and tissue samples for genetic analysis.

Figure 12: Emergence trap installed in winter 2015 to observe fry emergence from a Chinook Salmon redd

All emergence traps were removed by early April of each year after emergence was complete. After trap removal, CDFW staff collected data on physical habitat quality (e.g. grain-size distribution, intragravel flow, temperature) within these and other nearby mapped redds (Figure 13). This data will be compared to observed fry emergence, timing, and condition to assess limiting factors for fry production.

Fall-run 2014 and 2015 Chinook Salmon juvenile production within Reach 1, based on mean fry emergence and number of redds observed, was estimated at approximately 80,757 and 111,302, respectively (Castle et. al 2016).

Figure 13: CDFW and AmeriCorps staff measure intragravel flow within a fall-run 2014 Chinook Salmon redd

6.5 Juvenile Monitoring

Juvenile monitoring efforts can provide information on abundance, growth, survival, and migration timing of juvenile Chinook Salmon in the system. Such data over time will help to evaluate progress made towards meeting the SJRRP Restoration Goal and inform fisheries management decisions. Rotary screw traps (RSTs) are a type of juvenile trap that consist of a funnel-shaped cone that is screened and suspended in water between floating pontoons (Figure 14). The cone rotates as water pushes past an interior baffle, guiding fish moving downstream into a live box that is attached to the rear of the cone. Usually installed at a fixed location, RSTs can sample continuously for extended periods of time. When placed properly and calibrated, RSTs provide reliable estimates of juvenile abundance and distribution. Before reliable monitoring data can be attained and compared over time, however, consistent monitoring locations must first be selected. The objectives of near-term juvenile monitoring have been to evaluate RST efficiencies and to select potential long-term locations that function over the full range of Restoration Flows.

Figure 14: Rotary Screw Trap operated near the Hwy 99 Bridge

Suitability investigations into RST site placement and operational ranges (i.e., flow and depth limitations) began in 2013. Prior to the deployment of RSTs, sites were examined and selected based upon conditions where (1) a relatively high percentage of the total river discharge would flow through the RST cone, (2) depth was greater than 4 feet, (3) RSTs could potentially operate effectively over the entire range of discharge conditions, (4) RSTs could be placed directly downstream of a riffle, and (5) water velocities would not be less than 0.6 meters/second (≈ 2.0 feet/second).

In 2016, one RST was deployed at the SR-99 site on April 27 shortly after study fish had been reared to a size suitable for coded wire tagging and were ready for efficiency releases. The RST was placed approximately 250 feet downstream of previous year locations. Fished for a total of 28 days out of the 34-day season (82%), the RST was removed on June 1 due to elevated water temperatures.

The SJRRP's principal goal for 2016 restoration flows were to (1) provide continuous connectivity of the San Joaquin River from Friant Dam to the Merced River confluence and (2) to stimulate outmigration of juvenile Chinook Salmon while advancing juvenile salmon trapping methods in Reach 1. In April, Restoration Flows necessary to meet an 80 CFS target at Gravelly Ford were released from Friant Dam. In addition, five short-duration pulse flows were made through the month to help prompt juvenile outmigration. In May, Restoration Flows increased slightly to meet a 90 CFS target at Gravelly Ford and two additional short-duration pulse releases occurred. Figure 15 shows discharge observed at the Donny Bridge California Data Exchange Center (CDEC) Station, located approximately two river miles downstream of the SR-99 RST, during 2016 RST suitability investigations.

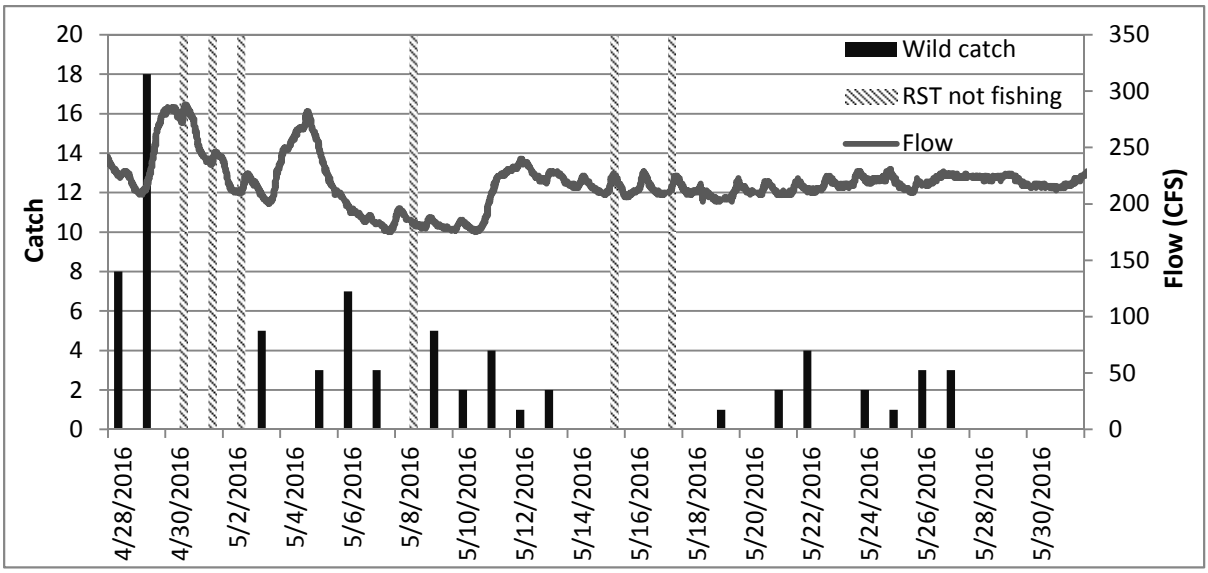

Figure 15: Amount and data of wild trapped juvenile Chinook Salmon at the SR-99 RST.

A total of 74 adipose-present (wild) juvenile fall-run Chinook Salmon were trapped (Figure 15). The first wild juvenile was captured on April 28 and the last on May 27. Peak outmigration of wild juveniles likely occurred prior to the deployment of the RST, largely occurring by late April (SJRRP Juvenile Trap and Haul 2014-2016, Unpublished data, Monitoring and Analysis Plan [MAP] Study 54). Fork lengths of wild juveniles ranged from 82mm to 122mm with a median fork length of 100mm (Figure 16). All wild juveniles captured were identified to the smolt life stage.

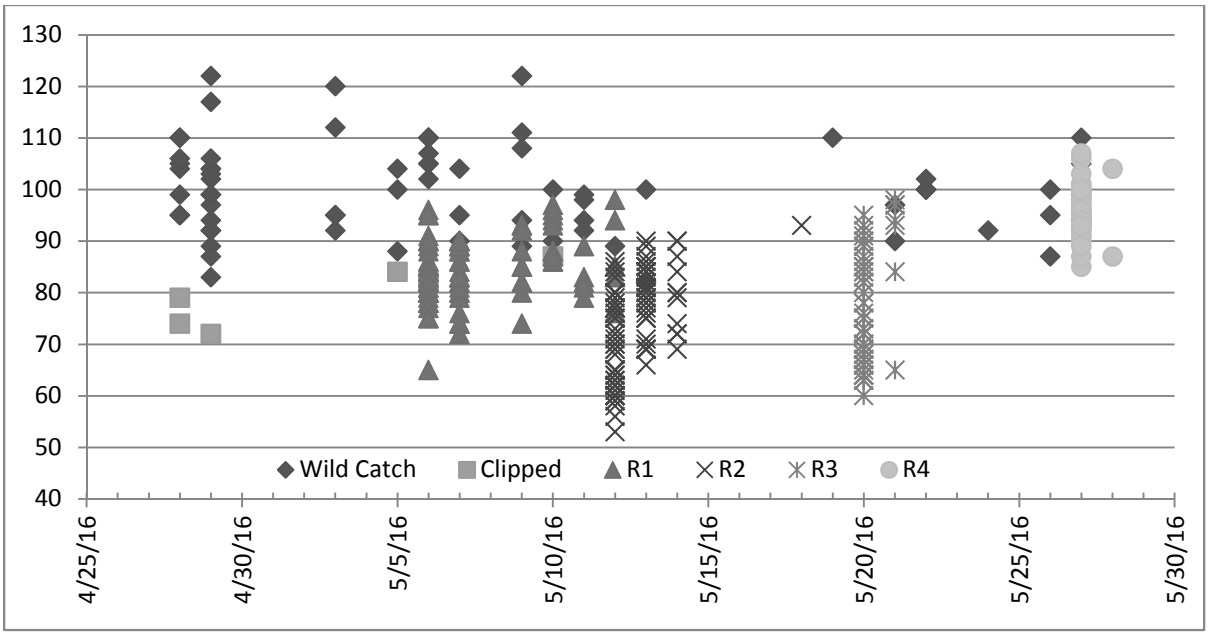

Figure 16: Fork length (mm) and date of trapped juvenile Chinook Salmon at the SR-99 RST. Wild Catch represents adipose-present fish, Clipped represents adipose-clipped fish not associated with RST

efficiency releases, R1 represents efficiency release trial number 1, R2 represents efficiency release trial number 2, and so forth.

Four efficiency release trials were conducted on the SR-99 RST between May 5 and May 26, 2016. The number of uniquely marked fish released and recaptured within a week were used to determine the weekly trap efficiency. Weekly trap efficiencies ranged from 11.7% to 19% (Table 9).

Table 9: Efficiency release trials conducted on the San Joaquin River SR-99 RST. Discharge is shown as an average instantaneous value of each efficiency release week recorded from the Donny Bridge CDEC Station (DNB).

Release	Number released	Number recaptured	Weekly efficiency (%)	Discharge (CFS)
1	1026	195	19.01	197
2	2195	359	16.36	215
3	1034	158	15.28	217
4	497	58	11.67	224

Although critical low water year types have limited the duration of monitoring and extent of efficiency trials in several years, much information and experience has been gained. This includes insights into efficiency releases (e.g., fish marking, holding, releasing) and site-specific information on gear efficiencies and flows necessary to turn the RST cone (see 2013 and 2014 Rotary Screw Trap Monitoring Reports). Further site-specific information on the operational range of each RST associated with flow and gear efficiencies at differing flows is needed before long term RST monitoring sites can be determined. Continued assessments into the suitability of RST locations and optimizing trap efficiencies are therefore important steps for this monitoring activity, and may take several seasons under various river flow conditions for a complete assessment.

6.6 Stream Temperature Monitoring

Water temperature is likely a limiting factor for each life history stage of spring- and fall-run Chinook Salmon in the San Joaquin River, particularly in the warmest and driest years. Adult salmon need appropriate temperatures for upstream migration, holding, and spawning. Additionally, suitable hyporheic water temperatures during egg incubation and pre-emergence rearing are critical to survival. Stream temperatures must also be adequate during juvenile rearing, smoltification, and outmigration. Furthermore, water temperatures in sections of the Restoration Area may present thermal barriers to successful fish migration, resulting in stranding and/or increased mortality. Understanding the longitudinal distribution of temperatures in relation to factors such as stream flow, air temperature, Friant Dam

release temperature, and other influences is critical for the ability to successfully manage the San Joaquin River for restoration of spring- and fall-run Chinook Salmon.

The goals of stream temperature monitoring are to better understand the water temperature conditions likely to be experienced by each life stage of spring- and fall-run Chinook Salmon in the Restoration Area and to inform management actions to address temperature concerns in the Restoration Area. The study also provides data for a number of other field and computer modeling studies. Study objectives were developed to address questions about the suitability of current conditions to meet the needs of fish and to test hypotheses related to the influence of external factors on stream temperatures.

The objectives of the study are to:

1) Collect reliable water temperature data at time and space intervals that sufficiently document thermal response of stream temperatures to Interim and Restoration Flows, local meteorological conditions, and restoration actions;

2) Evaluate the temporal and spatial suitability of stream temperatures to support all life stages of spring- and fall-run Chinook Salmon in the Restoration Area;

3) Determine the effects on instream temperatures of releases from Millerton Reservoir, tributary flows, agricultural returns, riparian shading, and/or channel morphology;

4) Identify warm- and cold-water inputs that affect temperature conditions in the San Joaquin River; and

5) Assess the influence of instream and off-stream pools and mining pits on stream temperatures.

CDFW began collecting San Joaquin River water temperatures in 2002 and developed a more robust monitoring program during the fall 2009 Interim Flow Period. Temperature loggers are deployed throughout the Restoration Area to evaluate subsurface stream temperature conditions in migration pathways and potentially suitable holding, rearing, and spawning habitat. Since 2009, logger deployment has expanded to old mining pits, flood bypasses, Salt and Mud Sloughs, and the Newman Wasteway. Data loggers are programmed to record temperatures hourly throughout the year and are downloaded by staff on a monthly to quarterly frequency.

CDFW scientists provide a Stream Temperature Summary Report to participants of the Flow Scheduling meetings coordinated by Reclamation. These summary reports evaluate real-time temperatures in the Restoration Area compared to temperature objectives for each reach and life stage of Chinook Salmon. Current drought conditions have increased the temperature of Friant Dam river releases to the San

Joaquin River (Figure 17), which affects both river temperatures and influent temperatures at CDFW fish facilities (i.e., SIRF, San Joaquin Trout Hatchery [SJH], Interim Facility).

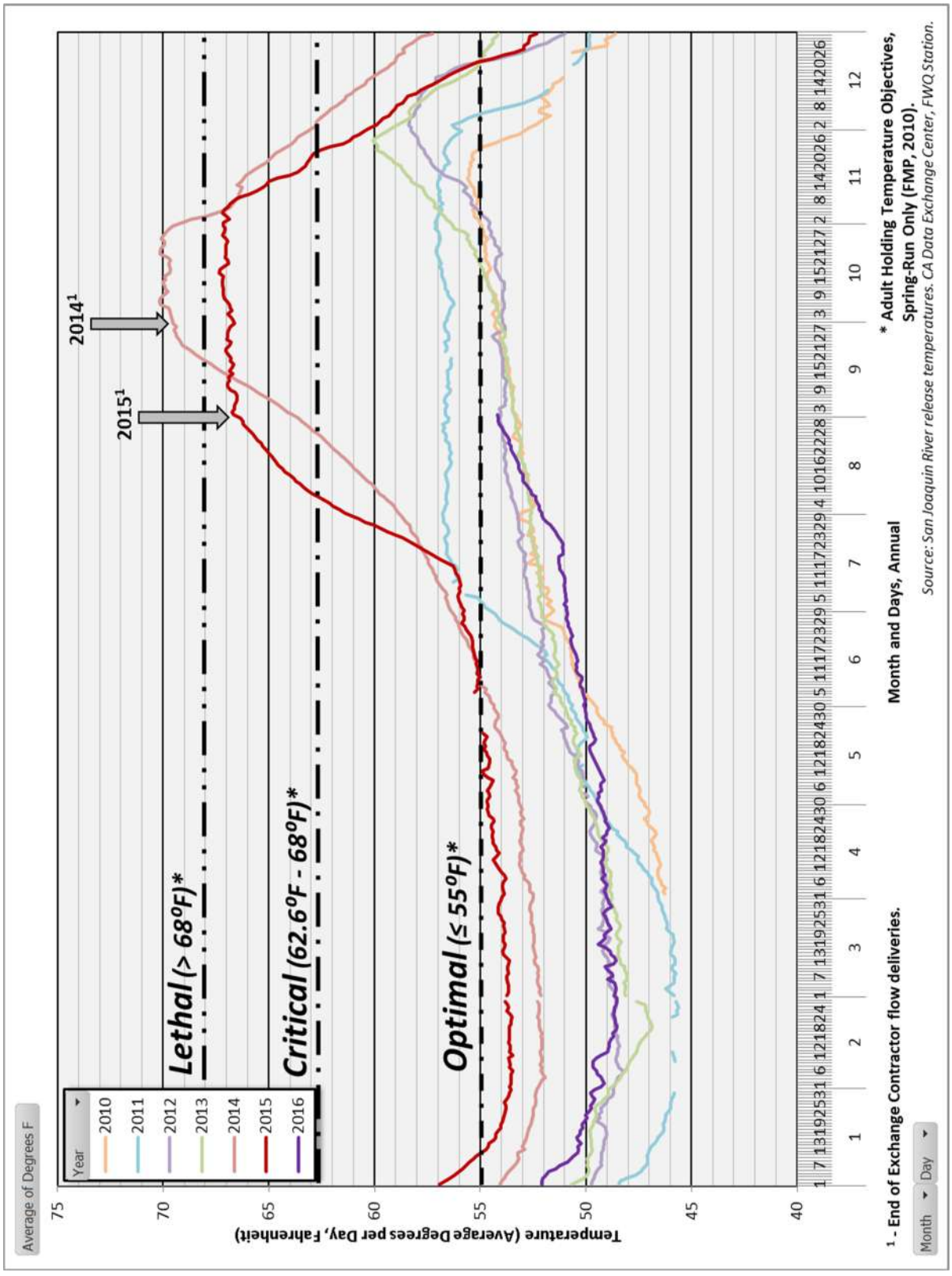

Figure 17: San Joaquin River release temperature at Friant Dam, Jan 2010 – Aug 2016

7 RESTORATION: SITE-SPECIFIC PLANNING

CDFW staff continued coordination with the Implementing Agencies on site-specific restoration projects. There are numerous major physical improvements proposed within the 153-mile Restoration Area that are necessary to achieving the Restoration and Water Management goals. The identification and timing of these proposed actions are described in Section 4.6 of this report. These activities will be largely carried out by Reclamation and DWR, but design, planning, and oversight are coordinated with CDFW. CDFW involvement with the major actions carried out in FY 2015/2016 is described below.

7.1 Mendota Pool Bypass and Reach 2B Improvements Project

The Mendota Pool Bypass and Reach 2B Improvement Project includes the construction of the Compact Bypass, which includes a new channel and structures able to convey up to 4,500 cfs of Restoration Flows around Mendota Pool and make deliveries of up to 2,500 cfs into Mendota Pool. Other proposed Reach 2B improvements include increasing the flow capacity of Reach 2B, constructing new fish passage facilities at the Compact Bypass control structure and Chowchilla Bifurcation's riverside control structure, and floodplain restoration for juvenile rearing habitat (Figure 18).

In June 2015, the SJRRP released the Reach 2B Draft Environmental Impact Statement/Report (EIS/R). Reclamation is the National Environmental Policy Act (NEPA) lead agency and the State Lands Commission (SLC) is the California Environmental Quality Act (CEQA) lead agency. The Final EIS/R is anticipated to be released in July 2016.

In anticipation of 2B construction activities beginning in 2017, Reclamation submitted survey protocols in March 2016 for Fresno kangaroo rat (*Dipodomys nitratoides exillis),* giant garter snake (*Thamnophis gigas*), and blunt-nosed leopard lizard (*Gambelia sila*) for review and approval by CDFW and USFWS. Reclamation's consultants began surveys for all three species in the spring and summer of 2016.

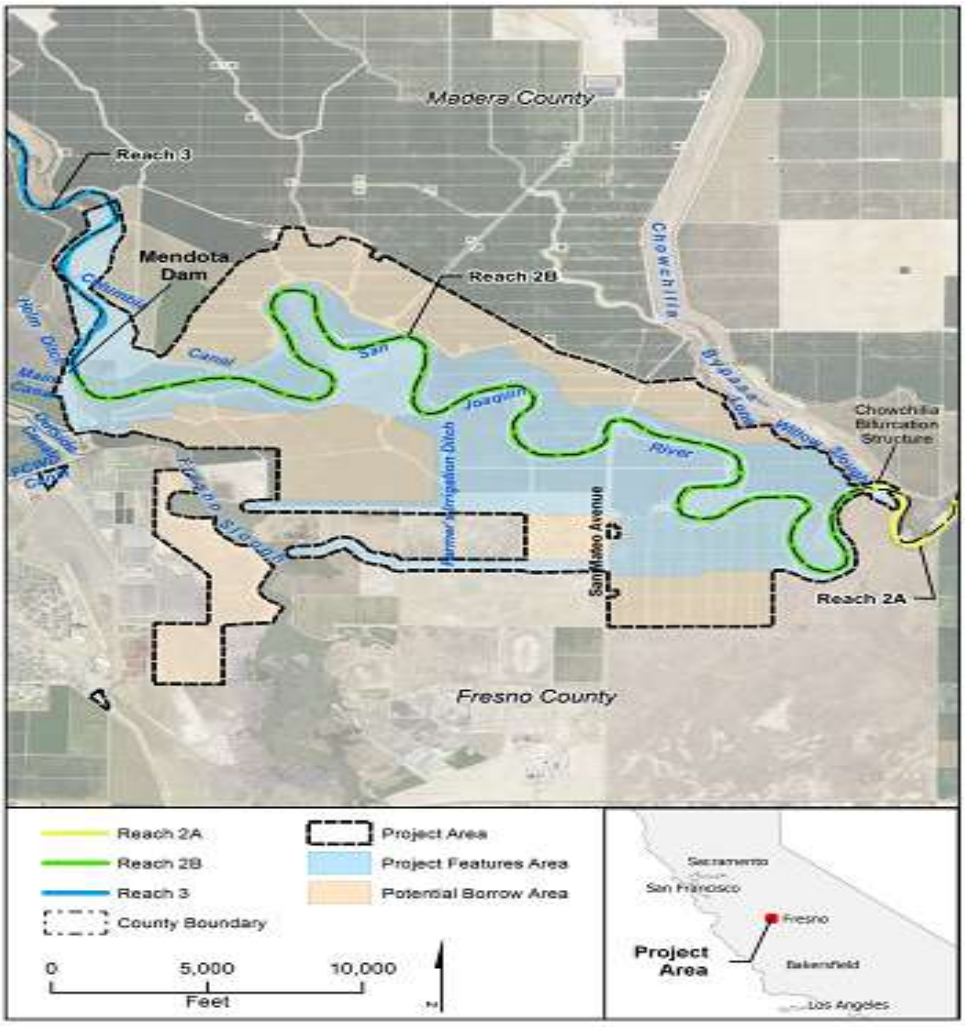

Figure 18: Project Area (Source: Mendota Bypass and Reach 2B Improvements Project Draft EIS/R)

7.2 Reach 4A Kangaroo Rat Surveys

USFWS and CDFW recommended conducting surveys throughout Reach 4A for Fresno kangaroo rat. Surveys were conducted by Reclamation consultants in May and June and will be completed in July 2016. To date no Fresno kangaroo rats have been trapped.

7.3 Reach 4A, Water Year 2016-2026 Transfer and Exchange from Madera Irrigation District and Chowchilla Water District to the Red Top Area

The Water Year 2016-2026 Transfer and Exchange from Madera Irrigation District (MID) and Chowchilla Water District (CWD) to the Red Top Area Project (Red Top

Project) includes the transfer of up to 10,000 acre feet of surface water annually for ten years from the Poso Canal to the Red Top Area in western Madera County. The flows would be picked up and conveyed through a newly constructed cast in place concrete box turnout on the Poso Canal and the Red Top Pipeline. The pipeline will be installed underneath the San Joaquin River in an area located approximately 5.8 miles northeast of Dos Palos (Figure 19).

Construction activities include trenching to install a 452-foot long, 36-inch pipeline underneath and across the San Joaquin River. The pipeline will connect from a new turnout on the Poso Canal to an existing pump station on the other side of the San Joaquin River. Construction will be timed to occur when the Project area is dry.

The Draft Environmental Assessment (EA)/Mitigated Negative Declaration (MND) was released for public review February 2016. Reclamation is the NEPA lead agency and Central California Irrigation District (CCID) is the CEQA lead agency.

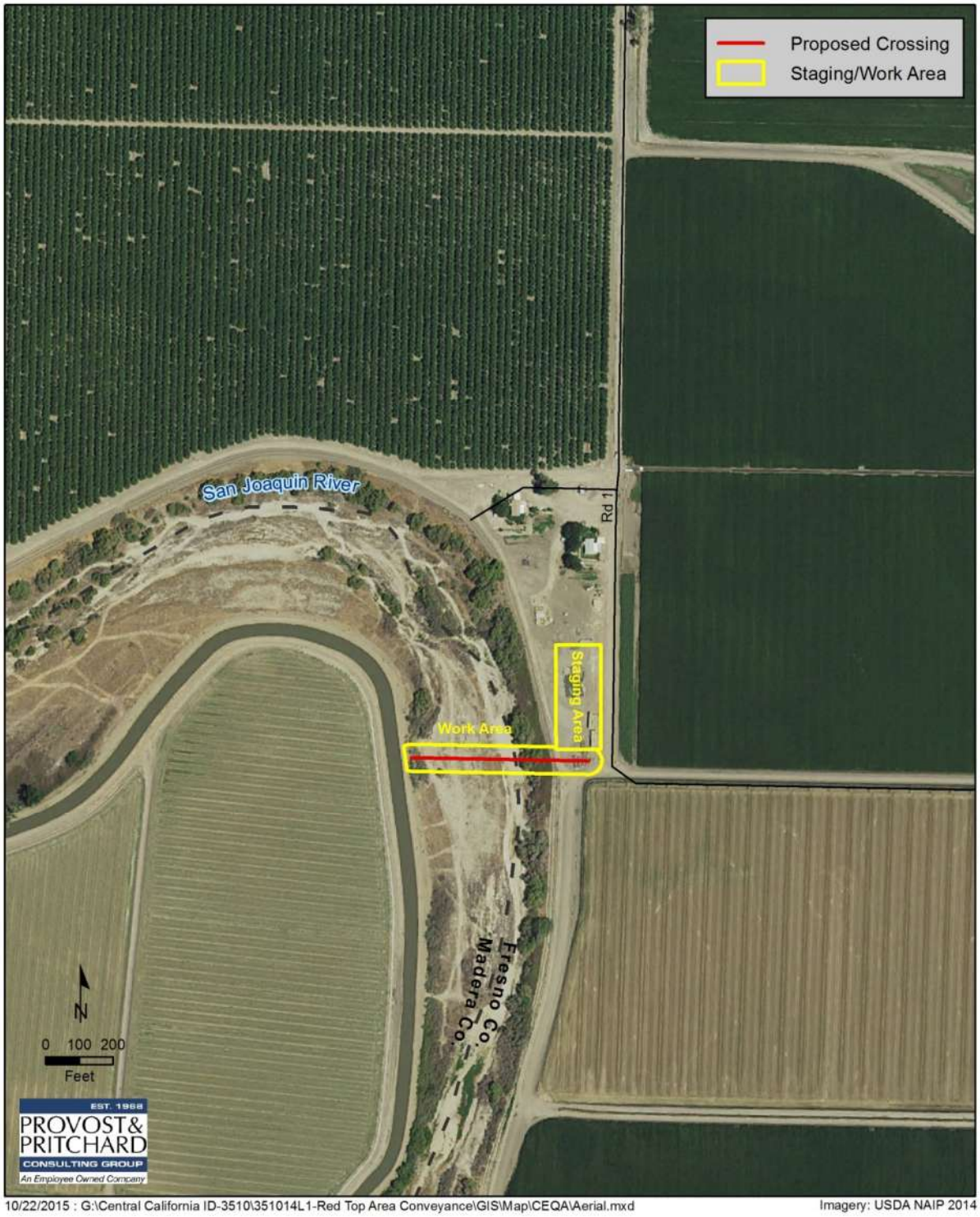

Figure 19: Red Top Project Work Area (Source: Water Year 2016-2026 Transfer and Exchange from MID and CWD to the Red Top Area Administrative Draft Environmental Assessment/Initial Study Project Description)

7.4 Reach 4B, Eastside and Mariposa Bypass Channel Structural Improvements

This proposed project includes modifications of the San Joaquin River channel capacity to enable the conveyance of flows necessary to support anadromous fish migration. Alternatives being formulated encompass flow conveyance of 475 cfs and up to 4,500 cfs through Reach 4B, or the use of alternative routing for pulse flows. Existing flow control structures at Sand Slough and within the Eastside and Mariposa Bypass channels, as well as the San Joaquin River headgate to Reach 4B would be modified to allow for fish passage (Figure 20). Planning for the Reach 4B, Eastside Bypass, and Mariposa Bypass Channel and Structural Improvements project continued in FY 15/16. Reclamation began a “consensus-based” process in coordination with local landowners and the levee district for developing a flow routing option for the project. Staff attended several technical meetings where information was shared on the differences between the routing options in hydrology, geology, flood control, water temperatures, and potential for revegetation.

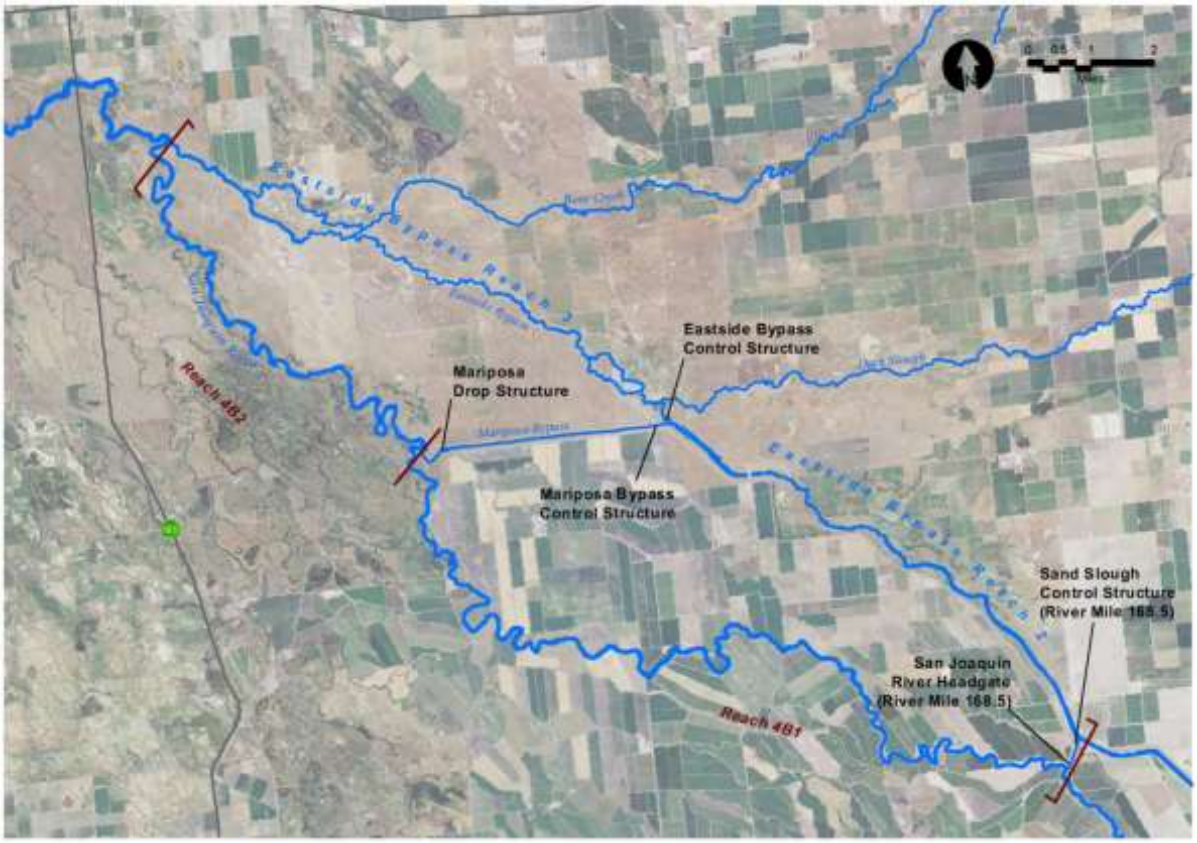

Figure 20: Project Area and Vicinity (Source: Reach 4B Eastside Bypass, and Mariposa Bypass Channel and Structural Improvements Draft Project Description)

8 RECREATION

CDFW historically stocked rainbow trout (*O. mykiss*) at locations below Friant Dam in the San Joaquin River, including Friant Cove and the Lost Lake Recreation Area. In 2014, changes in Department policy regarding stocking of trout in anadromous waters led to a decision to stop stocking rainbow trout below Friant Dam. Additionally, restoration of Chinook Salmon populations in the San Joaquin River may eventually require regulation changes (e.g., gear restrictions, seasonal fishing closures) that could reduce already limited in-river fishing opportunities.

In preparation for these changes, CDFW has been actively pursuing options to expand warm-water angling opportunities and establish an off-channel trout fishery in a number of ponds adjacent to and disconnected from the river.

Dozens of various sized ponds, remnants of past and current gravel mining operations, are scattered in the San Joaquin River corridor between Friant and Fresno. Those that provide appropriate habitat and access conditions could be used to provide new and expanded fishing options to anglers that otherwise might be displaced by regulatory and fish stocking changes. This enhanced off-river fishery could compensate for changes indirectly triggered by the SJRRP and add to the currently limited public access network in the San Joaquin River corridor.

Beginning in the fall of 2012, CDFW began seasonally stocking trout in an off-channel pond at Sycamore Island Recreation Area, owned by the San Joaquin River Conservancy (Conservancy) and operated by the San Joaquin River Parkway and Conservation Trust (Parkway). In partnership with Trout Unlimited and the Parkway, CDFW helped organize the Fourth Annual Sycamore Island Trout Derby on March 19, 2016. CDFW operated measuring stations and determined award winners in each age and species category. The event attracted over 300 registered participants.

CDFW is coordinating with the Conservancy, Vulcan Materials, the Parkway, and the DWR for additional projects to enhance recreational fishing in the San Joaquin River corridor. Dissolved oxygen and temperature loggers deployed in an off-channel pond at the Vulcan mining property near Friant continued to be downloaded in order to monitor habitat conditions. Furthermore, staff are working on an overall planning effort that identifies and assesses opportunities for off-channel fishing access near the San Joaquin River.

8.1 Sycamore Island Trout Pond Access Improvement Project

Sycamore Island Trout Pond is the first of the off-channel recreational fishing ponds planned for enhancement as outlined in the SCARF Environmental Impact Report (EIR). CDFW is planning recreation enhancements including an Americans with Disabilities Act -accessible fishing platform, a boat launch, improved parking lot, and

a single vault restroom. CDFW is working with DWR and the Conservancy to construct the new facilities and the Parkway will operate the facility. If funding is obtained to complete the project, construction would begin as early as 2018.

Preliminary designs and specifications were completed by DWR in June 2014 under an Interagency Agreement. In November 2014, Horizon Water and Environmental, LLC (Horizon), was approved to assist with CEQA compliance. Horizon completed the project description, Initial Study (IS), and Environmental Checklist to determine impacts resulting from the proposed Sycamore Island Trout Pond fishing enhancements. After the project description, IS, and Environmental checklist were completed and reviewed it was determined that no new effects would occur and no new mitigation measures would be required. To comply with CEQA, CDFW concluded that a second addendum to the SCARF Final EIR would be completed. Horizon completed a draft addendum March 2016 and finalization of the second addendum is anticipated in July 2016.

9 DROUGHT MANAGEMENT

Beginning in January 2014, CDFW began pursuing actions to protect native freshwater and anadromous fishes threatened and impacted by the statewide drought. Drought conditions increased water temperatures and decreased water quality in-river and in water supplies for fall- and spring-run Chinook Salmon being held at Program fish facilities. To ameliorate adverse drought conditions, CDFW increased investment in technology to protect spring and fall-run Chinook Salmon. This effort sought to ensure Chinook Salmon survival during unsuitable river conditions and continued progress in reintroduction and management of both spring- and fall-run Chinook in the San Joaquin River. Actions included:

- Installing water conservation and chiller equipment to maintain water quality and supply at fish rescue and captive rearing facilities to increase fish holding capacity, reduce water supply needs and maintain suitable water temperatures;

- Purchasing fish transports to facilitate fish rescues for translocation to drought-resistant habitat and holding facilities; and

- Monitoring conditions in-river and at the Interim Facility, SJH, and SIRF.

The installation of additional equipment and acquisition of fish transport equipment were completed in March of 2016. Monitoring continues with data provided for statewide drought condition monitoring efforts.

9.1 Water Temperature Impacts

Based on historical records from the SJH and Reclamation, water temperatures at the hatchery and in the San Joaquin River below Friant Dam prior to 2014 ranged from approximately 45°F to 55°F year-round, with occasional peaks above 58°F. Based on the objectives set in the FMP, optimal temperatures for adult Chinook are below 59°F, the critical range is between 62.6°F and 68°F, and lethal temperatures are over 68°F (based on a 7-day average daily maximum; SJRRP 2010). Emergency plans for the SJH, which is adjacent to the Interim Facility and utilizes that same water supply conduit from Friant Dam, recommend decreasing trout densities through outplanting if temperatures exceed 64°F.

During May through September 2014 and July through November 2015, Friant Dam water releases for agricultural deliveries quickly evacuated the cool water pool in Millerton Lake. Impacted by the ongoing drought, the cool (≤56°F) water pool was already smaller than average and therefore release water temperatures rose sharply during water deliveries. Temperatures peaked near 70°F in October 2014 and 67°F in the September of 2015 (Figure 21 and Figure 22). In 2016, the temperature finally began to lower in November. As the effects of the 2015/2016 El Niño began to

impact regional weather conditions, water temperatures dropped beginning in November 2015 and reached a 6 year low by the end of June 2016.

Fortunately, CDFW analyses in 2014 and 2015 (CDFW 2015) were able to fairly accurately forecast water temperature issues in the river and at the facilities so that actions could be taken to protect broodstock.

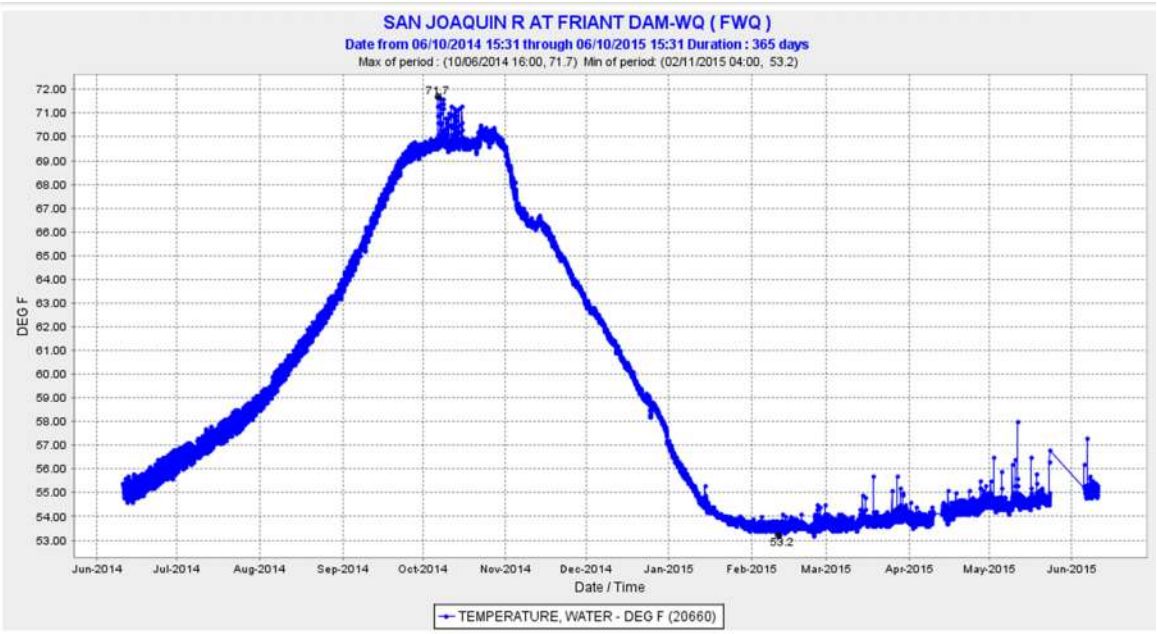

Figure 21: San Joaquin River water temperatures at Friant Dam, July 2014-June 2015 (CDEC 2016)

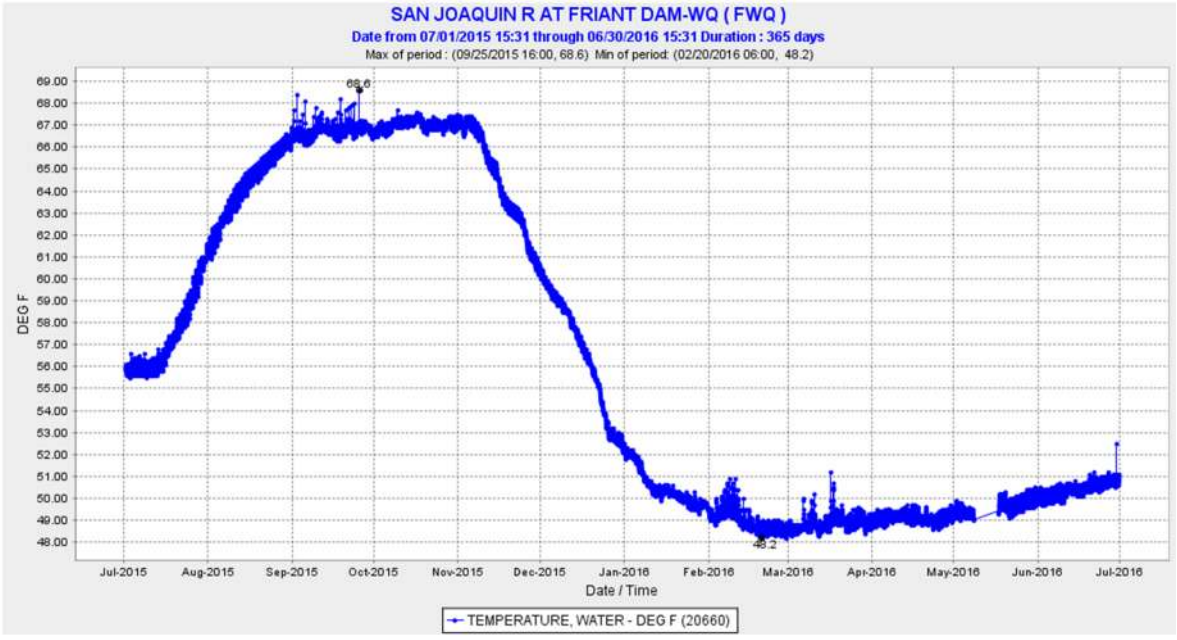

Figure 22: San Joaquin River water temperatures at Friant Dam, July 2015- June 2016 (CDEC 2016)

9.2 Interim Facility Recirculation/Chiller Project

In response to high water temperatures of the influent water supply during the fall of 2014 and 2015, CDFW installed eight water reuse/recirculation and chiller systems which were fully operational by March 2016 (Figure 23). These systems included six 95% water recirculation systems and two water reuse systems. The equipment includes features that chill and oxygenate water, filter and remove solids, remove CO_2 and ammonia, and disinfect pathogens. The equipment also includes a monitoring and alarm system that monitors water flow, temperature, and dissolved oxygen and is equipped with an audible alarm and a phone and email alert system. The systems are protected by a backup generator in the event of a power outage.

Ensuring effective operation of the recirculation and chiller systems during FY 2015/2016 required the following initial and ongoing activities:

- Developing and submitting 10(a)1(A) Permit operations change request to NMFS to allow use of the water recirculation equipment;
- Scheduling on-call evening duties with SJH personnel;
- Installing a temperature and oxygen monitoring alarm system;
- Installing water recirculation pumps to minimize water usage;
- Meeting with staff regularly to discuss proper equipment operation, any necessary modifications, and to review safety and security protocols; and
- Making regular adjustments to recirculation systems to maximize chiller effectiveness.

Of the eight systems that were installed, two are considered water reuse systems and six are recirculation systems. The water reuse systems recirculate less water (approximately 70%) and function with a simplified filtration system. Two of the five outdoor broodstock rearing tanks were fitted with the water reuse systems. The other three outdoor broodstock rearing tanks were fitted with 95% water recirculation systems, and the indoor egg incubation building was also equipped with a 95% water recirculation system. Finally, two additional smaller scale 95% water recirculation systems (also referred to as self-contained rearing units) were installed. Each of the self-contained rearing units includes four six-foot diameter tanks for rearing juvenile salmon.

Figure 23: Interim Facility with water recirculating and water chilling enhancements.

Staff assisted CDFW engineers in designing and procuring the equipment, as well as obtaining permits necessary to implement the project. The installation occurred in two phases, Electrical (Phase 1) and Piping and Tanks (Phase 2). Phase 1 involved installation of an electrical service panel and backup generator supplying electricity to each piece of equipment, electrical outlets within the enclosure, and outlets adjacent to each of the large outdoor tanks for ancillary purposes. PG&E installed a transformer and service meter, providing power to the electrical panel located adjacent to Interim Facility enclosure in December 2015.

Phase 2 construction began in April 2015 with clearing vegetation and grading for installation of the additional tanks and associated water reuse/recirculation and chiller systems. Construction continued into 2016 with concrete pad construction and equipment installation. CDFW staff were on hand each day of construction during the project to monitor construction activities and ensure compliance with mitigation measures and resource protection provisions, as well as conservation measures provided by the USFWS for protection of the state and federally threatened California tiger salamander (*Ambystoma californiense*; CTS). All major construction was complete by March 2016.

9.3 Satellite Incubation and Rearing Facility (SIRF) Upgrades

The temporary Satellite Incubation and Rearing Facility (SIRF) is located on a portion of Reclamation property approximately 1,000 feet downstream of Friant Dam and 0.75 miles upstream of the Interim Facility and SJH (Figure 24). At the site,

CDFW operates egg incubation and juvenile rearing systems where fall-run Chinook Salmon are reared and held prior to release into the San Joaquin River. Using a small amount of water and space, the SIRF is maintained and operated separately from the Interim Facility site.

Figure 24: Self-contained rearing units at the Satellite Incubation and Rearing Facility (SIRF)

The SIRF includes a portable egg incubation trailer, four 95% recirculation systems with chillers, a back-up generator (100 kilowatts), twenty 6-foot-diameter circular tanks and seven 3-foot-diameter circular tanks. Reclamation provides space, access, and water at the site under an access license agreement entered into in October 2015 (Contract No. 15-LC-20-0816). Beginning in the 2012-2013 season, two adult salmon captured during the SJRRP Trap and Haul program were spawned and their eggs incubated at the trailer. This provided a proof of concept for the facility and supplied a limited number of juveniles for Program studies. During the 2015-2016 season, the mobile trailer produced approximately 62,000 juveniles. The SIRF has the capacity to produce up to 140,000 juveniles per year if conditions are suitable and eggs are available.

In fall 2014, water temperatures at the facilities exceeded the target range for adult holding and egg incubation, and temperatures peaked at over 70 °F in early October. CDFW was not able to use the SIRF until water temperatures dropped

below 60°F in mid-December, over six weeks after trap and haul efforts began, reducing the number of fish available for studies in spring of 2015. As a long-term solution to prevent periodic high temperatures from impacting salmon reintroduction activities, CDFW installed water recirculation and chiller equipment at the SIRF. Systems were installed in phases for the 2015-2016 spawning and rearing season and were fully operational by the end of FY 2015/2016. Although delays in providing a power supply to the systems prevented spawning at the beginning of the 2015 season, the equipment will protect eggs and fish during periods of high water temperatures in the future, allowing spawning earlier in the season to produce larger juveniles for studies and give CDFW the ability to influence egg and alevin development rates through temperature adjustments.

For the first phase of the project, water recirculation and chiller equipment was installed on the existing mobile trailer to allow for spawning and egg incubation when influent water temperatures would otherwise have exceeded temperature objectives. Egg survival to emergence increased in BY 2015, which may have been due, at least in part, to the new equipment, representing a 17% and 8%increase over spawns that occurred on site for BYs 2013 and 2014, respectively. The second phase of the project included installing four new self-contained rearing units, each with a recirculation system, chiller, and five tanks. The units give CDFW flexibility for rearing juveniles and conducting studies and will allow rearing of juveniles to a size suitable for tagging with CWTs.

In addition to spawning and rearing fall-run Chinook Salmon for studies, the improvements at the SIRF will allow the SJRRP to collect FRH spring-run Chinook Salmon for translocation to the San Joaquin River as eyed eggs rather than juveniles. This strategy results in increased imprinting on San Joaquin River water. The rearing units and surrounding area also provide a safe and controlled work area for studies and fish tagging, tanks for holding adults prior to artificially spawning, and flexibility for rearing fall-run juveniles outside the river during periods of excessive water temperatures.

9.4 Transports and Monitoring Equipment

To facilitate fish transport and rescue activities, CDFW purchased two 2016 Ford F550 Super Duty flatbed trucks and one 800-gallon, 2-compartment fish hauling tank to be mounted on one of the F550s. The tank was delivered at the end of August 2015, and the trucks were delivered in February 2016. The second truck will pull an existing 500-gallon tank trailer.

10 ENVIRONMENTAL COMPLIANCE AND PERMITTING

CDFW has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitat necessary for biologically sustainable populations of those species and is the state trustee for fish and wildlife resources. CDFW must act within its authority and must obtain a variety of permits, authorizations, or other approvals to fulfill its commitment to the SJRRP.

Trustee Agency Authority
CDFW is a Trustee Agency under CEQA with regard to the fish and wildlife of the state [to designated rare or endangered native plants, and to game refuges, ecological reserves, and other areas administered by the department]. (Cal. Code of Regs., tit. 14, § 15386.) Pursuant to Fish and Game Code Section 1802, CDFW has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and the habitat necessary for biologically sustainable populations of those species. As a Trustee Agency for fish and wildlife resources, CDFW is responsible for providing biological expertise with respect to potentially significant impacts arising from project activities and means to mitigate or avoid such impacts.

Responsible Agency Authority
CDFW acts as a Responsible Agency for a project where another agency is the lead agency and CDFW has discretionary approval over the project. (Cal. Code Regs., tit. 14, § 15381.) This may include issuance of an Incidental Take Permit (ITP), pursuant to the California Endangered Species Act (CESA), or a Lake and Streambed Alteration Agreement (LSAA) issued under Fish and Game Code sections 1600 et seq.

Fish and Game Code section 2080 prohibits the “take” of species that is listed as endangered or threatened under CESA. If a Project could result in the “take” of any species listed as threatened, endangered, or candidate under CESA, CDFW may authorize take by issuing an ITP, pursuant to Fish and Game Code section 2081(b).

CDFW also has regulatory authority with regard to activities occurring in streams and/or lakes along with riparian habitat associated with and supported by watercourses, that could adversely affect any fish or wildlife resource, pursuant to Fish and Game Code sections 1600 et seq.

Unlisted Species
Species of plants and animals need not be officially listed as Endangered, Rare, or Threatened (E, R, or T) on any state or federal list to be considered E, R, or T under CEQA.

Fully Protected Species
CDFW has jurisdiction over fully protected species of birds, mammals, amphibians, reptiles, and fish pursuant to Fish and Game Code sections 3511, 4700, 5050, and

5515. Take of any fully protected species is prohibited under these statutes and CDFW cannot authorize their "take."

Bird Protection
CDFW has jurisdiction over actions which may result in the disturbance or destruction of active nest sites or the unauthorized "take" of birds. Fish and Game Code sections that protect birds, their eggs, and nests include sections 3503 (regarding unlawful take, possession or needless destruction of the nest or eggs of any bird), 3503.5 (regarding the take, possession or destruction of any birds-of-prey or their nests or eggs), and 3513 (regarding unlawful take of any migratory nongame bird).

10.1 Permits and Authorizations

The following permits and authorizations have been obtained by CDFW to support Program activities:

- California Air Resources Board Permits
- San Joaquin Valley Air Pollution Control District Permits
- U.S. Army Corps of Engineers Nationwide Permits (Clean Water Act [CWA] Section 404)
- U.S. Fish and Wildlife Service Authorizations
- CDFW Lake and Streambed Authorization Agreements
- State Lands Commission Leases
- Regional Water Quality Control Board (RWQCB) NPDES Permits and CWA Section 401 Certification
- Central Valley Flood Protection Board Authorizations
- Various Access Agreements and Leases

10.2 Environmental Compliance and Permitting Group

The Environmental Compliance and Permitting Group meet once a month. Monthly meetings provided updates on Program activities requiring NEPA or CEQA compliance and/or additional permits from regulatory agencies.

10.3 Fisheries Reintroduction Regulatory Team (FRRT)

The Fisheries Reintroduction Regulatory Team (FRRT) team met monthly to discuss and plan spring-run Chinook Salmon reintroduction activities, which included collections of broodstock and translocation fish from the FRH, operations of the Interim Facility, and other permitting needs for Chinook Salmon research and monitoring activities.

The FRRT began working towards a new 10(a)(1)(A) application that will encompass collections from FRH, Butte Creek, and San Joaquin River (if there are returning spring-run Chinook Salmon adults), translocation fish from FRH, rearing of broodstock, releases of ancillary broodstock and broodstock offspring, and population monitoring activities. The new 10(a)(1)(A) permit will supersede the two current permits (14868 and 17781) and is anticipated to be in place by January 2018, coinciding with the end of the five year term of permit 14868.

The anticipated first year for adult spring-run Chinook Salmon to potentially return to the San Joaquin River was 2016. The FRRT reviewed permits for monitoring and trapping spring-run Chinook Salmon. The Trap and Haul 1600 agreement (1600-2012-0187) and ACOE Nationwide Permit #4 (SPK-2012-01270) were amended and the annual Central Valley Flood Protection Board (CVFPB) Letter of Authorization (PA No. A2014092) was updated in November 2015. NMFS authorized the proposed activities where there were minor differences in the 4(d) authorization.

10.4 SCARF Construction Permitting

CDFW, with the assistance of Horizon, is pursuing environmental permits for construction activities occurring within sensitive areas from CDFW's Lake and Streambed Alteration Program, SLC, ACOE, CVFPB, and the RWQCB.

Progress was made for obtaining the following permits:

- CDFW Lake and Streambed Alteration Agreement (2016-0093-R4).
- SLC lease for a volitional release channel construction and use of a stormwater outfall (PCR 9174.9).
- ACOE Clean Water Act Section 404 for NWP #7 for Outfall Structures and Associated Intake Structures and NWP #18 for Minor Discharges and associated BA for potential impacts to federally listed species and cultural report for Section 106 consultation.
- State Historical Preservation Office (SHPO) consultation for Public Resources Code (PRC) § 5024 and 5024.5 to preserve historical resources.

- RWQCB Clean Water Act 401 Water Quality Certification (401 Certification), National Pollution Discharge Elimination System (NPDES) permit and approval through a General Order for Cold Water Aquatic Animal Production Facilities.

10.4.1 SCARF Pre-construction Biological Surveys

The EIR requires that additional surveys for special status plants and animals be conducted prior to construction. SCARF construction is scheduled to begin September 2016. CDFW is coordinating internally and with Horizon to plan surveys at the appropriate times. Per the EIR, the majority of the bird surveys will not need to be conducted if construction activities begin outside of the bird nesting season (February 1 through August 31). Horizon conducted the first rare plant survey in May 2015 and conducted a second survey in June 2016. No special plants were found during either survey. Horizon is also currently assessing the SCARF site for bats and burrowing owl. Additional surveys will need to be conducted within 30 days of the start of construction as per the EIR.

10.5 Drought Response Permitting

10.5.1 Satellite Incubation and Rearing Facility (SIRF) Upgrade

CDFW obtained the final necessary permit from the San Joaquin Valley Air Pollution Control District to permit the back-up generator in September 2015. Additionally, in compliance with the CEQA addendum, if construction occurs within the bird breeding season, surveys need to be conducted to avoid impacts to nesting birds. Those surveys were completed in July 2015.

11 PUBLIC OUTREACH

The SJRRP is a complex project affecting local, regional, state, and national interests. It is therefore necessary to increase awareness and understanding about the Program, provide mechanisms to assist with effective information sharing, solicit and respond to stakeholder and public input, and form partnerships to support efforts that will aid in achieving the overall goals of the Program.

Some of the affected parties include but are not limited to:

- Government agencies
- Tribal entities
- Landowners
- Fisheries and wildlife interest groups
- Agricultural organizations and interest groups
- Environmental and public interest groups
- Recreational interest groups
- Water policy and planning groups
- Elected officials (federal, state, local)
- Academic institutions
- Media
- Businesses
- General public

Outreach has been facilitated by conducting public meetings and workshops. There have also been a number of facility and resource area tours and public events showcasing the SJRRP while making information available to the public.

Information, in the form of documents and reports, are readily available on the Program website. The Program website (http://www.restoresjr.net/) has served as a clearinghouse for most all of the documents and reports prepared by CDFW in coordination with the Program. CDFW specific documents are also made available on the CDFW website (https://www.wildlife.ca.gov/Regions/4/San-Joaquin-River).

11.1 Trout Derby

CDFW collaborated with the Conservancy, Parkway, Trout Unlimited, and the San Joaquin River Partnership to hold the fourth annual Sycamore Island Fishing Derby in March 2016. CDFW stocked trout at Sycamore Island, an off-stream pond accessible to the public. The event was well-attended with over 300 registered entrants.

11.2 Media Events and Coordination

CDFW provided information and/or was presented on-air and in print for the following media outlets:

- West Beach Films
- The New York Times
- Fox News 26 KMPH
- KSEE 24 News
- Valley Public Radio, NPR Central California
- Reuters
- The Fresno Bee

11.3 Salmon Fest

CDFW collaborated with the San Joaquin River Parkway and Conservation Trust, Trout Unlimited, the San Joaquin River Partnership, and SJRRP Implementing Agencies to hold the third annual Salmon Fest at Lost lake Park in November 2015. The event showcased the SJRRP with agency and resource organization booths, a youth fishing pool, and family activities. CDFW helped release 46 fall-run adult Chinook Salmon to the river, attracting a great deal of attention. CDFW also provided approximately 300 Rainbow Trout for the youth fishing pool and assisted young anglers while fishing.

11.4 Science Meeting

The second annual Science Meeting is scheduled to occur in August 2016.

More information about the SJRRP Science Meeting can be found at: http://www.restoresjr.net/monitoring-data/science-meeting/

11.5 Field Tours

A variety of field tours were conducted with the media, agency staff, academic interests and public officials. There is an interest in field activities, program facilities and significant project features. There were several tours of the Interim Facility for agency staff and congressional representatives. CDFW also met with the media at the Interim Facility and for news coverage of Program fish releases and Program activities.

12 ENFORCEMENT

Enforcement efforts on the SJR River were increased with the addition of three game wardens to the squad in Fresno and Madera Counties. Citations in the last year totaled approximately 35, and this year total citations increased to 93. Citations mostly stemmed from fishing without licenses; however, there were a few take related violations. None of the citations included salmon take. However, enforcement received calls related to the take of salmon where insufficient information was provided to result in a citation. There was a report of salmon take from a YouTube video but an investigation determined that no violation had occurred.

Homeless encampments continue to exist on the river. Much of the river is difficult to access and patrol via foot and or vehicle. Enforcement is in the process of acquiring a boat that will enable effective patrolling. CDFW will be the only law enforcement agency that will have a boat to effectively patrol the river. Allied agency contacts have already been made and joint patrols have been planned to combat resource violations and address other issues on the river.

13 STATE FUNDING AND EXPENDITURES

13.1 Funding

Proposition 84: CDFW funding to support implementation of the Settlement comes, primarily, from State proposition 84, passed by California voters in November 2006. Proposition 84 funds are administered by the California Natural Resources Agency and provide $100 million for Settlement implementation, of which, $60 million is allocated to DWR and $40 million is allocated to CDFW.

Proposition 1: The Water Quality, Supply, and Infrastructure Improvement Act of 2014 authorized $45 million to meet the state's obligations towards the San Joaquin River Settlement, of which, $27 million is allocated to DWR and $18 million is allocated to CDFW.

Proposition 13: CDFW has also relied upon State proposition 13 funds, of which, $5 million has been allocated to contribute to restoration efforts.

Bureau of Reclamation: Beginning in 2012, Reclamation entered into annual operations and maintenance agreements to fund hatchery operations for a period of ten years Reclamation has not committed to funding SCARF operations past 2022, although the facility is expected to continue to be needed beyond that date.

13.2 Expenditures

Table 10: Fiscal Year 2015/2016 Expenditures

DESCRIPTION	AMOUNT
Proposition 84	
Personnel	$976,922.72
Operating Expenses	$110,705.20
Equipment	$5,427.31
Contracts	$218,230.98
TOTAL	**$1,311,286.21**

Proposition 13	
Personnel	$0
Operating Expenses	$80.06
Equipment	$0
Contracts	$0
TOTAL	**$80.06**
Hatchery Operations and Maintenance	
Personnel	$398,234.14
Operating Expenses	$75,849.29
Equipment	$26,936.64
Contracts	$2,181.62
TOTAL	**$503,201.69**
Total Expenditures	
	$1,814,567.96

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