

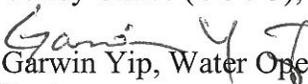


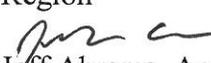
UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
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Sacramento, California 95814-4700

Effective Date: January 15, 2017

MEMORANDUM FOR: Administrative Record for the Designation of a Nonessential Population of Central Valley Spring-run Chinook Salmon Below Friant Dam in the San Joaquin River, California (ARN: 151422SWR2010SA00361) and the Biological and Conference Opinion on the Long-term Operations of the Central Valley Project and State Water Project (CVP/SWP Opinion); ARN: 151422SWR2006SA00268)¹

TO: 
Maria Rea, Assistant Regional Administrator, California Central Valley Office (CCVO), West Coast Region

THROUGH: 
Garwin Yip, Water Operations Branch Chief, CCVO, West Coast Region

FROM: 
Jeff Abrams, Acting San Joaquin Branch Chief, CCVO, West Coast Region

SUBJECT: 2017 (January 2017 – December 2017) Technical Memorandum Regarding the Accounting of San Joaquin River Spring-run Chinook Salmon at the Central Valley Project and State Water Project Sacramento-San Joaquin Delta Fish Collection Facilities

NMFS has prepared this Technical Memorandum (Tech Memo) to fulfill the following three purposes:

- 1) Fulfill one of the requirements of the *Designation of a Nonessential Experimental Population of Central Valley Spring-run Chinook Salmon Below Friant Dam in the San Joaquin River, California* (70 FR 79622, December 31, 2013) to release an annual technical memorandum to:

“Calculate and document the proportionate contribution of Central Valley (CV) spring-run Chinook salmon originating from the reintroduction to the San Joaquin River (San Joaquin River) and deduct or otherwise adjust for share of CV spring-run Chinook salmon take when applying the operational triggers and incidental take statements associated with the NMFS 2009 Biological and Conference Opinion on the Long-term Operations of the Central Valley Project and State Water Project

¹ NMFS. 2017. Technical Memorandum to Account for Reintroduced San Joaquin River Spring-Run Chinook Salmon per CFR 233.301(b)(5)(ii): 7



(CVP/SWP Opinion) or subsequent future biological opinions, or Section 10 permits.”

- 2) Present the methodology that will be employed in 2017 to identify reintroduced CV spring-run Chinook salmon (*Oncorhynchus tshawytscha*) from the San Joaquin River and the deduction or adjustment for such reintroduced spring-run Chinook salmon in the operations of the Central Valley Project (CVP) and State Water Project (SWP) such that the reintroduction will not impose more than *de minimus* water supply reductions, additional storage releases, or bypass flows on unwilling third parties as defined in P.L. 111-11, Title X, section 10011(c)(1).
- 3) Present the spring-run Chinook salmon release and monitoring plans for 2017.

2016 Tech Memo Implementation Summary

Elements of the 2016 Tech Memo were implemented as follows. The San Joaquin River Restoration Program (Program) released 57,320 Feather River Hatchery (FRFH) and 47,560 San Joaquin River Conservation and Research Facility (SCARF) spring-run Chinook salmon juveniles to the San Joaquin River just upstream of the confluence with the Merced River on March 17, 2016. All juvenile spring-run Chinook salmon released were adipose fin-clipped and coded wire tagged (CWT) with a common tag identifier (No. 06-05-21 and 06-86-97, respectively). None of the juvenile spring-run Chinook salmon released were implanted with an acoustic or passive integrated transponder (PIT) tag. All of the downstream sampling efforts and fish facilities were informed of the presence of these fish and their CWT identifiers. Program fish were detected within the San Francisco Estuary from March 21, 2016 until May 3, 2016. The Mossdale trawl captured 36 FRFH and 23 SCARF fish between March 21st and May 3rd, 2016. The Chipps Island trawl caught one SCARF fish on April 1, 2016. Seine surveys caught two Program fish; one SCARF fish at the Weatherbee location on March 31, 2016 and one FRFH fish at the Route 132 location on April 4, 2016. There was an observed count of 26 FRFH and 122 SCARF fish collected and identified at the Tracy and Banks Fish collection facilities (the Facilities), with an estimated loss of 82 FRFH and 439 SCARF fish, through May 3rd, 2016.

The observed count is the number of fish actually handled by biologists at the Facilities. Loss is an estimate of the number of fish that are lost to the system, typically in the form of mortality, and includes pre-screen loss and those fish that go through the louvers. Loss is calculated based on the expanded salvage at each Facility, the size of the observed fishes, and the export rate. All captured fish were sacrificed at the point of capture for CWT identification as per protocol.

No changes in water operations were experienced as a result of the juvenile spring-run Chinook salmon releases.

Genetic tissue samples were taken at the FRFH and SCARF from the parents of the released juvenile spring-run Chinook salmon for use in parentage analysis.

2016 was the first year that adult spring-run Chinook salmon had the potential to return to the San Joaquin River as 2-year-olds from the 2014 juvenile releases. However, monitoring occurred

using a VAKI River Watcher Unit paired with a funnel net at Hills Ferry from February 29, 2016 to June 6, 2016 and no adult spring-run salmon were detected.

On June 30, 2016, 25 ancillary spring-run broodstock (10 females and 15 males), from the SCARF were released by CDFW at Ledger Island in Reach 1A of the San Joaquin River. All of the fish had acoustic tags and were monitored with 14 acoustic arrays within Reach 1A, mobile acoustic listening devices, and snorkel surveys (when conditions allowed). As of September 8, 2016, 24 fish had been recorded within Reach 1A at least once, with one mortality early in the study. As of October 20th, 2016, three spring-run redds have been detected in Reach 1 of the San Joaquin River. There will be no trap and haul efforts to move juveniles past the significant barriers in Reaches 2 through 5. Therefore, if the redds are successful in producing spring-run offspring, it is highly unlikely that the offspring will survive to emigrate out of the Program Restoration Area. If unmarked juveniles produced from the Program do survive, are captured at the Facilities, are in the same size range of older juvenile Chinook salmon, and contribute to exceeding the loss density triggers in the CVP/SWP Opinion (Reasonable and Prudent Alternative Actions IV.2.3 and IV.3²), there is a rapid genetic analysis protocol in place for water year 2017³ to genetically confirm what Chinook species was salvaged by the pumps. Since spring-run is genetically distinct from winter-run, pumping will not be curtailed if spring-run are mistakenly identified as winter-run due to size.

In November 2016, the Program released 544 spring-run Chinook salmon juvenile ancillary broodstock to Reach 5 of the San Joaquin River. Juveniles are from the 2015 brood year and originated from Feather River Hatchery. The release occurred in accordance with Section 10(a)1(A) permit number 14778. All fish released are marked via adipose fin clip and tagged with both PIT tags and coded wire tags.

NMFS has committed to developing this Tech Memo, to the greatest extent possible, in coordination with interested parties and has formed a working group for this purpose. The focus of the 2016 Tech Memo working group process was to consolidate the technical information regarding accounting of naturally-produced San Joaquin River spring-run Chinook salmon and implement the Guidance Document for Methods to Assess San Joaquin River Spring-Run Chinook Salmon in Relation to Facility Operational Triggers and Incidental Take Limits⁴ (Guidance Document). NMFS and the Program used the Phase 2 approach within the Guidance Document to determine which methodology or combination of methodologies will be implemented in 2017; as described in the next section of the document.

² RPA Action IV.2.3 starts on page 74, and RPA Action IV.3 starts on page 79, of http://www.westcoast.fisheries.noaa.gov/publications/Central_Valley/Water%20Operations/Operations,%20Criteria%20and%20Plan/040711_ocap_opinion_2011_amendments.pdf

³ Reclamation's October 20, 2016, request: http://www.westcoast.fisheries.noaa.gov/publications/Central_Valley/Water%20Operations/Operations,%20Criteria%20and%20Plan/reclamation_s_request_to_implement_rapid_genetic_analysis_in_wy_2017_-_october_20_2016.pdf

NMFS's November 21, 2016, response: http://www.westcoast.fisheries.noaa.gov/publications/Central_Valley/Water%20Operations/Operations,%20Criteria%20and%20Plan/nmfs_response_to_reclamation_s_request_to_implement_rapid_genetic_analysis_in_wy_2017_-_november_21_2016.pdf

⁴ The Guidance Document can be found at: http://www.restoresjr.net/wp-content/uploads/20151104_Guidance-Document.pdf

2017 Implementation

River conditions within the Restoration Area will dictate the implementation of fish releases and fisheries monitoring. The Program will monitor river and climate conditions and may cancel or modify fisheries monitoring and/or fish release activities depending on expected conditions in the system.

In 2017, the Program will further investigate the use of genetics identification to account for San Joaquin River spring-run Chinook salmon at the Facilities. Steps of this investigation include:

- Continue to refine and learn from genetic testing at the Facilities.
- Identify and resolve (to the extent of the Program's control) potential issues with using genetic identification for meeting the *de minimus* requirement – process timing, chain of custody, necessary agencies' commitment.

Juvenile San Joaquin fall- and spring-run Chinook salmon migration timing to the Delta will be estimated from the capture of coded-wire tagged individuals in the Mossdale Trawl, Chipps Island trawl, and at the Facilities.

There is also a proposed study through UC Davis to estimate juvenile spring-run Chinook salmon survival from the Restoration Area through the lower San Joaquin River and south Delta using small juvenile salmon acoustic telemetry (JSAT) tags and strategically-placed acoustic arrays.

1. Calculation of incidental take:

a. Incidental take –

Incidental take calculations and adjustments to the incidental take estimates pursuant to the CVP/SWP Opinion are unnecessary for 2017 because all of the CV spring-run Chinook salmon released into the San Joaquin River will be adipose fin-clipped and CWTed. In addition, in the extremely unlikely event any potential offspring of released adults into the San Joaquin River make it out of the Program Restoration Area, all fish released and their offspring have parental based genetic sampling markers to identify them as Program fish.

b. Operational triggers –

Adjustment to the operational triggers pursuant to the CVP/SWP Opinion are unnecessary for 2017 because all spring-run Chinook salmon released into the San Joaquin River will be adipose fin-clipped and CWTed. There is also a rapid genetics analysis plan that was implemented in 2016 to identify winter-run Chinook juveniles from other Chinook juveniles caught at the Facilities. This plan will be implemented in 2017 as well.

2. Accounting Methodology:

a. Physical Marking –

All juvenile spring-run Chinook salmon released into the San Joaquin River as part of the Program will be adipose fin-clipped and CWTeD with a code unique to Program fish so that they can be distinguished from any other juvenile Chinook salmon release group. Because these fish will be adipose fin-clipped, they are exempted from take prohibitions under the 4(d) rule for West Coast threatened salmonids (70 FR 37160, June 28, 2005). As a result, reintroduced spring-run Chinook salmon will not be counted toward the incidental take limits and trigger levels provided under all applicable biological opinions and Endangered Species Act section 10 research permits for operation of any and all facilities of the CVP/SWP (outside of the Friant Division of the CVP).

Biologists at Program monitoring sites, the Mossdale and Chipps Island trawl stations, and the Facilities will record, measure, and sacrifice all adipose fin-clipped fish with a positive CWT detection (as currently undertaken via Facility Standard Operating Procedures). Samples collected at the Program monitoring sites and Mossdale and Chipps Island locations will be processed and reported to NMFS Program staff. The staff at the Facilities will process (tag code read) CWTeD fish within 24 hours and report to the California Department of Fish and Wildlife (CDFW), which will then report the CWT data and associated loss to the Data Assessment Team (DAT) and Delta Operations for Salmonids and Sturgeon (DOSS) group weekly. No operation changes will be recommended by NMFS to Reclamation during the period between collection of the samples and reporting to DOSS or DAT.

b. Genetic Analysis -

The Program has established a parentage based tagging (PBT) program for the San Joaquin River Chinook salmon populations. PBT involves the annual sampling and genotyping of adult Chinook salmon returning to the Restoration Area; these data are being used to create a database of their genotypes for future parentage assignment of their progeny. Genetic sampling of the San Joaquin River fall-run Chinook salmon population began in 2013. All adult Chinook salmon returning to the Restoration Area in 2016/2017 will be tissue sampled for genetic testing.

In addition, all natural origin (unmarked) juvenile Chinook salmon captured in the rotary screw traps or other juvenile traps deployed in 2017 can be tissue sampled for genetic analysis as part of the parental inference analysis. Parental inference analysis can include identification of both parents of each individual, estimation of the number of crosses that took place in the river, family line contribution, and identification of crosses not attributable to the Program. Although this parental based genetic testing can occur in 2017, it is unlikely to occur because of the

likelihood of limited success of the spring-run redds and the testing will not yield significantly beneficial information to the Program.

Genetic analysis of Chinook salmon at the Facilities is a definitive method to distinguish spring-run Chinook salmon from other runs of Chinook salmon once natural production is occurring within the San Joaquin River and adipose fin-clipping all juvenile spring-run Chinook salmon reintroduced to the San Joaquin River is no longer possible. With the present operational triggers, the key concern is whether reintroduced San Joaquin River spring-run Chinook salmon would be of the same size, and mis-identified as larger winter-run juveniles in the Facilities.

At this time, genetic testing of older juvenile Chinook salmon is needed to determine whether the observed fish at the Facilities are genetically winter-run or spring-run Chinook salmon juveniles in order for the operational triggers to be applied correctly. The Program will coordinate with the rapid genetic analysis effort in 2017 at the Facilities to ensure that spring-run from the Program, which are all identifiable by parental based genetic testing, do not contribute towards any loss density triggers that would warrant operational changes. Currently, all non-adipose clipped Chinook salmon captured at the Facilities are genetically sampled if they are in the length-at-date size class that would impact water exports.

3. Reintroduction Process:

a. Release Plans –

A total of approximately 120,000 juvenile spring-run Chinook will be released into the San Joaquin River upstream of the Merced River confluence in spring 2017 as part of the Program. There will be roughly 60,800 salmon from the FRFH, with the remaining juveniles coming from the SCARF. Also, adult broodstock from the SCARF will be released into Reach 1, although the exact numbers for release are currently unknown; these fish will have CWTs, acoustic tags, and have their adipose fins clipped. Additionally, the Program is planning to monitor Reach 5 for returning spring-run Chinook salmon 2-year-olds from 2015 juvenile releases and 3-year-olds from 2014 juvenile releases. If those adults are captured, they will be marked with a PIT tag, Peterson Disc Tag, and genetically sampled. Up to 30 individuals will be tagged with an acoustic transmitter, and released in Reach 1. These adults and the SCARF broodstock releases could spawn naturally in the Restoration Area in 2017, and juveniles would be out migrating as early as January 2018.

The exact release location, date, number of release groups, and numbers of fish per release group are dependent on water year type, physical river conditions within the Restoration Area (the San Joaquin River from Friant Dam to the Merced River confluence), and fish availability and size, which will not be known

until early spring. Target release timing, location and numbers of fish per release will be identified and posted on the Program website⁵ when determined.

The U.S. Fish and Wildlife Service (USFWS) will issue pre-release notifications via email to interested stakeholders and agencies approximately one week prior to fish release. A second notification will be made to the same list immediately after the fish release. A memorandum summarizing the hatchery releases will be prepared for the DOSS group with details regarding the releases, marks, and CWT codes. Release information will also be reported to the Regional Mark Processing Center website⁶.

b. Monitoring Plan -

Juvenile spring-run Chinook salmon released through the Program will be monitored throughout the San Joaquin River to determine migration timing, route selection, survival, and size. The scope of monitoring will depend on where fish are released within the Restoration Area and river conditions.

Rotary screw traps may be placed in one to four locations within the Program Restoration Area and operated when sufficient velocities allow for cone rotation and operations are safe for field personnel. The 2017 rotary screw trap data will be primarily used for limited survival, growth, and migration timing data, instead of juvenile abundance. Rotary screw traps will likely be installed in the following general areas: near Highway 99 in Reach 1, and at the San Mateo Crossing in Reach 2B (these are potential locations only and may change due to conditions, permitting or access and vandalism issues). An additional screw trap may be deployed near the downstream end of Reach 5 or the Highway 99 screw trap may be reallocated to this location to assess survival, migration, and growth rates within Reach 5. The rotary screw traps are anticipated to be deployed prior to the release of Program-tagged juvenile spring-run Chinook salmon into the river and operated until Program study activities are completed.

NMFS has determined (based on discussions with members of the Tech Memo group) that tracking juvenile salmon migration through the lower San Joaquin River, beyond the current monitoring efforts, will have considerable value this year. The two current monitoring efforts are: beach seining conducted by the USFWS and trawling at Mossdale conducted by the CDFW/USFWS. The new monitoring is a proposed study by UC Davis where acoustic telemetry will be used to track juvenile spring-run from Reach 5 of the Program Restoration area into the San Joaquin River and through the south Delta (please see above for more detailed explanation).

⁵ <http://restoresjr.net>

⁶ <http://www.rmhc.org>

4. Timeline:

Once final juvenile San Joaquin River CV spring-run Chinook salmon release information is available, this information will be posted to the Program website⁷. Beginning in February 2017, NMFS will hold monthly meetings to discuss implementation of this 2017 Tech Memo and to develop the 2018 Tech Memo. NMFS will also focus the meetings on implementation of the techniques developed in the Guidance Document.

5. Revision:

NMFS developed this memorandum to govern activities for one year only. As a result, it will not be in effect after January 15, 2018. NMFS intends to prepare a new memorandum by January 15, 2018, to govern activities during 2018.

6. Adjustments to the CVP/SWP Opinion:

No adjustments are needed in 2017 to the CVP/SWP Opinion because all released juvenile spring-run Chinook salmon will be adipose fin-clipped and CWTed. In the extremely unlikely event any potential spring-run juveniles survive and migrate out of the Program Restoration Area and are observed at the Facilities; they will be subject to the rapid genetic analysis protocol and not misidentified as winter-run.

⁷ www.restorsjr.net

Summary Table of Spring-run Releases and Detections to Date

Tech Memo Year	Release Year	Number of Juveniles Released into Reach 5			Numbers of Juveniles Detected Downstream of Release				Broodstock Adults Released into Reach 1	Adult Returns to Reach 5
		FRFH	SCARF	SCARF Yearlings	Mossdale Trawl	Chippis Island Trawl	Facilities	Beach Seine		
2015	2014	60,114	0	0	2	0	0	0	0	-
2016	2015	54,924	0	0	2	0	0	0	0	-
2017	2016	57,320	47,560	544	59 (36 FRFH, 23 SCARF)	1 (SCARF)	148 (26 FRHF, 122 SCARF)	2 (1 FRFH, 1 SCARF)	25 (15 male, 10 Female)	0

