



Weekly Fish and Water Operations Outlook

3/21/2023 – 3/27/2023

Water Project Operational Intent for Week

- Turbidity at OBI exceeded 12 FNU on Friday, March 17 and remains above 12 FNU through Sunday, March 19, therefore ITP COA 8.5.1 is “triggered”, requiring 5 consecutive days of OMR less negative than or equal to –2,000 cfs and a subsequent SMT re-assessment. Also, on March 18, the 3-day average water temperature was greater than 12 degrees Celsius and the average Secchi depth at the 12 central and south Delta stations was less than 1 meter. This “on ramps” ITP COA 8.5.2, requiring an OMR limit of less negative than or equal to –3,500 cfs for larval Delta smelt protection. The SWP will meet both COA 8.5.1 and COA 8.5.2 this week.
- The 50% of the annual loss threshold for Steelhead was exceeded on March 15. CVP and SWP will restrict OMR to a 14-day moving average OMR index of no more negative than -3,500 cfs until March 31. CVP will also meet COA 8.5.2 under the IOP.

Biological Context

- Due to very high flows, the Bay/Delta is in excess conditions and no ESA biological protections are “controlling” water project operations.

Forecasted Weather

- Showers return Tuesday and Wednesday. Cool and unsettled weather after Wednesday with below normal high temperatures.

Tables

Table 1: Anticipated weekly operational ranges by tributary. Environmental and fish conditions updated by respective watershed groups at varying intervals that may not coincide with the weekly range of Water Operations.

Tributary/Division	Anticipated Weekly Ranges	Related Environmental and Fish Conditions
Clear Creek	<ul style="list-style-type: none"> • Current Release: 200 cfs Anticipated Weekly Range of Releases: 200 cfs with possible channel maintenance release TBD. 	<ul style="list-style-type: none"> • Spring-run Chinook Salmon juveniles are rearing/emigrating. • Fall-run Chinook Salmon fry and juveniles are rearing/emigrating. • Late fall-run Chinook Salmon eggs are incubating in the gravel. • <i>O. mykiss</i> adults are spawning, and eggs are incubating in the gravel <p><i>(Updated 3/13/2023)</i></p>

Tributary/Division	Anticipated Weekly Ranges	Related Environmental and Fish Conditions
Sacramento River	<ul style="list-style-type: none"> • Shasta Storage: 3.394 MAF • Current Release: 3,750 cfs • Anticipated Weekly Range of Releases: 3,250 cfs to 3,750 cfs for Keswick side flow management 	<ul style="list-style-type: none"> • Spring-run Chinook salmon fry have completed final redd emergence and are rearing or migrating downstream. • Winter-run and spring-run Chinook salmon (length-at-date) juveniles are being caught sporadically in low numbers at RBDD traps. Fall-run Chinook salmon spawning is complete and juveniles have emerged. Carcass surveys for fall-run have ended. • Late-fall-run juveniles from December spawning are starting to emerge and the Jan-Mar spawned eggs and fry remain incubating in the redds. <p><i>(Updated 3/20/23)</i></p>
Feather River	<ul style="list-style-type: none"> • Oroville Storage: 2.916 MAF • Current Release: 35,000 cfs • Anticipated Weekly Range of Releases: 10,000 cfs to 35,000 cfs • Daily temperature maximum: 55 F at Fish Hatchery 	<ul style="list-style-type: none"> • Fall-run Chinook salmon juveniles are moving downstream. • Spring-run Chinook salmon juveniles are moving downstream. • <i>O. mykiss</i> adult spawning is complete. Eggs are in gravel and incubating. Fry are emerging. <p><i>(Updated 3/20/23)</i></p>
American River	<ul style="list-style-type: none"> • Folsom Storage: 624 TAF • Current Release: 12,000 cfs • Anticipated Weekly Range of Releases: 7,000 cfs to 16,000 cfs for flood management 	<ul style="list-style-type: none"> • Adult fall-run Chinook Salmon have completed spawning. Eggs are incubating in gravel and fry are emerging from redds. • Redd and carcass surveys have ended. • Juvenile and adult <i>O. mykiss</i> are present. Adult steelhead are spawning in river. Fry are beginning to emerge. <p><i>(Updated 3/14/23)</i></p>
Stanislaus River	<ul style="list-style-type: none"> • New Melones Storage: 1.312 MAF • Current Release: 1,500 cfs • Anticipated Range of Weekly Releases: 1,500 cfs 	<ul style="list-style-type: none"> • Juvenile and adult <i>O. mykiss</i> are present. Adults are spawning and their eggs are incubating in gravel. • Adult fall-run Chinook salmon spawning has ended. Chinook eggs are mostly emerged. Fry and some parr are rearing and migrating <p><i>(Updated 3/13/23)</i></p>

Tributary/Division	Anticipated Weekly Ranges	Related Environmental and Fish Conditions
Delta	<ul style="list-style-type: none"> Freeport: 50,000 to 80,000 cfs Vernalis: 30,000 to 36,000 cfs Delta Outflow index: 80,000 to 170,000 cfs Combined Exports: 10,180 to 10,880 cfs JPP: Current 4,200 cfs Range 3,500 cfs to 4,200 cfs CCF: Current 6,680 cfs Range 6,680 cfs Expected Daily OMR Index Values: +7,000 cfs to +11,000 cfs DCC Gates: Closed as of 11/28 and expected to remain closed for seasonal operation. 	<ul style="list-style-type: none"> Adult <i>O. mykiss</i> present. Spring-run and winter-run Chinook salmon juveniles are moving downstream and into the Delta. Adult and juvenile Green Sturgeon present Adult Delta Smelt spawning has begun. No adult DS have been detected by fish surveys since 3/8/23. Detections in the past 2 weeks indicate presence in Suisun Marsh and the Sac Deep Water Ship Channel. No DS were detected in salvage in the last week, and DS cumulative seasonal salvage is 52. Last week, Longfin Smelt sub-adults and adults were detected at Chipps, Sac Deep Water Ship Channel, Suisun Marsh, and San Pablo Bay. Spawning is ongoing and LFS larvae have most recently been detected in the lower San Joaquin River, Old River, lower Sacramento River, confluence, Suisun Bay, Suisun Marsh, and downstream to Carquinez, Napa River, and San Pablo Bay. Five adult LFS have been salvaged at the CVP and two adult LFS at SWP this WY, and no salvage in the last week for a cumulative seasonal salvage of 26. <p>(Updated 3/2/2023)</p>

Table 2a-b: WY 2023 relevant Fish and Environmental Criteria and Status in 2019 Reclamation LTO Action Cumulative loss for the duration of 2019 Biological Opinion began upon signature of ROD, 2/19/2020.

Table 2a: WY 2023 Salmonid Current Loss and Delta Smelt Abiotic Conditions. Additional Real-Time OMR Restrictions and Performance Objectives (4.10.5.10.2, 4.10.5.10.3) and Onset of OMR Management (4.10.5.10.1). Genetic identification of salmon is not used in calculating loss, but results are included in the Assessment as they become available. The Final WR JPE for BY2022 is 49,924.

Species/run	Threshold	Current Status	Weekly Trend	Updated
Green sturgeon	WY 2023 salvage = 74	WY 2023 salvage = 0 (0%)	No change expected	3/20/2023
Natural winter-run Chinook Salmon	WY 2023 loss = 292 (50% of 1.17% of JPE)	WY 2023 loss = 82.54 (28.2%)	Possible salvage	3/20/2023
Natural Steelhead	Dec 1 – Mar 31 = 707; (50% of 1,414), 1060.5; (75% of 1,414) Apr 1 – June 15 = 776 (50% of 1,552)	WY 2023 loss = 992.40 Dec 1 – Mar 31 = 992.40 (93.6% of the 75% threshold) Apr 1 – June 15 = 0 (0%)	Possible salvage	3/20/2023

Species/run	Threshold	Current Status	Weekly Trend	Updated
Sacramento River Hatchery winter-run Chinook salmon	WY 2023 loss = 114.6 (50% of 0.12% of JPE)	WY 2023 loss = 0 (0%)	Possible salvage	3/20/2023
Battle Creek Hatchery winter-run Chinook salmon	WY 2023 loss = 40 (1% of JPE)	WY 2023 loss = 0 (0%)	No change expected	3/20/2023
Proposed Action Hatchery yearling spring-run Chinook salmon surrogates	> 0.5% of each release group 1) 12/5/2022 group 1: 71,057 = 355.3 2) 12/23/2022 group 2: 66,735 = 333.7 3) 1/13/2023 group 3: 60,712 = 303.6	WY 2023 loss = 1) 127.5 (35.9%) 2) 141.3 (42.3%) 3) 32.0 (10.5%)	Possible salvage	3/20/2023
Delta Smelt	After Dec. 1: Running 3-day avg. flows at Freeport >25,000 cfs Running 3-day avg. turbidity at Freeport =>50 FNU	Freeport 3-day avg. Flow = Not relevant Turbidity = Not relevant	Triggered 12/31/22, ended 01/16/23	1/23/2023 Data from 1/22/2023
Delta Smelt	Daily avg. Turbidity at OBI=>12 FNU	OBI Daily Average = 24.36 NTU/FNU	In effect, not triggered; implemented 1/17/2023-2/8/2023; ripe females detected by SKT on 2/8/2023 have off-ramped Turbidity Bridge Avoidance	3/20/2023
Delta Smelt	Daily avg. Temperature at CCF > 25°C for three consecutive days	CCF daily avg. Temperature = Not relevant	Not relevant	12/20/2022

Table 2b. 10-Year Salmonid Cumulative Loss

Species/run	Threshold	Current Status	Updated
Natural winter-run Chinook salmon	Loss = 8,738	Cumulative loss = 341.39 (3.9%)	3/20/2023
Hatchery winter-run Chinook salmon	Loss = 5,356	Cumulative loss = 6.71 (0.13%)	3/20/2023
Natural steelhead	Loss = 6,038 (Dec 1 – Mar 31) Loss = 5,826 (Apr 1 – June 15)	Cumulative loss = 1553.70 (25.4%, Dec 1 – Mar 31) 474.5 (8.1%, Apr 1 – June 15)	3/20/2023

Table 3a-d: Relevant Water Year 2023 Fish Criteria and Status for Listed Fish under the SWP Long-Term Incidental Take Permit.

Table 3a: Chinook Salmon

* Based on NMFS letter received on 1/20/2023, Final WR JPE for BY2022 is 49,924.

** Based on the lab results received (up to sample date 2/26/23), there was **1** natural WR identified through genetic verification process.

Action	Timeframe	Current Action Status	Threshold(s)	Current Relevant Data	Weekly Trend	Last Updated	Comments
OMR Mgmt. triggered (8.3.2)	Jan. 1 - Jun. 30 <i>(when ≥ 5% of spring-run or winter-run in Delta)</i>	Not in effect	-5% of the Winter-run or Spring-run population in Delta	N/A	N/A	12/18/22	N/A
Winter-run yearly loss (8.6.1)	Nov. 1 - Jun. 30	In effect	584.11 (based on final JPE)*	WR loss: 82.54**	Possible salvage	3/20/23	Based on salvage data from 3/19/23
Winter-run discrete daily loss (8.6.2)	Nov. 1 - Dec. 31	Not in effect	12/1-12/31: loss of 26/day unclipped older juv. Winter-run	Daily loss from 12/18 unclipped WR loss: 17.54 fish loss >26	Possible salvage	1/3/23	Based on salvage data from 12/18/22
Mid and late season Winter-run daily loss threshold (8.6.3)	Jan 1 – May 31	In effect	3/1/23 - 3/31/23 Daily loss of older juvenile greater than 7.29; Updated with genetic results as they become available. If genetics confirms the older juvenile is NOT a WR then COA will offramp.	LAD WR salvaged at CVP on 3/13/23 had a loss of 2.60. (Was genetically identified as not WR)	Possible salvage	3/20/23	Based on salvage data from 3/19/23

Action	Timeframe	Current Action Status	Threshold(s)	Current Relevant Data	Weekly Trend	Last Updated	Comments
Spring-run surrogate protection (8.6.4)	Feb. 1 - Jun. 30	In effect	Hatchery Origin Young-of-year SR Surrogates. (0.25% of total in-river FR releases for each release group from FRFH) Group 1 Threshold: 1,828.64 (0.25% of 731,457)	No salvage from this group have been observed yet at either fish facility.	Possible salvage	3/20/23	Feather River Fish Hatchery released 731,457 spring-run Chinook salmon into Boyd's pump on 3/16/23. This is the first group released to satisfy the requirements of COA 8.6.4.

Table 3b: Delta Smelt

Action	Timeframe	Current Action Status	Threshold(s)	Current Relevant Data	Weekly Trend	Last Updated	Comments
Integrated Early Winter Pulse Protection ('First Flush') (8.3.1)	Dec. 1 - Jan. 31	Off-ramped 1/17/2023	- three-day Freeport daily flow running avg >= 25,000 AND [three-day Freeport turbidity running avg >= 50 NTU OR Smelt Monitoring Team recommendation]	FPT flow: Not relevant FPT turbidity: Not relevant	Decreasing	1/30/23	N/A
Turbidity Bridge Avoidance (8.5.1)	Dec. 15 - Apr. 1	In effect, triggered; implemented 1/17/2023-2/8/2023, 2/24/2023 - 2/26/2023, 3/18/2023 - Present	Occurs after the Integrated Early Winter Pulse protection or February 1 (whichever comes first) until April 1 -avg. OBI turbidity > 12 FNU	OBI = 24.36 FNU	Expected to remain elevated	3/20/23	Data from 3/19/23

Action	Timeframe	Current Action Status	Threshold(s)	Current Relevant Data	Weekly Trend	Last Updated	Comments
Larval and/Juvenile Delta smelt Protection (8.5.2)	ongoing	In effect, triggered	- If 5-day cum. salvage of juv.DS >= 1[average 3-yrFMWT index + 1], then – 5000 OMR - If DS in SLS/20mm or 3-d temp at Jersey Point >= 12C, and SLS/20mm Secchi for 12 south delta stations <= 1m, then –3500 OMR	Current 5-day salvage = 0 3-day SJJ temp = 12.52 C SLS 6 avg Secchi = 45.6 cm	Turbidity expected to remain high	3/20/23	Data from 3/19/23

Table 3c: Longfin Smelt

Action	Timeframe	Current Action Status	Threshold(s)	Current Relevant Data	Weekly Trend	Last Updated	Comments
Early Adult Protection (8.3.3)	Dec. 1 - Feb. 28	Off-ramped	-Cum. salvage > [most recent FMWT/10] =40 fish (Sept.-Dec. Index) OR -Smelt Monitoring Team determines high likelihood of LFS movement into high-risk areas	Cum salvage total = 26	No change expected	3/20/23	First salvage on 1/1/23.
OMR Mgt. for Adults (8.4.1)	Dec. 1 -Feb. 28	Off-ramped	-Smelt Monitoring Team recommendation	N/A	N/A	12/27/22	N/A
Larval and Juvenile Longfin Smelt Entrainment Protection (8.4.2)	Jan 1 – Jun 30	In effect, triggered	-LFS larvae or juveniles in >=4 SLS or 20 mm stations in central and south Delta, OR -LFS catch/tow >5 larvae or juveniles in >=2stations	SLS #5: 7 larvae at station 809, 1 at 812, 2 at 901, 3 at 902, and 1 at 915 in the central and south Delta	None expected, not active due to triggering of 8.4.3	3/16/23	SLS 5 was in the field 2/27 - 3/3
High Flow OMR Off-Ramp for Longfin Smelt (8.4.3)	Based on the status of 8.3.3, 8.4.1, & 8.4.2	In effect, triggered	-Sac. R. at Rio Vista >55,000, OR SJR at Vernalis >8,000	Rio Vista = 50,000 – 130,000 cfs SJ = 30,000 to 36,000 cfs	N/A	3/20/23	

Table 3d: OMR

Action	Timeframe	Current Action Status	Threshold(s)	Current Relevant Data	Weekly Trend	Last Updated	Comments
OMR Storm Flexibility (8.7)	Jan 1 – Jun 30	Not in Effect	-Delta is in excess -QWEST is > 0 -Measurable amount of precipitation has occurred -None of COA's are controlling operations (8.3.1, 8.3.3, 8.4.1, 8.4.2, 8.5.1, 8.5.2, 8.6.1, 8.6.2, 8.6.3, 8.6.4) -Cumulative salvage at CVP and SWP of yearling CNFH LFR Chinook salmon (as yearling CHNSR surrogates) is < 0.5% with any of the release groups -Risk Assessments conducted by the SaMT/SMT determines no changes in spawning, rearing, foraging, sheltering, or migration behavior as a result of OMR Flex operations beyond those are likely to occur.	N/A	N/A	1/3/23	Based on storm conditions
OMR Mgmt. Offramp (8.8)	Jun. 1 – Jun. 30	Not in effect	->95% of the Winter-run and Spring run populations have migrated past Chipps Island AND -Current daily average water temperature at Mosssdale and Prisoners Point. <ul style="list-style-type: none"> Days exceeded: Criteria met as of 6/16/2022 	N/A	N/A	10/10/22	N/A

Table 4: Fish monitoring gear efficiency and disruptions. Status Categories: [1] Active (ongoing sampling), [2] Partial Interruption (some sampling interruptions), [3] Interrupted (sampling fully suspended), [4] Not Active (sampling not scheduled)

Monitoring survey	Region	Notes (as of 3/21/2023)	Status
SWP regular counts, CWT reading	Delta	Active	1
SWP larval sampling	Delta	Active	1
CVP regular counts, CWT reading	Delta	Active	1
CVP larval sampling	Delta	Active	1
Smelt Larval Survey	Delta	Active	1

Monitoring survey	Region	Notes (as of 3/21/2023)	Status
LEPS	Delta	Active	1
20mm Survey	Delta	Active	1
Spring Kodiak Trawl	Delta	Active	1
Fall Mid-water Trawl	Delta	Not Active	4
Summer Towntnet Survey	Delta	Not Active	4
Bay Study	Delta	Active	1
DJFMP- Chipps and Sacramento Trawls	Delta	Active (Chipps Island & Sacramento Trawl running 5 days a week through March)	1
DJFMP- Seines	Delta	Active	1
EDSM	Delta	Active	1
EMP	Delta	Active	1
Mossdale	Delta	Active	1
USGS Flow monitoring	Delta	Active	1
Red Bluff Diversion Dam Rotary Screw Trap (RST)	Sacramento River	Active	1
Knights Landing RST	Sacramento River	Active (Since 3/12)	1
Tisdale RST	Sacramento River	Active (Since 3/13)	1
GCID RST	Sacramento River	Not Active	4
Yuba River (Hallwood) RST	Yuba River	Active (Since 3/20)	1
Redd dewatering and stranding surveys	Sacramento River	Not Active	4
Sacramento Carcass and Redd Surveys	Sacramento River	Active	1
Lower Sacramento RST	Sacramento River	Not Active (Since 3/8)	4
Feather River (upper DWR) RST	Feather River	Partial Interruption	2
Feather River (lower CDFW) RST	Feather River	Active (Inactive on 3/14)	1
SJRRP CDFW Field Monitoring	San Joaquin River	Not Active	4
SJRRP USBR Field Monitoring	San Joaquin River	Interrupted	3
Stanislaus Fish Weir	Stanislaus River	Active	1
American River Carcass/Redd Surveys	American River	Not Active	4
Caswell RST	Stanislaus River	Active	1