



# Weekly Fish and Water Operations Outlook

1/31/2023 – 2/6/2023

## Water Project Operational Intent for Week

- Reservoir releases stay at or ramp down to base levels
- Exports scheduled so that the 5-day average OMR is less negative or equal to -5,000 cfs.

## Biological Justification

- The Projects operated at -2000 cfs for 19 consecutive days (starting 1/3/2023, first flush for 14 days, then turbidity bridge avoidance for 5 days), at OMR no more negative than -3500 cfs for an additional 5 days, ending 1/26/2023, and at OMR no more negative than -5000 cfs thereafter. The cumulative effects of these actions reduced the entrainment footprint of the Projects for a period that extends through average upstream movement period of Delta Smelt (23.6 days see Sommer et al 2011; also see Grimaldo et al. 2009).
- The last detection of Delta Smelt in the South Delta occurred on 1/17/2023 near Franks Tract. Once Delta Smelt move upstream, they have limited movements (Polansky et al. 2017). Therefore, the risk of additional Delta Smelt moving into the interior Delta or getting entrained at the Projects is likely low.
- The 2008 FWS BiOp had an offramp for OMR triggers once SJR flows elevated above 10,000 cfs. As of 1/29, SJR flow (@ Vernalis) was 13,155 cfs. Data pre-2008 shows that when SJR flows reach high levels, adult entrainment and calculated proportional losses are relatively small (Kimmerer 2008; Smith et al. 2021) because Delta Smelt distribution shifts seaward away from the influence of the Projects. Turbidity values at OBI are decreasing and are anticipated to continue decreasing this week. Daily turbidity at OBI was 14.5 FNU on 1/29/2023.
- DWR and Reclamation propose that the Projects operating to -5000 cfs OMR will not create conditions that result in any additional movement of Delta Smelt into the interior Delta. The intent of first flush and turbidity bridge was never to expect zero salvage or zero fish movement into the interior Delta as Delta Smelt are capable of swimming to upstream locations under high outflows (Gross et al. 2021). The intent was to severely reduce a large proportion of the Delta Smelt from moving into the entrainment zone which historically (pre-2009 FWS BiOP) led to relatively high proportional population losses (Kimmerer 2008).

**Forecasted Weather:** Cool and dry weather through mid-week. Precipitation chances return by end of week.

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"> <li>• Current Release: 200 cfs. Anticipated Weekly Range of Releases: 200 cfs.</li> </ul>	<ul style="list-style-type: none"> <li>• Spring-run Chinook Salmon fry are emerging from redds and are rearing/emigrating.</li> <li>• Fall-run Chinook Salmon eggs are incubating in the gravel, and fry are emerging from redds and are rearing/emigrating. Late fall-run Chinook Salmon are entering and beginning to spawn. Eggs are incubating in the gravel.</li> <li>• O. mykiss adults are entering and are beginning to spawn. Eggs are incubating in the gravel.</li> </ul> <p><i>(Updated 1/9/2023)</i></p>
Sacramento River	<ul style="list-style-type: none"> <li>• Shasta Storage: 2.556 MAF</li> <li>• Current Release: 3,250 cfs</li> <li>• Anticipated Weekly Range of Releases: 3,250 cfs.</li> </ul>	<ul style="list-style-type: none"> <li>• Spring-run Chinook salmon fry have completed final redd emergence and are rearing or migrating downstream.</li> <li>• Winter-run Chinook juvenile salmon are migrating downstream. Winter-run and spring-run Chinook salmon (length-at-date) juveniles are being caught in low numbers and genetics being taken to confirm run assignment.</li> <li>• Fall-run Chinook salmon spawning is complete. Carcass surveys for fall-run have ended. Eggs are incubating in gravel and fry are beginning to emerge from redds.</li> <li>• Late fall-run Chinook salmon are spawning and eggs in gravel. Carcass surveys are underway. Late-fall spawning can occur up to late March but majority of spawning will be complete by the end of January.</li> <li>• Fall-run juveniles, according to length-at-date-criteria, are being caught at increasing numbers at the RBDD rotary traps.</li> </ul> <p><i>(Updated 1/30/23)</i></p>
Feather River	<ul style="list-style-type: none"> <li>• Oroville Storage: 2.285 MAF</li> <li>• Current Release: 950 cfs</li> <li>• Anticipated Weekly Range of Releases: 950 cfs</li> <li>• Daily temperature maximum: 55 F at Fish Hatchery</li> </ul>	<ul style="list-style-type: none"> <li>• Fall-run Chinook salmon fry are emerging and beginning to move downstream.</li> <li>• Spring-run Chinook salmon fry are emerging and are rearing/moving downstream.</li> <li>• Adult and juvenile O. mykiss present.</li> </ul> <p><i>(Updated 1/30/2023)</i></p>

Tributary/Division	Anticipated Weekly Ranges	Related Environmental and Fish Conditions
American River	<ul style="list-style-type: none"> <li>• Folsom Storage: 500 TAF</li> <li>• Current Release: 4,000 cfs</li> <li>• Anticipated Weekly Range of Releases: 3,000 cfs to 4,000 cfs</li> </ul>	<ul style="list-style-type: none"> <li>• Adult fall-run Chinook Salmon have completed spawning. Eggs are incubating in gravel and fry are emerging from redds.</li> <li>• Redd and carcass surveys have ended.</li> <li>• Juvenile and adult <i>O. mykiss</i> are present. Adult steelhead are spawning in river.</li> </ul> <p><i>(Updated 1/30/23)</i></p>
Stanislaus River	<ul style="list-style-type: none"> <li>• New Melones Storage: 978 TAF</li> <li>• Current Release: 200 cfs</li> <li>• Anticipated Range of Weekly Releases: 200 cfs.</li> </ul>	<ul style="list-style-type: none"> <li>• Juvenile and adult <i>O. mykiss</i> are present.</li> <li>• Adult fall-run Chinook salmon spawning has ended. Eggs are incubating in gravel.</li> <li>• Caswell RST began trapping this week to capture juvenile fall-run migrating downstream. Fry should begin emerging from redds beginning mid-January.</li> </ul> <p><i>(Updated 1/30/23)</i></p>
Delta	<ul style="list-style-type: none"> <li>• Freeport: 15,000 to 30,000 cfs</li> <li>• Vernalis: 6,000 to 13,000 cfs</li> <li>• Delta Outflow index: 15,000 to 30,000 cfs</li> <li>• Combined Exports: 6,700 to 11,700 cfs</li> <li>• JPP: Current 4,200 cfs, Range 3,500 cfs – 4,200 cfs</li> <li>• CCF: Current 7,500 cfs Range 2,500 cfs to 7,500 cfs</li> <li>• Expected Daily OMR Index Values: - 3,500 to -5,000 cfs</li> <li>• DCC Gates: Closed as of 11/28 and expected to remain closed for seasonal operation.</li> </ul>	<ul style="list-style-type: none"> <li>• Adult <i>O. mykiss</i> present.</li> <li>• Spring-run and winter-run Chinook salmon juveniles are moving downstream and into the Delta.</li> <li>• Adult and juvenile Green Sturgeon present</li> <li>• Adult Delta Smelt migration is likely starting to end. DJFMP Chipps Island trawl caught an experimentally released adult DS on 1/19/23. EDSM caught an unmarked adult DS in the South Delta on 1/17/23, as well as marked DS in the lower Sacramento River, Liberty Island, and Suisun Bay during the week of 1/23/23. The salvage of a cultured DS adult at CVP occurred on 1/7/23. Experimental release of hatchery DS at Rio Vista occurred on 11/30/22 and 1/18-19/23 and in the Sac DWSC 1/25-26/23.</li> <li>• Longfin Smelt sub-adults and adults have recently been detected in the lower San Joaquin River, Chipps, the lower Sacramento River, the Western Delta, and Suisun Marsh and Suisun Bay. Spawning is ongoing and LFS larvae have most recently been detected in the confluence, Suisun Bay, and downstream to San Pablo Bay. Four adult LFS have been salvaged at the CVP and 1 adult LFS at SWP this WY for an expanded total of 20.</li> </ul> <p><i>(Updated 1/31/2023)</i></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	1/30/2023
Natural winter-run Chinook Salmon	WY 2023 loss = 292 (50% of 1.17% of JPE)	WY 2023 loss = 50.91 (17.4%)	Possible salvage	1/30/2023
Natural Steelhead	Dec 1 – Mar 31 = 707 (50% of 1,414)  Apr 1 – June 15 = 776 (50% of 1,552)	WY 2023 loss = 74.22 Dec 1 – Mar 31 = 74.22 (10.49%) Apr 1 – June 15 = 0 (0%)	Possible salvage	1/30/2023
Sacramento River Hatchery winter-run Chinook salmon	WY 2023 loss = TBD* (50% of 0.12% of JPE)	WY 2023 loss = 0 (0%)	No change expected	1/30/2023
Battle Creek Hatchery winter-run Chinook salmon	WY 2023 loss = TBD * (50% of 0.12% of JPE)	WY 2023 loss = 0 (0%)	No change expected	1/30/2023
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 (0.18%) 2) 141.3 (0.21%) 3) 0 (0%)	Possible salvage	1/30/2023
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 Avg Turbidity = 14.5 FNU	Triggered; Turbidity Bridge Avoidance implemented 1/17/23 – Present Decreasing	1/30/2023

Species/run	Threshold	Current Status	Weekly Trend	Updated
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 = 309.76 (3.5%)	1/30/2023
Hatchery winter-run Chinook salmon	Loss = 5,356	Cumulative loss = 6.71 (0.13%)	1/30/2023
Natural steelhead	Loss = 6,038 (Dec 1 – Mar 31) Loss = 5,826 (Apr 1 – June 15)	Cumulative loss = 615.35 (10.1%, Dec 1 – Mar 31) 474.5 (8.1%, Apr 1 – June 15)	1/30/2023

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 1/17/23), there was no 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: 50.19**	Possible salvage	1/30/23	Based on salvage data from 1/29/23

Action	Timeframe	Current Action Status	Threshold(s)	Current Relevant Data	Weekly Trend	Last Updated	Comments
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 salvage: 17.54 fish/TAF < 26 fish/TAF	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	1/1/23 - 1/31/23 Daily loss of older juvenile greater than 3.17 and updated with genetic results as they become available. If genetics confirms the older juvenile is NOT a WR then COA will offramp. Upcoming: 2/1/23 - 2/28/23 Daily loss of older juvenile greater than 4.95	Salvage of older juvenile with loss of 3.60 on 1/29/23	Possible salvage	1/30/23	Based on salvage data from 1/29/23
Spring-run surrogate protection (8.6.4)	Feb. 1 - Jun. 30	Not in effect	TBD (based on the number of fish released)	N/A	N/A	10/31/22	N/A

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-Present	Occurs after the Integrated Early Winter Pulse protection or February 1 (whichever comes first) until April 1 -avg. OBI turbidity > 12 FNU	OBI = 14.5 FNU	Decreasing	1/30/23	Data from 1/29/23
Larval and/Juvenile Delta smelt Protection (8.5.2)	ongoing	In effect, not triggered	- If 5-day cum. salvage of juv.DS >= 1 [average 3-yr FMWT 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 = 9.4  SLS 2 avg Secchi = 25 cm	No change expected	1/30/23	Data from 1/29/23

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 = 20	No change expected	1/30/23	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, not 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 #2: 0 larvae in central and south Delta	None expected	1/30/23	SLS 2 was in the field 1/17- 1/19
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	Triggered, not controlling	-Sac. R. at Rio Vista>55,000, OR SJR at Vernalis >8,000	Rio Vista = 10,000 – 25,000 cfs SJ = 6,000 to 13,000 cfs	N/A	1/23/23	N/A



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"> <li>Days exceeded: Criteria met as of 6/16/2022</li> </ul>	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 1/31/2023)	Status
SWP regular counts, CWT reading	Delta	Active	1
SWP larval sampling	Delta	Not Active	4

Monitoring survey	Region	Notes (as of 1/31/2023)	Status
CVP regular counts, CWT reading	Delta	Partial (reduced counts on 1/23-1/25)	2
CVP larval sampling	Delta	Not Active	4
Smelt Larval Survey	Delta	Active	1
LEPS	Delta	Active	1
20mm Survey	Delta	Not Active	4
Spring Kodiak Trawl	Delta	Active	1
Fall Mid-water Trawl	Delta	Not Active	4
Summer Townet Survey	Delta	Not Active	4
Bay Study	Delta	Active	1
DJFMP- Chipps and Sacramento Trawls	Delta	Active (sampling three days a week starting in May)	1
DJFMP- Seines	Delta	Partial	2
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 (inactive 1/23-1/24)	1
Tisdale RST	Sacramento River	Active (inactive on 1/22 -1/23)	1
GCID RST	Sacramento River	Not Active (Traps pulled out of river due to high flows on 12/27)	4
Yuba River (Hallwood) RST	Yuba River	Active – weekdays only	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	Active (as of 1/30)	1
Feather River (upper DWR) RST	Sacramento River	Active	1
Feather River (lower CDFW) RST	Sacramento River	Active	1
SJRRP CDFW Field Monitoring	San Joaquin River	Active	1
SJRRP USFWS and USBR Field Monitoring	San Joaquin River	Not Active	4

Monitoring survey	Region	Notes (as of 1/31/2023)	Status
Stanislaus Fish Weir	San Joaquin River	Active	1

### Delta Smelt References

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