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.

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 | * Current Release: 200 cfs. Anticipated Weekly Range of Releases: 200 cfs. | * Spring-run Chinook Salmon fry are emerging from redds and are rearing/emigrating. * 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. * O. mykiss adults are entering and are beginning to spawn. Eggs are incubating in the gravel. * *(updated 1/9/2023)* |
| Sacramento River | * Shasta Storage: 2.556 MAF * Current Release: 3,250 cfs * Anticipated Weekly Range of Releases: 3,250 cfs. | * Spring-run Chinook salmon fry have completed final redd emergence and are rearing or migrating downstream. * 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. * 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. * 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. * Fall-run juveniles, according to length-at-date-criteria, are being caught at increasing numbers at the RBDD rotary traps. * (updated 1/30/23) |
| Feather River | * Oroville Storage: 2.285 MAF * Current Release: 950 cfs * Anticipated Weekly Range of Releases: 950 cfs * Daily temperature maximum: 55 F at Fish Hatchery | * Fall-run Chinook salmon fry are emerging and beginning to move downstream. * Spring-run Chinook salmon fry are emerging and are rearing/moving downstream.   Adult and juvenile *O. mykiss* present. *(updated 1/30/2023)* |
| American River | * Folsom Storage: 500 TAF * Current Release: 4,000 cfs * Anticipated Weekly Range of Releases: 3,000 cfs to 4,000 cfs | * 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 *O. mykiss* are present. Adult steelhead are spawning in river.   (*updated 1/30/23*) |
| Stanislaus River | * New Melones Storage: 978 TAF * Current Release: 200 cfs * Anticipated Range of Weekly Releases: 200 cfs. | * Juvenile and adult *O. mykiss* are present. * Adult fall-run Chinook salmon spawning has ended. Eggs are incubating in gravel. * Caswell RST began trapping this week to capture juvenile fall-run migrating downstream. Fry should begin emerging from redds beginning mid-January. * *(updated 1/30/23)* |
| Delta | * Freeport: 15,000 to 30,000 cfs * Vernalis: 6,000 to 13,000 cfs * Delta Outflow index: 15,000 to 30,000 cfs * Combined Exports: 6,700 to 11,700 cfs * JPP: Current 4,200 cfs, Range 3,500 cfs – 4,200 cfs * CCF: Current 7,500 cfs Range 2,500 cfs to 7,500 cfs * Expected Daily OMR Index Values: -3,500 to -5,000 cfs * DCC Gates: Closed as of 11/28 and expected to remain closed for seasonal operation. | * Adult O. mykiss 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 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. * 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. * (updated 1/31/2023) |

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 |
| 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  *(when ≥ 5% of spring-run or winter- run in*  *Delta)* | Not in effect | -5% of the  Winter-run or Spring-run population in  Delta | N/A | N/A | 12/18/22 |  |
| 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 |
| 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 |  |

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 |  |
| 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-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 = 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 |  |
| 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 |  |

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 Mossdale and Prisoners Point.   * Days exceeded: Criteria met as of 6/16/2022 |  | N/A | 10/10/22 |  |

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 |
| 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 |
| Stanislaus Fish Weir | San Joaquin River | Active | 1 |

Delta Smelt References

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