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 | * Current Release: 200 cfs Anticipated Weekly Range of Releases: 200 cfs with possible channel maintenance release TBD. | * 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. * *O. mykiss* adults are spawning, and eggs are incubating in the gravel. *(updated 3/13/2023)* |
| Sacramento River | * 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 | * 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. * (updated 3/20/23) |
| Feather River | * 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 | * Fall-run Chinook salmon juveniles are moving downstream. * Spring-run Chinook salmon juveniles are moving downstream. * O. mykiss adult spawning is complete. Eggs are in gravel and incubating. Fry are emerging. *(updated 3/20/23)* |
| American River | * Folsom Storage: 624 TAF * Current Release: 12,000 cfs * Anticipated Weekly Range of Releases: 7,000 cfs to 16,000 cfs for flood management | * 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. Fry are beginning to emerge. * (*updated 3/14/23*) |
| Stanislaus River | * New Melones Storage: 1.312 MAF * Current Release: 1,500 cfs * Anticipated Range of Weekly Releases: 1,500 cfs | * Juvenile and adult *O. mykiss* 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. *(updated 3/13/23)* |
| Delta | * 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. | * 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 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. * (updated 3/2/2023) |

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 | 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 |
| 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  *(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: 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 |
| 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 |  |
| 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 |
| 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 |  |
| 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 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 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 |
| LEPS | Delta | Active | 1 |
| 20mm Survey | Delta | Active | 1 |
| 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 (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 |