**Weekly Fish and Water Operations Outlook 12/21/2021 – 12/27/2021**

Cold nights with fog and frost on Monday. A series of storms will bring precipitation and snow from Tuesday through the weekend, with few breaks between events. Wet conditions continue into early next week.

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| **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 eggs are incubating and hatching, and fry are rearing in the system. * Adult fall-run Chinook Salmon spawning is mostly complete. Many millions of Fall-run Chinook Salmon eggs are incubating in the gravel and some eggs are beginning to hatch. * O. mykiss/steelhead adults are present, and their migrations upstream into Clear Creek will continue through the next few months. They are just starting to spawn, and their spawning will continue through March. * Late-fall run Chinook Salmon are migrating and entering Clear Creek to spawn. Their peak spawning will occur December through February.   *(updated 12/13/2021)* |
| Sacramento River | * Shasta Storage: 1.211 MAF * Current Release: 3,250 cfs * Anticipated Weekly Range of   Releases: 3,250 cfs w/ possibility of increases due to flood/Keswick side-flow management. | * Winter-run Chinook Salmon juveniles present in low numbers above RBDD and distributed throughout the Sacramento River and to the Delta. * Spring-run Chinook Salmon, few remaining alevins in gravel, many fry present and migrating downstream. * Fall-run Chinook Salmon adults spawning, eggs and alevin in gravel, spawning mostly completed, fry emergence and passage beginning to increase daily. * Late fall-run Chinook Salmon holding and early spawning occurring. * Green Sturgeon adults and juvenile present in lower river with Delta entry likely. * Adult steelhead present; juveniles absent from upper river catch. Hatchery steelhead released into Battle Creek 12/12/2021 and should be present in the river.   (*updated 12/13/21*) |
| Feather River | * Oroville Storage: 1.158 MAF * Current Release: 950 cfs * Anticipated Weekly Range of Releases: 950 cfs * Daily temperature targets: 51°F (±4°F) at Fish Hatchery | * Fall-run Chinook Salmon spawning is mostly complete. Eggs and alevin in gravel and some fry present * Juvenile and Adult steelhead present * Spring-run Chinook Salmon eggs and alevins in gravel. Some fry present.   (*updated 12/13/21)* |
| American River | * Folsom Storage: 424 TAF * Current Release: 550 cfs * Anticipated Weekly Range of Releases: 550 cfs w/ possibility of increases due to flood/Natoma side-flow management | * Fall-run Chinook Salmon are spawning. Eggs are in gravel. * Juvenile and adult O. mykiss are present and holding. Spawning has not yet been observed but historical data suggests it should begin in early January.   *(updated 12/16/21)* |
| Stanislaus River | * New Melones Storage: 892 TAF * Current Release: 200 cfs * Anticipated Range of Weekly Releases: 200 cfs w/ possibility of increases due to flood/Tulloch side-flow management | * Juvenile and adult *O. mykiss* are present. O. mykiss spawning season begins in December. * Adult fall-run Chinook Salmon present. Spawning observed.   (*updated 12/15/21)* |
| Delta | * Freeport: 13,000 to 35,000 cfs * Vernalis: 800 to 2,500 cfs * Delta Outflow index: 14,000 to 40,000 cfs * Combined Exports: 2,000 to 3,200 cfs * JPP: 800 cfs to 1,700 cfs * CCF:300 cfs to 1,500 cfs * Expected OMR Index Values: -1,800 to -2,200 cfs * DCC Gates: Closed as of 11/30/2021. | * Juvenile winter-run Chinook Salmon 60-65% yet to enter Delta, 35-39% in Delta, 0-1% exited Delta past Chipps Island * YOY spring-run Chinook Salmon: 90-95% yet to enter Delta, 5-10% in Delta, 0% exited past Chipps Island * Juvenile Steelhead: 88-93% yet to enter Delta, 7-11% in Delta, 0-1% exited Delta past Chipps Island * Adult fall-run Chinook Salmon entering Delta and migrating upstream towards spawning grounds * Adult steelhead present * Adult and juvenile Green Sturgeon present * Adult Delta Smelt expected to be present in the Sacramento Deep Water Ship Channel (DWSC), lower Sacramento River. Delta Smelt with a migratory life history are expected to be moving upstream in response to first flush conditions. * Longfin Smelt >60mm have been detected at Chipps, lower Sacramento River, Suisun Bay/Marsh, San Pablo, and Central Bay. Longfin Smelt larvae have been detected in the confluence, lower Sacramento River, and lower San Joaquin River.   (*updated 12/21/2021*) |

\* Environmental and fish conditions updated by respective watershed groups at varying intervals that may not coincide with the weekly range of Water Operations

Table 2a-b: WY 2022 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 2022 Salmonid Current Loss and Delta Smelt Abiotic Conditions. Additional Real-Time OMR Restrictions and Performance Objectives (4.10.5.10.2) and Onset of OMR Management (4.10.5.10.1).

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| **Species/run** | **Threshold** | **Current Status** | **Weekly Trend** | **Updated** |
| Green sturgeon | WY 2022 salvage = 74 | WY 2022 salvage = 0 (0%) | No change expected | 12/19/2021 |
| Natural winter-run Chinook Salmon | WY 2022 loss = TBD \* | WY 2022 loss = 2.6 | Possible additional salvage | 12/19/2021 |
| Natural Steelhead  \*\* | Dec 1 – Mar 31 = 707 (50% of 1,414) Apr 1 – June 15 = 776 (50% of 1,552) | Dec 1 – Mar 31 = 3.4 (0.47%)  Apr 1 – June 15 = 0 (0%) | Possible | 12/19/2021 |
| Hatchery spring-run Chinook salmon surrogates | > 0.5% of each release group:  1) 12/15/2021: 84,343 = 421.7  2) NA  3) NA | 1) 0 (0%)  2) NA  3) NA | Possible | 12/19/2021 |
| Delta Smelt | After Dec. 1:  Running 3-day avg. flows at Freeport >25,000 cfs  Running 3-day avg. turbidity at Freeport =>50 FNU  Daily avg. Turbidity at OBI=>12 FNU | Freeport 3-day avg.  Flow = 26,583  Turbidity = 60.19  OBI daily Avg  Turbidity = 3.52 | Decreasing  Early Integrated Winter Pulse Protection Trigged 12/17/2021  Increasing | 12/20/2021 |

\* TBD – no draft JPE produced, ITL and performance thresholds are TBD currently

\*\* Steelhead observed on 10/30/2021 and 11/19/2021 are included in the December 1 through March 31 period

# Table 2b. 10-Year Salmonid Cumulative Loss

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| **Species/run** | **Threshold** | **Current Status** | **Updated** |
| Natural winter-run Chinook salmon | Loss = 8,738 | Cumulative loss = 207.5 (2.4%) | 12/19/2021 |
| Hatchery winter-run Chinook salmon | Loss = 5,356 | Cumulative loss = 0 (0%) | 12/19/2021 |
| Natural steelhead | Loss = 6,038 (Dec 1 – Mar 31) Loss = 5,826 (Apr 1 – June 15) | Cumulative loss =  446.59 (7.4%, Dec 1 – Mar 31)  374.8 (6.4%, Apr 1 – June 15) | 12/19/2021 |

Table 3a-d: Relevant Water Year 2022 Fish Criteria and Status for Listed Fish under the SWP Long-Term Incidental Take Permit.

Table 3a: Chinook Salmon

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| **Action** | **Timeframe** |  | **Threshold(s)** |  | **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 | NA | NA | **10/4/21** |  |
| Winter-run yearly loss  (8.6.1) | Nov. 1 - Jun. 30 | In effect  (Based on JPE  Value) | TBD (Based on JPE guidance) | Current yearly WR loss (natural) = 2.60;  Current yearly WR loss (hatchery) = 0 | Possible additional salvage of natural Winter-run | **12/20/21** | **Based on salvage data from 12/19/21** |
| Winter-run discrete daily loss (8.6.2) | Nov. 1 - Dec. 31 | In effect | 12/1-12/31: loss 26/day  unclipped older juv. Winter-run | max single daily loss from previous week = 2.60 fish (no WR observed yet) | Possible additional salvage | **12/20/21** | **Based on salvage data from 12/19/21** |
| Spring-run surrogate protection  (8.6.4) | Feb. 1 - Jun. 30 | Not in effect: | TBD (based on the number of fish released) | NA |  | **11/1/21** |  |
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Table 3b: Delta Smelt

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| 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 | In effect, triggered on Dec 17 | * three-day Freeport daily flow running avg >= 25,000 AND   [three-day Freeport turbidity running avg >=50 NTU OR Smelt Monitoring Team recommendation] | **FPT 26,643 cfs & 60.77 fnu** | **Turbidity and flows expected to increase in next 7 days** | **12/20/21** | **using data from 12/19/21** |
| Turbidity Bridge Avoidance (8.5.1) | Dec. 15 -  Apr. 1 | Not in effect | Occurs after the Integrated Early Winter Pulse protection or February 1 (whichever until April 1) comes first  - avg. OBI turbidity > 12 NTU | **N.A.** | **N.A.** | **N.A.** | **N.A.** |
| Larval and/Juvenile Delta smelt Protection (8.5.2) | ongoing | In effect, not triggered | * 5-day cum. salvage of juv. DS >= 1 [average 3-yr FMWT index + 1] OR,   3-day cum. salvage of juv. DS >11 | **current 5-day salvage = 0** | **no change expected** | **12/20/2021** | **Based on salvage data from 12/19/21** |

Table 3c: Longfin Smelt

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| 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 | Offramped | * Cum. salvage > [most recent FMWT/10] = 1 fish (Sept.-Oct. Index) OR * Smelt Monitoring Team determines high likelihood of LFS movement into high-risk areas | **Cum salvage total = 0** | **no change expected** | **12/20/21** | **based on salvage data from 12/19/21** |
| OMR Mgt. for Adults (8.4.1) | Dec. 1 -Feb. 28 | Offramped | - Smelt Monitoring Team recommendation | **N.A.** | **N.A.** | **N.A.** | **N.A.** |
| Larval and Juvenile longfin smelt Entrainment Protection (8.4.2) | Jan 1 – Jun 30 | Not in effect | - 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 >=2 stations | **SLS 12 detected larvae at 809 and 812** | **Hatching started and will increase** | **12/20/21** | **SLS 12 sampled week of 12/13** |
| 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, not triggered | * Sac. R. at Rio Vista >55,000, OR   SJR at Vernalis >8,000 | **Rio Vista = 7,000 to 25,000 cfs**  **SJ = 500 to 2,000 cfs** |  | 12/13/21 |  |

Table 3d: OMR

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| Action | Timeframe | Current  Action  Status | Threshold(s) | **Current**  **Relevant**  **Data** | **Weekly Trend** | **Last**  **Updated** | **Comments** |
| OMR  Mgmt.  Offramp  (8.3.2) | Jun. 1 – Jun. 30 | Not in effect | * >95% of the Winter-run and Springrun populations have   migrated past Chipps Island AND     * Current daily average water temperature at Mossdale   exceeds22.2°C for 7 nonconsecutive days in June  AND     * Current daily average water temperature at Prisoners Point exceeds 22.2°C for 7 non-consecutive days in June.      * Current daily mean water temperature at CCF is greater than 25°C for three consecutive days | N/A |  | **10/4/21** |  |

Table 4. Fish monitoring gear efficiency and disruptions.

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| **Monitoring Survey** | **Notes (as of 12/21/2021)** | **Status \*** |
| **Delta** |  |  |
| SWP regular counts, CWT reading, and larval sampling | Active (No disruptions) | 1 |
| CVP regular counts, CWT reading, and larval sampling | Active (No disruptions) | 1 |
| Smelt Larval Survey | Active | 1 |
| 20mm Survey | Not Active | 4 |
| Spring Kodiak Trawl | Not Active | 4 |
| Fall Mid-water Trawl | Active (No disruptions) | 1 |
| Summer Townet Survey | Not Active | 4 |
| Bay Study | Active (No disruptions) | 1 |
| DJFMP- Chipps and Sacramento  Trawls | Active (5x a week) | 1 |
| DJFMP- Seines | Active with one disruption: not sampling San Joaquin Seines (due to low water) | 2 |
| EDSM | Active | 1 |
| EMP | Active (No disruptions) | 1 |
| Mossdale | Not active (due to low water and vessel availability) | 4 |
| USGS Flow monitoring | Active (No disruptions) | 1 |
| **Sacramento River** |  |  |
| Red Bluff Diversion Dam screw trap | Active (No disruptions) | 1 |
| Knights Landing screw trap | Active (No disruptions) | 1 |
| Tisdale screw trap | Active (No disruptions) | 1 |
| GCID screw trap | Active (partial disruptions – cone was removed 12/10 due to high water flows) | 2 |
| Redd dewatering and stranding surveys | Not Active | 4 |
| Sacramento Carcass and Redd Surveys | Active (No disruptions) | 1 |
| **Feather River** |  |  |
| Feather River screw trap | Active (weekdays only) | 1 |
| **San Joaquin River** |  |  |
| SJRRP CDFW Field Monitoring | Active (No disruptions) | 1 |
| SJRRP USFWS and USBR Field  Monitoring | Active (No disruptions) | 1 |
| Stanislaus Fish Weir | Active (No disruptions) | 1 |

\* Status: Weekly categories include:

1. Active (ongoing sampling)
2. Partial Interruption (some sampling interruptions)
3. Interrupted (sampling fully suspended)
4. Not Active (sampling not scheduled)