



Weekly Assessment of CVP and SWP Delta Operations on ESA-listed Species

November 26, 2024

Executive Summary

Operational Conditions

See Weekly Fish and Water Operation Outlook document for November 26 - December 2

Winter-run Chinook Salmon

No loss of natural winter-run Chinook Salmon (by length at date, LAD) has occurred in the past week at the State or Federal fish salvage facilities. Loss of natural winter-run Chinook Salmon at the Central Valley Project (CVP) and State Water Project (SWP) fish collection facilities is possible to occur over the next week. 10-15% of juvenile natural winter-run Chinook Salmon from brood year (BY) 2024 are estimated to be present in the Delta.

Spring-run Chinook salmon

No loss of natural spring-run Chinook Salmon (by length at date, LAD) has occurred in the past week at the State or Federal fish salvage facilities. 0-1% of juvenile natural spring-run Chinook Salmon was estimated in the Delta. It is possible that juvenile natural yearling spring-run Chinook Salmon are present near the DCC gates, the Central Valley Project and State Water Project collection facilities; CV spring-run Chinook Salmon adults have completed spawning and eggs are in gravel.

Central Valley Steelhead

No loss of natural California CV (CCV) steelhead has occurred in the past week at the State and Federal fish salvage facilities. Loss of Central Valley steelhead at the Central Valley Project (CVP) and State Water Project (SWP) fish collection facilities is unlikely to occur over the next week. 0% of CCV steelhead were estimated in the Delta.

Green Sturgeon

Loss of green sturgeon has not occurred in the past week at the State and Federal fish salvage facilities (WY 2025 total loss = 0 fish, as of 11/25/2024). Loss of green sturgeon is unlikely to occur over the next week due to their rare presence in the South Delta.

Delta Cross Channel Gates

The DCC gates were closed on 11/18/2024 to meet Sacramento River flow requirements at Rio Vista. Gates were scheduled to reopen on 11/22/2024, but were kept close due to recent storm events

Delta Smelt

Limited detection data from the past month supports Delta Smelt presence in Suisun Marsh and the Sacramento Deepwater Ship Channel. The last Delta Smelt observation was of a marked adult detected on 11/25/24 in the Sacramento Deep Water Ship Channel. Cultured Delta Smelt were released at Lookout Slough on 11/18/2024. Based on elevated flow and turbidity ("first flush") conditions, Delta Smelt are likely beginning their population-level upstream spawning migration and thus risk of entrainment has increased from low to moderate. Turbidity in the South and Central Delta is currently low but could increase with OMRI more negative than -5,000 cfs. The regulations for Integrated Early Winter Pulse Protection (IEWPP) do not go into effect until 12/1/2024. If flow and turbidity at Freeport remain elevated through the end of the week (3-day average flow >25,000 cfs, 3-day average turbidity >50 FNU), IEWPP will be triggered on December 1st.

Monitoring Teams summary

There were no non-consensus issues to report from the Salmon Monitoring Team.

There were no non-consensus issues to report from the Smelt Monitoring Team.

Operational and Regulatory Conditions

See current Weekly Fish and Water Operation Outlook document.

Biology, Distribution, and Evaluation Winter-run Chinook salmon, Spring-run Chinook salmon, Central Valley Steelhead

Population Status

Winter-run Chinook Salmon

- Delta Life Stages:
 - Juveniles, Adults
- Brood Year 2024 Productivity:
 - Catch of juvenile winter run Chinook Salmon at Red Bluff Diversion Dam continues and juveniles are likely migrating towards the middle reaches of the Sacramento River. Tisdale, lower Sacramento, and Knights Landing rotary screw traps as well as the Sacramento Trawls and Sacramento Seine have observed winter-run Chinook salmon which further confirms that winter-run Chinook salmon have begun migrating downstream.

- Hatchery winter-run Chinook salmon: No hatchery winter-run Chinook salmon have been released in WY 2025.
- Supporting Information regarding DCC Management Effects

Spring-run Chinook Salmon

- Delta Life Stages:
 - Young-of-year (YOY) and Yearlings
- Brood Year 2024 Productivity:
- Hatchery spring-run Chinook Salmon: 698,892 general production late-fall yearling sized fish from Coleman Fish Hatchery were released on November 20-21 and an additional 67,422 were released on November 25. The first release that occurred on 11/20/24 will count towards COA 8.4.5 for yearling SR surrogate releases and tracking of these fish in the SWP and CVP facilities will be closely monitored.
 - See additional supporting information in winter-run Chinook Salmon section.
- Supporting Information regarding DCC Management Effects

Central Valley Steelhead

- Delta Life Stages:
 - Spawning Adults, Kelts, Juveniles
- Brood Year 2024 Productivity:
 - See additional supporting information in winter-run Chinook Salmon section.
- Supporting Information regarding DCC Management Effects

Table 1. Salmonid distribution estimates*

Location	Yet to Enter Delta (%)	In the Delta (%)	Exited Delta past Chipps Island (%)
Young-of-year (YOY) winter-run Chinook salmon	Current: 85-90 % Last Week: 98-99%	Current: 10-15 % Last Week: 1-2%	Current: 0% Last Week: 0%
YOY spring-run Chinook salmon	Current: 99-100% Last Week: 100%	Current: 0-1% Last Week: 0%	Current: 0% Last Week: 0%
YOY hatchery winter-run Chinook salmon	Current: NA Last Week: NA	Current: NA Last Week: NA	Current: NA Last Week: NA
Natural origin steelhead	Current: 100% Last Week: 100%	Current: 0% Last Week: 0%	Current: 0% Last Week: 0%

Table 2. Historic migration and salvage patterns. Last updated 11/25/2024

Species	Red Bluff Diversion Dam	Tisdale Rst	Knights Landing Rst	Sac Trawl Sherwood Catch Index	Chippis Island Trawl Catch Index	Salvage
Chinook, Winter-run, Unclipped	88.7%(83.6%, 93.7%) BY: 2014 - 2023	27.5%(7.2%, 47.8%) BY: 2014 - 2023	28.5%(5.5%, 51.5%) BY: 2014 - 2023	9.8%(-9.3%, 29.0%) BY: 2014 - 2023	1.0%(-1.3%, 3.3%) BY: 2014 - 2023	0.0%(0.0%, 0.0%) WY: 2015 - 2024
Chinook, Spring-run, Unclipped	2.7%(0.5%, 5.0%) BY: 2014 - 2023	0.8%(-0.1%, 1.6%) BY: 2014 - 2023	2.7%(-2.5%, 7.9%) BY: 2014 - 2023	0.0%(-0.0%, 0.0%) BY: 2014 - 2023	0.0%(0.0%, 0.0%) BY: 2014 - 2023	0.0%(0.0%, 0.0%) WY: 2015 - 2024
Steelhead, Unclipped (January-December)	N/A	N/A	N/A	N/A	N/A	N/A
Steelhead, Unclipped (December-March)	N/A	N/A	N/A	N/A	N/A	N/A
Steelhead, Unclipped (April-June)	N/A	N/A	N/A	N/A	N/A	N/A

Table 3. Knight’s Landing (KLCL) and Sacramento Seine and Trawl (SCI). No catch indices for juvenile salmonid migration were triggered during the past week.

Date	Knights Landing RST: Winter Chinook: Catch Index	Knights Landing RST: Older Chinook: Catch Index	Sacramento Trawls: Older Chinook: Catch Index	Sacramento Beach Seines: Older Chinook: Catch Index	Alert: Catch Index > 5	Alert: Catch Index 3 < X ≤ 5
2024-11-25	N/A	N/A	21.6	6.0	SacTrawl 21.6 SacBeach 6.0	N/A
2024-11-24	N/A	N/A	N/A	N/A	N/A	N/A
2024-11-23	N/A	N/A	N/A	N/A	N/A	N/A
2024-11-22	N/A	N/A	N/A	0	N/A	N/A

Date	Knights Landing RST: Winter Chinook: Catch Index	Knights Landing RST: Older Chinook: Catch Index	Sacramento Trawls: Older Chinook: Catch Index	Sacramento Beach Seines: Older Chinook: Catch Index	Alert: Catch Index > 5	Alert: Catch Index 3 < X ≤ 5
2024-11-21	0	0	0	N/A	N/A	N/A
2024-11-20	0	0	0	0	N/A	N/A
2024-11-19	0	0	N/A	N/A	N/A	N/A
2024-11-18	0	0	0	0	N/A	N/A
2024-11-17	0	0	N/A	N/A	N/A	N/A

Table 4. Mean daily flow and percent change (Wilkins Slough, Deer Creek, Mill Creek; cfs from CDEC) and temperature and percent change (Knights Landing; °F from RST).

Date	Mill Creek (MLM): mean daily flow (cfs)	Mill Creek (MLM): flow % change	Mill Creek (MLM): Alert	Deer Creek (DCV): mean daily flow (cfs)	Deer Creek (DCV): flow % change	Deer Creek (DCV): Alert	Wilkins Slough (WLK): mean daily flow (cfs)	Knights Landing RST: water temp.(f)	Alert Triggered
11/24/2024	1,014.7	-73.1%	Flow>95cfs	790.3	-72.3%	Flow>95cfs	25,940.1	N/A	N/A
11/23/2024	3,778.3	-50.4%	Flow>95cfs	2,857.2	-50.6%	Flow>95cfs	24,842.2	N/A	N/A
11/22/2024	7,619.2	405.8%	Flow>95cfs Change>50%	5,778.5	285.5%	Flow>95cfs Change>50%	14,363.9	N/A	N/A
11/21/2024	1,506.4	544.8%	Flow>95cfs Change>50%	1,499.1	215.6%	Flow>95cfs Change>50%	5,789.5	41.9	N/A
11/20/2024	233.6	86.3%	Flow>95cfs Change>50%	475.0	323.2%	Flow>95cfs Change>50%	4,316.9	42.2	N/A
11/19/2024	125.4	-6.0%	Flow>95cfs	112.2	-0.7%	Flow>95cfs	3,932.9	42.4	N/A
11/18/2024	133.3	7.9%	Flow>95cfs	113.1	2.0%	Flow>95cfs	4,074.6	42.7	N/A

Table 5. STARS model simulations for route-specific entrainment, travel times, and survival. Travel time is calculated in days

Stock	Date	Route	Median Travel Time	Survival	Routing Probability
Winter Chinook	2024-11-24	Overall	4.41	0.73	N/A
Winter Chinook	2024-11-24	Sacramento River	4.00	0.77	0.66
Winter Chinook	2024-11-24	Yolo Bypass	9.63	0.65	0.00
Winter Chinook	2024-11-24	Sutter Slough	4.61	0.64	0.13
Winter Chinook	2024-11-24	Steamboat Slough	4.01	0.77	0.10
Winter Chinook	2024-11-24	Interior Delta	7.05	0.57	0.11
Late-fall Chinook	2024-11-24	Overall	10.52	0.30	N/A
Late-fall Chinook	2024-11-24	Delta Cross Channel	18.36	0.13	0.19
Late-fall Chinook	2024-11-24	Georgiana Slough	16.81	0.17	0.18
Late-fall Chinook	2024-11-24	Sacramento River	7.54	0.40	0.36
Late-fall Chinook	2024-11-24	Sutter and Steamboat Slough	7.62	0.37	0.27

Evaluation

1. How much salmonid loss has occurred in the past week?
 - a. No loss of juvenile winter-run Chinook Salmon, spring-run Chinook Salmon, or Steelhead has occurred in the past week at the CVP and SWP fish salvage facilities.
2. Were salmonids observed near the DCC gate in the last seven days?
 - a. Juvenile salmonids have been observed this year at delta monitoring locations and may be present near the DCC gates.
3. Given forecasted conditions and observations of salmonids, what are the effects of DCC gate operations on salmonids in the next seven days?
 - a. It is possible juvenile winter-run Chinook Salmon are present near the DCC gates. Closure of the gates would positively impact any present juvenile salmonids by preventing entrainment into the interior Delta. Closure of the DCC gates also reduces straying of Mokelumne River adult fall-run Chinook salmon during the fall attraction flow releases.

Biology, Distribution, and Evaluation of Delta Smelt

Population Status (Brood Year 2024)

- Delta Smelt Life Stages: Juveniles, Subadults and Adults
- The abundance estimate as of the week of 11/11/24 was 990 (95% CI: 98 to 4,054).

- Adult, subadult and juvenile Delta Smelt are expected to be present in Suisun Bay and Marsh and the Sacramento Deepwater Shipping Channel.

Distribution

Current Distribution

- Real time detection data is currently limited to EDSM, Chipps Island Trawl. Bay Study and Fall Midwater Trawl Survey provide data as available.
- Since there are few recent detections of Delta Smelt, the Smelt Monitoring Team’s capacity to estimate where they are within the Delta is limited.
- The most recent Delta Smelt detection was a juvenile on 11/13/24 in Suisun Marsh and one marked adult on 11/25/25 in the Sacramento Deep Water Ship Channel. Two Delta Smelt (1 marked, 1 unmarked) have been detected this water year.
- Larval sampling at the Skinner Fish Facility (SFF) and the Tracy Fish Collection Facility (TFCF) has not yet been initiated this year.

Table 6. Summary of newly reported detections of Delta Smelt since the last assessment. Identifications are considered tentative and additional genetic testing will confirm the identity of individuals. Individuals with no tags are provided alive to the FCCL as potential additions to the FCCL Broodstock. Delta Smelt >58mm FL are considered adults. Subadult fish are considered by the SMT to be fish from the previous year’s cohort based on size and timing of collection. Young of year are considered juveniles and larvae. Regions are those defined by EDSM sampling. Salvage values reflect pre-expansion salvage.

Date	Survey	Life Stage	Catch	Tag Type	Stratum/Station	Region
11/25/2024	EDSM	Adult	1	VIE-LBA	Sac DW Ship Channel	North

Table 7. Summary of recent Delta Smelt detections reported since last assessment and the total detections for the current water year. Notes reflect latest information on reported detections or completion of survey for the water year and include both larval and adult detections. Total Fish counts do not distinguish between hatchery origin and wild Delta Smelt. Table indicates detections that have undergone preliminary ID, QA/QC, and genetic confirmation. Numbers are updated as QA/QC and genetic confirmation become available

Sampling Method	Frequency	New Detections	Preliminary Detections	QA/QC Detections	Genetically Confirmed Detections	Total WY 2025	Notes
EDSM	Weekly	1	N/A	1	N/A	2	Phase 3 began 7/1/24. Phase 1 begins:
SLS	Biweekly	0	N/A	N/A	N/A	0	Begins: 12/2/24
20-mm	Biweekly	0	N/A	N/A	N/A	0	Begins: 3/10/25
Summer Townet	Biweekly	0	N/A	N/A	N/A	0	Begins: 6/9/25
Bay Study	Monthly	0	N/A	N/A	N/A	0	Ongoing
FMWT	Monthly	0	N/A	N/A	N/A	0	Ongoing
Chippis Island Trawl	Weekly	0	N/A	N/A	N/A	0	Ongoing
FCCL Brood Stock Collections	Weekly	0	N/A	N/A	N/A	0	Began 11/19/2024
LEPS	As available	0	N/A	N/A	N/A	0	Begins: 1/6/25
TFCF	Daily	0	N/A	N/A	N/A	0	Ongoing
Skinner Fish Facility	Daily	0	N/A	N/A	N/A	0	Ongoing
Total	N/A	1	N/A	N/A	N/A	2	Sum of all Delta Smelt observed during the OMR Management Season

Cultured Delta Smelt Experimental Releases

- Approximately 100,000 fish are expected to be released for Water Year 2025:
 - 13,573 released on November 18, 2024 at Lookout Slough (truck hard release)
 - 15,000 planned on December 9, 2024 at Sandy Beach in Rio Vista
 - 20,000 planned on December 18, 2024 at Lookout Slough
 - 10,000 planned on January 8, 2025 at Sandy Beach in Rio Vista
 - 25,000 planned on January 22, 2025 at Sandy Beach in Rio Vista
 - 15,000 planned on January 27, 2025 at Lookout Slough
- See [Current Conditions for the Smelt Monitoring Team \(SMT\)](#) for details about releases.

Historical Trends

- Upstream migration for Delta Smelt occurs between September and December and in response to “first flush” conditions (Sommer et al. 2011, Grimaldo et al. 2009). Migration typically ranges one to four weeks after flow and turbidity increases, based on salvage data (Sommer et al. 2011).
- Historically, detections of ripe Delta Smelt began in January and peaked in February and March and the majority of Delta Smelt spawning occurs within a temperature range of 9-18°C (Damon et al. 2016).
- Based on historical monitoring data from the past few years (<https://github.com/Delta-Stewardship-Council/deltafish>), first detection of larvae in the Central and South Delta has typically occurred by mid to late March.
- Salvage data as presented on SacPas indicates that adult Delta Smelt salvage in recent years has reached the 50th percentile at the end of February – beginning of March, see [Delta Smelt Adult](#) query.
- Historically, the highest peak in salvage is in May and the second highest is in June (Grimaldo et al 2009; figure 5).

Forecasted Distribution within Central Valley and Delta regions

- Predicting the distribution of Delta Smelt is currently difficult because detection data is limited to a few wild individuals and historic patterns may not be representative of the low population levels.
- The SMT uses turbidity as a surrogate for Delta Smelt presence and in making assessments of the likelihood of entrainment for larval Delta Smelt after spawning begins.
- The potential of experimentally released Delta Smelt to distribute from their release site is unknown at this time and SMT cannot predict their distribution beyond the original

release site and subsequent recaptures. There is a high degree of uncertainty regarding the response of cultured fish to environmental cues typically applied to wild Delta Smelt.

Abiotic Conditions

Turbidity

- Rain is subsiding this week. In Stockton, light rain today and calm wind all week. In Antioch, light N and NE winds up to 9 mph.
- Turbidity is below 12 FNU at OBI and at other stations in the central and south Delta.

Table 9. Relevant Environmental Factors to the current management actions for Delta Smelt

Date Reported	FPT 3-day Running Average Flow (cfs)	FPT 3-day Running Average Turbidity (FNU)
11/25/2024	41,013	148.5

X2 Conditions

- As of 11/26/2024, X2 was estimated to be upstream of 81 km.

Other Environmental Conditions

- The Fish and Water Operation Outlook OMR Index values are expected to range between -2,000 to -10,000 cfs this week.
- QWEST was +3,298 cfs as of 11/26/2024 and is expected to fluctuate between -5,000 and +4,000 cfs this week.
- Real time tracking of environmental conditions, relevant thresholds and Delta Smelt catch data are updated daily at: [Current Conditions for the Smelt Monitoring Team \(SMT\)](#).

Evaluation

USBR and DWR Proposed Operations

- Both (CVP and SWP) water projects are operating to the following D-1641 standards: 1) monthly average Delta Outflow (and Rio Vista flow) not less than 4,500 cfs in November, 2) E/I ratio no greater than 0.65, and 3) daily Chlorides at Contra Costa Intake (at Rock Slough) no greater than 250 mg/l.

Questions and Discussions

1. Between December 1 and January 31, has any first flush condition been exceeded?
 - a. The question is not applicable until Dec. 1, however if flow and turbidity at Freeport remain high through the end of the week (3-day average >25,000 cfs, >50 FNU), first flush will be triggered on December 1st.

2. Do DSM have a high risk of migration and dispersal into areas at high risk of future entrainment? (December 1- January 31)
 - a. The question is not applicable until Dec. 1.
3. Has a spent female been collected?
 - a. The question is not applicable until Turbidity Bridge Avoidance begins.
4. If OMR of -2000 cfs does not reduce OBI turbidity below 12NTU/FNU, what OMR target is deemed protective between -2000 and -5000 cfs?
 - a. The question is not applicable until Turbidity Bridge Avoidance begins.
5. If OBI is 12 NTU/FNU, what do other station locations show?
 - a. The question is not applicable until Turbidity Bridge Avoidance begins.
6. If OBI is 12 NTU/FNU, is a turbidity bridge avoidance action not warranted? What is the supporting information?
 - a. The question is not applicable until Turbidity Bridge Avoidance begins.
7. After March 15 and if QWEST is negative, are larval or juvenile DSM within the entrainment zone of the CVP and SWP pumps based on surveys?
 - a. This question is not applicable until March 15th.
8. Based on real-time spatial distribution of Delta Smelt and currently available turbidity information, should OMR be managed to no more negative than -3,500?
 - a. This question is not applicable until March 15th.
9. What do hydrodynamic models, informed by EDSM or other relevant data, suggest the estimated percentage of larval and juvenile DSM that could be entrained may be?
 - a. This question is not applicable until March 15th.

Delta Smelt References

Damon, L. J., S. B. Slater, R. D. Baxter, and R. W. Fujimura. 2016. Fecundity and reproductive potential of wild female Delta smelt in the upper San Francisco Estuary, California. *California Fish and Game* 102(4):188–210.

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<https://doi.org/10.1038/s41598-019-52273-8>

Grimaldo, L. F., T. Sommer, N. Van Ark, G. Jones, E. Holland, P. B. Moyle, B. Herbold & P. Smith (2009) Factors Affecting Fish Entrainment into Massive Water Diversions in a Tidal Freshwater Estuary: Can Fish Losses be Managed? *North American Journal of Fisheries Management*, 29:5, 1253-1270, DOI: 10.1577/M08-062.1

Polansky, L., Newman, K.B., Nobriga, M.L. et al. [Spatiotemporal Models of an Estuarine Fish Species to Identify Patterns and Factors Impacting Their Distribution and Abundance](#). *Estuaries and Coasts* 41, 572–581 (2018).

Sommer, T., F. Mejia, M. Nobriga, and L. Grimaldo. 2011. The Spawning Migration of Delta Smelt in the Upper San Francisco Estuary. *San Francisco Estuary and Watershed Science* 9(2).

Attachments

Attachment A. Mokelumne River Pulse Flow Plan

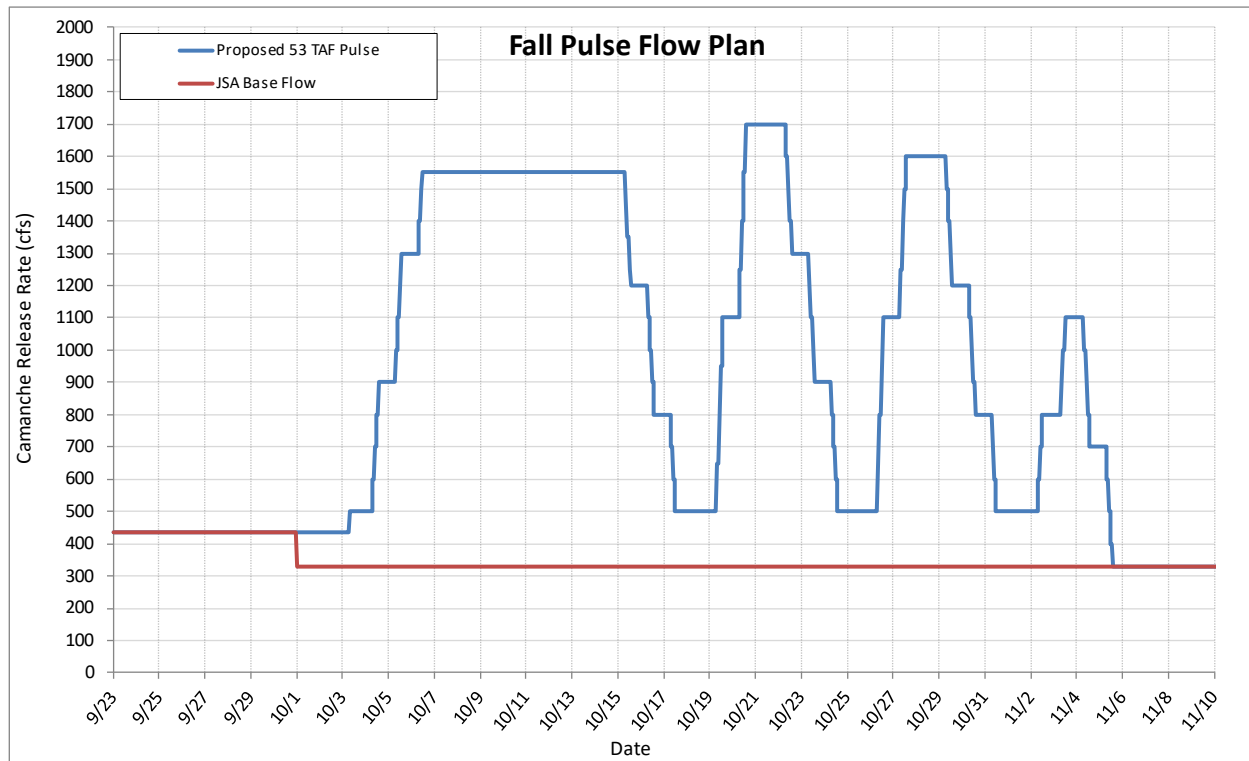


Figure A1. September 2024 Mokelumne River Pulse Flow plan (source: Final Fall Pulse Flow Plan 2024 v7tab: Pulse Flow – Hourly INPUT)

Figure A1 is a line graph of the Mokelumne River Pulse Flow plan that shows Comanche release rates in cubic feet per second from late September to early November. The graph shows the JSA Base Flow from September 23 until November 10, 2024, and the Proposed 53 TAF Pulse from October 1 until November 5, 2023.

Table A1. September 2024 Mokelumne River Pulse Flows Accounting (source: Final Fall Pulse Flow Plan 2024 v7tab: Pulse Flow – Hourly INPUT)

Date	JSA Minimum Release (cfs)	INPUT - Base Flow (cfs)*	Add. Pulse Flow (cfs)	Total Release (cfs)	Daily Release Volume (AF)	Cumulative Release Volume (AF)
9/23/2024	290	435	0	435	863	863
9/24/2024	290	435	0	435	863	1,726
9/25/2024	290	435	0	435	863	2,588
9/26/2024	290	435	0	435	863	3,451

Date	JSA Minimum Release (cfs)	INPUT - Base Flow (cfs)*	Add. Pulse Flow (cfs)	Total Release (cfs)	Daily Release Volume (AF)	Cumulative Release Volume (AF)
9/27/2024	290	435	0	435	863	4,314
9/28/2024	290	435	0	435	863	5,177
9/29/2024	290	435	0	435	863	6,040
9/30/2024	290	435	0	435	863	6,902
10/1/2024	330	330	105	435	863	7,765
10/2/2024	330	330	105	435	863	8,628
10/3/2024	330	330	148	478	949	9,577
10/4/2024	330	330	387	717	1,421	10,998
10/5/2024	330	330	787	1,117	2,215	13,213
10/6/2024	330	330	1120	1,450	2,876	16,089
10/7/2024	330	330	1220	1,550	3,074	19,164
10/8/2024	330	330	1220	1,550	3,074	22,238
10/9/2024	330	330	1220	1,550	3,074	25,312
10/10/2024	330	330	1220	1,550	3,074	28,387
10/11/2024	330	330	1220	1,550	3,074	31,461
10/12/2024	330	330	1220	1,550	3,074	34,536
10/13/2024	330	330	1220	1,550	3,074	37,610
10/14/2024	330	330	1220	1,550	3,074	40,684
10/15/2024	330	330	1024	1,354	2,686	43,370
10/16/2024	330	330	653	983	1,950	45,321
10/17/2024	330	330	295	625	1,240	46,560
10/18/2024	330	330	170	500	992	47,552
10/19/2024	330	330	495	825	1,636	49,188
10/20/2024	330	330	1095	1,425	2,826	52,015
10/21/2024	330	330	1370	1,700	3,372	55,387
10/22/2024	330	330	1153	1,483	2,942	58,329
10/23/2024	330	330	753	1,083	2,149	60,478
10/24/2024	330	330	353	683	1,355	61,833

Date	JSA Minimum Release (cfs)	INPUT - Base Flow (cfs)*	Add. Pulse Flow (cfs)	Total Release (cfs)	Daily Release Volume (AF)	Cumulative Release Volume (AF)
10/25/2024	330	330	170	500	992	62,825
10/26/2024	330	330	495	825	1,636	64,461
10/27/2024	330	330	1049	1,379	2,736	67,197
10/28/2024	330	330	1270	1,600	3,174	70,370
10/29/2024	330	330	1053	1,383	2,744	73,114
10/30/2024	330	330	653	983	1,950	75,064
10/31/2024	330	330	295	625	1,240	76,304
11/1/2024	330	330	170	500	992	77,296
11/2/2024	330	330	345	675	1,339	78,635
11/3/2024	330	330	645	975	1,934	80,569
11/4/2024	330	330	553	883	1,752	82,321
11/5/2024	330	330	166	496	983	83,304
11/6/2024	330	330	0	330	655	83,959
11/7/2024	330	330	0	330	655	84,613
11/8/2024	330	330	0	330	655	85,268
11/9/2024	330	330	0	330	655	85,922
11/10/2024	330	330	0	330	655	86,577
11/11/2024	330	330	0	330	655	87,231
11/12/2024	330	330	0	330	655	87,886
11/13/2024	330	330	0	330	655	88,540
11/14/2024	330	330	0	330	655	89,195
11/15/2024	331	330	0	330	655	89,850
11/16/2024	332	330	0	330	655	90,504
11/17/2024	333	330	0	330	655	91,159
11/18/2024	334	330	0	330	655	91,813
11/19/2024	335	330	0	330	655	92,468
11/20/2024	336	330	0	330	655	93,122
11/21/2024	337	330	0	330	655	93,777

Date	JSA Minimum Release (cfs)	INPUT - Base Flow (cfs)*	Add. Pulse Flow (cfs)	Total Release (cfs)	Daily Release Volume (AF)	Cumulative Release Volume (AF)
11/22/2024	338	330	0	330	655	94,431
11/23/2024	339	330	0	330	655	95,086
11/24/2024	340	330	0	330	655	95,740
11/25/2024	341	330	0	330	655	96,395
11/26/2024	342	330	0	330	655	97,050
11/27/2024	343	330	0	330	655	97,704
11/28/2024	344	330	0	330	655	98,359
11/29/2024	345	330	0	330	655	99,013
11/30/2024	346	330	0	330	655	99,668