

Delta Operations for Salmonids and Sturgeon (DOSS) Group

Conference call: 11/22/11 at 9:00 a.m.

Objective: Provide advice to the Water Operations Management Team (WOMT) and National Marine Fisheries Service (NMFS) on measures to reduce adverse effects from Delta operations of the Central Valley Project and the State Water Project on salmonids and green sturgeon.

DOSS will coordinate the work of other technical teams. DOSS notes and advice can be found at: <http://www.swr.noaa.gov/ocap/doss.htm>

DWR: Angela Llaban, Mike Ford, Edmund Yu, James Gleim, Tracy Pettit

FWS: Leigh Bartoo, Craig Anderson, Roger Guinea

NMFS: Barb Byrne, Jeff Stuart, Bruce Oppenheim

Reclamation: Josh Israel, Russ Yaworsky

DFG: Robert Vincik, Bob Fujimura

EPA, SWRCB: not present

Agenda

1. Fish Monitoring
2. Current operations
3. DCC closure contingency plan over Thanksgiving holiday
4. Spring-run surrogate release timing from Coleman National Fish Hatchery

Action Item

Evaluate the data from Mill and Deer Creek RST and compare to Knights Landing RST, to see if the timing of the first alert is the same.

Fish Monitoring: The following table presents fish monitoring data 11/14/11 through 11/21/11.

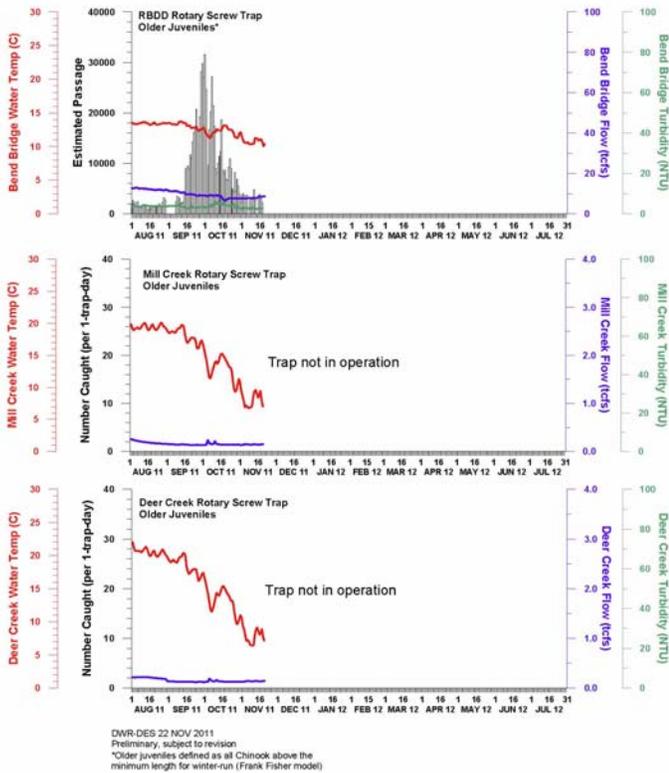
See: <http://www.water.ca.gov/swp/operationscontrol/calfed/calfedmonitoring.cfm>

| Location | Chippis Is. Midwater Trawl | Sacramento Kodiak Trawl | Mossdale Kodiak Trawl | Beach Seines | Knights Landing RST | Tisdale Weir RST |
|--------------------|----------------------------|-------------------------|-----------------------|--------------|---------------------|-------------------|
| Sample Date | 11/17 | 11/15, 16, 18 | 11/14, 16, 18 | 11/14–11/18 | 11/14, 16, 18, 21 | 11/14, 16, 18, 21 |
| Total Catch | 6 | 0 | 1 (Splittail) | 1 | 0 | 1 |
| FR | | | | | | |
| WR | | | | | | 1 |
| SR | | | | 1 (35 mm) | | |
| Ad-Clipped Chinook | | | | | | |
| DS | 6 | | | | | |
| SH (ad-clip) | | | | | | |
| SH (wild) | | | | | | |
| W. Temp. (avg. °F) | 14.1 | 12.2 | 12.6 | 12.7 | 54.5 | 51.8 |

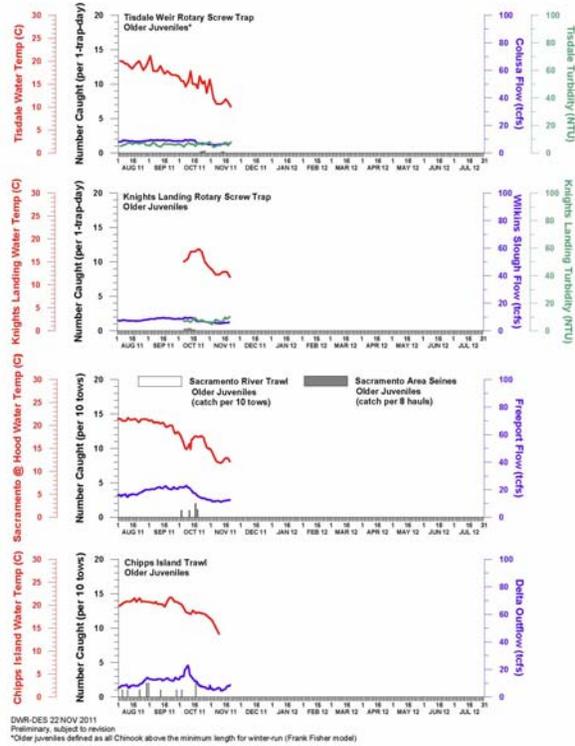
| | | | | | | |
|----------------------|--|--|--|--|------|-------|
| Flows (avg. cfs) | | | | | 5687 | 6663 |
| Turbidity (avg. NTU) | | | | | 8.8 | 6.81 |
| WR/LFR Avg. CPUE | | | | | 0 | 0.043 |

Key: FR = Fall run; LFR = Late-fall run; SR = Spring run; WR = Winter run; SH = Steelhead; DS = Delta smelt; LFS = Longfin smelt; SPTL = Splittail, CPUE = catch per unit of effort, ACT = acoustical tag

NUMBER OF OLDER JUVENILE CHINOOK MEASURED IN THE UPPER SACRAMENTO RIVER & TRIBUTARIES



NUMBER OF OLDER JUVENILE CHINOOK MEASURED IN THE LOWER SACRAMENTO RIVER



Fish Salvage Data

No listed species were salvaged at either fish facility from 11/14 to 11/20/2011.

White sturgeon: No white sturgeon were salvaged at either facility last week and the season salvage total from 10/1 to present is 56.

Operations (11/21/11)

| SWP | | CVP | |
|---------------------------------|-------|----------------------|--------------------------------|
| Exports (cfs) | | | |
| Clifton Court Forebay | 2,000 | Jones Pumping Plant | 3,200 |
| Reservoir releases (cfs) | | | |
| Feather - Oroville | 2,300 | American - Nimbus | 2,500 |
| | | Sacramento - Keswick | 7,000 (dropping to 6,000 on |

| | | | |
|--------------------------------|----------------------|------------------------------------|--------|
| | | | 11/27) |
| | | Stanislaus - Goodwin | 500 |
| Reservoir Storage (TAF) | | | |
| San Luis (SWP) | 942 | San Luis (CVP) | 840 |
| Oroville | 2,817 | Shasta | 3,161 |
| | | Folsom | 504 |
| | | New Melones | |
| Delta Operations | | | |
| DCC | Open | Sacramento River at Freeport (cfs) | 13,589 |
| Outflow Index (cfs) | 12,500 | San Joaquin River (cfs) | 2,243 |
| Total Delta Inflow (cfs) | 16,854 | OMR (daily) | |
| Water Temperature (°F) | | OMR 5 day | |
| X2 (km) | 80 | OMR 14 day | |
| E/I | 34.3% (14-d average) | | |

The recent daily X2 values have been between 80 and 81 km (which indicates a location to the west of Collinsville). Since the daily X2 values are greater than 79 km, the Projects are operating to the average monthly outflow (which is half of the average monthly Delta inflow) as described in the July 2011 memo from Reclamation to USFWS (see attached) regarding implementation of the “Fall X2 action”. The average monthly Delta inflow is calculated from the average monthly inflows from the Sacramento River at Freeport, the San Joaquin River at Vernalis, and the Cosumnes, Mokelumne, and Calaveras Rivers. Currently the average monthly Delta inflow is projected to be approximately 16,000 cfs.

It was reported that:

- Nimbus release dropped to 2,250 cfs this morning
- Keswick release was not expected to drop this week --CVP export pumping was scheduling a planned outage for maintenance next week on 11/29 and 11/30, of both the export and fish collection facilities.
- the last day of management for the “Fall X2 action”, which is currently being implemented as outflow management, is 11/30.

Weather forecast

Weather forecast suggests that the rain expected Thursday is likely to hit the coast without too much rain expected inland. The Feather and Yuba watersheds might see at most 0.2–0.3 inch of precipitation on Thursday, with just 0.1 inch expected farther north.

Delta Cross Channel (DCC) operations

The group discussed the plan for monitoring the DCC closure triggers over the Thanksgiving holiday. Reclamation needs 48 hours to notify boaters of a closure. DFG will report data to NMFS on Friday morning, 11/25. If a trigger for DCC closure is hit, NMFS will, on Friday, notify the on-call Reclamation operator and Reclamation will then schedule the gate closure for Monday, 11/28. The group agreed that no DOSS call would be necessary if the trigger is hit.

The DCC gates will close 12/1, per NMFS RPA Action IV.1.2, unless there is a water quality concern. The project agencies did not expect any water quality concerns in early December.

Scheduling of the spring-run surrogate release(s)

Coleman National Fish Hatchery (CNFH) can release up to three groups of late-fall-run Chinook salmon as surrogates for spring-run Chinook salmon. DOSS discussed two options for the timing of these surrogate releases:

Option 1: three surrogate releases; one each in November, December, and January

Option 2: two surrogate releases; two release groups combined and released in December, one release group released in January.

Last year, CNFH implemented two releases of surrogates, with the first batch of spring-run Chinook salmon surrogates (a single surrogate group) released on 12/21 and the second batch (two surrogate groups combined) released in January. The production release of fall-run Chinook salmon occurred on 12/9.

CNFH generally times the spring-run Chinook salmon surrogate releases (as well as the late-fall-run Chinook salmon production release) to coincide with higher flows from a natural storm event, and also tries to separate releases by at least 2 weeks.

The group discussed the possibility of releasing half of the available surrogates in December and half in January (rather than 2/3 in December and 1/3 in January, or vice versa). NMFS will check with the hatchery to see whether this is in fact a viable option.

CNFH staff asked whether DOSS had considered using the late-fall-run production release as the (or at least a) surrogate release group. Last year's data showed that approximately 0.3% of the late-fall-run production release was observed at the fish collection facilities, while just 0.15% and 0.04% of the two surrogate releases were observed. DOSS discussed whether switching to use of the late-fall production release would change the fish triggers in the Delta. Consensus among the biologists was that even though the production release is larger, the percentage showing up at the fish facilities should be the same as the surrogates if released at the same time and same place.

Last year at Tisdale RST, spring-run-size fish were observed in mid-December, which is about the same time the first surrogate releases were made at CNFH. This figure is the cumulative daily loss of each run, late fall not included since only 11 late-fall-size fish were detected at Tisdale, and shows that a big pulse of spring-run-size fish (~30% of all spring run) was observed during December. An additional large fraction of the spring-run-size fish (~20% of all spring run) was observed during the first week in February.

DOSS decided to investigate further and carry this over until next week.

Review of Mill & Deer Creek data

It was reported that DFG staff was reviewing the existing Mill and Deer Creek rotary-screw-trap data. Reclamation and NMFS will work to compare the migration timing observed in the Mill and Deer Creek data to that observed in the Knights Landing and Tisdale data.

Smelt Working Group

The Smelt Working Group (SWG) will meet for the first meeting this season on Monday, 11/28, and a SWG representative will report to DOSS during the 11/29 DOSS conference call

DOSS advice to WOMT and NMFS: None

Next Meeting: November 29, 2011, at 9:00 a.m.



United States Department of the Interior

BUREAU OF RECLAMATION
Mid-Pacific Regional Office
2800 Cottage Way
Sacramento, California 95825-1898

IN REPLY
REFER TO:

BDO-100
ENV-7.00

JUL 21 2011

Memorandum

To: Regional Director, U.S. Fish and Wildlife Service
Pacific Southwest Region

From: **FOR** Donald R. Glaser *Donald R. Glaser*
Regional Director

Subject: Endangered Species Act Consultation on the Coordinated Operation of the Central Valley Project and State Water Project and Implementation of Reasonable and Prudent Alternative Component 3

On December 15, 2008, the Fish and Wildlife Service (Service) transmitted the Biological Opinion (BiOp) on the effects of the Coordinated Long-Term Operation of the Central Valley Project (CVP) and State Water Project (SWP) on delta smelt and its designated critical habitat. The Service included a Reasonable and Prudent Alternative (RPA) in the BiOp which included an action in the fall of certain years (Component 3 of the RPA), also referred to as the Fall X2 action. The purpose of this memorandum is to describe proposed coordinated CVP and SWP operations consistent with Component 3 of the RPA for the months of September, October and November 2011. As you know, average X2 position (an index for the location of the low salinity zone) is largely determined by average Delta outflow. Delta outflow depends on both Delta inflow and exports. The Bureau of Reclamation has made assumptions about the Department of Water Resources (DWR) projected operations in Reclamation's current forecast based on a 50 percent exceedance hydrology. Reclamation also assumes that both combined CVP and SWP reservoir releases and combined export reductions will be used to implement Component 3. Those combinations of actions are described below.

Reclamation intends that the CVP and SWP will operate in September to maintain monthly average X2 no greater than 74 kilometers (km). In order to meet that average through the month of September, Reclamation anticipates the CVP and SWP will begin to modify combined operations for the second half of August. Based on a 50 percent exceedance hydrology, in the second half of August, Reclamation anticipates average daily combined inflows to the Delta of 25,000 cubic feet per second (cfs), combined exports of about 11,400 cfs and net Delta outflow of 11,800 cfs that will move X2 near the 74 km target. Because of the high level of exports and reservoir releases for multiple purposes during this period, Reclamation has forecasted no water cost to either the CVP or SWP during the month of August.

Reclamation's current forecast projects an average outflow of 11,400 cfs to maintain X2 at 74 km. Reclamation is forecasting a continued average inflow to the Delta of about 25,000 cfs based on the 50 percent exceedance hydrology. Under these conditions, combined exports will be maintained near 11,000 cfs. Because of the high level of exports and reservoir releases for multiple purposes during this period, Reclamation has forecasted no water cost to either the CVP or SWP during the month of September.

Reclamation intends that the CVP and SWP will also operate in October to maintain a monthly average X2 position no greater than 74 km. In October, Reclamation is forecasting an average daily inflow of 18,200 cfs into the Delta. Combined average exports are expected to be reduced to approximately 6,300 cfs. The main reason for this reduction in total exports as compared to September is that the SWP has indicated that they will likely reduce reservoir releases on the Feather River from 7,000 cfs to 1,750 cfs in mid-October to avoid triggering a requirement to maintain those higher releases through the winter to prevent the dewatering of salmon redds in the Feather River. With the reduced reservoir releases, combined exports will be correspondingly reduced to maintain average X2 at 74 km. Reclamation believes Delta outflow required to maintain X2 at 74 km in October could be less than 11,400 cfs and that the initial calculation of outflow required is only an estimate.¹ Assuming Delta outflow of 11,400 cfs is required to maintain average X2 at 74 km, and that DWR will reduce its Feather River releases to 1,750 cfs, then Reclamation estimates reduced exports of up to 300,000 acre-feet (AF) by the SWP. If Delta outflow of 10,000 cfs proves to be sufficient to maintain average X2 at 74 km in October, the SWP would incur an estimated reduction of exports of about 210,000 AF for October. In addition, if DWR's river releases at Oroville Dam were to be set above 1,750 cfs, the SWP could increase exports while maintaining X2 at 74 km. Based on the 50 percent exceedance forecast and an outflow requirement of between 11,400 and 10,000 cfs, Reclamation estimates little or no water supply impact to the CVP for October.

Component 3 of the RPA describes requirements for November outflow :

“ . . . During any November when the preceding water year was wet or above normal as defined by the Sacramento Basin 40-30-30 index, all inflow into CVP/SWP reservoirs in the Sacramento Basin shall be added to reservoir releases in November to provide an additional increment of outflow from the Delta to augment Delta outflow up to the fall X2 of 74 km for Wet WYs or 81 km for Above Normal WYs, respectively. In the event there is an increase in storage during any November this action applies, the increase in reservoir storage shall be released in December to augment the December outflow requirements in SWRCB D-1641 . . . ”
Service BiOp at 282-283

¹ While the equation found in Kimmerer, W. & Monismith, S. 1993 “An estimate of the historical position of 2ppt salinity in the San Francisco Bay estuary” (*SFEP 1993 Managing Freshwater Discharge to the San Francisco Bay/ Sacramento-San Joaquin Delta Estuary: The Scientific Basis for an Estuarine Standard*) generally suggests that an outflow of 11,400 cfs will result in a steady-state X2 position of 74 km, a review of information based on DSM2 modeling results indicates that somewhat less flow may be required to maintain an average X2 position at 74 km for moderate periods of time.

Because past experience has shown that an average outflow of 11,400 cfs has consistently resulted in an X2 position of 74 km, the 11,400 cfs value was used for the attached forecast.

This RPA component describes an outflow requirement for November but not a specific X2 requirement. There are several ways that this outflow requirement can be implemented. Reclamation believes the proposed approach satisfies the intent of the passage quoted above, and is implementable. The goal of the proposed operations is to allow November precipitation that increases Central Valley runoff to augment Delta outflow. A detailed description of the proposed operations is provided below.

Specific November Operations:

- A. Any accumulated CVP and SWP Sacramento Basin reservoir storage attributable to November runoff will be added to reservoir releases. To the extent possible, Reservoir releases will be adjusted as necessary to achieve no net increase of storage in the month of November. The total amount of runoff passed-through for release may be apportioned among the Sacramento River Basin CVP and SWP reservoirs in any combination, irrespective of the source of the reservoir inflow, as long as the combined total of releases equals the volume of November inflow into these reservoirs.
- B. For purposes of calculating the average November outflow required under these proposed operations, the average required outflow will be set at one half the computed Delta inflow in November, but will be no less than an average of 5,700 cfs². Delta inflow will be calculated in a manner consistent with the technique used in the State Water Resources Control Board's water right decision D-1641. At the beginning of the month of November, outflow will be based on one half the then current 14-day running average Delta inflow and will be adjusted through the month to achieve an average monthly outflow that is one half the computed average inflow for November.
- C. In the event there is a net increase in Sacramento Basin CVP and SWP storage during November, the increase in reservoir storage shall be released in December in a manner consistent with the RPA as quoted above. If this situation should arise, Reclamation will notify the Service to discuss project operations into the month.
- D. Nothing in this proposal should be construed to override potential flood operations at CVP and SWP reservoirs and facilities that operators judge to be required for health, safety, and protection of property. Reclamation will notify the Service if operations deviate from those outlined in this proposal due to any of these reasons.

² The minimum value of 5,700 cfs is the average November Delta outflow reported in DAYFLOW taken over the years 2002-2009. The underlying data (7331, 6626, 6708, 5249, 5182, 4290, 5534, and 4665 cfs for 2002-2009, respectively) represent November Delta outflow during the Pelagic Organism Decline (POD) years under the premise that the POD began after 2001. Use of the POD-era values reflects Reclamation's intent that the action should improve on POD-era outflow.

Properly implemented, these operations are intended to result in November, Delta outflow will vary in accordance with runoff from the Sacramento and San Joaquin River Basins. In the absence of significant November precipitation, this proposal would impose no additional reservoir releases at the CVP and SWP reservoirs beyond those needed to pass through projected November reservoir inflows, not requiring pumping reductions beyond those necessary to maintain a minimum Delta outflow of at least 5700 cfs, or other modifications to coordinated CVP and SWP operations beyond what is needed to meet any other relevant obligations, both upstream and in the Delta. With increasing November runoff, the proposed operations for this year would result in Delta outflow to increase until the 74 km X2 value required for September and October under the RPA is achieved. Runoff exceeding what is needed to achieve 74 km X2 could be retained in upstream reservoirs or exported consistent with D-1641 at the discretion of the CVP and SWP, as it would not be needed to achieve the outflow objectives of the action.

Reclamation intends that the CVP and SWP will operate in November to maintain a monthly average Delta outflow consistent with the methods described above. Applying these methods in November, Reclamation is forecasting that average Delta outflow for the month would be 8,500 cfs based on the 50 percent exceedance hydrology forecast. In a 90 percent exceedance hydrology forecast, Delta outflow is estimated to be around 7,000 cfs for the month of November. Reclamation would anticipate that a Delta outflow sufficient to maintain X2 at 74 km (11,400 cfs) would occur at about a 40 percent exceedance hydrology this fall.

The proposed Delta outflow is higher than the combined Sacramento Valley reservoir inflows minus losses anticipated for such flows to reach the Delta. These estimates reflect average flow losses that are seen in the Sacramento River system and are consistent with the losses that are generally assumed for water transfers or other water actions in the basin.

Based on a 50 percent exceedance forecast, Reclamation estimates a reduction in SWP pumping associated with a 8,500 cfs outflow requirement to be about 130,000 AF and little or no water supply impact to the CVP in November. Reclamation estimates that there would be little or no water costs associated with the action in November if conditions were wet enough to increase Delta inflow to a point where the prescribed outflow is sufficient to maintain an X2 position of 74 km.

Reclamation intends to ensure that any interaction between implementation of Component 3 and reservoir storage is analyzed and appropriately addressed by providing ongoing operations and forecast updates to the National Marine Fisheries Service (NMFS) and Service to facilitate review in accordance with NMFS' operations RPA Action 1.2.2.A. Criterion #3 specifies that NMFS will continue to participate in the Habitat Study Group, which we interpret to include other informal discussions among NMFS, Reclamation, and Service. In addition, if

... "a fall flow action is recommended that draws down fall storage significantly from historical patterns, then NMFS and USFWS will confer and recommend to Reclamation an optimal storage and fall flow pattern to address multiple species needs . . ." (NMFS BiOp at 593)

Additionally, as you know, Reclamation has been working on an Adaptive Management Plan (Plan) for implementation of Component 3. Reclamation intends to use this Plan to study factors related to ecosystem effects of outflow variability and delta smelt growth, fecundity, health, and survival. The information developed from implementation of this Plan may, as findings warrant, lead to changes in fall habitat actions. Reclamation submitted a draft version of the Plan to an independent science panel for review and received several helpful comments on the Draft Plan. Reclamation is still in the process of incorporating the comments into the Plan, which it intends to submit to the Service when it is ready. Reclamation anticipates that this revised Plan will be submitted to the Service by about August 5, 2011. In accordance with the reviewers' advice, the revised Plan is strongly focused on monitoring and studies intended to be implemented in fall 2011. The Plan also extends the conceptual model to the ecosystem level and more explicitly links physical drivers to delta smelt habitat to biological mechanisms expected to benefit delta smelt. The Plan will continue to be viewed as a "living document" that will evolve as it is implemented by the agencies and adaptive management proceeds into the future.

Reclamation appreciates the work of Service staff to implement the fall X2 action in this year and looks forward to continuing the good working relationship in the future.

Attachments:

CVP July, 2011 Forecast

Storages

Federal End of the Month Storage/Elevation (TAF/Feet)

| | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | |
|-------------|-------|------|------|------|------|------|------|------|------|-------|-------|------|------|
| Trinity | 2419 | 2311 | 2197 | 2077 | 1996 | 1913 | 1864 | 1861 | 1976 | 2100 | 2216 | 2160 | 1981 |
| Elev. | 2362 | 2354 | 2346 | 2341 | 2335 | 2331 | 2331 | 2339 | 2348 | 2355 | 2352 | 2340 | |
| Whiskeytown | 239 | 238 | 238 | 238 | 206 | 206 | 206 | 206 | 206 | 206 | 238 | 238 | 238 |
| Elev. | 1209 | 1209 | 1209 | 1209 | 1199 | 1199 | 1199 | 1199 | 1199 | 1199 | 1209 | 1209 | 1209 |
| Shasta | 4402 | 3979 | 3619 | 3423 | 3284 | 3254 | 3261 | 3507 | 3792 | 4104 | 4306 | 4258 | 4037 |
| Elev. | 1047 | 1033 | 1026 | 1020 | 1019 | 1019 | 1029 | 1040 | 1051 | 1059 | 1057 | 1049 | |
| Folsom | 928 | 796 | 666 | 621 | 496 | 466 | 456 | 501 | 542 | 637 | 784 | 938 | 912 |
| Elev. | 449 | 436 | 431 | 416 | 412 | 411 | 417 | 422 | 433 | 448 | 462 | 460 | |
| New Melones | 2300 | 2250 | 2072 | 1918 | 1885 | 1896 | 1913 | 1923 | 1966 | 1955 | 1952 | 1959 | 1869 |
| Elev. | 1074 | 1059 | 1045 | 1042 | 1043 | 1044 | 1045 | 1049 | 1048 | 1048 | 1049 | 1040 | |
| San Luis | 899 | 532 | 311 | 362 | 449 | 603 | 767 | 899 | 966 | 966 | 757 | 729 | 748 |
| Elev. | 473 | 431 | 442 | 429 | 443 | 466 | 478 | 492 | 514 | 481 | 463 | 465 | |
| Total | 10105 | 9102 | 8638 | 8316 | 8337 | 8467 | 8896 | 9447 | 9968 | 10252 | 10282 | 9785 | |

State End of the Month Reservoir Storage (TAF)

| | | | | | | | | | | | | | |
|----------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Oroville | 3515 | 3201 | 2735 | 2333 | 2232 | 2192 | 2232 | 2399 | 2750 | 3074 | 3353 | 3392 | 3207 |
| Elev. | 878 | 845 | 813 | 804 | 800 | 804 | 818 | 846 | 869 | 888 | 891 | 879 | |
| San Luis | 926 | 694 | 481 | 528 | 320 | 299 | 367 | 368 | 452 | 711 | 538 | 377 | 381 |
| Total San Luis (TAF) | 1825 | 1226 | 792 | 890 | 768 | 901 | 1134 | 1267 | 1418 | 1677 | 1295 | 1106 | 1129 |

Monthly River Releases (TAF/cfs)

| | | | | | | | | | | | | | |
|-------------|-----|-------|-------|------|------|------|------|------|------|------|-------|-------|-------|
| Trinity | TAF | 68 | 28 | 27 | 23 | 18 | 18 | 18 | 17 | 18 | 59 | 260 | 178 |
| | cfs | 1,102 | 450 | 450 | 373 | 300 | 300 | 300 | 300 | 300 | 1,000 | 4,225 | 3,000 |
| Clear Creek | TAF | 5 | 5 | 9 | 12 | 12 | 12 | 12 | 11 | 12 | 12 | 12 | 12 |
| | cfs | 85 | 85 | 150 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 | 200 |
| Sacramento | TAF | 768 | 676 | 506 | 461 | 416 | 461 | 430 | 472 | 523 | 416 | 523 | 595 |
| | cfs | 12500 | 11000 | 8500 | 7500 | 7000 | 7500 | 7000 | 8500 | 8500 | 7000 | 8500 | 10000 |
| American | TAF | 277 | 246 | 149 | 197 | 121 | 123 | 108 | 222 | 215 | 280 | 307 | 238 |
| | cfs | 4500 | 4000 | 2500 | 3207 | 2030 | 2000 | 1750 | 4000 | 3500 | 4700 | 5000 | 4000 |
| Stanislaus | TAF | 129 | 123 | 104 | 52 | 18 | 18 | 37 | 33 | 92 | 83 | 123 | 119 |
| | cfs | 2100 | 2000 | 1750 | 842 | 300 | 300 | 600 | 600 | 1500 | 1400 | 2001 | 2000 |
| Feather | TAF | 369 | 492 | 476 | 123 | 104 | 108 | 108 | 97 | 123 | 178 | 184 | 238 |
| | cfs | 6000 | 8000 | 8000 | 2000 | 1750 | 1750 | 1750 | 1750 | 2000 | 3000 | 3000 | 4000 |

Trinity Diversions (TAF)

| | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun |
|----------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Carr PP | 94 | 96 | 99 | 68 | 95 | 87 | 68 | -3 | 5 | 29 | 8 | 96 |
| Spring Crk. PP | 90 | 90 | 90 | 90 | 90 | 90 | 90 | 30 | 30 | 9 | 10 | 90 |

Delta Summary (TAF)

| | Jul | Aug | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun |
|--------------|------|------|-----|------|------|------|-----|-----|------|------|------|-----|
| Tracy | 260 | 263 | 253 | 259 | 250 | 240 | 210 | 196 | 185 | 48 | 98 | 250 |
| USBR Banks | 0 | 0 | 0 | 35 | 35 | 35 | 0 | 0 | 0 | 0 | 0 | 0 |
| Contra Costa | 11.1 | 12.7 | 14 | 16.8 | 18.4 | 18.3 | 14 | 14 | 12.7 | 12.7 | 12.7 | 9.8 |
| Total USBR | 271 | 276 | 267 | 311 | 303 | 293 | 224 | 210 | 198 | 60 | 111 | 260 |
| State Export | 405 | 410 | 383 | 79 | 220 | 240 | 210 | 230 | 330 | 42 | 98 | 390 |
| Total Export | 676 | 686 | 650 | 390 | 523 | 533 | 434 | 440 | 528 | 102 | 209 | 650 |
| COA Balance | 0 | 0 | 0 | 0 | 32 | 32 | 32 | 32 | 32 | 32 | 32 | 32 |

| | | | | | | | | | | | | |
|---------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|------|-------|--------|
| Old/Middle R. std. | | | | | | | | | | | | |
| Old/Middle R. calc. | -6,986 | -7,869 | -7,754 | -4,435 | -6,587 | -6,491 | -5,039 | -4,939 | -5,017 | -115 | 2,525 | -2,700 |

| | | | | | | | | | | | | |
|----------------------|-------|-------|-------|-------|------|-------|-------|-------|-------|-------|-------|-------|
| Computed DOI | 12200 | 11843 | 12237 | 11403 | 8506 | 13567 | 20741 | 28078 | 33023 | 23433 | 32648 | 22811 |
| Excess Outflow | 4197 | 2277 | 840 | 0 | 0 | 9061 | 14738 | 16677 | 21619 | 12036 | 6312 | 6068 |
| % Export/Inflow | 40% | 43% | 43% | 34% | 50% | 40% | 25% | 21% | 20% | 6% | 8% | 29% |
| % Export/Inflow std. | 65% | 65% | 65% | 65% | 65% | 65% | 65% | 35% | 35% | 35% | 35% | 35% |

Hydrology

| | | | | | | | | |
|-------------------------------------|-------------|------|--------|-------|--------|-------|-------------|------|
| Water Year Inflow (TAF) | Clair Engle | 1713 | Shasta | 6,738 | Folsom | 4,680 | New Melones | 2064 |
| Year to Date + Forecasted % of mean | 142% | 122% | 172% | 195% | | | | |