**Delta Operations for Salmonids and Sturgeon (DOSS) Group**
**Conference call: 2/7/2017 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 work with other technical teams. DOSS notes and advice can be found at: http://www.westcoast.fisheries.noaa.gov/central_valley/water_operations/doss.html.

**CDFW:** Bob Fujimura, Duane Linander, Ken Kundargi, Jason Julienne, Jerry Morinaka
**DWR:** Kevin Reece, Farida Islam, Dan Yamanaka, Bryant Giorgi
**NMFS:** Barb Byrne, Kristin McCleery
**Reclamation:** Tom Patton, Mike Hendrick, Towns Burgess, Josh Israel, Elissa Buttermore
**SWRCB:** Chris Kwan, Chris Carr
**USFWS:** Craig Anderson, Leigh Bartoo

## Agenda Items

1. Agenda review and introductions
2. RPA Implementation review (For the DOSS Dashboard, click on the "Triggers & Indices" tab at: www.baydeltalive.com/djfmp)
3. Winter-run JPE for brood-year 2016
4. Smelt Working Group update
5. Current Operations
6. Hatchery Releases
7. Fish Monitoring: Tracking of acoustic-tagged hatchery winter-run Chinook salmon
8. Fish Monitoring: Salvage
9. Fish Monitoring: RSTs/trawls/seines
   *SacPAS (http://www.cbr.washington.edu/sacramento/) has some summaries of juvenile sampling)*
10. DOSS Estimates of Fish Distribution and Assessments of Entrainment Risk
11. DOSS advice
12. Next DOSS meeting

## Agenda Item 2.
**RPA Implementation Review**

## Delta RPA Actions affecting operations during February:

**Action IV.1.2[1] (DCC gate operations):**

- From February 1 to May 20, the gates will remain closed**.**

[1] For details, see pages 62-66 in Enclosure 2 of the 2011 Amendments to the 2009 RPA document at: http://www.westcoast.fisheries.noaa.gov/publications/Central_Valley/Water%20Operations/Operations,%20Criteria%20and%20Plan/040711_ocap_opinion_2011_amendments.pdf

**Action IV.2.3[2] (OMR Management)**

- Implementation of this action in WY 2017 began 1/1/17, and requires that Old and Middle River (OMR) flow be no more negative than -5,000 cfs.
- Since the action went into effect on 1/1/17, no salvage-based triggers that would require more positive OMR levels have been exceeded.

**Agenda Item 3.**
**Winter-run JPE for brood-year 2016**

NMFS issued the Juvenile Production Estimate (JPE) of Brood Year 2016 winter-run Chinook; the 2/3/17 letter is posted under "Biological Opinion Actions" at: http://www.westcoast.fisheries.noaa.gov/central_valley/water_operations/.

- JPE = 166,189 (the number of natural-origin winter-run Chinook estimated to enter the Delta in WY 2017)
- Incidental take limit (ITL) for natural-origin winter-run Chinook at the export facilities = 1,662 (1% of the JPE, using genetic race assignment)
- Estimate of the hatchery-origin winter-run release that will enter the Delta = 58,188
- ITL of hatchery-origin winter-run Chinook at the export facilities = 582 (1% of the hatchery fish entering the Delta)

As anticipated in the 12/20/16 DOSS advice[3], the JPE is low enough that the minimum trigger values of 2.5 fish/TAF and 5.0 fish/TAF for the first and second stage triggers, respectively, are in effect for implementation of the JPE-based trigger in Action IV.2.3. During WY 2017, any exceedance of an OMR trigger based on older juvenile loss at the facilities will trigger rapid genetic testing; see full details in the 11/21/16 letter from NMFS to Reclamation[4].

**Agenda Item 4.**
**Smelt Working Group update**
The Smelt Working Group (SWG) met on Monday, 2/6/17 at 10am. Bartoo (USFWS) provided the following SWG meeting summary:

> The Working Group reviewed current Delta conditions, survey data, and forecasted weather. Hydrology that meets the temporary release from OMR prescriptions as identified in the RPA Component 1, Action 2 (page 356) is expected to be in effect by February 7. The SWG indicated that the anticipated OMR flows (Index -4,000 cfs today) are sufficiently protective of Delta Smelt.

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[2] For details, see pages 74-79 in Enclosure 2 of the 2011 Amendments to the 2009 RPA document at: http://www.westcoast.fisheries.noaa.gov/publications/Central_Valley/Water%20Operations/Operations,%20Criteria%20and%20Plan/040711_ocap_opinion_2011_amendments.pdf

[3] See advice at the end of the 12/20/16 DOSS meeting notes: http://www.westcoast.fisheries.noaa.gov/publications/Central_Valley/Water%20Operations/Delta%20Operations%20for%20Salmonids%20and%20Sturgeon/DOSS%20WY2016/2016.12.20_final_doss_notes.pdf

[4] http://www.westcoast.fisheries.noaa.gov/publications/Central_Valley/Water%20Operations/Operations,%20Criteria%20and%20Plan/nmfs_response_to_reclamation_s_request_to_implement_rapid_genetic_analysis_in_wy_2017_-_november_21__2016.pdf

The Working Group is following guidance for entrainment protections from Action 2 (adult Delta Smelt). The Working Group will continue to monitor Delta Smelt survey and salvage data and Delta conditions, and will meet again on Monday, February 13, 2017 at 10 am.

**Agenda Item 5.**

**Current Operations**

| SWP | | CVP | |
|---|---|---|---|
| **Exports (cfs)** | | | |
| Clifton Court Forebay | 10,300 | Jones Pumping Plant | 4,200 |
| **Reservoir Releases (cfs)** | | | |
| Feather - Oroville | 70,000 | American - Nimbus | 30,000 |
| | | Sacramento - Keswick | 26,000 |
| | | Stanislaus - Goodwin | 1,000 |
| | | Trinity - Lewiston | 300 |
| **Reservoir Storage (in TAF)** | | | |
| San Luis (SWP) | 1,036 | San Luis (CVP) | 740 |
| Oroville | 2,819 | Shasta | 3,743 |
| New Melones | 1,066 | Folsom | 448 |
| **Delta Operations** | | | |
| DCC | Closed | Sacramento River at Freeport (cfs) | 77,000 |
| Outflow Index (cfs) | ~139,000 | San Joaquin River at Vernalis (cfs) | 17,500 |
| E:I | % (3-day)<br>10% (14-day avg.) | X2 | <56 km |

OMR index for 2/7/17:

- Daily: -5,000 cfs
- 14-day: -3,300 cfs

Factors controlling Delta exports:

- 1/31 – 2/7: Both CVP and SWP facilities at maximum operational capacity

The weather forecast for next week shows drier conditions, with another system moving in at the end of the week.

**Agenda Item 6.**

**Hatchery Releases**

The San Joaquin River Restoration Program will be releasing ~100,000 hatchery spring-run Chinook into the restoration area. Release date will likely be in late February; release location has not yet been finalized.

**Agenda Item 7.**
**Fish Monitoring: Tracking of acoustic-tagged hatchery winter-run Chinook salmon**

Livingston Stone National Fish Hatchery released approximately 141,388 hatchery winter-run Chinook at Caldwell Park in Redding on 2/2/17. 570 were acoustic-tagged with JSATS tags and NOAA's Southwest Fisheries Science Center (SWFSC) is tracking movement of these acoustic-tagged fish past several "real-time" receiver locations (Tower Bridge, and the I-80/Hwy 50 bridge) near Sacramento. As of the morning of 2/7/17, zero acoustic-tagged hatchery winter-run Chinook salmon have been detected at the receivers.

**Agenda Item 8.**
**Fish Monitoring: Salvage[5]**

[5] Salvage data reported in this section represent the total estimated and expanded salvage based on the number of fish observed at the fish collection facility. For example, if one steelhead is observed in the typical ½-hour sampling period within a 2-hour operation period, the single steelhead is expanded to a salvage of four.

# DOSS Weekly Salvage Update

**Reporting Period: January 30-February 5, 2017**

Prepared by Bob Fujimura on February 6, 2017 15:40

**Preliminary Results -Subject to Revision**

| Criteria | 30-Jan | 31-Jan | 1-Feb | 2-Feb | 3-Feb | 4-Feb | 5-Feb | Trend | |
|---|---|---|---|---|---|---|---|---|---|
| **Loss Densities** | | | | | | | | | |
| Wild older juvenile CS | 0 | 0 | **0.60** | 0 | 0 | 0 | 0 | ↗ | 0.09 |
| Wild steelhead | 0 | 0 | 0 | 0 | 0 | 0 | 0 | ↘ | 0 |
| **Exports** | | | | | | | | | |
| SWP daily export | 20,297 | 20,297 | 20,297 | 20,680 | 20,211 | 20,211 | 20,297 | → | 20,327 |
| CVP daily export | 7,975 | 7,968 | 7,965 | 7,979 | 8,003 | 7,982 | 7,984 | → | 7,979 |
| SWP reduced counts | 0% | 0% | 0% | 0% | 0% | 0% | 0% | ↘ | 0% |
| CVP reduced counts | 0% | 0% | 0% | 0% | 0% | 0% | 0% | → | 0% |

Loss Density = fish lost/TAF; water export = AF; Trend = compared to previous week; wild = adipose fin present

Loss = estimated number of fish lost at the CVP and SWP Delta export facilities based on estimated salvage (see below)

Reduced counts = percentage of time that routine salvage sample time were less than 30 min per 2 hours of salvage and export operations

Yellow highlighted counts indicated dates secondary channel flushes occurred at SWP fish salvage facility during water exports.

Blue highlighted counts indicate dates when brief interruptions of fish salvage facility operations occurred during water exports

## Chinook Salmon Weekly/Season Salvage and Loss

Combined salvage and loss for both CVP and SWP fish facilities

**Race determined by size at date of capture; hatchery = adipose fin missing;**

| | | Weekly Total | | | Season Total | |
|---|---|---|---|---|---|---|
| Category | | Salvage | Loss | Trend | Salvage | Loss |
| **Wild** | | | | | | |
| | Winter Run | 0 | 0 | → | 12 | 23 |
| | Spring Run | 0 | 0 | → | 0 | 0 |
| | Late Fall Run | 4 | 17 | ↗ | 16 | 56 |
| | Fall Run | 1,482 | 4,050 | ↘ | 5,997 | 11,296 |
| | Unclassified | 0 | 0 | ↘ | 84 | NC |
| | **Total** | **1,486** | **4,067** | | **6,109** | **11,374** |
| **Hatchery** | | | | | | |
| | Winter Run | 0 | 0 | ↘ | 316 | 943 |
| | Spring Run | 0 | 0 | → | 0 | 0 |
| | Late Fall Run | 4 | 17 | ↘ | 635 | 1,370 |
| | Fall Run | 0 | 0 | → | 116 | 192 |
| | Unclassified | 0 | 0 | → | 6 | NC |
| | **Total** | **4** | **17** | | **1,073** | **2,505** |

Trend = weekly loss per race; Salvage = estimated number of fish collected by the CVP and SWP fish protective facilities per unit of time

NC = can not be calculated

## Steelhead Weekly/Season Salvage and Loss

Combined salvage and loss for both CVP and SWP fish facilities

| | Weekly Total | | | Season Total | |
|---|---|---|---|---|---|
| Category | Salvage | Loss | Trend | Salvage | Loss |
| Wild | 0 | 0 | ↘ | 20 | 57 |
| Hatchery | 1 | 1 | ↗ | 1 | 1 |
| **Total** | **1** | **1** | | **21** | **58** |

State Water Project loss = salvage x 4.33; Central Valley Project loss = salvage x 0.68

Generated by Bob Fujimura on February 6, 2017

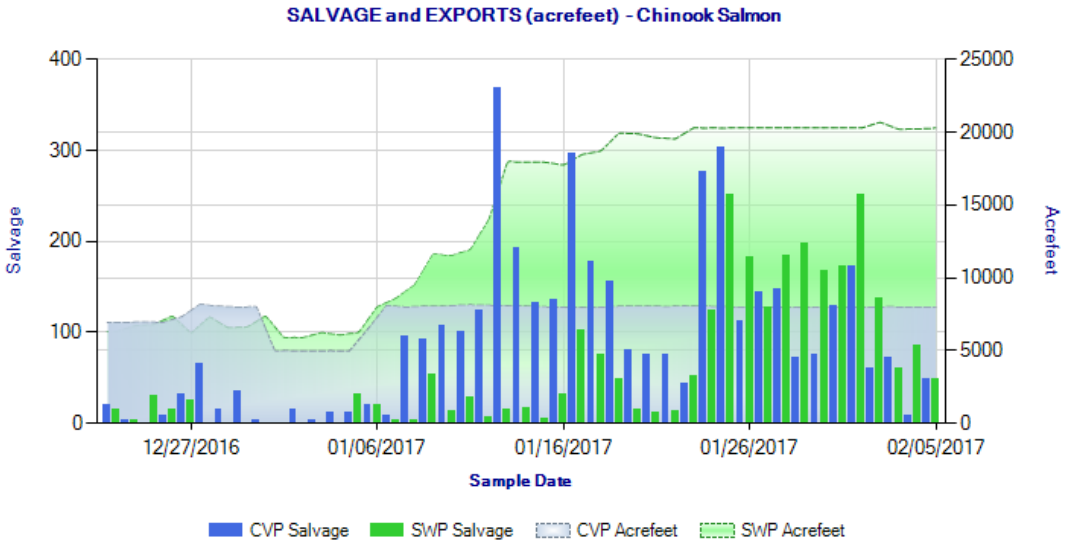



Figure 1. Daily salvage of Chinook Salmon (all races) and water exports from the state and federal fish salvage facilities during Dec 23, 2016 through Feb 5, 2017. Graph obtained from the DFG salvage monitoring web-page: http://www.dfg.ca.gov/delta/apps/salvage/SalvageExportCalendar.aspx.

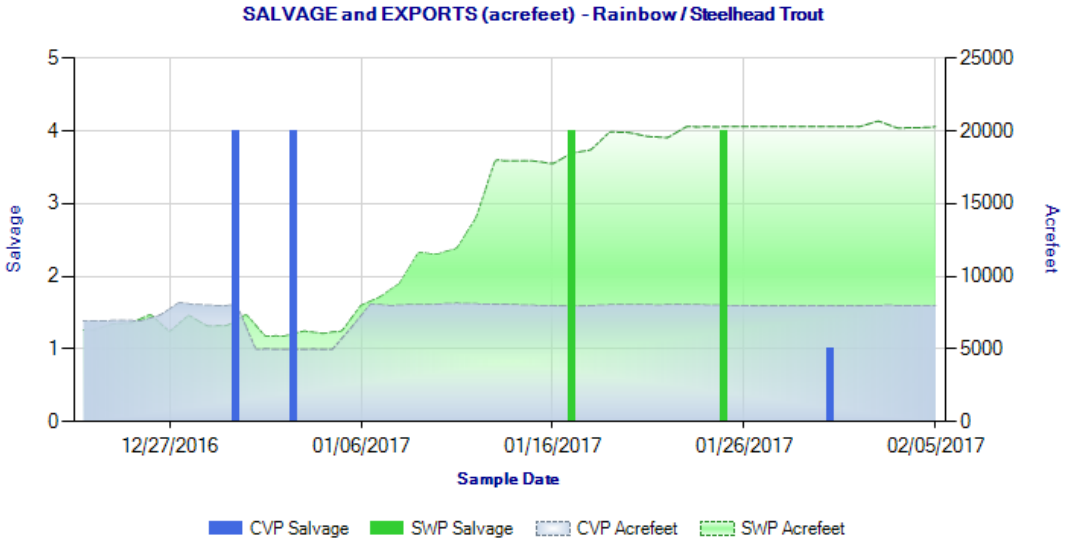



Figure 2. Daily salvage of Steelhead and water exports from the state and federal fish salvage facilities during Dec 23, 2016 through Feb 5, 2017. Graph obtained from the DFG salvage monitoring web-page: http://www.dfg.ca.gov/delta/apps/salvage/SalvageExportCalendar.aspx.

## CONFIRMED HATCHERY (ADIPOSE-FIN CLIPPED) CHINOOK SALMON LOSS AT THE SWP & CVP DELTA FISH FACILITIES as of 2/6/17

| Release Date | CWT Race | Hatchery | Release Site | Release Type | Confirmed Loss | Number Released[1] | Total Entering Delta | % Loss of Number Released[2] | % Loss of Total Entering Delta[3] | First Stage Trigger | Date of First Loss[4] | Date of Last Loss[4] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 12/9/2016 | LF | Coleman NFH | Battle Creek | Production | 1492.205 | 861,966 | n/a | 0.173 | n/a | n/a | 12/18/2016 | 1/23/2017 |
| 12/12/2016 | LF | Coleman NFH | Battle Creek | Spring Surrogate | 179.22 | 75,000 | n/a | 0.239 | n/a | 0.50% | 12/22/2016 | 1/19/2017 |
| 12/21/2016 | LF | Coleman NFH | Battle Creek | Spring Surrogate | 346.73 | 81,279 | n/a | 0.427 | n/a | 0.50% | 12/30/2016 | 1/29/2017 |
| 1/9/2017 | LF | Coleman NFH | Battle Creek | Spring Surrogate | 0.00 | 75,000 | n/a | 0 | n/a | 0.50% | * | * |
| 2/2/2017 | W | Livinstone NFH | Sacramento River | WR | 0.00 | 141,388 | n/a | 0 | n/a | 0.50% | * | * |
| 11/29/2016 | S | SJRRP | San Joaquin River | Experimental | 116.82 | 1/8/2017 | 1/18/2017 | 0.273 | n/a | n/a | 1/8/2017 | 1/17/2017 |
| 11/29/2016 | F | SJRRP | San Joaquin River | Experimental | 6.05 | 12/27/2016 | 1/14/2017 | 0.014 | n/a | n/a | 12/27/2016 | 1/14/2017 |

## UNCONFIRMED HATCHERY (ADIPOSE-FIN CLIPPED) CHINOOK SALMON LOSS AT THE SWP & CVP DELTA FISH FACILITIES, 2016/2017

| Facility | Unknown CWT Loss[5] | Unread CWT Loss[6] | Unknown Hatchery Loss[7] | Acoustic Tag Loss[8] | Number of Unassigned CWTs[9] |
|---|---|---|---|---|---|
| SWP | 119.65 | | | | |
| CVP | 2.6 | | | | |
| **TOTAL** | **122.25** | | | | |

*This table is an update to the CWT table originally shared with DOSS, which did not include all CWTs recovered within the reporting period.

**Agenda Item 9.**

**Fish Monitoring:** The following table presents fish monitoring data summarized over the identified sampling dates. Unless otherwise noted, any reported sizes are fork length. Chinook run assignments are based on length-at-date criteria. DOSS acknowledges the limitations of the length-at-date criteria, particularly in distinguishing between young-of-year spring run Chinook and young-of-year fall-run Chinook. When reviewing spring-run catch in the monitoring data, DOSS considers that run misclassifications might arise from both large genetic fall-run falling into the spring-run sized class and small genetic spring-run falling into the fall-run size class.

| Location | Chipps Is. Midwater Trawl[A, E] | Sacramento Trawl[A] | Beach Seines[A] | Knights Landing RST[B] | Tisdale RST[C] | GCID RST[D] | Mossdale Kodiak Trawl[A] |
|---|---|---|---|---|---|---|---|
| **Sample Date** | 2/1, 2/3, 2/4 | 1/30, 2/1-2/4 | 1/30-2/3 | 1/29-2/5 | 1/29-2/5 | | 2/1 |
| **FR Chinook** | | 742 | 147 | 193 | 157 | | 1 |
| **SR Chinook** | | 7 | 3 | | 4 | | |
| **WR Chinook** | | | | | 2 | | |
| **LFR Chinook** | | | | | | | |
| **Ad-Clipped Chinook** | | 1 | | | | | |
| **Steelhead (ad-clip)** | 3 | 6 | | 1 | 1 | | |
| **Steelhead (wild)** | | | | | | | |
| **Green Sturgeon** | | | | | | | |
| **Flows (avg. cfs)** | | | | 25,914 | 36,871 | | |
| **W. Temp. (avg. °F)** | | | | 47.7 | 47 | | |
| **Turbidity (avg. NTU)** | | | | 61.9 | 114.5 | | |

[A]Data reported in the 1/29 to 2/4 DJFMP sampling summary.
[B]Knights Landing RST sampling period was from 1/29 at 9:45 am to 2/5 at 9:15 am.
[C]Tisdale RST sampling period was from 1/29 at 10:00 am to 2/5 at 9:00 am.
[D]The GCID RST cone was pulled on 1/3 at 9:00 pm due to predicted high flows and heavy debris.

**Red Bluff Diversion Dam (RBDD)**

USFWS biweekly report (1/15/17-1/28/17) for preliminary daily estimates of passage for all runs of unmarked juvenile Chinook salmon and steelhead captured by rotary screw traps at RBDD included:

| Run and Species | Biweekly Total | Brood Year Total (90% CI) |
|---|---|---|
| Winter-run Chinook (BY2016) | 1,118 | 523,267 (386,786-659,748) |

| | | |
|---|---|---|
| Spring-run Chinook (BY2016) | 1,794 | 52,704 (26,827-78,581) |

**Enhanced Delta Smelt Monitoring (EDSM) Catch**

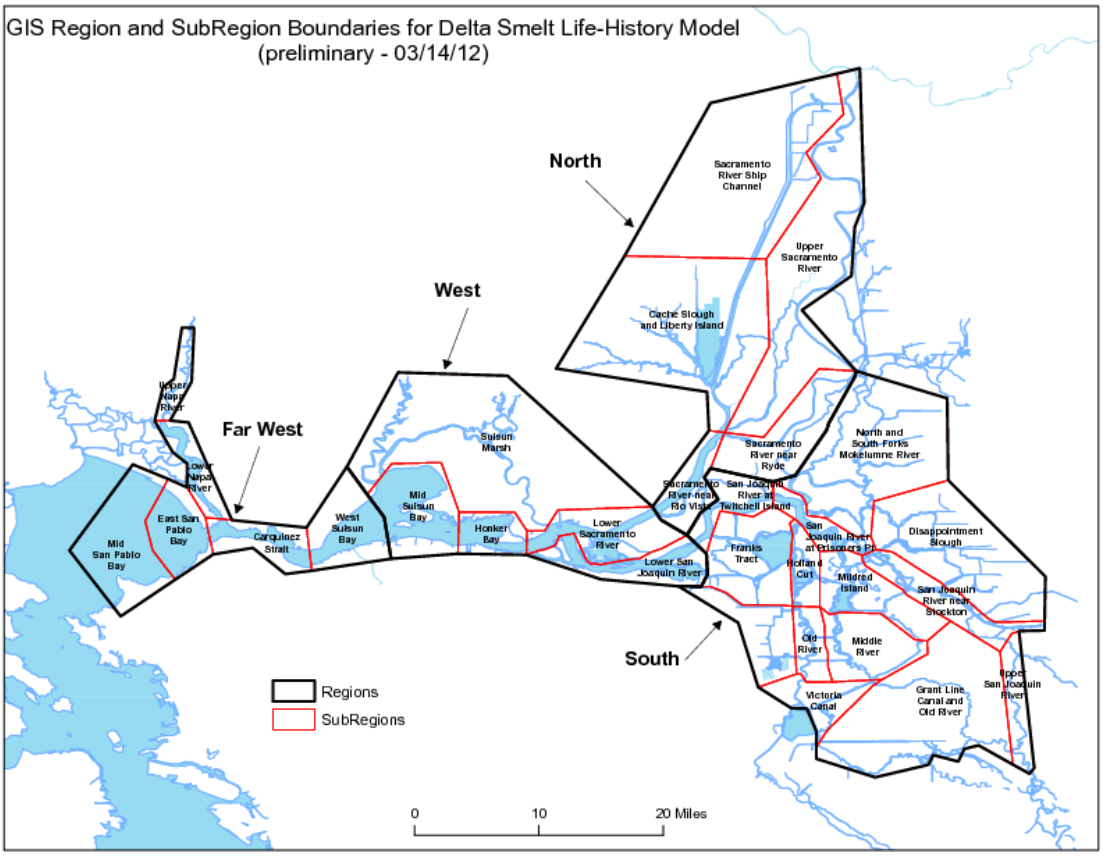
EDSM data posted on DJFMP website:
https://www.fws.gov/lodi/juvenile_fish_monitoring_program/jfmp_index.htm

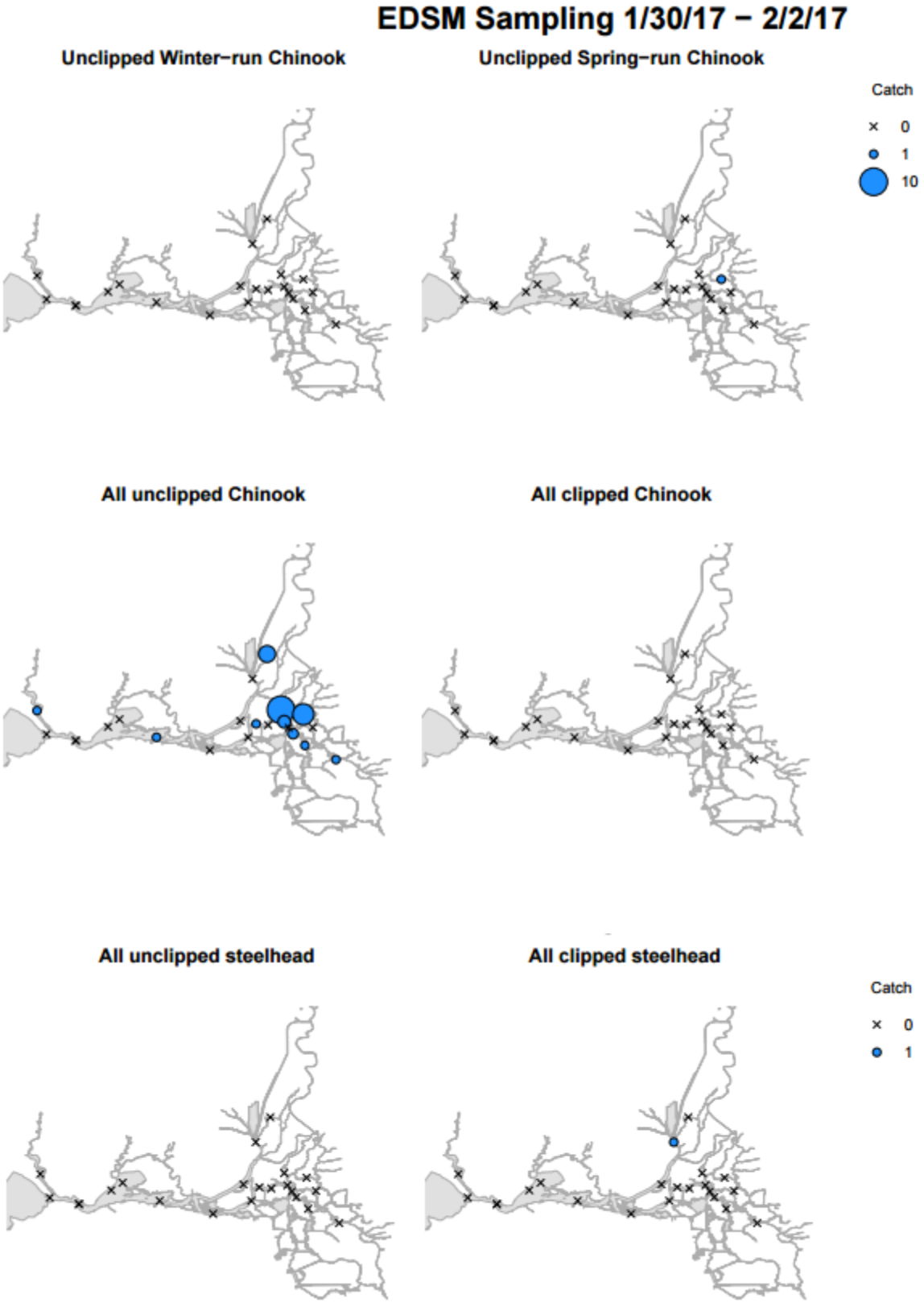
Chinook run assignments for unclipped fish are based on length-at-date criteria. DOSS acknowledges the limitations of the length-at-date criteria, particularly in distinguishing between young-of-year spring run Chinook and young-of-year fall-run Chinook. When reviewing spring-run catch in the monitoring data, DOSS considers that run misclassifications might arise from both large genetic fall-run falling into the spring-run sized class and small genetic spring-run falling into the fall-run size class. "Tagged Chinook" represents ad-clipped Chinook and "Steelhead" represents catch of *Oncorhynchus mykiss*, which may exhibit either a resident life-history expression (rainbow trout) or an ocean-going life-history expression (steelhead).

Over the last week of sampling (1/30/17-2/2/17), a total of 31 fall-run-sized Chinook, 1 spring-run-sized Chinook, and 1 ad-clipped steelhead were caught across all sampling sites. Salmonid catch in the EDSM sampling is summarized in the table below by subregion, and in the bubble plots by individual sampling location.

| | Raw catch | | | | | | | Catch per 10-minute tow* | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Subregion | Winter-run Chinook | Spring-run Chinook | Fall-run Chinook | Late-fall-run Chinook | Tagged Chinook | Tagged Steelhead | Total Tow Minutes | Winter-run Chinook | Spring-run Chinook | Fall-run Chinook | Late-fall-run Chinook | Tagged Chinook | Tagged Steelhead | Region |
| Cache Slough and Liberty Island | 0 | 0 | 5 | 0 | 0 | 1 | 50 | 0 | 0 | 1.00 | 0 | 0 | 0.2 | North |
| Sacramento River near Ryde | 0 | 0 | 10 | 0 | 0 | 0 | 80 | 0 | 0 | 0.13 | 0 | 0 | 0 | |
| Mildred Island | 0 | 0 | 1 | 0 | 0 | 0 | 80 | 0 | 0 | 0.13 | 0 | 0 | 0 | South |
| North and South Forks Mokelumne River | 0 | 1 | 6 | 0 | 0 | 0 | 160 | 0 | 0.06 | 0.06 | 0 | 0 | 0 | |
| San Joaquin River at Prisoner's Pt | 0 | 0 | 5 | 0 | 0 | 0 | 150 | 0 | 0 | 0.33 | 0 | 0 | 0 | |
| San Joaquin River near Stockton | 0 | 0 | 1 | 0 | 0 | 0 | 80 | 0 | 0 | 0.13 | 0 | 0 | 0 | |
| San Joaquin River near Twitchell Island | 0 | 0 | 1 | 0 | 0 | 0 | 140 | 0 | 0 | 0.07 | 0 | 0 | 0 | |
| Honker Bay | 0 | 0 | 1 | 0 | 0 | 0 | 25 | 0 | 0 | 0.40 | 0 | 0 | 0 | West |
| Lower Napa River | 0 | 0 | 1 | 0 | 0 | 0 | 80 | 0 | 0 | 0.13 | 0 | 0 | 0 | Far West |
| **Total** | **0** | **1** | **31** | **0** | **0** | **1** | **845** | | | | | | | |

*(Raw catch/Total tow minutes)*10


GIS Region and SubRegion Boundaries for Delta Smelt Life-History Model
(preliminary - 03/14/12)
North
West
Far West
South
Sacramento River Ship Channel
Upper Sacramento River
Cache Slough and Liberty Island
Upper Napa River
Lower Napa River
Suisun Marsh
Sacramento River near Ryde
North and South Forks Mokelumne River
Sacramento River near Rio Vista
San Joaquin River at Twitchell Island
Mid San Pablo Bay
East San Pablo Bay
Carquinez Strait
West Suisun Bay
Mid Suisun Bay
Honker Bay
Lower Sacramento River
Lower San Joaquin River
Franks Tract
San Joaquin River at Prisoners Pt
Disappointment Slough
Holland Cut
Mildred Island
San Joaquin River near Stockton
Old River
Middle River
Victoria Canal
Grant Line Canal and Old River
Upper San Joaquin River
Regions
SubRegions
0
10
20 Miles


EDSM Sampling 1/30/17 − 2/2/17
Unclipped Winter−run Chinook
Unclipped Spring−run Chinook
Catch
0
1
10
All unclipped Chinook
All clipped Chinook
All unclipped steelhead
All clipped steelhead
Catch
0
1

**Agenda Item 10.**

**DOSS Estimates of Fish Distribution and Assessment of Entrainment Risk**

DOSS estimates of the current distribution of listed Chinook, as a percentage of the population, are based on recent monitoring data and historical migration timing patterns.

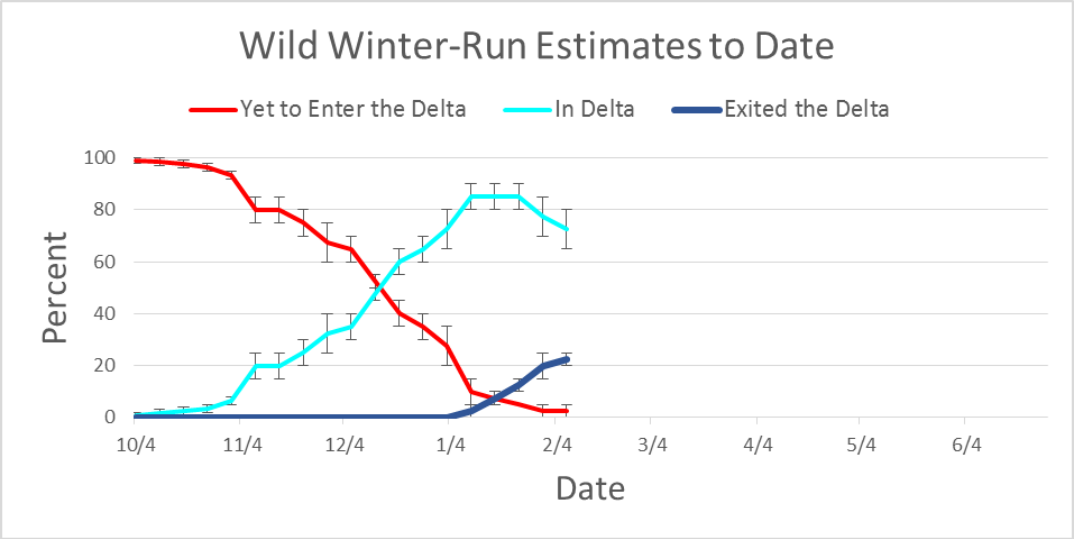
| Location | Yet to Enter Delta (Upstream of Knights Landing) | In the Delta | Exited the Delta (Past Chipps Island) |
|---|---|---|---|
| *Wild young-of-year (YOY) winter-run Chinook salmon* | 0%-5%<br>(Last week: 0-5%) | 65%-80%<br>(Last week: 70%-85%) | 20%-25%<br>(Last week: 15%-25%) |
| *Wild young-of-year (YOY) spring-run Chinook salmon* | 20-30%<br>(Last week: 20% - 40%) | 40%-70%<br>(Last week: 35%-65%) | 20-25%<br>(Last week: 15%-25%) |
| *Hatchery winter-run Chinook salmon (released 2/2/17)* | 100%<br>(first estimate) | 0%<br>(first estimate) | 0%<br>(first estimate) |

* DOSS acknowledges the limitations of the length-at-date criteria, particularly in distinguishing between young-of-year spring run Chinook and young-of-year fall-run Chinook. When reviewing spring-run catch in the monitoring data, DOSS considers that run misclassifications might arise from both large genetic fall-run falling into the spring-run sized class and small genetic spring-run falling into the fall-run size class.

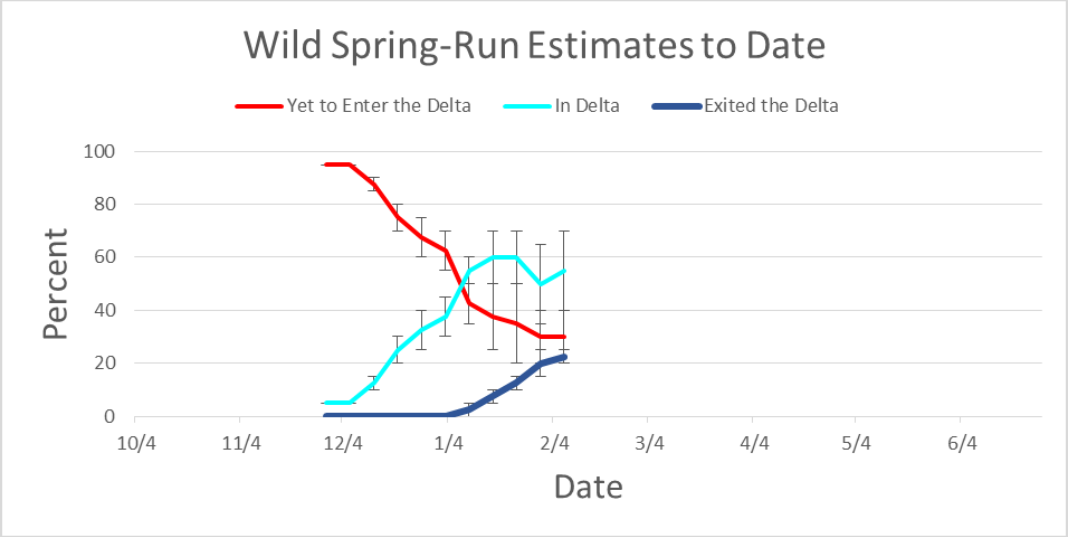
**Rationale for changes in distribution**

Wild winter-run Chinook: While only 2 juvenile winter-run-sized Chinook salmon were observed at Tisdale, upstream of the Delta, DOSS considered that the trap efficiency was likely lower at the recent high flows (because the traps are sampling a smaller fraction of the water passing each trapping location). Also, DOSS noted that with all weirs spilling, some winter-run Chinook entered the flood bypasses and did not pass by some trapping locations. Because of the high flows and due to seasonal timing, DOSS estimated that some winter-run Chinook moved past Chipps Island, potentially rearing westward in Honker, Grizzly, Suisun and San Pablo Bays.

Wild spring-run Chinook: Over the past week, 4 juvenile spring-run-sized Chinook were observed at Tisdale and 10 at the beach seines and Sac trawl. When estimating the wild spring-run Chinook distribution, DOSS considered that trap efficiency was likely lower at the recent high flows (because the traps are sampling a smaller fraction of the water passing each trapping location) and that with all weirs spilling, some spring-run Chinook entered the flood bypasses and did not pass by some trapping locations. Because of the high flows and due to seasonal timing, DOSS estimated that some spring-run Chinook moved into the Delta, and a similar fraction exited past Chipps Island, potentially rearing westward in Honker, Grizzly, Suisun and San Pablo Bays.




WY 2017 wild winter-run distribution estimates to date.




WY 2017 wild spring-run distribution estimates to date.

**DOSS Feedback on Entrainment Risk**

DOSS provides weekly entrainment risk outlooks by considering (a) two different categories of entrainment risk based on listed fish distribution and (b) factors that influence their potential for entrainment. The two entrainment risk categories considered include:

- **Interior Delta Entrainment Risk**- fish in the Sacramento River that have the potential to be entrained into the Interior Delta through the Delta Cross Channel (when open) and/or Georgiana Slough; and
- **CVP/SWP Facilities Entrainment Risk**- fish in the Interior Delta that have the potential to be entrained into the CVP/SWP facilities.

Influencing factors considered include:

- **Exposure Risk** (both categories)- estimated scale (low, medium, high) of fish anticipated to be in vicinity of an entrainment risk,

- **Routing Risk** (Interior Delta Entrainment Risk)- estimated scale (low, medium, high) that flow split conditions could result in fish migrating into the interior delta instead of remaining in main channel, and
- **OMR/Export Risk** (CVP/SWP Facilities Entrainment Risk)- for fish in the Interior Delta, estimated scale (low, medium, high) that OMR and/or Export levels could result in entrainment into the CVP/SWP facilities.

To provide an overall assessment of entrainment risk, the estimated current status of these influencing factors are described below for each of the entrainment risk categories.

**Interior Delta Entrainment Risk for listed salmonids in the Sacramento River over the next week**:

- **Exposure Risk:** HIGH
  - Flow and turbidities from recent rains, which are cues for salmonid movement, have been high since the weekend and are expected to remain high through the coming weekend.
  - Some fish are going into bypasses. Fish entering the Yolo Bypass will exit the bypass downstream of the Georgiana Slough junction, reducing entrainment risk into the interior Delta.
  - Overall, despite bypass overflow, the group assessed the exposure risk as high.

- **Routing Risk:** LOW
  - Continued high river flows are expected to mute the tidal effects at Georgiana Slough (reducing the risk of routing into Georgiana Slough).
  - Delta Cross Channel is closed.
  - However, we are seeing Sacramento-basin-origin fish in salvage

- **Overall Entrainment Risk:** MEDIUM

**CVP/SWP Facilities Entrainment Risk for listed salmonids in the Interior Delta over the next week:**

- **Exposure Risk:** MEDIUM-HIGH
  - Have seen high salvage of unclipped Chinook, some portion of which are likely from the Sacramento basin.
  - Beginning in mid-January, have seen salmonid catch (fall-run-sized Chinook, no steelhead to date) at Mossdale.

- **OMR/Export Risk:**
  - OMR -2,500 cfs: LOW
  - OMR -3,500 cfs: MEDIUM
  - OMR -5,000 cfs: HIGH

- OMR -6,250 cfs[7]: incrementally HIGHER (given projected hydrology and high Vernalis flow)

Some members expect the relative risk of entrainment of an OMR limit of -6,250 compared to -5,000 cfs to further increase when Vernalis flows decrease.

- **Overall Entrainment Risk:**
  - OMR -2,500 cfs: LOW
  - OMR -3,500 cfs: LOW-MEDIUM (given projected hydrology and high Vernalis flow)
  - OMR -5,000 cfs: MEDIUM-HIGH (given projected hydrology and high Vernalis flow)
  - OMR -6,250 cfs[6]: incrementally higher within MEDIUM-HIGH (given projected hydrology and high Vernalis flow)

Considering the high Sacramento River and Vernalis flows forecasted through the weekend, and with the expectation that most ESA-listed salmonids will be entering the Delta from the Sacramento basin, most members agreed that overall entrainment risk into the export facilities is lower at most OMR levels than it would be under lower flow conditions. The overall entrainment risk was driven in large part by the MEDIUM-HIGH exposure risk and less so (given projected hydrology) by the OMR/Export Risk.

Considering projected hydrologic conditions, the difference between OMR levels of -5,000 and -6,250 represents an incrementally elevated overall entrainment risk to Sacramento Basin salmonid populations. This assessment is likely to change should export levels continue at the current levels and Vernalis flows decrease, at which point risk to Sacramento Basin salmonids will increase.

**Agenda Item 11.**
**DOSS Advice to NMFS and WOMT: None**

**Agenda Item 12.**
**Next Meeting:** The next DOSS conference call will be on **2/14/17 at 9am**.

[7]By request of management, DOSS also assessed risks at an OMR flow more negative than -5,000 cfs.