

**Delta Operations for Salmonids and Sturgeon (DOSS) Group**  
**Conference call: 10/31/2014 at 3:00 p.m.**

**DWR:** Aaron Miller, Kevin Reece, Farida Islam, Rhiannon Mulligan, Dan Yamanaka, Mike Ford, Harry Spanglet, Tracy Pettit  
**USFWS:** Craig Anderson, Roger Guinee  
**NMFS:** Barb Byrne, Jeff Stuart, Meiling Roddam  
**USBR:** Russ Yaworsky, Josh Israel  
**CDFW:** Ken Kundargi, Duane Linander

DCC operations are currently governed by the criteria table for Oct 1 - Nov 15 in Attachment G of the Drought Operations Plan<sup>1</sup>. According to those criteria, when the Knights Landing Catch Index (KLCI) or Sacramento Catch Index exceeds a fish trigger, and water quality exceeds the concern level at any of four stations listed in footnote E, the required action response is that "DOSS review[s] monitoring data and makes recommendation to NMFS and WOMT per procedures in Action IV.5".

Because the KLCI exceeded 5 fish/ trap-day on 10/31/14, and water quality exceeded the concern levels at all four stations, DOSS held an emergency meeting at 3pm on 10/31/14 in order to discuss the fish monitoring and water quality data. DOSS members summarized that discussion at the 3:30pm WOMT meeting, and provided some recommendations regarding DCC gate operations.

**DOSS Recommendation:** While there was a range of opinion on the urgency of closing the DCC gates in consideration of the balance between fish protection, water quality, and boater safety considerations, there *was* general consensus that closing the DCC gates for at least three days, with closure occurring no later than Sunday evening, would prevent DCC entrainment risk for most of the winter-run Chinook in the pulse observed at Knights Landing and for any additional winter-run that might move downstream in response to the forecasted precipitation the coming weekend.

**DOSS Discussion Highlights:**

Water Quality:

- water quality at all four stations (Jersey Point, Holland Tract, Bethel Island, Bacon Island) was just above the concern levels (see yellow-highlighted data in the attached WQ summary, reviewed by DOSS).
- the recent "improving" trend in water quality was influenced in part by the neap tide; tidal conditions are now entering a spring tidal cycle which will tend to worsen water quality
- the forecasted precipitation may not generate much runoff, and any runoff may not be realized until next week
- while storms bring rain, they also bring low atmospheric pressure, which tends to draw in salinity and worsen water quality
- DCC gate closure was expected to worsen water quality at all four stations

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<sup>1</sup> Attachment G begins on p. 132 of the Drought Operations Plan, available at: <http://ca.gov/drought/pdf/2014-Operations-Plan.pdf>

--In terms of timing of a potential DCC closure, it was estimated that a 3-day closure, whether occurring on Saturday or Monday, would result in similar water quality conditions by the end of the first week of November.

#### Fish monitoring:

--CDFW reported the morning of 10/31/14 that 40 winter-run were caught at the Knights Landing rotary screw traps.

--At the time of the 3pm emergency DOSS call, the trap hours were not available and so the exact KLCI could not be calculated. Because estimates based on recent trap hours put the KLCI estimate at >20 fish/day -- well over the 3 and 5 fish/day thresholds in the DCC Trigger Table -- DOSS members were comfortable presuming the catch trigger had been exceeded. [KLCI was calculated Friday evening and sent out to DOSS and WOMT; see the attached KLCI spreadsheet]

-->300 winter-run Chinook were observed on 10/28 at the Glenn-Colusa Irrigation District (GCID) rotary screw traps, associated not with a big change in flow, but with a large change in turbidity

--Mill Creek and Deer Creek showed flow increases over the weekend

--Battle Creek was reported to have an unusual flow event recently that included highly turbid water (potentially including ash -- the water reportedly smelled like smoke)

--no major changes in flow at Knights Landing led DOSS to conclude that the migration of fish was likely cued in large part by turbidity

--because of the general agreement that forecasted precipitation might cue additional winter-run to migrate downstream, the DOSS discussion on DCC operations considered both the observed pulse of fish at Knights Landing, and a potential second pulse of fish responding to the upcoming storm

#### DCC operations:

--Was generally agreed that a gate closure should last at least three days, then reassessed based on fish monitoring and water quality information

--Since it was assumed that the winter-run caught at Knights Landing passed Thursday night, a two-day travel time would put that pulse of fish at the DCC on Saturday night, arguing for Saturday gate closure

--Because flows were relatively low, it was noted that travel time to the DCC from Knights Landing might be on the slower side under current conditions, and that fish might not arrive until Sunday night or later, arguing for Sunday or Monday gate closure

--if water quality limited gate closure to three days, Saturday closure would protect the observed pulse of fish at Knights Landing, but might not last long enough to protect additional winter-run cued to move on the late week/weekend rain

--concern was noted that boater notifications regarding gate closure would be difficult over the weekend, arguing for Monday morning closure

--water quality concerns were noted, arguing for no, or at least later, gate closure, and frequent re-assessment of water quality conditions in the event of a gate closure

--while recognizing the challenges of earlier (e.g. Saturday) closure, it was noted that pre-empting entrainment of winter-run into the interior delta through the DCC could, in the long-term, preserve more operational flexibilities. Once winter-run enter the interior delta, they may rear there for months and could increase the likelihood of exceeding loss-density triggers in Action IV.2.3 (OMR management), which goes into effect on January 1.

--some were skeptical of the "preemptive salvage reduction" argument, noting that it was based on a series of hypotheticals

## Compliance Standards

for the Sacramento - San Joaquin Delta and Suisun Marsh  
Thursday, October 30, 2014

Criteria	Standard	Status
<b>Flow/Operational</b>		
% of inflow diverted	65 %	12 %
NDOI, monthly average *	>= 3,000 cfs	4,146 cfs
NDOI, 7 day average*	>= 2,000 cfs	4,991 cfs
Rio Vista flow, monthly average *	>= 2,000 cfs	2,164 cfs
Rio Vista flow, 7 day average*	>= 1,500 cfs	2,796 cfs

### Water Quality

Days @ CCWD PP#1 w/ chlorides <= 150 mg/l	155 days	271 days
Export Areas for SWP, CVP, CCWD, et al	<= 250 mg/l Cl	151 mg/l

Maximum 30 day running average of mean daily EC at:

Vernalis	<=1.0 mS/cm	0.4 mS/cm
Brandt Bridge	<=1.0 mS/cm	0.6 mS/cm
Old River Near Tracy	<=1.0 mS/cm	0.9 mS/cm
Old River Near Middle River	<=1.0 mS/cm	0.6 mS/cm

SUISUN MARSH:

Suisun Marsh Salinity Control Gates :                      0 Open / 0 Closed / 3 Full Tide Open  
 Flashboard Status : In  
 Boat Lock Status : Open

### California Hydrologic Conditions: (California Cooperative Snow Surveys Forecast, May 1, 2014)

Previous Month's Index (8RI for Apr): 1.712 MAF  
 Water Year Type: Critical  
 Sacramento valley water year type index (40/30/30) @ 50%: 4.0 MAF (Critical)  
 San Joaquin valley water year type index (60/20/20) @ 75%: 1.1 MAF (Critical)

Electrical Conductivity (EC) in milliSiemens per Centimeter.  
 Chlorides (Cl) in milligrams per liter  
 mht - mean high tides  
 md - mean daily  
 14 dm - fourteen day running mean  
 28 dm - twenty-eight day running mean  
 NR - No Record  
 NC - Average not computed due to insufficient data.  
 BR : Below Rating  
 e - estimated value

Montezuma Slough Gate Operation:  
 Number of gates operating at either Open, Closed, or Full Tide Open  
 Flashboard Status : In, Out, or Modified In  
 Boat Lock Status : Open or Closed

Coordinated Operation Agreement Delta Status:  
 (Note: below label begins on October 1, 2013)  
 c = excess Delta conditions  
 b = balanced Delta conditions  
 r = excess Delta conditions with restrictions:

\* NDOI, Rio Vista & Vernalis Flows:  
 - 7 day average is progressive daily mean for the first six days of the month.

## Delta Water Quality Conditions

Date	Antioch Tides		Net Delta Outflow Index cfs	Martinez mdEC	Port Chicago		Mallard mdEC	Chipps Island		Collinsville	
	High	Half			mdEC	14dm		mdEC	14dm	mdEC	14dm
10/01/2014	6.02	4.31	3,335	29.52	4.43	15.92	14.30	14.24	14.67	10.65	10.14
10/02/2014	5.88	4.16	3,540	29.05	14.94	15.59	14.34	14.29	14.65	9.62	10.20
10/03/2014	5.86	4.09	3,274	28.73	21.71	15.65	14.35	14.30	14.64	9.68	10.21
10/04/2014	5.97	4.17	3,799	29.89	22.08	15.64	15.10	15.13	14.66	10.48	10.21
10/05/2014	6.04	4.29	3,778	30.13	22.69	15.85	15.70	15.79	14.68	11.31	10.23
10/06/2014	6.10	4.39	3,870	30.64	22.90	16.15	15.98	16.11	14.79	11.99	10.33
10/07/2014	6.23	4.53	3,835	30.81	23.02	16.35	16.68	16.89	14.97	12.96	10.53
10/08/2014	6.45	4.57	4,169	31.46	22.08	16.67	16.93	17.16	15.15	13.11	10.76
10/09/2014	6.55	4.63	4,670	31.68	22.93	16.87	17.18	17.45	15.35	13.32	11.04
10/10/2014	6.50	4.58	3,956	31.62	23.99	17.43	17.06	17.32	15.58	12.98	11.26
10/11/2014	6.44	4.52	3,809	31.43	23.44	18.16	16.31	16.48	15.70	12.37	11.40
10/12/2014	6.29	4.43	4,314	31.36	22.87	18.72	15.58	15.66	15.77	11.88	11.53
10/13/2014	6.41	4.50	4,209	31.48	23.29	19.70	16.25	16.41	15.88	11.64	11.60
10/14/2014	6.60	4.96	3,089	32.69	24.47	21.06	17.93	18.29	16.11	13.62	11.83
10/15/2014	5.96	4.78	3,590	31.87	22.85	22.38	16.87	17.10	16.31	12.19	11.94
10/16/2014	5.74	4.46	4,364	30.60	19.63	22.71	15.84	15.96	16.43	11.22	12.05
10/17/2014	5.58	4.32	3,395	30.16	18.53	22.48	15.64	15.73	16.53	10.96	12.14
10/18/2014	5.65	4.30	4,438	29.62	19.01	22.26	15.63	15.72	16.58	10.64	12.16
10/19/2014	5.84	4.41	3,790	30.40	20.65	22.12	16.41	16.58	16.63	12.06	12.21
10/20/2014	5.96	4.44	3,574	31.19	22.74	22.11	16.92	17.16	16.71	12.35	12.24
10/21/2014	5.78	4.24	4,235	30.34	20.53	21.93	15.89	16.01	16.65	11.58	12.14
10/22/2014	5.85	4.10	4,541	29.98	19.22	21.72	15.51	15.59	16.53	11.54	12.02
10/23/2014	5.99	4.13	3,872	29.87	22.26	21.68	15.53	15.61	16.40	11.35	11.88
10/24/2014	6.17	4.23	4,599	30.47	22.48	21.57	15.87	15.99	16.31	11.56	11.78
10/25/2014	6.53	4.56	4,090	32.16	23.00	21.54	17.50	17.81	16.40	12.59	11.80
10/26/2014	6.15	4.26	3,651	29.88	21.81	21.46	16.25	16.41	16.46	12.27	11.83
10/27/2014	6.05	4.13	5,994	29.68	21.31	21.32	15.58	15.66	16.40	11.29	11.80
10/28/2014	5.93	4.05	5,311	29.00	20.39	21.03	14.78	14.78	16.15	10.21	11.56
10/29/2014	5.79	4.04	5,274	29.15	21.25	20.91	14.33	14.28	15.95	9.69	11.38
10/30/2014	5.93	4.17	6,015	28.93	20.72	20.99	14.49	14.46	15.84	9.70	11.27

Antioch Tides measured in feet above mean sea level.

Net Delta Outflow Index calculated from equation as specified in D-1641, revised June 1995.

Chipps Island EC calculated from measurements recorded at Mallard Slough.

Electrical Conductivity (EC) units: milliSiemens per Centimeter

md : mean daily

14dm : fourteen day running mean

NR : No Record

NC : Average not computed due to insufficient data

BR : Below Rating

e - estimated value

## Delta Water Quality Conditions

Date	Antioch		Jersey Point		Threemile Slough		Cache Slough	Good Year Slough	Sunrise Club	Volanti Slough	Beldon Landing	Collinsville
	mdEC	14mdEC	mdEC	14mdEC	mdEC	14mdEC	mdEC	mhtEC	mhtEC	mhtEC	mhtEC	mhtEC
10/01/2014	6.52	6.27	1.91	1.75	1.88	1.59	0.64	15.83	12.98	13.80	12.17	11.80
10/02/2014	6.40	6.28	1.79	1.74	2.00	1.62	0.65	16.07	13.17	13.88	11.59	10.93
10/03/2014	6.44	6.30	1.79	1.75	2.17	1.67	0.63	16.16	13.49	14.30	12.21	12.02
10/04/2014	6.97	6.36	1.95	1.76	2.46	1.73	0.57	16.24	13.91	14.72	13.45	12.05
10/05/2014	7.48	6.42	2.16	1.78	2.71	1.80	0.52	16.63	14.32	15.18	14.41	12.87
10/06/2014	7.90	6.57	2.23	1.82	2.85	1.89	0.50	17.02	14.94	15.97	15.78	14.19
10/07/2014	8.13	6.74	2.36	1.88	3.07	2.01	0.47	17.57	14.99	15.48	14.76	14.90
10/08/2014	8.22	6.89	2.53	1.94	3.20	2.15	0.49	17.79	15.14	15.42	15.27	14.56
10/09/2014	8.17	7.03	2.64	2.01	3.25	2.27	0.51	18.13	15.71	16.83	16.81	15.06
10/10/2014	7.92	7.17	2.50	2.08	3.12	2.40	0.58	18.61	16.06	17.75	17.08	14.15
10/11/2014	7.62	7.26	2.44	2.14	3.04	2.51	0.63	19.14	16.31	18.24	17.46	13.44
10/12/2014	7.36	7.32	2.30	2.17	2.70	2.58	0.62	19.48	16.67	18.97	18.16	12.48
10/13/2014	7.50	7.38	2.44	2.21	3.09	2.67	0.59	19.68	16.80	18.73	18.23	13.48
10/14/2014	8.73	7.53	2.89	2.28	3.72	2.80	0.59	19.72	18.01	18.10	18.79	15.31
10/15/2014	8.16	7.64	2.57	2.33	3.45	2.92	0.63	19.87	18.65	18.58	18.63	13.46
10/16/2014	7.33	7.71	2.21	2.36	2.95	2.98	0.66	20.01	16.93	18.43	18.66	12.35
10/17/2014	7.37	7.78	2.15	2.38	2.99	3.04	0.64	20.19	16.70	18.72	19.17	13.02
10/18/2014	7.38	7.80	2.12	2.40	3.03	3.08	0.60	20.33	16.70	18.64	19.26	11.46
10/19/2014	7.89	7.83	2.20	2.40	3.28	3.12	0.59	20.42	16.81	18.76	19.28	13.55
10/20/2014	8.23	7.86	2.33	2.41	3.29	3.16	0.61	20.43	16.80 e	18.81	19.40	13.75
10/21/2014	7.40	7.81	2.09	2.39	2.92	3.15	0.71	20.45	16.86	18.91	19.33	13.24
10/22/2014	7.02	7.72	1.89	2.34	2.65	3.11	0.74	20.45	16.75	18.60	19.03	13.02
10/23/2014	7.09	7.64	1.94	2.29	2.62	3.06	0.73	20.47	16.73	18.76	18.09	12.26
10/24/2014	7.32	7.60	2.04	2.26	2.79	3.04	0.71	20.44	16.59	19.12	17.36	13.58
10/25/2014	8.56	7.67	2.50	2.26	3.46	3.07	0.71	19.99	16.40	18.09	16.35	13.92
10/26/2014	7.35	7.67	2.09	2.25	2.74	3.07	0.77	20.00	15.86	16.64	13.67	13.72
10/27/2014	6.59	7.60	1.89	2.21	2.43	3.02	0.78	20.41	15.33	15.71	12.63	13.19
10/28/2014	6.19	7.42	1.75	2.13	2.33	2.92	0.76	20.34	15.23	15.10	12.85	11.83
10/29/2014	6.13	7.27	1.75	2.07	2.25	2.84	0.73	20.37	15.38	15.15	13.27	11.00
10/30/2014	6.27	7.20	1.83	2.04	2.26	2.79	0.72	19.89	15.23	15.36	14.37	11.41

Concern level=1.8

Electrical Conductivity (EC) units: milliSiemens per Centimeter  
 Chloride (Cl) units: milligrams per liter  
 mht : mean high tides  
 md : mean daily  
 NR : No Record  
 NC : Average not computed due to insufficient data  
 BR : Below Rating  
 e : estimated value



# Delta Water Quality Conditions

## South Delta Stations

Date	Vernalis		Brandt Bridge		Old River Near Tracy		Old River Near Middle River	
	md EC	30 day avg	md EC	30 day avg	md EC	30 day avg	md EC	30 day avg
10/01/2014	0.73	0.60	0.73	0.70	1.13	1.11	0.73	0.66
10/02/2014	0.70	0.60	0.70	0.70	1.01	1.11	0.69	0.66
10/03/2014	0.61	0.61	0.68	0.70	0.98	1.10	0.68	0.66
10/04/2014	0.58	0.61	0.67	0.70	1.01	1.10	0.68	0.66
10/05/2014	0.52	0.61	0.68	0.70	1.05	1.11	0.68	0.66
10/06/2014	0.44	0.61	0.69	0.70	1.09	1.11	0.69	0.66
10/07/2014	0.48	0.61	0.70	0.70	1.08	1.11	0.71	0.67
10/08/2014	0.47	0.62	0.71	0.70	1.02	1.12	0.73	0.67
10/09/2014	0.43	0.61	0.72	0.70	0.95	1.12	0.74	0.67
10/10/2014	0.44	0.61	0.71	0.70	0.91	1.12	0.74	0.68
10/11/2014	0.51	0.61	0.69	0.70	0.89	1.11	0.72	0.68
10/12/2014	0.47	0.61	0.65	0.70	0.85	1.10	0.70	0.68
10/13/2014	0.50	0.60	0.60	0.70	0.84	1.09	0.67	0.69
10/14/2014	0.50	0.60	0.60	0.70	0.83	1.09	0.64	0.69
10/15/2014	0.50	0.59	0.58	0.69	0.83	1.07	0.61	0.69
10/16/2014	0.47	0.59	0.55	0.69	0.84	1.06	0.58	0.69
10/17/2014	0.46	0.58	0.54	0.68	0.84	1.05	0.56	0.69
10/18/2014	0.46	0.57	0.54	0.67	0.82	1.03	0.55	0.68
10/19/2014	0.46	0.57	0.55	0.67	0.82	1.02	0.54	0.68
10/20/2014	0.45	0.56	0.56	0.66	0.86	1.00	0.53	0.67
10/21/2014	0.41	0.56	0.56	0.65	0.88	0.99	0.54	0.67
10/22/2014	0.41	0.55	0.58	0.65	0.90	0.98	0.56	0.67
10/23/2014	0.28	0.53	0.60	0.65	0.91	0.98	0.56	0.66
10/24/2014	0.29	0.52	0.60	0.64	0.92	0.97	0.59	0.66
10/25/2014	0.34	0.50	0.58	0.64	0.90	0.97	0.59	0.65
10/26/2014	0.30	0.49	0.55	0.64	0.91	0.96	0.56	0.65
10/27/2014	0.30	0.48	0.41	0.63	0.95	0.96	0.48	0.64
10/28/2014	0.29	0.47	0.32	0.61	1.00	0.95	0.35	0.63
10/29/2014	0.28	0.46	0.27	0.60	1.05	0.94	0.30	0.61
10/30/2014	0.23	0.44	0.26	0.58	1.06	0.94	0.27	0.60

Electrical Conductivity (EC) units: milliSiemens per Centimeter  
 md : mean daily  
 NR : No Record  
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 BR : Below Rating  
 e : estimated value

KLCI calculations completed by Barb Byrne, NMFS (*barbara.byrne@noaa.gov*, 916-930-5612)

Winter-run Chinook and all four late-fall-run Chinook were in the "older juvenile" size range (personal communication from Chris McKibbin)  
Calculations used non-rounded values.

<b>Date of morning trap-check</b>	<b>Trap hours since previous day's morning trap-check</b>	<b>Trap days (trap hours/24)</b>	<b>"Older juvenile" catch</b>	<b>"Older juvenile" KLCI (# fish/trap day)</b>	<b>Spring-run catch</b>	<b>Spring-run KLCI (# fish/trap day)</b>
10/31/2014	45.5	1.9	44	23.2	1	0.5