NMFS Reaffirms January 1st Onset of OMR Flow Management for 2015
December 30, 2014

On June 4, 2009, NOAA's National Marine Fisheries Service (NMFS) issued a biological opinion on the long-term operation of the Central Valley Project and State Water Project. As a result of the "jeopardy" determination, NMFS included a reasonable and prudent alternative (RPA) that included Old and Middle River (OMR) Flow Management Action IV.2.3 [OMR flow no more negative than -5,000 cubic feet-per-second (cfs)] at certain specified times during fish migrations through the Delta. The objective for Action IV.2.3 is to:

> "Reduce the vulnerability of emigrating juvenile winter-run, yearling spring-run, and CV steelhead within the lower Sacramento and San Joaquin rivers to entrainment into the channels of the South Delta and at the pumps due to the diversion of water by the export facilities in the South Delta. Enhance the likelihood of salmonids successfully exiting the Delta at Chipps Island by creating more suitable hydraulic conditions in the mainstem of the San Joaquin River for emigrating fish, including greater net downstream flows." (page 74 of the 2009 RPA with 2011 amendments, http://www.westcoast.fisheries.noaa.gov/publications/Central_Valley/Water%20Operations/Operations,%20Criteria%20and%20Plan/040711_ocap_opinion_2011_amendments.pdf)

The historical data provided in tables 1 and 2, in addition to the real-time data provided in table 3, support NMFS' conclusion that the January 1st onset of Action IV.2.3 in 2015 is warranted and necessary to protect winter-run and spring-run, as intended.

Historical Data Method

The January 1st onset of -5000 OMR (sometimes referred to as a "calendar-based trigger") is based on an analysis of historical data across a wide range of water year types and hydrologies, and is intended to protect the majority of emigrating juvenile fish in the majority of hydrologic conditions.

Tables 1 and 2, below, provide the emigration timing of winter-run and spring-run Chinook salmon past the Knights Landing rotary screw trap (RST) in water years 2001 through 2012. In 58% of the water years, 50% of the annual winter-run population migrated past the Knights Landing RST location on the Sacramento River by the end of December. Control of the OMR flows starting on January 1st would protect a sizeable proportion of the winter-run population that has already entered the Delta region. These fish will distribute themselves within the Delta and are expected to rear for up to 3 to 4 months before continuing their emigration to the marine environment. During such time, they are vulnerable to entrainment at the Federal and State fish collection facilities and the influences of altered hydrodynamics in the Delta created by export actions.

Table 1. Emigration timing of winter-run (WR) and spring-run (SR) Chinook salmon past the Knights Landing rotary screw trap in water years 2001-2012.

	Recovery of winter run and spring run sized fish in the Knights Landing RSTs													
							Water Year						Percentage occuring before January	
	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012		
Water Year type	D	D	AN	BN	BN	W	D	C	D	BN	W	BN		
Date first WR @ KL	11/6/2000	11/16/2001	10/11/2002	10/6/2003	10/29/2004	10/11/2005	10/6/2006	12/12/2007	12/29/2008	10/15/2009	10/11/2010	10/10/2011	100	
25% @ KL	1/19/2001	11/27/2001	12/17/2002	12/9/2003	12/11/2004	12/3/2005	12/15/2006	12/31/2007	1/26/2009	10/28/2009	12/8/2010	1/23/2012	75	
50% @ KL	1/29/2001	12/11/2001	12/22/2002	12/11/2003	12/13/2004	12/6/2005	12/17/2006	1/12/2008	2/24/2009	1/20/2010	12/17/2010	1/25/2012	58	
75% @ KL	2/23/2001	1/4/2002	1/4/2003	12/20/2003	1/5/2005	12/24/2005	12/30/2006	1/28/2008	2/27/2009	1/26/2010	12/23/2010	1/27/2012	58	* 3 years had cutoff reached in first week of January
100% @ KL	4/25/2001	4/24/2002	4/21/2003	4/5/2004	4/22/2005	4/18/2006	3/13/2007	3/3/2008	4/6/2009	4/16/2010	4/9/2011	4/11/2012	0	
Date first SR @ KL	12/20/2000	11/27/2001	12/16/2002	12/10/2003	12/11/2004	11/14/2005	12/13/2006	10/19/2007	10/27/2008	10/26/2009	12/9/2010	10/24/2011	100	
25% @ KL	2/26/2001	2/22/2002	12/19/2002	12/12/2003	1/4/2005	12/21/2005	12/12/2006	1/9/2008	3/19/2009	4/14/2010[a]	1/4/2011	3/30/2012	50	* Two years had cutoff in first week of January
50% @ KL	3/28/2001	4/23/2002[a]	1/4/2003	12/24/2003	3/31/2005	2/7/2006	3/18/2007	1/13/2008	3/25/2009	4/15/2010[a]	2/27/2011	4/2/2012	17	
75% @ KL	4/18/2001[a]	4/25/2002[a]	4/9/2003	3/22/2004	4/20/2005[a]	4/19/2006[a]	4/19/2007[a]	2/7/2008	4/14/2009[a]	4/16/2010[a]	4/7/2011	4/13/2012	0	
100% @ KL	5/14/2001	5/14/2002	5/9/2003	5/12/2004	5/12/2005	5/6/2006	5/14/2007	5/15/2008	5/12/2009	5/17/2010	5/2/2011	5/10/2012	0	
Date CNFH FR release	4/13/2001	4/4/2002	4/18/2003	4/16/2004	4/15/2005	4/14/2006	4/12/2007	4/23/2008	4/9/2009	4/8/2010	4/14/2011	4/19/2012		

(a) Release of unmarked fall run Chinook salmon from the CNFH occurred prior to these dates. Overlap of in-river spring run sized fish and hatcheryfall run fish obscure origin of unclipped fish in spring run sized classsification.

Table 2. Percentages of winter-run and spring-run annual catch at the Knights Landing RST for water years 2001 to 2012 broken down by month.

							Water Year									
	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	Mean	Range	Stdev	
% of Annual WR Cat	D	D	AN	BN	BN	W	D	C	D	BN	W	BN				
End of October	0	0	0.4	0.3	0.1	1.6	2.1	0	0	26.5	15	4.8	4.23	0 - 26.5	8.22	Oct
End of November	0.6	43	1.2	0.5	4.9	20.2	3.8	0	0	29.4	19.1	5.7	10.70	0-29.4	14.09	Nov
End of December	6.7	71.9	65.9	85.2	64.2	91.8	80.9	2.5	22.3	32.9	82.3	6.7	51.11	2.5-91.8	34.34	Dec
End of January	60	93	94.7	92.9	92	95.4	90.8	78.8	36.9	90	94.4	86.7	83.80	36.9-95.4	17.81	Jan
End of February	81.6	97	97.7	97.2	97.5	98.5	99.5	99.1	82.3	94.7	96.1	91.4	94.38	81.6-99.5	6.20	Feb
End of March	99	98.8	99.3	99.9	99.9	99.6	100	100	99.2	98.8	99.2	95.2	99.08	95.2-100	1.30	Mar
End of April	100	100	100	100	100	100	100	100	100	100	100	100	100.00	100-100	0.00	Apr
End of May	100	100	100	100	100	100	100	100	100	100	100	100	100.00	100-100	0.00	May
% of Annual SR Catch																
End of October	0	0	0	0	0	0	0	0.3	0.2	0.2	0	0.1	0.07	0-0.3	0.11	Oct
End of November	0	5.5	0	0	0	0.2	0	0.3	0.2	0.2	0	0.1	0.54	0-5.5	1.57	Nov
End of December	1	17.6	47.7	56	21.4	42.5	17.5	0.9	0.8	0.2	18.7	0.1	18.70	0.1-47.7	20.11	Dec
End of January	10.2	21.8	58.2	66	32.7	47.1	20.2	64.7	1.8	8.5	33.3	1.2	30.48	1.2-64.7	23.83	Jan
End of February	26	27.3	61	69.6	37	58.9	45.4	80.7	19.8	10.2	50.6	1.7	40.68	1.7-80.7	24.49	Feb
End of March	58.7	33.1	68.8	79.4	51.1	65.8	52.2	82.8	52.4	14.3	67.2	36.1	55.16	14.3-82.8	19.91	Mar
End of April	93.4a	92.2	99.8	98.7	99.1	98.9	96.4	97.8	99.4	99.5	99.6	99.2	98.24	92.2-99.8	2.23	Apr
End of May	100a	100	100	100	100	100	100	100	100	100	100	100	100.00	100-100	0.00	May

Real-time data evaluation for Drought Conditions

As part of the drought contingency planning process, NMFS supports evaluation of augmented real-time monitoring for fish presence and short-term flexible OMR operations to capture storm events. The agencies have also remained open to considering whether to defer the January 1st onset of OMR, given real-time conditions and the drought planning context. However, because of the wet November and December, the agencies have determined that proceeding with the January 1st start date is advisable, and NMFS therefore so recommends.

In general, it may be advisable to develop triggers based on hydrology and fish presence to vary the January 1st onset date, in order to more finely tune this RPA. For example, new information exists since 2009 that demonstrates that winter-run tend to hold in the mid-Sacramento river and enter the Northern Delta in mid-January to early February in very dry December and January hydrologies, such as last year. In these hydrologies, triggers could be developed to delay the onset of -5000 until after January 1st.

In contrast, in very wet November and December hydrologies, such as this year, we know that winter-run Chinook will follow those storm pulses into the North Delta and gradually distribute and rear in the Delta. In these hydrologies, a real-time trigger most likely would trigger -5000 before January 1st.

NMFS has discussed utilizing a real-time monitoring based approach with Reclamation and other parties, and remains open to developing such monitoring based real-time triggers for next year, if doing so remains of interest to the parties. However, in the immediate real-time context, due to the December storms, the January 1st onset of -5000 is necessary to provide minimum protection for fish already in the Delta, and given the current distribution of juveniles in the Delta, the use of such real-time triggers would merely confirm the need for instituting the OMR flow regimes in RPA Action IV.2.3.

The Delta Operations for Salmonids and Sturgeon (DOSS) technical team meets on a weekly basis and examines several data sets to assess species presence and distribution, and met today, December 30th, to examine current conditions and estimated that the large majority of juvenile winter-run Chinook have migrated into the Delta with these recent rains. Table 3 provides the likely distribution of winter-run and spring-run as discussed during the December 30, 2014, DOSS group meeting, and based on real-time data from various sampling locations (Tisdale and Knights Landing rotary screw traps, Sacramento beach seines, Sacramento trawl, Jersey Point and Prisoners Point trawls, Chipps Island trawl, and Banks and Skinner fish collection facilities) and the professional opinion of the DOSS membership.

Table 3. Distribution of winter-run and spring-run Chinook salmon, as discussed during the December 30, 2014, DOSS group meeting.

Species	**Location**		
	Yet to Enter Delta (Upstream of Knights Landing)	**In the Delta**	**Exited the Delta (Past Chipps Island)**
Young-of-year (YOY) winter-run Chinook salmon	< 5% (last week <10%)	>95% (last week >90%)	<5% (last week same)
YOY spring-run Chinook salmon	50% (last week 50% - 60%)	50 % (last week 40% - 50%)	<5% (last week same)
*Yearling spring-run Chinook salmon**	<5 % (last week <10%)	80 – 90 % (last week >75%)	15% (last week <10%)

*No yearling spring-run Chinook salmon have been observed in monitoring, but few are usually observed because of their ability to avoid monitoring gear due to larger size and greater swimming ability.