

CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE SUPPLEMENTAL REPORT  
SACRAMENTO RIVER WINTER CHINOOK – STATUS AND TREND CONSIDERATIONS FOR FISHERY  
PLANNING

As in 2015, The California Department of Fish and Wildlife (CDFW) recommends the Council consider additional protections for Sacramento River winter Chinook in 2016 beyond those required under the federal control rule and ESA consultation standard. This is in response to information suggesting poor survival of the 2013, 2014 and 2015 brood years that have yet to return as adults. The ESA-required control rule for 2016 Chinook fisheries south of Point Arena allows for a maximum impact rate of 19.9 percent, as calculated using the three year geometric mean of winter run escapement – which equates to nearly full fishing. The Department further notes that a retrospective look at adult escapement of past brood years does not inform management about the strength of brood years in the ocean that may be subject to ocean fisheries in 2016. The Department believes there is a need to deliberately consider information about survival of out-migrants and prospective brood strength in the management process this year, in response to current events associated with the ongoing California drought and ocean conditions.

The estimate of brood year 2013 juvenile winter run that emigrated from the upper Sacramento River past Red Bluff Diversion Dam (RBDD) was approximately 1.7 million fish (Table 1). Despite this relatively normal upper river passage, only 57 age-2 fish from this brood returned as jacks last year (see Table B-3 of Appendix B, pg 209 from agenda item E.2, Review of 2015 Ocean Salmon Fisheries). Given the probable correlation between the number of jacks returning in year 1 with the number of adults to return in year 2 (see Agenda Item D.1.e CDFW Supplemental Report, April 2015 Council Meeting), the Department expects the 2016 adult escapement of brood year 2013 winter run will likely be low. This was the third lowest jack escapement on record under the current escapement methodology. The first and second lowest jack escapements were in 2009 when there were 53 jacks, and 2010 when there were only 41. The adult escapements in the following years were roughly 1,500 in 2010 and 600 in 2011 (Table 2). The only lower jack escapements were estimated using the RBDD counts in the early to mid-1990s when the stock was listed as endangered under the ESA and at historically low levels.

During the 2015 season setting process, the Council recommended time and area closures as well as a reduced maximum allowable impact rate for California's 2015 fisheries to provide additional protection to winter run in light of new information suggesting high mortality on emigrating juveniles. Fishery data collected in 2015 could suggest these additional protections were effective in minimizing winter run impacts in ocean fisheries, as only two coded-wire tags were recovered in sampled harvest (one from brood year 2012, and one from brood year 2013). However, it is unclear if this minimal showing of winter run in the harvest - particularly the absence of 2013 brood year fish which would have been the most susceptible to take in the fishery last season - suggests management was highly effective, or conversely, there are very few fish in the ocean.

The estimate of brood year 2014 juvenile winter run passage at RBDD was approximately 411,000 fish. This brood suffered as much as 95 percent mortality in the river prior to emigration due to effects of the drought on reservoir storage and water temperature in the uppermost portion of the river. The 2014 brood will be susceptible to fishery-related mortality and harvest as age-3 adults in the 2016 ocean salmon fishery. This brood also likely encountered warmer and less productive ocean conditions prior to recruitment to the fishery (see Agenda Item D.1.a NMFS Report 1, State of the California Current Report, 2016). For these reasons it is anticipated that this brood will require additional protections in 2016 ocean salmon fisheries.

The estimate of brood year 2015 juvenile winter run passage at RBDD was approximately 334,000 fish at the time this document was produced, and it is likely that juvenile emigration is nearly complete at this time. Similar to the 2014 brood, this low juvenile production has been attributed to unsuitable water temperatures in the upper Sacramento River due to drought conditions and low water storage in Lake Shasta. These fish have the potential to be contacted in ocean fisheries in 2016 as sublegals, and may warrant considering the need for additional protections in ocean fisheries next year when they are most susceptible to fishery impacts.

The Department expects there is a precipitous decline occurring in the winter run stock at this time, given the poor showing of the 2013 brood year to date, coupled with extremely low juvenile emigration of the 2014 and 2015 brood years which are expected to experience inhospitable ocean conditions before returning to the river as adults. As a result, the Department recommends the Council apply added precaution in crafting 2016 fishery regulations, as it did in 2015. CDFW will work closely with constituents and federal managers to tailor fishery opportunities south of Point Arena to allow for harvest of healthy stocks while also employing needed protection for the Sacramento River winter Chinook.

For determining 2016 ocean fisheries, the Department again recommends the Council use both of the following tools to provide additional winter run protections, as it did in 2015:

- A. Pre-season fishery impact rate should not exceed 17.1 percent, which is the pre-season rate predicted using the 2015 fishery regulations against 2016 ocean abundance forecasts of target stocks. This is intended to limit opportunity in the range of alternatives to no greater than what was had in 2015, however additional impact rate savings should be considered during the pre-season planning process.
- B. Employ time/area closures where risk of winter run encounters is greatest (e.g., south of Point Sur, see Agenda Item D.1.e Supplemental CDFW Report 3, April 2015 Council Meeting).

<u>Brood Year</u>	<u>Passage</u>
2009	4,401,776
2010	1,280,951
2011	848,980
2012	1,364,132
2013	1,773,886
2014	411,328
2015	334,173

Table 1. Yearly estimated passage of unmarked juvenile winter Chinook salmon at Red Bluff Diversion Dam for brood-years 2009-2015. Sampling and estimates of passage by USFWS. 2015 total is current as of February 25, 2016.

<u>Escapement Year</u>	<u>Jacks</u>	<u>Adults</u>
2009	53	4,363
2010	41	1,555
2011	187	637
2012	144	2,527
2013	462	5,623
2014	327	2,688
2015	57	3,382

Table 2. Annual escapement of Sacramento River winter Chinook since 2009 in jacks (age-2) and adults. Jacks in year 1 for 2009 and 2010 and adults that followed in year 2 are highlighted. 2015 jack total also highlighted. 2016 adult total will be reported in the Review of 2016 Ocean Salmon Fisheries.