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December 15, 2015

Mr. Will Stelle
Regional Administrator, West Coast Region
National Marine Fisheries Service
7600 Sand Point Way Northeast
Seattle, WA 98115

Dear Mr. Stelle:

Winter-run Chinook Salmon Escapement Estimates for 2015

The California Department of Fish and Wildlife (Department) has developed Sacramento River winter-run Chinook salmon escapement estimates for 2015. These estimates were developed from data collected in the Upper Sacramento River Winter-run Chinook Salmon Escapement Survey (carcass survey) by Department and U.S. Fish and Wildlife Service (USFWS) personnel.

Escapement estimates based on the application of the Cormack-Jolly-Seber (CJS) mark-recapture population model to the carcass survey data for 2015 are shown below:

Estimated Total In-river Escapement (hatchery and natural origin)	3,182
Estimated In-river Escapement (hatchery origin)	639
Estimated Number of In-river Adult Females (hatchery and natural origin)	2,063

These estimates include naturally spawning winter-run Chinook salmon (winter-run) in the upper Sacramento River. In addition, 257 winter-run were collected at the Keswick trap site upstream from RBDD for spawning at Livingston Stone National Fish Hatchery (LSNFH). These fish are not included in the above estimate of naturally spawning winter-run. The total winter-run spawning escapement estimate in 2015, including in-river spawners and fish collected for hatchery broodstock, is **3,439** fish. The 90% confidence interval on this total estimate is from **3,042 to 3,836** fish.

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This year, the escapement estimate was again calculated from the carcass survey data using a CJS model. The CJS model has been used from 2013 to present. From 2003-2011, the escapement estimate had been based on application of the Jolly-Seber model. In 2012, based on the recommendations of the *Central Valley Chinook Salmon In-River Escapement Monitoring Plan* (DFG 2012), the winter-run carcass survey used field and analysis methods consistent with application of the CJS model. In simulation studies performed in the development of the Monitoring Plan, the CJS model was shown to more accurately estimate escapement based on mark-recapture data than any other available model. Due to its similarity to the Jolly-Seber model previously used to estimate winter-run escapement, we consider the data for 2013 to be directly comparable for trend analysis with escapement estimates from 2003 through 2012. The CJS model allows the calculation of confidence intervals; we began reporting confidence intervals on our total estimate for the first time in 2012 and continue doing so this year. The total escapement number above is the winter-run total estimate modelled to date and is a final number subject to revision. This estimate is subject to revision if additional data becomes available after the date of this letter. The additional data would then be used in the CJS model to recalculate the final escapement number. The most up to date modelled estimate calculation can be found in the [GrandTab spreadsheet](#) which is updated periodically after this letter is sent in the event that new information is received.

In the spring of 2015 the Department and the other fisheries agencies again recognized the continuing severity of the drought in California. To maximize survival of adult winter-run given the uncertainty of sufficiently cold water in the upper Sacramento River later in the year, the LSNFH was permitted to take additional winter-run brood stock. In prior years LSNFH was permitted to take 120 adults for hatchery brood stock, but given the emergency drought conditions, the LSNFH staff removed 257 fish in 2015 including 146 natural-origin and 111 hatchery-origin fish.

We look forward to further discussion and collaboration with NOAA Fisheries staff regarding the application of this information. Inquiries regarding the methodology and development of the estimates in this letter should be directed to Mr. Douglas Killam, Doug.Killam@wildlife.ca.gov or Mr. Daniel Kratville, Daniel.Kratville@wildlife.ca.gov and at the address and phone number above.

Sincerely,

Stafford Lehr, Chief

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