

Sacramento River Winter-Run Chinook Salmon Update

August 31, 2015

This document provides preliminary reporting of impacts to brood year 2015 Sacramento River winter-run Chinook salmon (winter-run). Parents of the 2015 brood year began returning this past winter, and are monitored and collected in California Department of Fish and Wildlife's adult spawner surveys. Carcass collections to date (N=1,169) indicate that the final spawner population will likely be lower than the previous three years (2012= 2,671, 2013=6,085, and 2014=3,015). Precise numbers are not available until completion of the survey in late September, but a draft estimate range of between 2,000 to 3,000 spawners is projected for 2015.

Recovery of the winter-run stock is based upon wild fish contribution to the population. Livingston Stone National Fish Hatchery (LSNFH) is a conservation hatchery intended to maintain genetic integrity across the range of abundances for this stock, including protection against catastrophic collapse. Concurrently it is also intended to supplement the wild fish production of the winter-run stock through the release of marked smolts tagged with coded-wire tags; a statistically based proportion of the fish are also implanted with acoustic tags. The Council was updated on the actions to supplement the 2014 brood year natural production at its March meeting (http://www.pcouncil.org/wp-content/uploads/2015/03/F1a_Sup_Att2_ReconSactoHrvstCntrlRule_MAR2015BB.pdf).

Efforts to expand winter-run broodstock collection at LSNFH in 2015 due to ongoing drought were hampered by limited numbers of broodstock collected in the trap at Keswick Dam. Additionally, disease outbreak and related mortality within the captured winter-run broodstock further limited available spawners. The hatchery observed higher than usual rates of a bacterial furunculosis as well as erythema rash on some of the broodstock fish. The pathogen responsible for these outbreaks is still under investigation by the United States Fish and Wildlife Service (USFWS).

To date, LSNFH staff has finished their 2015 collection and spawning efforts resulting in a preliminary total collection of 256 winter-run, of which 186 were successfully spawned. As discussed above the winter-run broodstock suffered pre-spawn mortality (N=70). LSNFH staff report no elevated mortality of fry to date and have provided a preliminary release estimate of 400,000 smolts later this year or early 2016. This is a reduction from the approximately 600,000 smolts that were released in the previous year. The reduction in smolt production is due to the combination of factors discussed above -- limited broodstock and an incidence of disease among those broodstock that were collected. Both the 2014 and 2015 production releases are a substantial increase from the normal 200,000 smolt production target for this hatchery. These increases were implemented to mitigate for the anticipated mortality to natural-origin in-river production due to the ongoing drought.

It should be noted that a closure to all fishing from the Highway 44 Bridge upstream to Keswick Dam was initiated in 2015, in response to low winter-run numbers and to eliminate the risk of incidental hooking mortality associated with the resident trout fishery in this stretch of the waterway. This closure was intended to protect winter-run spawners returning to this area, including those fish that may be trapped and used for broodstock.

Redd surveys by boat and helicopter report that all but two of 196 observed 2015 winter-run redds were located upstream of the Highway 44 Bridge in Redding in the fishery closure area, which constitutes the uppermost six miles of spawning habitat in the Sacramento River. All of these 196 redds are located within the stretch of the Sacramento River that is regulated for temperature compliance below the Shasta Dam. Due to ongoing severe drought, the Shasta Reservoir outflow water quality is monitored closely and water temperatures within this regulated reach are continuously monitored for compliance as it relates to winter-run survival.

Winter-run survival is expected to be best when water temperatures within the Sacramento River do not exceed 56 °F. The Department of Fish and Wildlife, USFWS, and National Marine Fisheries Service agreed to raise the minimum temperature at the compliance point from 56 °F to 57 °F to extend the ability to maintain in-river water temperatures through the critical life stages of winter-run development. Because water temperatures have been higher than 56 °F at times, some mortality of eggs and fry may have occurred. Due to drought conditions this year, temperatures and flows have been maintained to reduce impacts to winter-run eggs and fry through the fall. However recent short duration fluctuations in flow due to unannounced hydropower testing at Keswick Dam have elevated concern that shallow water redds have been dewatered and mortality to winter-run eggs and fry may have occurred. Ongoing multiagency discussions are taking place to eliminate these types of unscheduled flow changes. No determination of mortality as a result of the short term flow and water temperature fluctuations is possible until juvenile survival is assessed downstream.

Efforts to conserve cold water flows through management of releases and adjustment to the maximum allowable water temperature may help to extend the cold water outflow season for winter-run eggs and fry through the fall. However, there are new efforts to release this water at a higher rate for downstream water supply needs. It is unknown if this will shorten the available cold water season for the needs of winter-run critical life stages.

Juvenile winter-run survival is measured at the Red Bluff Diversion Dam (RBDD) using USFWS operated screw traps to estimate abundance. The traps provide an estimate of winter-run passage (wild and hatchery juveniles) as they emigrate to the ocean. To date, a few thousand juvenile winter-run have been observed at the RBDD traps (as is typical this early in the emigration season). Further information on survival will be available as the emigration season progresses, but at this point in time it is premature to determine how 2015 brood year winter-run survival has been impacted. Information from the RBDD traps will be available after November and can be provided to the Council for consideration at its March 2016 meeting.