

INTERNAL NMFS DRAFT 1/17/2020 4:59 PM
NOT FOR DISTRIBUTION

Dear Reclamation:

The last four years of drought; in combination with record high temperatures, record low precipitation, and record low snowpack; have been unprecedented. Comparably unprecedented is the level of coordination between NOAA's National Marine Fisheries Service (NMFS) and the U.S. Bureau of Reclamation (Reclamation), in addition to the U.S. Fish and Wildlife Service, California Department of Water Resources, California Department of Fish and Wildlife, and California State Water Resources Control Board, on the development and implementation of Sacramento River temperature management plans over the past two years. System-wide operations were intensely examined during the collective development of multiple drought strategies and drought contingency plans (including the Sacramento River temperature management plans) by the State and Federal agencies, and the agencies displayed equally impressive coordination through the implementation of these plans through real-time operational discussions at the Sacramento River temperature task group meetings, real-time drought operations management team meetings, directors' meetings, and Shasta operations meetings. However, despite our valiant and concerted efforts, juvenile Sacramento River winter-run Chinook salmon (winter-run, *Oncorhynchus tshawytscha*) from brood year 2014, and likely brood year 2015, suffered considerably higher than average mortalities in the egg to fry stages.

This letter is to inform you that the amount and extent of take on winter-run associated with the last two years of Shasta operations is greater than was analyzed or authorized in NMFS' June 4, 2009 biological and conference opinion on the long-term operation of the Central Valley Project (CVP) and State Water Project (SWP, 2009 Opinion). We also write to you today in the hopes of providing initial direction to prepare for the operational season ahead.

Our conclusion at this juncture is that various reasonable and prudent alternative (RPA) actions within Action Suite I.2 Shasta Division¹, as prepared by our staff in consultation with your staff, are not performing as designed to achieve their objective to avoid jeopardy of Sacramento River winter-run Chinook during an extended drought. Specifically, the following actions in RPA Action Suite I.2, despite our collective best efforts, have remained unachieved:

1. Ensure a sufficient cold water pool to provide suitable temperatures for winter-run Chinook spawning between Balls Ferry and Bend Bridge in most years, without sacrificing the potential for cold water management in a subsequent year.
2. Ensure suitable spring-run Chinook temperature regimes, especially in September and October. Suitable spring-run temperatures will also partially minimize temperature effects to naturally-spawning, non-listed Sacramento River fall-run, an important prey base for endangered Southern Resident killer whales.

RPA Action I.2.1, as you are aware, requires various performance measures to be established and operated to for temperature compliance points and End-of-September (EOS) carryover storage at Shasta Reservoir, enabling Reclamation and NMFS to assess their effectiveness over time. RPA

¹ Action Suite I.2 starts on page 17 of enclosure 2 in http://www.westcoast.fisheries.noaa.gov/publications/Central_Valley/Water%20Operations/Operations,%20Criteria%20and%20Plan/040711_ocap_opinion_2011_amendments.pdf

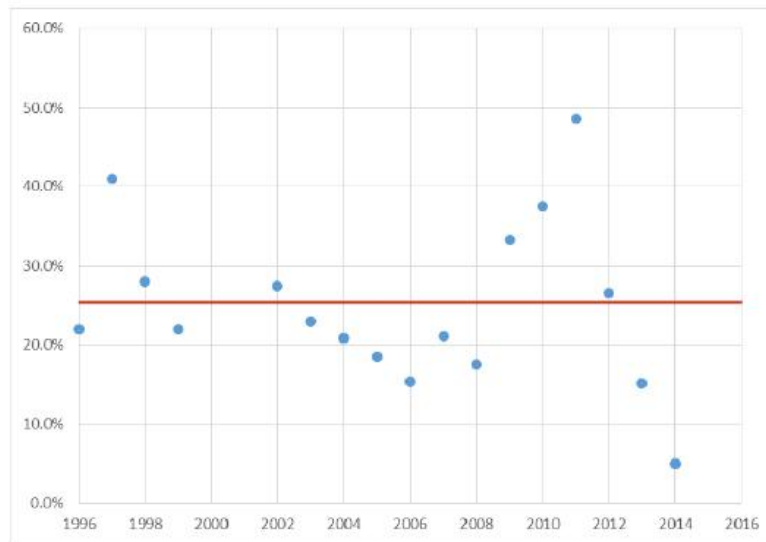
Action I.2.3.C further provides for drought exception procedures if DWR's February hydrologic forecast shows, based on 90 percent hydrology, that the temperature compliance point at Clear Creek or 1.9 million acre-feet EOS storage at Shasta is not achievable. (However, this action still requires a daily average water temperature not to exceed 56°F at the temperature compliance point.)

In 2014, daily average water temperatures of 56°F were maintained (with several exceedances) for much of the summer until temperature control was lost in the beginning of September. Following loss of temperature control, daily average water temperatures eventually increased to past 62°F at the Clear Creek compliance point. This exceedance likely resulted in considerable mortality, as the majority of winter-run Chinook fry were still incubating within their redds.

To avoid this same situation in 2015, Reclamation, NMFS, and CDFW worked to develop a Sacramento River temperature management plan that included stable Keswick releases, and targeted a daily average water temperature of 57°F, but allowed increases up to 58°F if they resulted in cold water savings at Shasta Reservoir. Daily coordination among the agencies on fish monitoring and operations ensured that metrics within this Sacramento River temperature management plan were met, and we ended the water year with relatively successful plan implementation, despite three instances where daily average water temperature exceeded 58°F and two additional planned (required testing) and unplanned (power generation unit shut down) flow fluctuations that may have resulted in additional negative effects to incubating winter-run eggs and alevin.

Despite these efforts, Sacramento River winter run Chinook in brood year 2014, and likely brood year 2015, have suffered considerable loss. Data collected by XXXXX, illustrate that the 17-year (1996-2014, except for 2000-2001) average survival of winter run egg and fry to Red Bluff Diversion Dam (RBDD) was approximately 26%. According to XXXX, the approximately 5% survival for brood year 2014 was an 80% reduction in survival compared to the 17-year average.

Winter-run egg to fry survival RBDD



In addition, although the juvenile winter-run emigration season for brood year 2015 is not complete, it is shaping up to have very poor survival in the egg and fry stages, as provided in the table, below, with monitoring through November 18.

Year	Winter-run Fecundity (eggs per female)	Winter-run Population Estimate ¹			Red Bluff Juvenile passage estimate through 11/18
		In-river	LSNFH ²	Total	
2014	5,308	2,627	388	3,015	354,876
2015	4,819	3,171	256	3,428	252,675
Dif 2015-2014	-489	544	-132	413	-102,201
Percentage	-9%	21%			-28.8%

¹ Population estimate is preliminary and may change

² LSNFH = Livingston Stone National Fish Hatchery

The incidental take statement in the 2009 Opinion anticipates, and provides for:

- incidental take associated with reduced spawning area, embryo incubation (Table 13-1 starting on page 730); and
- some incidental take resulting from dry hydrologic conditions or moderate precipitation (Section 13.1.2.3, page 771 on Water Temperatures and Flows), including:
 - Dewatering of some winter-run, spring-run, and Central Valley (CV) steelhead redds, and egg and pre-emergent fry mortality.
 - Mortality of juvenile CV steelhead resulting from high water temperatures (*e.g.*, Clear Creek and American River).

- Reduced availability and suitability of winter-run, spring-run, and CV steelhead habitat for juvenile rearing and emigration.
- Adult salmonids not being able to reach spawning areas within tributary streams by creating thermal barriers and subjecting them to increased poaching or predation in summer holding pools.

The 2009 Opinion does not anticipate, or provide for, the level of incidental take resulting from Sacramento River temperature management operations in 2014 and likely in 2015.

With generally a 3-year life cycle, and brood years 2014 and 2015 having very low survival in the early life stages, it will be very important to provide for adequate suitable habitat (water quantity and quality) to provide for higher survival of the early life stages of brood year 2016. This will require early and careful planning of operations, along with utilizing conservative forecasts, prior to the temperature management season, and regular and frequent coordination throughout the temperature management season.

While we are open to exploring with you options for reinitiation of consultation, we believe at this time that the most expeditious path to an effective operation is to utilize the amendments process in provided in the RPA (section 11.2.1.2 Research and Adaptive Management on page 9 of the 2011 amendment²). This section of the RPA anticipated that new scientific information, such as new information on the amount and extent of take, could be included through an amendment.

Therefore, we propose to craft a new Shasta RPA action suite for 2016, and potentially beyond, that includes lessons learned from the past two years. Considerations may include, but are not limited to temperature model inputs that create a conservative buffer for initial allocations in order to augment the cold water pool available by the end of May. These may include:

- a target temperature more conservative than the daily average water temperature of 56°F for the February forecast,
- managing to a 7-day average of the daily maximum temperature, and/or a daily minimum, in lieu of or in addition to the daily average,
- utilizing model inputs of ambient air temperatures based on the historic record temperatures of the past two summers,
- managing the temperature compliance point with a spatial buffer for redd location,
- managing gate operations in real-time to delay the full side gate operation until at least October 31st, and
- further limited Keswick releases in February through July to augment and conserve cold water resources.

We recognize that some of these elements may cause re-operations in ways that affect deliveries to the Sacramento River Settlement (SRS) contractors and the integrated CVP/SWP system as a whole, and we propose to work closely together to minimize any impacts to operations and

2

http://www.westcoast.fisheries.noaa.gov/publications/Central_Valley/Water%20Operations/Operations,%20Criteria%20and%20Plan/040711_ocap_opinion_2011_amendments.pdf

deliveries. Specifically, operations at Folsom and Oroville reservoirs are important to consider to balance all needs.

At this juncture, we also request that you reinitiate consultation on the SRS contracts themselves. As you know, NMFS issued a concurrence letter to Reclamation on January 10, 2005, that stated, "No additional incidental take is authorized for these contract specific actions beyond the amount or extent of incidental take authorized in the October 22, 2004 OCAP BO." For reasons stated in this letter, that conclusion is no longer supported by recent evidence. We believe it will be important to work closely with the SRS contractors, in a Section 7 consultation process, to explore options for further rescheduling and transferring their water in order to allow for protection of the last cohort of winter-run.

NMFS appreciates the multiple efforts of the SRS contractors, especially in 2014 and 2015, to help manage the limited water supply in Shasta Reservoir and maximize the efficiency of the Keswick releases, including by:

- Limiting and delaying flood up diversions in April and May;
- Planting different varieties of rice for shorter growing seasons;
- Limiting diversions for rice decomposition in the fall;
- Coordinating large volumes of transfers in the summer and fall; and
- Coordinating and rotating diversions among the SRS contractors to limit the flow reductions within the Sacramento River.

Based on these coordination efforts in the past, NMFS has confidence that together, we can balance the many needs for the limited water supply in 2016 if drought conditions persist.

Close by inviting joint efforts and dialog over the months ahead; recognize the need to balance, importance of being both science based and innovative to get through these very difficult circumstances.