UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
650 Capitol Mall, Suite 5-100

Jeanine Townsend
Clerk to the Board
State Water Resources Control Board
P.O. Box 100
Sacramento, California 95812-2000

Dear Ms. Townsend:

NOAA's National Marine Fisheries Service (NMFS) appreciates the opportunity to submit comments on the State Water Resources Control Board's (Board) Working Draft Scientific Basis Report (SBR) on the Phase II update of the 2006 Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary (2006 Bay-Delta Plan). NMFS is responsible for the administration of the Endangered Species Act (ESA) of 1973, as amended [16 U.S.C 1531 *et seq.]* with regard to listed salmonids and green sturgeon. In the Sacramento River, Sacramento-San Joaquin Delta (Delta), and the Delta's eastside tributaries, these include: Sacramento River winter-run Chinook salmon *(Oncorhynchus tshawytscha),* Central Valley spring-run Chinook salmon (*O. tshawytscha),* California Central Valley steelhead (*O. mykiss),* and the Southern Distinct Population Segment of North American green sturgeon *(Acipenser medirostris).* In addition, NMFS has jurisdiction over managed species pursuant to the Magnuson-Stevens Conservation and Management Act, which include all Chinook salmon runs in the Central Valley (including fall-run and late fall-run Chinook salmon).

The purpose of the SBR is to identify the science that will be relied upon to consider potential changes to the Bay-Delta Plan in Phase II. Below we have summarized NMFS' comments on the Working Draft SBR:

1) **New Tributary Inflows:** NMFS supports the recommendations for year-round inflow requirements for the Sacramento River mainstem and certain tributaries and eastside Delta tributaries based on hydrology. Instream flows need to be developed that embrace the unimpaired, historic life history presence of anadromous fish, to support all anadromous salmonid and sturgeon life history stages and the ecological function of critical and essential fish habitat. Instream flows should support upstream and downstream migration and rearing needs, including successful, unimpeded passage over critical riffles and other impediments. They should also support effective inundation of important rearing habitats such as riparian zones, floodplains and side channels.

2) **Percent of Unimpaired Flow:** NMFS also believes percent of unimpaired flow is a useful approach to achieve a more natural flow pattern in the Sacramento River and Delta as it captures both within year and between year changes in hydrology. However, the lower end of the proposed range (starting at 35 percent of unimpaired flow) is not adequate to achieve viable salmonid populations.

3) **Species Specific Analysis:** NMFS recommends the Board use the best available scientific information for developing flow needs. The SBR uses "a combined species evaluation for all four runs of Chinook salmon and Central Valley steelhead." We believe this approach does not adequately address the very specific flow needs the different runs of Chinook salmon and steelhead throughout the Sacramento Basin, particularly in certain tributaries such as Mill, Deer, Butte and Antelope creeks. The SBR would be strengthened through the development and use of tributary and river-reach specific life history timing tables for each specific anadromous fish species.

4) **Interior Delta Flows and Modified Delta Outflows:** Insufficiencies in the quality and quantity of Delta flows have contributed to the decline of the Delta ecosystem. Unsustainable conditions in the Delta have also contributed to species declines. Increased Delta outflow requirements in the January through June period in combination with other requirements affecting interior Delta flows (Delta Cross Channel Operations, management of Old and Middle River flows, and export limits) will, in combination, reduce the disruption of the natural hydrograph and flow patterns. NMFS emphasizes that the Delta requirements implemented via the Phase II process must protect the San Joaquin River flows entering the Delta via requirements in the Phase I process. Through-Delta survival rates for outgoing juvenile Chinook in the San Joaquin River are particularly low and unlikely to support viable salmon populations at current levels. NMFS recommends the Board also look at the pending Collaborative Adaptive Management Team's Salmon Scoping Team's Gap Analysis Report (focused on salmonid survival in the south Delta), the NMFS Southwest Fisheries Science Center (SWFSC) acoustic tagging work on reach-specific survivals, and the updated flow-survival work being completed as part of the California WaterFix ESA Section 7 consultation. Once publications related to those efforts are completed, NMFS will provide them to the Board's staff.

5) **Coldwater Habitat:** NMFS supports increased cold water habitat below reservoirs but recommends that the Board look at other options contained in our California Central Valley Salmon and Steelhead Recovery Plan[1] to help increase the flexibility needed to implement the broad Bay-Delta Plan. These include, among others, the reintroduction of winter-run Chinook salmon to Battle Creek and above Shasta Dam. These efforts will significantly increase the flexibility for Shasta Reservoir operations. In the meantime, the focus should be on management of cold water storage (which will require balancing with the expected benefits of increased inflows also recommended in the SBR) and temperature control below the dams. Winter-run Chinook salmon are highly vulnerable to water temperatures in their current spawning range below Shasta Reservoir. Given two out of the last three cohorts have likely suffered year class failures, we had to be vigilant this past water year to ensure optimal management of the Shasta cold water pool to protect the third year class. Recent investigations into causes of low egg-to-fry survival in 2014 and 2015 revealed that the 56°F daily average temperature criterion mandated in RPA Action I.2.4 of the 2009 Biological

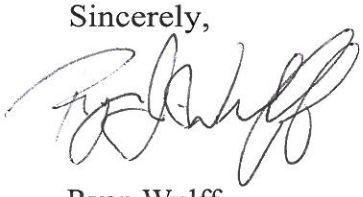
[1]http://www.westcoast.fisheries.noaa.gov/protected_species/salmon_steelhead/recovery_planning_and_implementation/california_central_valley/california_central_valley_recovery_plan_documents.html

Opinion on Long-term Operations of the Central Valley Project and State Water Project[2] is not adequate to protect the earliest life-stages of winter-run Chinook salmon. Therefore, NMFS currently supports the recommended metric of 55°F, measured as a 7-day average of the daily maximum temperatures from EPA[3]. As a specific example of coordinated temperature management, we recommend the Board look at the NMFS concurrence on the Sacramento River Temperature Management Plan for WY 2016[4]. This planning effort relied on several of the temperature management tools developed by the SWFSC, specifically the River Assessment for Forecasting Temperatures temperature model[5] and a temperature dependent mortality model.[6,7]

6) **Adaptive Management:** NMFS supports the use of adaptive management, but the Board should provide clear direction in the adaptive management process in its subsequent documents. The decision-making process should be well defined with clear guidance, for example, that any adjustment to protective measures should be linked to observed population trends and conditions needed to meet the narrative fish and wildlife protection objectives. Any new process should also build off of, and augment, existing efforts.

We thank you for the opportunity to provide comments on the SBR. NMFS looks forward to continue working with the Board, Board staff, and other stakeholders involved in the Bay-Delta Plan process. If you have any questions regarding this correspondence, or if NMFS can provide further technical assistance, please contact me at (916) 930-3733 or via email at Ryan.Wulff@noaa.gov.

Sincerely,



Ryan Wulff
Branch Chief, Delta Policy and Restoration
California Central Valley Office

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[2] The latest RPA language is provided in the 2011 Amendments to the 2009 Biological LTO BiOp, available at: http://www.westcoast.fisheries.noaa.gov/publications/Central_Valley/Water%20Operations/Operations,%20Criteria%20and%20Plan/040711_ocap_opinion_2011_amendments.pdf

[3] https://www3.epa.gov/region10/pdf/water/final_temperature_guidance_2003.pdf

[4] NMFS (National Marine Fisheries Service). 2016. Letter from Maria Rea to David Murillo re: Sacramento River Temperature Management Plan. June 28, 2016. 132 pages. http://www.westcoast.fisheries.noaa.gov/publications/Central_Valley/Water%20Operations/nmfs_concurrence_on_the_bureau_of_reclamation_s_sacramento_river_temperature_management_plan-_june_28__2016.pdf

[5] Pike A, Danner E, Boughton D, Melton F, Nemani R, Rajagopalan B and Lindley S 2013 Forecasting river temperatures in real time using a stochastic dynamics approach Water Resour. Res. 49 5168–82

[6] Martin, B., S. John, A. Pike, J. Roberts, and E. Danner. 2016a. Modeling temperature dependent mortality of winter-run Sacramento River Chinook salmon. National Marine Fisheries Service, Southwest Fisheries Science Center. Santa Cruz, California. Enclosure to June 28, 2016 letter from Maria Rea to David Murillo available at: http://www.westcoast.fisheries.noaa.gov/publications/Central_Valley/Water%20Operations/nmfs_concurrence_on_the_bureau_of_reclamation_s_sacramento_river_temperature_management_plan-_june_28__2016.pdf

[7] Martin, B. T., A. Pike, S. N. John, N. Hamda, J. Roberts, S. Lindley and E. Danner. 2016b. Phenomenological vs. biophysical models of thermal stress in aquatic eggs. Ecology Letters. doi: 10.1111/ele.12705