

## **Written Summary**

NOAA's National Marine Fisheries Service (NMFS) has jurisdiction over marine resources, including anadromous salmon, steelhead, and sturgeon that migrate through and rear in the Sacramento-San Joaquin Delta (Delta). NMFS administers the Endangered Species Act (ESA) for anadromous fish. In the Central Valley and Delta these include: winter-run Chinook salmon, spring-run Chinook salmon, Central Valley steelhead, and North American green sturgeon. Adequate flows are an essential component of habitat for all life stages of listed and non-listed anadromous fish, both upstream in rivers and spawning habitats and in the Delta. Flows affect cues for both upstream and downstream migration, affect access to and quality and quantity of rearing habitat, affect temperatures necessary for maintaining spawning, egg incubation and juvenile rearing, and are positively correlated with juvenile salmon survival. NMFS is providing these submittals in our role of offering technical assistance. We are ready to assist the State Water Resources Control Board (SWRCB) in its efforts to develop criteria for flow, temperature, and other conditions necessary for a Delta ecosystem that can support healthy fish populations.

## **Responses to Questions in the Original Notice**

### ***Question 2 – Methodology for developing flow criteria***

Clearly articulating what it means to protect public trust resources should be the starting point in the SWRCB's process of developing Delta flow criteria. Section 7 of the ESA requires that Federal agencies insure that their actions do not jeopardize the continued existence of threatened or endangered species or adversely modify their designated critical habitat. Courts have interpreted this standard to require consideration of the action's effects on recovery of the species. Section 7 has not been found, however, to require that an agency action insure recovery of threatened and endangered species. Consequently, prescriptions in an ESA biological opinion are likely to be less than what is required for full recovery of the species. In contrast, protection of public trust resources means insuring the conditions that will support a sufficient number of self sustaining populations for the species as a whole to be self-sustaining for the foreseeable future – in other words, insuring recovery of the species.

### ***Question 3 – The importance of the source of Delta outflow***

Establishing appropriate inflow requirements for the Sacramento and San Joaquin rivers is very important for providing the appropriate cues and conditions for successful migration of salmon, steelhead, and sturgeon into and out of habitats upstream of the Delta. For example, setting a Sacramento River inflow criterion that maintains unidirectional flows in the mainstem Sacramento downstream of Georgiana Slough during the salmon emigration period would minimize opportunities for emigrating smolts to enter the Central Delta once they have passed the Georgiana Slough bifurcation.

In order to protect all life history stages of Central Valley salmon, steelhead, and sturgeon, Delta flow criteria must not preclude the ability to meet upstream requirements for flow and temperature maintenance. For example, in the Bay Delta Conservation Plan process, NMFS has recommended the following end of April (and September) Shasta storage numbers deemed necessary to support adequate water temperatures for winter-run Chinook, spring-run Chinook, and fall-run Chinook below Shasta Dam:

End of April storage in Shasta Reservoir:

Minimum end of April storage for all water year types other than those specified below: 3.8 million acre-feet (MAF; objective to meet Balls Ferry temperature compliance point (TCP) through management of cold water pool releases).

Minimum end of April storage for wet years: 4.2 MAF (objective to meet Jelly's Ferry TCP through adaptive management of cold water pool releases).

Minimum end of April storage for third (or more) year in a series of dry and/or critically dry of years (*i.e.*, a prolonged drought): 3.3 MAF (objective to meet Clear Creek TCP through management of cold water pool releases).

End of September storage in Shasta Reservoir:

Minimum end of September storage: 2.2 MAF (objective to meet 3.8 MAF in end of April in the following year).

Minimum end of September storage for second (or more) year in a series of dry and or critically dry years: 1.9 MAF (objective to meet 3.3 MAF in end of April in the following year).

Similar storage recommendations are included in the NMFS Biological Opinion (Action I.2, p 590-603), with consultation among fishery agencies and Bureau of Reclamation built in to develop release schedules that optimize use of the cold water pool and help to maintain sufficient carryover storage.

Our supporting documents address both flows within the Delta and upstream flow considerations. We urge the SWRCB to consider inflow and upstream constraints when setting Delta outflow criteria. .

***Question 4- Uncertainty and Adaptive Management:***

The SWRCB is likely to face two kinds of uncertainty in the process of establishing Delta flow criteria:

- (1) uncertainty as to what flows each species requires for each life stage under different hydrological conditions, and
- (2) uncertainty as to how current conditions will change over time and lead to changes in flow needs.

In a system as complex as the Delta, it is impossible to gather enough data to describe key processes, evaluate important variables, and predict results of management actions with absolute certainty, especially in light of the climate disruption which is already evident in the Delta. In addition, analyses are subject to different interpretations by interest groups, and professional judgment plays a role in management decisions.

NMFS encourages the SWRCB to establish initial flow criteria that provide a margin of safety for fish populations dependent on the Delta, including full public trust protection of fishery

resources. Monitoring and adaptive management processes can be used to refine flows as they are incorporated into regulatory processes at a later date. Due to the highly imperiled status of many species, if flows are set too low initially and monitoring demonstrates that they are inadequate, some species could be extirpated. Protection of imperiled species in the face of uncertainty requires a precautionary approach.

### **Exhibit Highlights**

#### **NMFS Opinion (Exhibit 3)**

On June 4, 2009, NMFS issued its *Biological and Conference Opinion on the Long-Term Operations of the Central Valley Project (CVP) and State Water Project (SWP)* (Opinion) which provides many actions within its Reasonable and Prudent Alternative (RPA) to protect Delta species listed under the Federal ESA for which NMFS has jurisdiction. Flow related components of the Opinion include:

- In the Sacramento River Basin, the Opinion includes actions to manage the cold water pool in Shasta Reservoir in order to provide suitable habitat for winter-run and spring-run Chinook salmon in most years, without sacrificing the potential for cold water management in a subsequent year (Action Suite I.2, p.590-603).
- The Opinion includes a flow schedule for the American River to provide minimum flows for all steelhead life stages (Action II.1, p. 612)
- In the San Joaquin River Basin, the Opinion provides a minimum in-stream flow schedule throughout the year for the Stanislaus River, to protect Central Valley steelhead (Action III.1.3, p. 622-625, Appendix 2-E).
- The Opinion provides an interim minimum flow schedule for the San Joaquin River at Vernalis during April and May (Action IV.2.1, p. 641-645), effective through 2011. These flows are based on maintaining a minimum status quo for San Joaquin River basin salmonids populations. Long term flow schedules for the San Joaquin River are expected to result from the SWRCB proceedings on San Joaquin flows. .
- Additionally, in order to improve the outmigration success of San Joaquin River steelhead (as well as Sacramento River salmonids diverted into the interior Delta), Action IV.2.1 of the NMFS Opinion protects a fraction of San Joaquin River flow by means of an inflow (at Vernalis):export (combined CVP and SWP) ratio during April and May. This inflow to export ratio is responsive to water year type and has additional flexibility in the case of multiple dry years or health and safety concerns.

It is important to note that the flow protections described in the project description and RPA are the minimum flows necessary to avoid jeopardy. The Delta flow criteria necessary to “protect public trust resources” may not be the same as those called for in the NMFS Opinion, and will likely be greater than those described in the opinion. In addition, NMFS considered provision of water to senior water rights holders to be non-discretionary for purposes of the federal ESA as it applies to Section 7 consultation with the Bureau of Reclamation. This constrained development

of RPA Shasta storage actions and flow schedules. This constraint may not apply to the SWRCB flow criteria process. Vernalis flows in the Opinion were constrained by the Opinion's scope extending only to CVP New Melones operations. Operations on other San Joaquin tributaries were not within the scope of the consultation.

#### **NMFS Recovery Plan (Exhibit 5)**

In October of 2009, NMFS released a *Public Draft Recovery Plan for the Evolutionarily Significant Units of Sacramento River Winter-Run Chinook Salmon and Central Valley Spring-Run Chinook Salmon and the Distinct Population Segment of Central Valley Steelhead* (NMFS Recovery Plan). Required under Section 4 of the Federal ESA, a recovery plan is a roadmap that describes the steps, strategies, and actions that must be taken to return listed species to viable status and ensure their long-term persistence and evolutionary potential. One of the priority actions of the NMFS Recovery Plan is to implement a Sacramento River flow management plan that balances carryover storage need with instream flow and water temperature needs for winter-run, spring-run, and steelhead based on runoff and storage conditions, including flow fluctuation and ramping criteria.

While the "recovery standard" of this document may be nearer the charge of the SWRCB to protect public trust resources, it, like the NMFS Opinion, does not explicitly address the needs for fall-run Chinook salmon. That said, many of the actions described in the NMFS Opinion or NMFS Recovery Plan to improve conditions for ESA-listed species will also improve conditions for fall-run Chinook salmon.

#### **EFH Consultation (Exhibit 6)**

In addition to its authority under the Federal ESA, NMFS has authorities under the Magnuson-Stevens Fishery Conservation and Management Act to identify and describe Essential Fish Habitat (EFH) in fishery management plans, and to provide conservation recommendations to any agency taking an action that may adversely affect EFH. NMFS concluded that the proposed long-term operations of the CVP and SWP would adversely affect EFH for Pacific salmon, and offered conservation recommendations (p. 21-29) which include actions upstream of the Delta as well as in the Delta (p. 26-29). Many of the conservation recommendations include flow provisions to protect the habitat of all life history stages of Pacific salmon.

#### **Other Exhibits (Exhibits 7-10)**

Other exhibits provide information about:

- the magnitude of pulse flows important for emigration of winter-run Chinook salmon (Exhibit 7)
- the relationship of winter-run Chinook salmon smolt emigration and monthly Sacramento River flow volumes (Exhibit 8)
- patterns of observed vs. unimpaired flows in the Sacramento and San Joaquin basins (Exhibit 9)
- flow needs for green sturgeon and white sturgeon (Exhibit 10)