To advance the economic, social and environmental sustainability of Northern California by enhancing and preserving the water rights, supplies and water quality.

Predation – State of the Science Workshop on Fish Predation on Central Valley Salmonids in the Bay-Delta Watershed

July, 2013

The Northern California Water Association (NCWA) urges the independent panel to formally acknowledge and state that predation is a significant problem in the Bay-Delta and develop the foundation for the state and federal agencies to begin a concerted process to undertake actions necessary to address this important issue.

Although there seems to be a general recognition in the scientific community that predation is a major problem in the Bay-Delta, the actions to rectify this problem in an effective way are less clear to us based on our scientific understanding of the river and estuary system. In its deliberations, we urge the panel to seriously consider various options to help improve anadromous fish survival through the Delta and to remove or modify site-specific stressors and re-focused study efforts in the Delta with the objective of locating and fixing fish mortality sites.

NCWA and water resources managers in the Sacramento Valley are undertaking ongoing efforts to foster regional sustainability with respect to water resources in the Sacramento Valley. These efforts focus on partnering with federal and state agencies and conservation partners to improve migratory corridors and habitat for anadromous fish within the region. Tremendous investments and progress have been made in this regard; yet, there is more work ahead.

To further these efforts and advance our scientific understanding of these fisheries in the Sacramento River hydrologic region, water resources managers commissioned fisheries biologist Dave Vogel to prepare a scientific report investigating the reasons for the fish population declines and, more importantly, how to improve anadromous fisheries in the Sacramento Valley. We recommend panel members read the detailed scientific report entitled, *Insights into the Problems, Progress and Potential Solutions for Sacramento River Basin Native Anadromous Fish Restoration,* which can be viewed at http://www.norcalwater.org/wp-content/uploads/2011/07/vogel-final-report-apr2011.pdf.

I. Conclusions

In summary, the report includes the following key conclusions:

- Despite the enormous, unprecedented actions to improve fish production in the upper watersheds, there has been remarkable lack of focus or progress to fix the serious predation and habitat problems in the Delta, through which all Sacramento Valley anadromous fish must migrate. Overall, predation is likely the highest source of mortality to anadromous fish in the Delta. Despite the fact that in-Delta problems of predation at a variety of locations have been well-known for many years, very little progress—in many instances, no progress—has been made. Ironically, some measures implemented under the auspices of improving fish habitats have likely increased predation of anadromous fish in the Delta. The best available evidence indicates that in-Delta predation and habitat problems have gotten worse during recent decades.

- Until significant progress is made on correcting the habitat problems and largely site-specific sources of native juvenile anadromous fish mortality in the Delta, it is likely that many of the benefits of upstream actions are, and will continue to be, negated. Although many studies over decades have demonstrated low survival of anadromous fish in the Delta, more such studies continue and are proposed, but are not oriented to determine site-specific in-Delta mortality sources. Re-focused study efforts in the Delta are sorely needed with the objective of locating and fixing fish mortality sites. Overall, until major predation problems in the Delta are corrected, difficulties for anadromous fish restoration will remain.

- Other in-Delta and ocean-related actions also could significantly benefit the Sacramento Valley's salmonid populations. Appropriately-designed restoration of shallow-water rearing habitats in the Delta should be aggressively pursued because they would have a high probability of success. There may also be alternative ocean harvest methods that would increase salmonid populations by increasing the fecundity, or reproduction capacity, of the salmonids that spawn in the Sacramento Valley.

- The Sacramento Valley has instream flow agreements or requirements on every major watercourse in the Sacramento River hydrologic region. These requirements are found in State Water Resources Control Board (SWRCB) decisions, biological opinions, streamflow agreements, and other processes. A good summary of these agreements is available at: http://www.norcalwater.org/efficient-water-management/instream-flows/. Each of these agreements or requirements is intended to benefit anadromous fish by providing improved flows and temperatures. The state and federal fishery agencies have been actively involved in negotiating and approving these agreements, in overseeing their implementation (including monitoring and

adaptive management) and in evaluating the manner in which these programs meet the coequal goals of water supply reliability and ecosystem restoration.

- On the other hand, the State Water Resources Control Board and California Department of Fish & Game prepared reports in 2010 describing flow criteria that would result in high reservoir releases to attempt to ameliorate problems in the Delta. If implemented as proposed, without considering the risk of drastically reducing reservoir levels in some years, cold-water storage may be depleted, resulting in devastating impacts on anadromous fish egg incubation at critical times. Additionally, improperly timed high flows could provide unfavorable conditions for mainstem rearing fish. Implementation of the flows described in the SWRCB and DFG reports would have a high potential of largely undoing decades' progress in restoring conditions for salmonids in the Sacramento Valley. Development of opportunities to reduce site-specific Delta stressors through non-flow measures is warranted and overdue.

II. Recommended Actions

Borrowing from the report, we recommend that the following Delta actions be considered:

- Address out-migration diversions at the Delta Cross Channel and Georgiana Slough. Many juvenile salmon from the Sacramento River currently are diverted, as they seek to migrate to the ocean, into the central Delta by the Delta Cross Channel and Georgiana Slough. This problem occurs largely because of tides that would dwarf the effects of any Sacramento River streamflow requirements. Federal and state agencies should continue to study, and eventually implement, measures to help juvenile salmon migrate past the Delta Cross Channel and Georgiana Slough.

- Restore shallow-water habitats without promoting predators. Federal and state agencies should evaluate the opportunities for restoring shallow-water areas in strategic locations in the Delta that would expand rearing habitat for juvenile salmon. Restoration must be conducted carefully to ensure that restored areas do not become "hot spots" for salmon predators. In particular, any levee breaches must be feathered to ensure that breach areas do not become deep scour holes where predation rates are high. The state should evaluate the possibility of restoring shallow-water habitat on Sherman and Twitchell Islands, which are under state ownership to a significant degree.

- Address existing scour holes where predators consume juvenile salmon. Deep pools and holes in the Delta dramatically favor salmon predators. Some of these holes were created by levee breaches intended to restore habitat, as at Liberty Island. Federal and state fishery and resource management agencies should remedy problems at as

many in-Delta deep pools and scour holes as possible, partly by feathering levee breaches to reduce predators' advantage at those locations.

- Docks, marinas and other structures along Sacramento River salmon's migration route should be assessed and addressed as potential predator "hot spots." In-river structures create habitat that favors salmon predators. For example, a pipeline spanning the Sacramento River near the Sacramento Regional County Sanitation District's outfall is known as a striped bass fishing spot because striped bass congregate there to consume salmon. All in-river structures along Sacramento River salmon's migration must be assessed and addressed as potential contributors to in-Delta predation problems.

You can be sure that water resources managers in the Sacramento Valley, in partnership with federal and state agencies and conservation partners, will continue to pursue improvements for anadromous fish corridors and habitat in areas upstream of the Delta. We appreciate the panel considering the importance of predation as a significant problem in our ongoing efforts to improve the various runs of anadromous fish. We also look forward to working with the agencies in these efforts. Please let us know if we can assist you in any way or provide any additional information.

Sincerely yours,

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