

CALIFORNIA DEPARTMENT OF FISH AND GAME

TESTIMONY OF MICHAEL HEALEY

I, Michael Healey, provide the following written testimony under penalty of perjury in relation to the State Water Resources Control Board's Hearing to Determine whether to Adopt Draft Cease and Desist Order No. 262.31-XX and whether to Impose Administrative Civil Liability as Proposed in Administrative Civil Liability Complaint No. 262.5-46 against the North San Joaquin Water Conservation District.

Q1: Please state your name and your professional qualifications.

1. I, Michael Healey, graduated from Humboldt State University with a Bachelor of Science Degree in Fisheries in 1987. After graduation, I held a variety of seasonal jobs which entailed using many different methodologies for sampling fish and also for conducting fish populations with respect to hydroelectric power plant projects that ranged from small power plants to large scale power plants and water projects, such as the Central Valley Project and State Water Project. A copy of my resume is attached as CDFG Exhibit 6.

Q2: How long have you worked for the California Department of Fish and Game (CDFG) and in what capacity?

2. I have worked for the Department of Fish and Game for over 15 years as a full time employee. For over nine years I was involved with conducting fishery research in the South Delta related to special water diversions. My current position is the District Fishery Biologist for Sacramento and San Joaquin Counties. In that position, I am tasked with multiple assignments related to fishery management within my assigned Counties. These assignments include, but are not limited to the following:

- I am the Lead Biologist for performing the annual American River Escapement Survey,
- I am the Biologist in Charge of the Rotary Screw Trap Monitoring on the American River,
- I am the DFG representative for several river groups as they relate to Water Management and Fishery Protection, including the Mokelumne River Technical Advisory Committee, American River Operations Group, and the American River Task Force. In addition, in the past, I have participated in the Calaveras River Fish Group.
- I serve as the Department representative for a number of project teams working to improve monitoring survey data for use in assessing the success of restoration activities and flow standards, evaluating progress toward recovery of listed Anadromous and other fish species, and managing ocean and inland fisheries.

- I am the North Central Region's Triploid grass carp coordinator.

Q3: Is the Mokelumne River in San Joaquin County, one of your assigned counties?

3. Yes. I am generally familiar with the Mokelumne River and its resources below Camanche Reservoir. I have been the CDFG representative to the Mokelumne River Technical Advisory Committee since 2001. The Mokelumne River Technical Advisory Committee was created as a result of the 1996 Joint Settlement Agreement among CDFG, East Bay Municipal Utility District (EBMUD) and the United States Fish and Wildlife Service (JSA) and is a venue to coordinate fishery and habitat studies, river operations, monitoring programs, and research efforts to advance the knowledge and science about the Mokelumne River. In accordance with the JSA, EBMUD established a \$2,000,000 Partnership Fund in 1999 to develop joint action plans to protect the Mokelumne River Ecosystem. Currently, I am representing the CDFG on the Mokelumne River Partnership Coordinating Committee (PCC), which is another committee created pursuant to the JSA. The PCC provides operating support for the Partnership Fund program and consists of members from EBMUD, U.S. Fish and Wildlife Service, and the CDFG. The PCC makes recommendations to the Partnership Steering Committee to approve or reject funding for proposals with respect to the Mokelumne River ecosystem.

Q4: To your knowledge, what aquatic species are present in the Mokelumne River?

4. The Mokelumne River has approximately thirty eight aquatic species that I am aware of. Twelve species are native and twenty six species are non-native species. These species include five anadromous fish species: fall-run Chinook salmon, Central Valley steelhead, striped bass, American shad, and Pacific lamprey. (J. Merz, EBMUD, 2004). Central Valley steelhead are currently listed under the Federal Endangered Species Act as a threatened species

5. According to creel census data, the steelhead trout was the most important recreational fish in the Mokelumne River prior to the completion of Camanche Dam (DFG, 1959, The Influence of Proposed Water Projects on the Fisheries Resources of the Lower Mokelumne River; Amador, Calaveras, and San Joaquin Counties). After construction of Camanche Dam in 1963, steelhead numbers in the Mokelumne River declined precipitously (DFG Mokelumne River Fish Hatchery Annual Reports 1964-2001), reducing runs to a level of 200 or fewer fish per year (DFG 1991). More recent data suggests that the number of steelhead spawning redds ranged from zero in 1996 and 1997 to as high as 50 redds in 2002 (EBMUD, 2004), and that annual runs remain low.

6. A number of factors for over 100 years, including water use and availability, have contributed to the sparse returns of steelhead to the lower Mokelumne River. Recently, several of those factors have been identified and corrective measures taken by EBMUD and Woodbridge Irrigation District have been invested in efforts to enhance the availability and quality of habitat for salmon and steelhead spawning and rearing within the river. For example, in 1994 EBMUD installed a Super Oxygenation cone in Camanche Reservoir in an effort to increase dissolved oxygen levels below Camanche Dam and prevent further fish kills in the Lower Mokelumne River. In 2006 Woodbridge Irrigation District completed construction of a new and improved Woodbridge Irrigation Dam and its associated fish ladders to improve flow control at the dam to manage more effectively the JSA flow releases and provide attraction and passage for upstream migration. In addition, WID has placed a bypass pipe for fish diverted at their fish screen and subsequently released into the lower Mokelumne River downstream of the dam. Currently, WID is in the process of constructing a new fish screen at their diversion

7. Due to flow and temperature problems in the raceways at the Mokelumne River Fish Hatchery (MRFH), the Joint Settlement Agreement with EBMUD (CDFG Exhibit 7) identified that improvements were necessary to accommodate more rearing space to promote fish health and fish survival rates, while making hatchery operations more efficient. As part of the Joint Settlement Agreement, EBMUD agreed to pay construction costs for remodeling the MRFH. The upgraded MRFH was completed in July 2002 and EBMUD funds the annual operations and maintenance costs for all mitigation-related fish produced at the hatchery.

8. Because steelhead have been so heavily impacted by the construction of Camanche Dam, and by the allocation and availability of water downstream from the dam, the process of reestablishing a viable population in the Mokelumne River remains challenging. This process could be significantly enhanced through the screening of intake facilities along the river and by increasing river flows, especially during warm weather months when temperatures are highest.

Q5: Are there certain life stages of those species present in the Mokelumne River today in which they are more vulnerable and if so, when is that?

9. Yes. Essentially all life stages of Chinook salmon and steelhead are vulnerable to decreases in flow, increased water temperatures, water diversions, and impeded passage. Dam construction, diversion, mining activities, State Water Project and Central Valley Project operations, and impeded passage have caused a decline of the anadromous resources of the Mokelumne River (Department of Fish and Game. 1991. Lower Mokelumne River Fishery Management Plan).

10. Spawning Chinook salmon and steelhead adults are most vulnerable to elevated water temperatures above 60° Fahrenheit (F). Elevated water temperatures above 60° F support several diseases, parasites, and fungus already common in the environment and can contribute to the mortality rate of Chinook salmon retaining eggs. Salmon eggs incubated in water temperatures $\geq 60^{\circ}$ F can experience 100% mortality. Eggs released from a female salmon in $\geq 60^{\circ}$ F and incubated in $\leq 56^{\circ}$ F can experience 30% mortality. (Healey, 1977. The Effects of High Temperature on the Survival of Sacramento River Chinook Salmon *Oncirhynchus tshawytscha*, Eggs and Fry.)

11. Chinook salmon and steelhead redds (nests) and fry are vulnerable to flow fluctuations in river flow regimes. Flow fluctuations can cause redds to be dewatered, and cause stranding and isolation of fry. Aside from isolation and stranding, unscreened water diversions can also entrain fry and juvenile Chinook salmon and steelhead. Once salmon fry have absorbed their yolk sac they actively seek slower water velocities with ample water exchange and food availability in slower glides and pools where they begin to feed on smaller organisms. At this stage they are not very good swimmers and are easily at the mercy of the river flows. Unscreened diversions have been known to entrain fry and juvenile salmonids because the fry are not able to escape the current caused by the diversion, and therefore are entrained into the diversion. (Healey, MP, personal communication and observations at diversion sites along the Sacramento River and San Joaquin River). As the salmon fry continue to grow, they actively seek higher velocity water.

12. The critical stage from fry emergence through fry rearing differs somewhat for both Chinook salmon and steelhead. Adult Chinook salmon tend to spawn earlier and have a different life strategy for emigration than do steelhead. Chinook salmon fry emerge and rear mostly during the months December through March and most emigrate back to the ocean through June. Some of the Chinook salmon progeny may, however, remain in the river for one year.

13. Steelhead egg incubation and emergence is from January through June. Steelhead fry and juveniles orient themselves to riffles and runs with large cobbles. Unlike the Chinook salmon, steelhead fry and juvenile rearing is year around and they tend migrate back to the ocean as juveniles in one to two years following their emergence. Due to the year round residence of Mokelumne River juvenile steelhead in fresh water, they are particularly vulnerable to increased water temperatures, flow changes, and unscreened water diversions.

Q6: Assuming that NSJWD is not able to immediately install fish screens at their two existing diversions and their proposed diversion, do you have any recommendations, based on your knowledge of the above listed species and their life stages, for interim diversion operations?

14. Fry and juvenile Chinook salmon and steelhead rearing will be taking place from December through June. Diverting unscreened water during this period has the potential to entrain both juvenile and fry Chinook salmon and steelhead as they are seeking shallow water for food sources. Pumping should not be permitted without screened (or temporarily screened) diversions from December through June of each year. Regardless if the diversions are permanently or temporarily screened, a fish monitoring/salvage program, approved by CDFG, should accompany any diversion operations to verify that the screens are working properly.

Q7: Do you believe that it would be unnecessary for NSJWCD to be required to bypass a certain amount of water for the aquatic resources of the Mokelumne River?

15. No. NSJWCD should be required to bypass a certain amount of water for the aquatic resources of the Mokelumne River. Central Valley steelhead, as I previously stated, are listed as threatened under the federal Endangered Species Act.

16. The Mokelumne River fishery resource in general has suffered greatly throughout history since the early mining era from water pollution, water diversions, dam construction, low water flow, changes in the hydrograph, and elevated water temperatures. The main spawning area in the Mokelumne River for salmon and steelhead was where the now present Camanche Reservoir resides. Below Camanche Reservoir the river is incised because Camanche Dam prevented gravel recruitment downstream. Therefore, the riffle habitat, necessary for salmonid spawning and fry rearing has diminished over time. A dedicated amount of bypass water would benefit the Mokelumne River fisheries by incrementally increasing the amount of shallow water spawning and rearing habitat, which is almost nonexistent in the lower Mokelumne River (FERC/FEIS-0067, 1993). Without a bypass flow, water velocities decrease and ambient temperatures heat the slow moving water producing warmer water temperatures downstream especially during periods of warm ambient air temperatures.

Q8: To your knowledge, has the NSJWCD asked the CDFG to review and comment on study plans prepared by NSJWCD for the purpose of determining an adequate bypass flow requirement?

17. No.

Q9: To your knowledge, has the NSJWCD begun performing the studies that would be necessary to determine an adequate bypass flow requirement?

18. No.

Q10: Have you read and are you familiar with the Joint Settlement Agreement for the Lower Mokelumne River Project; FERC Project No. 2916-004 that is CDFG Exhibit 7?

19. Yes. I have read the Joint Settlement Agreement for the Lower Mokelumne Project that is CDFG Exhibit 7 and am generally familiar with its contents.

Q11: Is the NSJWCD a party to the Joint Settlement Agreement for the Lower Mokelumne River Project?

20. No.

Q12: Does the Joint Settlement Agreement for the Lower Mokelumne River Project, by its terms as you understand them, require the NSJWCD to do anything?

21. No.

Q13: Does the Joint Settlement Agreement for the Lower Mokelumne River Project, by its terms as you understand them, make any statement that the flow measures and non-flow measures would make it unnecessary for any other diverter on the Lower Mokelumne River to bypass a certain amount of water for the aquatic resources of the Mokelumne River?

22. No. The Joint Settlement Agreement for the Lower Mokelumne River Project is very specific that it only provides a reasonable contribution toward state and federal fishery goals from East Bay Municipal Utility District (EBMUD). For example, paragraph F8 provides:

The Parties agree that implementation of the flow requirements and non-flow measures set forth in this Agreement constitutes a reasonable contribution by EBMUD to provide reasonable protection and enhancement from current conditions for the anadromous fishery and ecosystem of the lower Mokelumne River, and constitutes a reasonable contribution on the part of EBMUD toward state and federal fishery restoration goals for the River set forth in the California Salmon, Steelhead Trout, and Anadromous Fisheries Program Act and the CVPIA.

Q14: To your knowledge, does the NSJWCD contribute financially to or otherwise contribute to the Partnership Coordinating Committee referenced in paragraph 3 of your testimony?

23. No.

Q15: Have you read and are you familiar with CDFG Exhibit 8, a transmittal memorandum and a Stipulated Agreement for Permit 10477, executed in 1992?

24. Yes. I have read that exhibit.

Q16: Is it your understanding that this Stipulated Agreement, executed by NSJWCD in June of 1992, requires NSJWCD not only to bypass flows released from Camanche Reservoir by the East Bay Municipal Utility District for the protection an/or enhancement of fish and wildlife, but also to cease diversion until under Permit 10477 until NSJWCD reaches an agreement with CDFG with respect to additional bypass flows or failing such agreement, until a further order is entered with respect to those additional bypass flows?

25. Yes. It is my understanding from reading the Stipulated Agreement that is CDFG Exhibit 8 that NSJWCD agreed in 1992 not only to bypass EBMUD flows for the fishery but also to cease diversion until reaching agreement with CDFG with respect to an additional bypass flow, or failing such agreement, until a further order by the State Water Resources Control Board, regarding such additional bypass flow from the NSJWCD, was entered.

Q15: Were you an employee of the CDFG in 1993 and at all times since then?

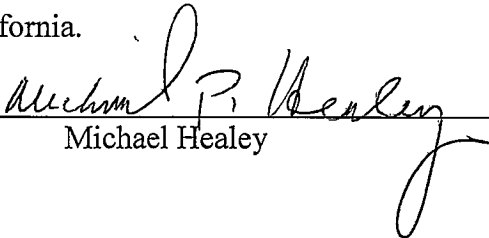
26. Yes.

Q16: Do you recall ever telling the NSJWCD that they did not need to install a permanent fish screen at any of their diversions on the Mokelumne River?

27. I have never told NSJWCD that they do not need to install a permanent fish screen at any of their diversion sites on the Mokelumne River.

I, Michael Healey, declare under penalty of perjury under the laws of the State of California that I have read the foregoing "Testimony of Michael Healey" and know its contents. The matters stated herein are true of my own knowledge except those matters which are stated based on information and belief, and as to those matters, I believe them to be true.

Executed on May 30, 2007 at Sacramento, California.



Michael Healey