January 28, 2008

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Dr. William Trush
Mr. Scott McBain
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Dear Doctors Gunther and Trush, and Mr. McBain:

Subject: Alameda Creek Population Recovery Strategies and Instream Flow Assessment for Steelhead Trout (December 2007), Alameda County

Department of Fish and Game (DFG) personnel have reviewed the above-referenced document (Study Document) prepared by consultants, McBain & Trush, for the Alameda Creek Fisheries Restoration Workgroup (Workgroup). This Workgroup, consisting of representatives from agencies and non-governmental organizations, was organized in 1999 to recover the anadromous steelhead (*Oncorhynchus mykiss*) population in Alameda Creek. Initial Workgroup efforts focused on identifying and removing or modifying physical barriers that prevent or delay steelhead migration. Since then, a number of Workgroup participants signed a Memorandum of Understanding (MOU) to cooperatively study and implement additional restoration actions in the Alameda Creek watershed. The above-referenced Study Document presents "Phase 1" of three phases to quantify, evaluate, and propose instream flow releases necessary to restore anadromous steelhead to Alameda Creek "while minimizing impacts to water supply and considering other native fishes and riparian communities."

DFG has reviewed this Study Document and have the following "process" and "technical" comments:

I. Process Comments

DFG applauds and encourages the efforts being made by the Workgroup members in their working cooperatively to restore steelhead in the Alameda

Creek watershed. In order to attain a viable population of steelhead in the watershed, DFG staff recommends that the objective and study elements of this Study Document focus exclusively on the science of restoring physical and ecological functions to Alameda Creek, particularly on native (listed and unlisted) species. After a robust scientific study is conducted to determine appropriate flows for native fishes, DFG can then negotiate with water agencies in regard to water operations within the Alameda Creek watershed. Therefore, DFG recommends deleting the second part of the objective "while minimizing impacts to water supply" so that this study is biologically-based and focused.

DFG is providing comments on the Study Document as both a responsible and trustee agency. As trustee for the State's fish and wildlife resources, DFG has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and the habitat necessary for biologically sustainable populations of such species. In this capacity, DFG administers the California Endangered Species Act (CESA), the Native Plant Protection Act (NPPA), and other provisions of the Fish and Game Code that afford protection to the State's fish and wildlife public trust resources. Since some of the Workgroup participants propose to use the Study Plan as a foundation to quantify and evaluate instream flow releases for facilities that are out of compliance with Fish and Game Code or require a Streambed Alteration Agreement (Fish and Game Code Section 1602), DFG, as a responsible agency, may consider using the data produced from the Workgroup and Study Plan for permitting purposes.

DFG reminds Workgroup members of Fish and Game Code Section 5937. This Code Section states, "The owner of any dam shall allow sufficient water at all times to pass through a fishway, or in the absence of a fishway, allow sufficient water to pass over, around or through the dam, to keep in good condition any fish that may be planted or exist below the dam." Anadromous steelhead have been extirpated from the Alameda Creek watershed primarily due to migration barriers and existing water supply operations in the watershed. The public utility agencies in the watershed, which are also Workgroup participants, should be aware that significant modifications in the current water supply operations may be required in order to restore viable steelhead populations.

II. Technical Comments

DFG recommends that this Study Document focus on enhancing habitat for steelhead, as well as for other native (listed and unlisted) fish species. DFG recommends that the Study Document also aim at enhancing habitat for foothill yellow-legged frogs (FYLF) (*Rana boylii*), a species of special concern,

California red-legged frogs (CRLF) (*Rana aurora draytonii*), a species federally listed as "threatened," western pond turtles (*Clemmys momorata*), a species of special concern, as well as other native aquatic species. California tiger salamander (*Ambystoma californiense*), a species federally listed as threatened, also reside in the watershed and may be considered within the document.

DFG recommends that the Study Document take into consideration differences between colder Northern California streams and arroyo-type Central/Southern California streams. Northern California streams are generally characterized by the following: they are cooler, more shaded, have lower food production, require two years for steelhead smolting, and have a lesser stream flow rearing effect. In contrast, Central/Southern California streams generally require lagoons or augmented stream flows, have a potential of one year for steelhead smolting, and stream flow is determined to have a major effect on rearing. DFG believes that Alameda Creek has the characteristics of a Central/Southern California stream and therefore are concerned that the Study Document portrays the Alameda Creek system as a Northern California stream with too much emphasis on the creation of deep pool habitat. Smith and Li (1983) showed that as temperature increased in Uvas Creek in Santa Clara County, habitat preferences for steelhead switch from pools (slow water velocity) to fast water habitat (riffles, runs, and the heads of pools) due to the elevated metabolic needs of steelhead and the associated higher food production (macroinvertebrate drift) of fast water. D. W. Alley and Associates (2004) found that juvenile steelhead that reared in the relatively warm, fast water habitats of the lower San Lorenzo River in Santa Cruz County grew larger than their counterparts in the headwaters of the San Lorenzo River (colder and less productive habitat). Trapping adults on the San Lorenzo River by Alley further showed that the majority of the returning adults were reared as juveniles in the relatively warm, fast water habitats of the SLR, indicating that fish which reared in the relatively warm, fast water habitat were more "successful" (had higher smolt-to-adult survival rates). Dr. Jerry Smith during his sampling at Alameda Creek found that the rearing steelhead preferred fast water habitat, further proving evidence that Alameda Creek fits the Central/Southern California Stream model (Dr. Smith, personal communication).

DFG agrees with the Study Document in its statement that the production of large smolts is important for their survival so that they can return as adults. As previously stated, however, DFG recommends that a different approach ("complex interaction" of variables) be utilized rather than the more simplistic model which is described by this Study Document (i.e., temperature maintenance by enhancement of pools and reservoir releases). Summer and Fall rearing habitat quality depends on a complex interaction between: 1) water volume (which affects fast-water feeding habitats);

2) water temperature (which affects metabolism, digestion, and growth rates); 3) invertebrate food availability (affected by algal growth, substrate quality, and water flow); and 4) visibility for feeding fish (affected by turbidity and shade) (Smith 2007).

It is the opinion of DFG, that one would be remiss if one studied only one or two of these variables at the exclusion of others. For example, stream reaches with high quality substrate (abundance of macroinvertebrates and low imbeddedness) and adequate stream flow may produce enough food to compensate for higher metabolic needs of steelhead caused by elevated temperatures. These conditions at Uvas Creek and the San Lorenzo River actually produced *larger* smolts (with higher smolt-to-adult survivor rates) than the colder, poorer-substrate-quality reaches. DFG, therefore, recommends studying how the current population of resident trout is utilizing meso- (riffle, runs, and pools) and micro habitats (i.e., heads of pools) and how utilization, abundance, and growth rates change with flow and temperature. We recommend that metrics be developed for the above four variables and implemented into the study design so that smolt production is enhanced so as to maximize the likelihood for juveniles to return as adults.

Also a limiting factor in Central California streams is having adequate and timely stream flows for smolt out-migration. DFG recommends careful consideration of the quantity and timing of these flows, and believe this to be critical for the survival of steelhead.

Creating fast water habitat is critical in minimizing predation on steelhead. Pike minnows (*Ptychocheilus grandis*), a native species of Alameda Creek (and also a predator of steelhead), prefer slow water habitat. In addition, many non-native fishes (i.e., bass) are predators of steelhead and prefer slow water habitat. Steelhead require fast water habitat to escape from these predators. DFG disagrees with the Study Document's statement (Section 5.4.1.1) that steelhead can avoid largemouth bass (LMB) (*Micropterus salmoides*) by seeking refuge and "hunkering down" in pools. Our disagreement with this is based on the fact that we believe that the LMB will be utilizing these pools and enhancement of these pools will be increasing habitat for these steelhead predators. DFG therefore recommends that the amount of fast water habitat (riffles and runs) be increased and with enough depth to provide, not only food for increased metabolic needs of steelhead, but also for refuge habitat from predators.

DFG is aware of ongoing monitoring of FYLF and CRLF in the Alameda Creek watershed by East Bay Regional Parks District (Bobzein and Didonato 2007) and other researchers (Kupferberg et al. 2006). These monitoring programs are studying FYLF, a species known to be very sensitive to ambient stream conditions, as well as the responses to temperature and flow regimes in Alameda Creek. Stream temperature is known to affect the timing of egg deposition by the adults as well as

the duration of egg and tadpole development. Flow regimes and ramping rates are therefore critical in providing suitable habitat for egg placement and ensuring that eggs are less likely to be washed away (i.e., in storm events or from high bypass flow ramping rates) or left to dessicate during receding streamflows. DFG recommends data collection/analysis coordination with these researchers, and further recommends that this study address temperature, flow, and ramping rates and their potential impacts on these populations.

In addition to steelhead, this Study Document (Section 4.7.1) discusses the "recovery of (Fall-run) Chinook salmon populations in Alameda Creek." DFG is aware that Chinook salmon stray into Alameda Creek, however, DFG would like to point out there is no documentation that a run of Chinook salmon ever existed in Alameda Creek. DFG is also concerned that management of this species could take important focus from the recovery of native, threatened steelhead population. Chinook salmon that have been observed at the BART weir in recent years have been determined to be *hatchery* strays. DFG, therefore, recommends that the Workgroup focus on enhancing instream flows and habitat for native species rather than stray *hatchery* Chinook salmon.

In many sections (i.e., Section 4.10.1) the Study Document discusses utilizing the San Francisco Public Utilities Commission's (SFPUC) trapping data as a model for population estimates of steelhead trout. DFG recommends utilizing caution with how this trapping data is utilized. A DFG letter dated April 14, 2004 stated that the reported numbers appeared to be erroneous due to steelhead likely swimming in and out of the traps and advised the Workgroup not to use the numbers for population estimates or management. SFPUC staff looked into the issue as to whether fish were escaping from the traps and found this to be true (SFPUC Biologist Mr. Brian Sak, personal communication). Further preventing accurate population estimates, was the flashiness of the watershed which caused SFPUC/Entrix biologists to pull traps during high flow storm events, thereby missing migrating fish. DFG recommends that the Workgroup include status and trend monitoring for the entire life history of steelhead within the study plan similar to what is being proposed for life history stations in the California Coastal Salmonid Monitoring Plan. This would include at a minimum monitoring adult escapement and/or spawning surveys, smolt out-migrant trapping, and late summer early fall juvenile rearing assessment using the Hankin and Reeve's methodology. Without this type of monitoring, the Workgroup will not be able to assess the success of re-establishing steelhead in Alameda Creek and the effects of any management changes within the watershed.

Another problem associated with the trapping numbers is a temporal fish passage impediment at Arroyo Hondo caused by the lowering of Calaveras

Reservoir (since winter 2001), which created a delta at the confluence of Arroyo Hondo and Calaveras Reservoir. This delta is a fish migration impediment/barrier at low flows, thereby preventing migration to/from Calaveras Reservoir/Arroyo Hondo (DFG Letter dated October 14, 2004). In July 2007, DFG staff worked with SFPUC staff to relocate adult steelhead that were trapped and dying in pools of Arroyo Hondo, unable to migrate back to Calaveras Reservoir (DFG letter dated July 6, 2007). The SFPUC had to lower the surface water elevation of Calaveras Reservoir in order to comply with the California Department of Water Resources, Division of Safety of Dams (DSOD) regulations.

In many sections (i.e., Section 4.10.1) the Study Document discusses utilizing the SFPUC's trapping data as a model for ages of steelhead. It is our understanding that the ages of the steelhead were determined by length-frequency distribution and not verified by fish scale annulus analysis. As previously stated, habitat quality affects growth rates and, therefore size alone should not be utilized to determine steelhead age. DFG recommends that the ages of the fish be verified by fish scale analysis before any age determinations be made.

In reference to gaining steelhead passage at the Alameda Creek Diversion Dam, the Study Document (Section 4.8.1) is correct in its statement that "CDFG would not likely consider trap-and-haul as a substitute for unassisted fish passage". DFG, in fact, recommends that fish passage be attained by either dam removal or by constructing a fish ladder. Fish and Game Code Section 5901 states, "Except as otherwise provided in this Code, it is unlawful to construct or maintain in any stream in Districts 1, 1-1/2, 2, 2-1/2, 2-3/4, 3, 4, 4-1/2, 23, and 25, any device or contrivance which prevents, impedes, or tends to prevent or impede the passing of fish up and down stream." Section 5901 covers Alameda and Santa Clara counties, District 3.

In addition to evaluating stream flows, DFG recommends that the Alameda Creek Workgroup investigate ways to jump-start the steelhead run in Alameda Creek once fish passage barriers are remediated and flows restored. DFG is aware that alternatives were discussed in a report written by Hagar Environmental Science (HES) in 2004, but as we stated in our letter (dated April 14, 2004), we are concerned about HES's use of the problematic population estimates determined by the aforementioned-SFPUC trapping data. DFG recommends further exploration of utilizing the adfluvial steelhead from tributaries to San Antonio and Calaveras Reservoirs as a source population for jump-starting runs of anadromous steelhead once fish passage is remediated in the lower watershed. We believe that utilizing the native genetic stock (Nielsen 2003) of the watershed to be the preferred alternative to jump-starting the native anadromous steelhead run.

We appreciate your consideration of our comments. DFG personnel are available for consultation regarding environmental planning, as well as for fisheries management and restoration. If you have any questions regarding environmental planning processes, please contact Mr. Greg Martinelli, Water Conservation Supervisor, at (707) 944-5560. If you have questions regarding fisheries management or restoration, please contact Ms. Kristine Atkinson, Environmental Scientist, at (831) 427-2638 or Mr. George Neillands, Senior Fishery Biologist, at (707) 944-5525.

Sincerely,

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