Appendix K

Mitigation Strategies for Effects of Fish Stocking

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Process for Addressing Potentially Significant Salmon and Steelhead Stocking Impacts on Native Salmon and Steelhead Populations

The California Department of Fish and Game (DFG) recognizes that the demographic, genetic and ecological risks to natural salmon and steelhead populations of concern cannot be addressed through hatchery measures alone. Harvest management measures to reduce impacts on natural populations of concern also need to be addressed. In California, the California Fish and Game Commission has the power to regulate the taking of fish. The California Fish and Game Commission has promulgated regulations for the method of taking of commercial and recreational fishing. To this end, the National Marine Fisheries Service (NMFS), DFG, and U.S. Fish and Wildlife Service (USFWS) are currently evaluating mass marking and mark-selective fisheries as part of a proposed fishery management system designed to maximize fishing opportunity while meeting the annual conservation objectives and consultation standards for all west coast salmon stocks. Ultimately, harvest and hatchery management need to be integrated.

An investigation of the factors contributing to the recent collapse of Sacramento River fall-run Chinook salmon concluded that this collapse was due in part to the increasing dominance of hatchery fish in the evolutionarily significant unit (ESU) and the long-term impacts of hatchery straying and other practices on the genetic diversity and fitness of natural populations (Lindley et al. 2009). Based on these findings, Lindley et al. (2009) recommended that a hatchery scientific review panel be formed to review existing hatchery practices and to identify the types of actions that are needed to address these issues.

The fisheries agencies recently sent a memorandum to NMFS's Southwest Fisheries Science Center requesting the formation of an independent scientific review panel to thoroughly review the implications of adopting a mass marking and mark-selective fisheries program and to develop scientifically supported recommendations that adequately address all sides of the management issues for California's natural and hatchery salmon stocks. The review panel is currently being assembled and will meet for the first time in October 2009. This panel would focus on mass marking and mark-selective fisheries programs only, which is a part of the review panel recommended by Lindley et al. (2009) but is not the same as the comprehensive review recommended by that group.

DFG has initiated the Hatchery and Genetics Management Plan (HGMP) process for all of its affected hatchery programs. As a central part of the HGMP process, DFG has instituted and participates in multi-agency steering groups that advise and direct operations of its listed-species hatchery programs (i.e., Iron Gate Hatchery coho, Trinity River Hatchery coho, Warm Spring Hatchery coho, Feather River Hatchery Spring-run Chinook and steelhead, Nimbus Fish Hatchery steelhead, and Mokelumne River Hatchery steelhead). These steering groups include members from NMFS, DFG, hatchery owners, and other state, federal, and local agencies that advise on HGMP requirements for the program. The purpose of the steering groups is to provide expert guidance on strategies and protocols to avoid or minimize impacts of hatchery programs on listed species; to help draft, review,

monitor, and adaptively manage the HGMP for each listed-species program; and to determine whether and how listed-species programs can aid recovery. Through this process, all of DFG's listed-species hatchery programs are currently planning and/or implementing conservation measures to reduce impacts on listed stocks that will be included in associated HGMPs for those programs. HGMPs are being drafted for all DFG-run hatchery programs that propagate ESA-listed species.

For hatchery programs propagating non-ESA listed species of salmon and steelhead, DFG will develop expanded Hatchery Goals and Constraints documents based on the NMFS HGMP template. These documents will clearly state the purpose of the hatchery program and measures to avoid and/or minimize program impacts on ESA-listed salmonids, affected non-ESA listed salmonid species in the watershed and surrounding areas, and the natural-origin component of the propagated stock.

DFG will finalize the draft HGMPs it has prepared in consultation with NOAA Fisheries and develop HGMPs for those hatcheries that do not have draft HGMPs. At the same time, DFG will recommend to the hatchery owners (U.S. Bureau of Reclamation, U.S. Army Corps of Engineers [USACE], East Bay Municipal Utility District [EBMUD], California Department of Water Resources [DWR], PacifiCorp, and DFG as to Mad River and Merced Hatcheries) that the hatchery owners form an independent hatchery scientific review panel (HSRP) to develop a set of recommendations. The HGMPs being completed by DFG would contain language that would allow for adaptive management to incorporate the recommendations of the HSRP and the mass marking and mark-select fisheries panel discussed above.

The purpose of the proposed HSRP review will be to develop detailed options for reducing risks and maintaining the benefits of hatchery production. The HSRP would begin with fact finding, where information about hatchery programs and affected natural populations will be assembled. The HSRP would meet with hatchery staff to make sure the information is accurate and most importantly that each hatchery's population-specific goals for conservation and harvest are captured correctly. Following fact finding, the HSRP would analyze the information and develop proposed solutions for each hatchery program. These draft solutions would then be shared with DFG and the hatchery owners in a series of meetings, where the HSRP would explain the rationale behind its findings and comments would be addressed. HSRP would then issue its final report to the hatchery owners and DFG.

The HSRP review would cover hatchery operations and facilities as well as programmatic issues (brood stock management and release and recovery of hatchery fish). In particular, reproductive and ecological interactions between hatchery and natural fish on the spawning grounds have been identified as a significant concern.

In the interim, as this process described above proceeds, DFG is undertaking the following actions.

- Continue to manage salmon and steelhead hatcheries consistent with California Fish and Game Commission policies;
- Eliminate inter-basin transfer of salmon and steelhead eggs between hatcheries;
- Modify brood stock management to improve native fish input to the genetic pool of native salmon and steelhead populations;

- Review current trucking programs for central valley hatcheries with a goal of increasing volitional release of hatchery-reared salmon and steelhead; and
- Work with salmon and steelhead hatchery owners to modify operational agreements to be consistent with the operational modifications described above.

The comprehensive action planning process and other actions described above will not reduce the significant adverse competition, predation, non-target harvest, or genetic effects of current hatchery operations on native salmon ESUs and native steelhead DPSs to less-than-significant levels.

Process for Addressing Potentially Significant Trout and Inland Salmon Stocking Effects on Sensitive, Native, or Legally Protected Fish and Wildlife Species Other than Native Salmon and Steelhead

This protocol (see Figure K-1) will be used by DFG biologists to determine if a water body may be stocked with DFG hatchery trout or inland salmon. The intent is to reduce to less than significant any impacts from the DFG hatchery stocking program on Decision Species, as defined in this EIR/EIS. The PSEP would include external collaboration with FWS where listed species may be affected, to consider common conservation goals and confer on fish stocking management to best conserve native species.

The first step in the protocol is to determine that the proposed stocking action will not conflict with existing DFG management programs, such as management directions stated in approved Aquatic Biodiversity Management Plans (ABMP), species recovery plans, or species conservation strategies. The next step is to assure that a stocking action will not impact any Decision Species known to occur in the proposed stocking area, and that the proposed stocking is not located in federally designated critical habitat for any potentially impacted Decision Species. If impacts could occur, the DFG fishery biologist will continue to move through the evaluation process below. If no impacts could occur, DFG could stock the water body.

If, based on historic range, a Decision Species could be present, a determination of habitat suitability for the Decision Species will be completed. This may involve a review or survey of stocking area physical habitat characteristics and water quality. Additionally, the presence of a biological community that would normally favor or preclude the presence of the Decision Species may be considered.

If suitable habitat is present, DFG biologists will determine presence of a Decision Species at a proposed stocking area and potential for stocking-related impacts using best available information, including background information found in this EIR/EIS, published papers, new information regarding Decision Species status or susceptibility to impacts from stocked DFG fish, or by conducting appropriate DFG-approved surveys. If Decision Species are present and stocking would have a substantial[1] effect on the species, then the water will not be stocked. However, DFG can reconsider stocking the water during the development of a basin-level, or watershed-level, ABMP that mitigates impacts to Decision Species at a larger spatial scale. If the species are not present, DFG could stock the water body.

A positive stocking evaluation (okay to stock) is valid for a five year period at which time the PSEP process will be re-implemented prior to continued stocking. Should new information become available that necessitates reevaluation prior to the end of the five year period, re-implementation of the PSEP process shall commence prior to continued stocking. Periodic PSEP implementation is independent of and in addition to ongoing CDFG or Federally approved survey protocols implemented under the original PSEP. Both initial and subsequent PSEP implementations shall consider incremental environmental changes attributable to climate change, as well as other available sources of scientific and technical information, in making determinations.

Process for Addressing Potentially Significant Effects of Fish Stocking on Sensitive, Native, or Legally Protected Fish and Wildlife Species under the Private Stocking Permit Program

California Fish and Game Code Section 6401 provides that any person may, under the terms of a permit first obtained from the DFG under regulations prescribed by the California Fish and Game Commission, purchase or receive live fish from any registered aquaculturist and may stock the fish in a stream or lake.

The California Fish and Game Commission has prescribed regulations to further implement this code section at CCR Title 14 Section 238.5. Section 238.5. This regulation contains some general guidelines and prohibitions. For example, Section 238.5(a) prohibits the stocking of aquaculture products that are parasitized, diseased, or of an unauthorized species. Section 238.5(d) prohibits the stocking of fish in any water in which the stocking of such fish is contrary to the fisheries management programs of the DFG for that water or drainage. Section 238.5(d) prohibits the stocking of fish in any water in which the stocking of such fish is contrary to the fisheries management programs of the DFG for that water or drainage. For example, any potential new

[1] The Department is guided by the common sense plain meaning of the word substantial such that a substantial effect means a wide-ranging or long-lasting consequence on a species that extends beyond the temporal or spatial context of one specific direct impact. Such substantial effects could include the following examples:

1. The degree to which the action may adversely affect a species listed as candidate, threatened or endangered under the state or federal Endangered Species Act;
2. A significant reduction in the range of any native species or population of a decision species; or
3. A fundamental change to the structure of an ecosystem, including significant reductions in biodiversity or resiliency to disturbance.

introductions of fish species into an area require the approval of the Chief, Fisheries Branch and any such request must include the objectives, expected benefits, and an evaluation plan for the proposed introduction.

The protocol diagrammed in Figure K-2 is designed to further assist district fisheries biologists and fisheries management supervisors in DFG regions in determining the terms and conditions of an individual permit and whether or not such a permit will be issued. It is also to be used by DFG staff to maximize the success of individual stocking projects and to prevent or minimize ecosystem impacts to the State of California. This protocol is not intended to and does not supersede applicable provisions in the California Fish and Game Code or the regulations adopted by the California Fish and Game Commission to implement that code. The protocol is designed to further clarify those provisions. Each permit will be evaluated on a case-by-case basis by the district fisheries biologist assigned to that geographic area and then either approved or denied under the discretion of the regional manager or his or her designate. The PSEP would include external collaboration with FWS where listed species may be affected, to consider common conservation goals and confer on fish stocking management to best conserve native species.

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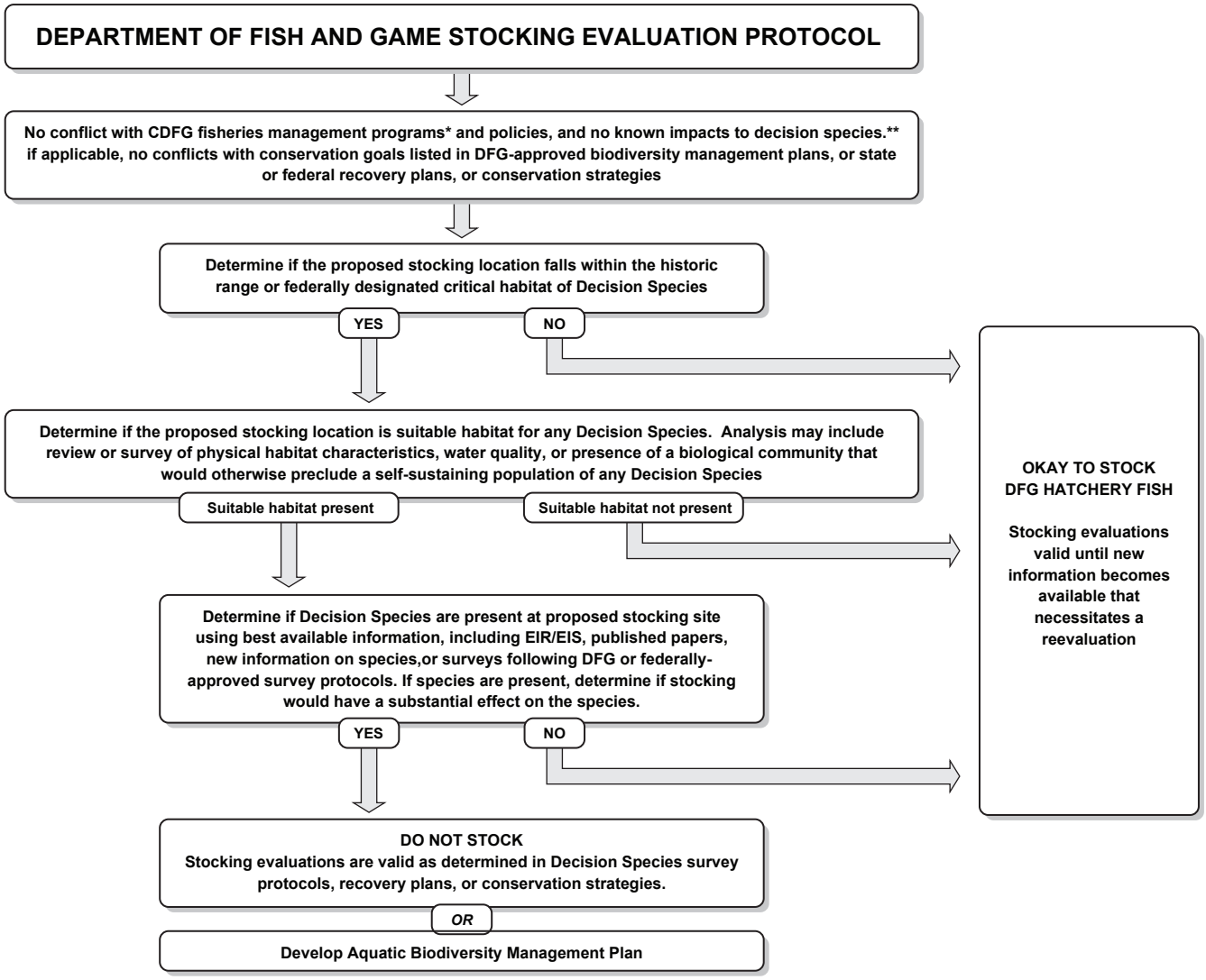
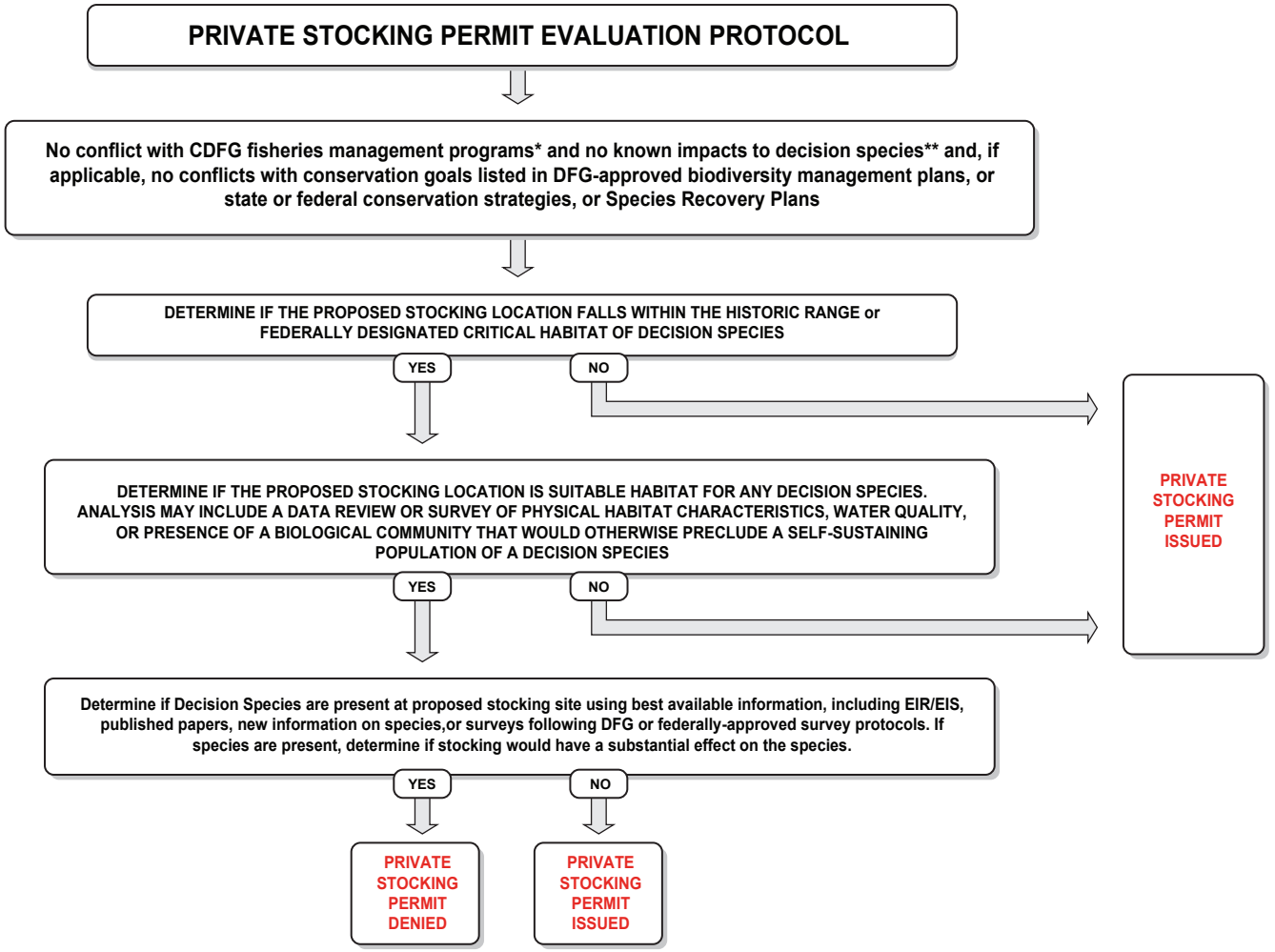


* See Title 14; 238.5(d)(3)

**Decision species are defined in Chapter 4 of the DFG Hatchery EIR/EIS

Source: DFG 2009.

Figure K-1
DFG Trout and Inland Salmon Stocking Evaluation Protocol



* See Title 14; 238.5(d)(3)
**Decision species are defined in Chapter 4 of the DFG Hatchery EIR/EIS

Source: DFG 2009.

Figure K-2
Private Stocking Evaluation Protocol