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**California Fish and Game Commission's
Workshop on Strategic Improvement in
California's Anadromous Hatcheries**

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**West Coast Hatcheries
NMFS Message Points
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The National Marine Fisheries Service (NMFS) aspires for hatchery programs and fisheries to comply with the Endangered Species Act (ESA). This is because we now know, based upon our experience, that many negative effects of hatchery production on naturally-spawning fish can, through reforms, be avoided while maintaining most – but perhaps not all – of the benefits of the hatchery. We have found that reforms emerge most easily from the Hatchery and Genetic Management Plan (HGMP) development and review process under the ESA.

NMFS will harmonize ESA reviews with its trust responsibilities to Indian tribes.

NMFS looks forward to receiving hatchery plans (i.e., HGMPs) that it can approve under the ESA. NMFS has a long-standing partnership with the California Department of Fish and Wildlife (CDFW) on developing HGMPs that we can approve for California hatcheries. Following our merger into one West Coast Region, NMFS is re-directing new staff resources to review these CDFW plans and make sure they are current in their use of best available science and are tailored to site-specific conditions. Our sense of urgency is not only driven by our desire to begin the transition from where we are today to where we want to be in the future – to initiate steps in conservation - but also by the practical knowledge that if we don't show rapid progress, litigation has the potential to take away from us the ability to control our own schedule for workload, the allocation of staff resources, and the substantive outcome.

NMFS will work with co-managers to develop HGMPs supporting mitigation hatchery programs that are compatible with recovery of salmon ESUs and steelhead DPSs. NMFS strongly encourages the managers to develop and articulate a vision for how mitigation, in whatever form, will keep pace with best available science and emerging action plans for salmon and steelhead recovery. In this way, it should be possible to largely avoid conflicts between mitigation responsibilities and requirements under the ESA to conserve and recover threatened and endangered species. Hatchery mitigation production that is compatible with existing or emerging recovery plans for salmon and steelhead is likely to enjoy greater certainty and success. Under the status-quo, hatchery programs may face disruptions and an increasing chance of not meeting their operational needs and production/mitigation goals. NMFS wants to avoid this outcome and is eager to work with the managers on new HGMPs that can be approved under the ESA.

Hatchery Scientific Review Group guidance and recommendations are an important factor in NMFS' review and analysis of HGMPs. According to the California Hatchery Science Review Group (CHSRG), their report published in 2012 provides “guidance to policy makers who will be responsible for implementing changes in how California hatcheries are operated”. For NMFS' part, guidance provided by the CHSRG and by the Columbia River and Puget Sound HSRGs will be an important factor in our review and analysis of HGMPs across the West Coast. NMFS is also committed to working collaboratively with CDFW, the tribes, and our other co-managers under the hatchery coordination team process that is currently underway to review and consider guidance and recommendations provided by the CHSRG.

The National Marine Fisheries Service (NMFS) has substantial experience with hatchery programs and has developed and published a series of guidance documents for designing and evaluating hatchery programs following best available science. These documents are available upon request from the NMFS Sacramento, Arcata, and Portland, Oregon offices.

Generally speaking, artificial propagation entails opportunities as well as risks for salmon and steelhead conservation. Benefits and risks are refined and narrowed after available scientific information and the circumstances and conditions that are unique to an individual hatchery program are accounted for in a Hatchery and Genetic Management Plan (HGMP). The HGMP is what NMFS turns to for the purposes of evaluating hatchery programs under the Endangered Species Act (ESA). The presence of hatchery fish can positively affect the overall status of an ESU or steelhead DPS by increasing the number of natural spawners, by serving as a source population for repopulating unoccupied habitat and increasing spatial distribution, and by conserving genetic resources. Conversely, a hatchery program managed without adequate consideration can negatively affect the status of an ESU or steelhead DPS by reducing adaptive genetic diversity and reproductive fitness and productivity. The range and net effect of a specific hatchery program is determined relative to the attributes that define population viability, including abundance, productivity, spatial structure, and diversity, and will depend on which of the four attributes are currently limiting the ESU or DPS, and how the program affects each of the attributes (70 FR 37215, June 28, 2005).

One example of HGMP effects that NMFS must evaluate are hatchery fish and the progeny of naturally spawning hatchery fish on the spawning grounds. There are two aspects to this part of the analysis: genetic effects and ecological effects. NMFS generally views genetic effects as detrimental or a risk factor because at this time, based on the weight of available scientific information, we believe that artificial breeding and rearing is likely to result in some degree of genetic change and fitness reduction in hatchery fish and in the progeny of naturally spawning hatchery fish relative to desired levels of diversity and productivity for natural populations. Hatchery fish thus pose a threat to natural population rebuilding and recovery when they interbreed with fish from natural populations.

However, NMFS recognizes that there are benefits as well, and that the risks just mentioned may be outweighed under circumstances where demographic or short-term extinction risk to the population is greater than risks to population diversity and productivity. Conservation hatchery programs may accelerate recovery of a target population by increasing abundance faster than may occur naturally and they can also be used to create genetic reserves for a population to prevent the loss of its unique traits due to catastrophes. Furthermore, NMFS also recognizes there is considerable uncertainty regarding genetic risk. The extent and duration of genetic change and fitness loss and the short and long-term implications and consequences for different species, for species with multiple life-history types, and for species subjected to different hatchery practices and protocols remains unclear and should be the subject of further scientific investigation. As a result, NMFS believes that hatchery intervention is a legitimate and useful

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tool to alleviate short-term extinction risk, but otherwise managers should seek to limit interactions between hatchery and natural-origin fish and implement hatchery practices that harmonize conservation with the implementation of applicable Indian fishing rights and other applicable laws and policies.