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

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Comments on Hatchery Reform

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The NMFS mission includes supporting sustainable fisheries and conserving living marine resources. These goals are shared with CDFW, and one or both of them can also be the goals of salmon hatcheries.

Fishing and conservation can be in conflict under some circumstances, but ultimately, sustainable fisheries depend on productive natural populations. This is also true for hatchery programs.

California's hatcheries were built and are operated to mitigate for fishing opportunities lost when dams blocked access to important salmon-producing river habitats. In the intervening decades, we have learned that hatcheries can have significant negative impacts on natural populations through evolutionary, ecological and social mechanisms. It should be noted that Central Valley fall/late-fall Chinook ESU is a candidate for listing under the ESA. The concerns about this ESU stem from concerns about the large scale of hatchery production, extensive straying of offsite releases, lack of geographically structured genetic variation, and suspicion that natural production is very low.

The CHSRG was convened to review the state of these affairs in California, and to make recommendations on how hatcheries could be operated to reduce risks to natural populations while providing fishery and conservation benefits.

It is clearly the job of scientists to estimate risks and benefits of existing or proposed hatchery regimes. The choice of a particular regime is a policy decision, ideally reflecting an appropriate balance of risks and benefits for stakeholders and society at large. Such policy decisions are the domain of CDFW, the Fish and Game Commission, and the NMFS WCRO, among others, but not including the NMFS science center.

The CHSRG identifies 14 issues of greatest importance, and develops a number of standards and guidelines for improving operations of California's salmon hatcheries. Eleven of these are essentially problems that can be addressed by individual hatchery programs, and I won't comment on them except for the issue of Nimbus hatchery broodstock. I strongly concur with the CSHRC's recommendation to move to a native broodstock as soon as possible.

The remaining three issues are bigger and will require coordination beyond CDFW. I deal with these in turn.

1. Offsite releases

Offsite releases cause widespread straying of hatchery fish into natural areas. CV fall Chinook are unique among Chinook salmon in lacking geographically structured genetic variability, and have presumably lost much of the associated adaptations to local conditions within different CV streams. The underlying genetic variation is not lost, however, but for local adaptation to re-emerge, straying must be drastically reduced. On site releases would help immensely, but raise other important issues that will need to be addressed. These include identifying and remedying the causes of high in-river mortality, and monitoring and mitigating the impacts of large numbers of juvenile hatchery fish in freshwater.

2. Managing harvest for natural production

The current fishery management regime for CV fall Chinook doesn't distinguish between hatchery and natural production. It is likely that historical harvest rates were not sustainable by natural populations, and we don't really have the data to know whether current harvest rates are sustainable. We should move towards management that has explicit goals for natural production, with harvest rates and escapement goals based on the productivity and habitat capacity of natural areas. This will require significant work through the Pacific Fishery Management Council process to update conservation objectives, control rules, and assessment models, as well as continued implementation of the CFM and tag recovery program.

3. Habitat

Hatcheries are ultimately dependent on healthy natural runs as a source of broodstock. The habitat problems in the Central Valley are myriad and daunting, but we must remain focused on finding ways to improve conditions. There are bright examples showing what is possible: Clear Creek and Battle Creek, where salmon populations are growing in periods when other populations suffered sharp declines due to unfavorable ocean conditions.

Conclusion: the CHSRG has made a number of well-supported and helpful recommendations for improving the operation of California's salmon hatchery programs. I urge CDFW and the Fish and Game Commission to support these recommendations and I offer the assistance of the NMFS Southwest Fisheries Science Center in implementing them as appropriate.