

This Presentation was part the

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

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The Scientific Review: Marking and Tagging

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Monitoring and Evaluation

- Importance cannot be understated
 - Essential component of all CA anadromous programs
 - Quality of production, effects on natural populations, whether achieving goals & objectives
- Has received insufficient emphasis in CA programs
- M&E components
 - Hatchery and Genetic Management Plan
 - Hatchery Coordination Team
 - Marking and tagging program
 - Monitoring/data collection/reporting
 - In-hatchery, juvenile post-release, adult harvest/escapement
- Marking/Tagging critical to much of M&E

Marking and Tagging

- CA HSRG major topic of discussion
- Approach:
 1. Define *Standard* to be achieved
 - Identify essential information needs
 - Applicable to all hatcheries/programs
 - Species-specific (Chinook, coho, steelhead)
 2. Develop *Guidelines* that satisfy Standard
 - M&T recommendation given present-day technologies

Chinook: Standard 4.5

Chinook salmon marking and tagging programs allow for:

- a) Estimation of ocean and freshwater fishery impacts, and natural area and hatchery escapement at the age-, stock- and release group-specific levels
- b) Estimation of the proportion of hatchery-origin fish in natural spawning areas (pHOS)
- c) Estimation of the proportion of natural-origin fish in hatchery broodstock (pNOB)
- d) Real-time identification of hatchery-origin juveniles and adults (i.e., hatchery vs. non-hatchery origin)
- e) Identification of stock of origin for hatchery-origin fish
- f) Real-time identification of yearling vs. fingerling release-type fish at the adult stage

Chinook: Current M&T

- Mitigation/harvest programs (e.g., fall run)
 - 25% CWT and 25% adipose fin clip
 - Meets Standard 4.5 a, b, c
 - Does not meet Standard 4.5 d, e, f
- Conservation programs (e.g., winter run)
 - 100% CWT and 100% adipose fin clip
 - Meets Standard 4.5

Chinook: M&T Guidelines

- Mitigation/harvest programs (e.g., fall run)
 - 100% CWT and 25% adipose fin clip
 - Yearlings: additional external mark or tag
 - IGH, TRH, MOK
- Conservation programs (e.g., winter run)
 - 100% CWT and 100% adipose fin clip

Chinook: M&T

- M&T Guidelines
 - Enable real-time detection of hatchery-origin fish via electronic detection at any time and place deemed necessary
 - Provide hatchery-of-origin and run-type via CWT extraction
 - Does not affect existing M&E survey programs for ocean harvest, river harvest, and natural area escapement
 - Maintains CWT “recovery boost” for conservation programs
- Did not recommend mass marking (100% adipose fin clip)
 - Crude mark: does not provide hatchery-of-origin or run-type
 - Would require significant changes to existing M&E survey programs
 - Would eliminate CWT “recovery boost” for conservation programs
 - CA HSRG did not conclude that mark-selective fisheries were necessary or desirable for effective mgt of CA’s hatcheries
 - Therefore, CA HSRG did not want to unintentionally facilitate their adoption

M&T: Recommended First Step

Fall run Chinook

- 100% CWT and 25% adipose fin clip