

Implications of Legislative Directives to Mass Mark Hatchery Production

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State and federal legislation in the U.S. has directed that hatchery coho and chinook salmon be mass marked.

Objectives:

- mark-selective fisheries.
- distinguish between hatchery and natural origin spawners in the escapement.

The cost implications from these legislative directives can be broken down into three components:

- Tagging and Marking
- Sampling and CWT Processing
- Data Analysis and Reporting

The “Core” CWT Program

- Indicator stock program utilized for monitoring changes in fishery harvest rates and stock exploitation rates.
- The adipose fin clip was sequestered as visual cue to indicate the presence of a CWT.
- Regional coverage provided by 29 chinook and 30 coho indicator stocks.

Table 1 – Exploitation Rate Indicator Stocks

Coho	Chinook
Big Qualicum River	Alaska Spring
Chilliwack River	Kitsumkalum
Goldstream River *	Robertson Creek
Inch Creek	Quinsam
Quinsam River	Puntledge
Coldwater River *	Big Qualicum
Robertson Creek	Cowichan
Nooksack River *	Chilliwack *
Skagit River *	Skagit Spring Yearling *
Skykomish River *	Nooksack Spring Yearling *
Green River *	South Puget Sound Fall Yearling
Puyallup River *	South Puget Sound Fall Fingerling *
Quilcene River *	George Adams Fall Fingerling *
Quilcene Bay Pens *	Samish Fall Fingerling *
George Adams *	Squaxin Pens Fall Yearling
Elwha River *	Hoko Fall Fingerling
Solduc River *	Elwha Fall Fingerling
Queets River *	White River Spring Yearling
Quinault River *	Queets Fall Fingerling
Satsop *	Sooes Fall Fingerling
Forks Creek *	Cowlitz Tule
Lewis River *	Spring Creek Tule
Tanner Creek (Lower Columbia) *	Columbia Lower River Hatchery
Sandy *	Lewis River Wild *
Tanner Creek (Umatilla R.) *	Columbia Upriver Brights
Tanner Creek (Yakima R.) *	Hanford Wild
Nehalem River *	Lyons Ferry Columbia River Summers
Salmon River (Oregon) *	Willamette Spring *
Rock Creek *	Salmon River
Rogue River *	

Implications of Mass Marking and Mark-Selective Fisheries

- Loss of visual tag detection capability.
- Exploitation of marked coded wire tagged fish are no longer representative of exploitation of untagged fish.
- Uncertainty persists over our ability to estimate impacts associated with the new harvest strategy - mark-selective fishing.

An Additional \$16.7 Million for Tagging and Marking

- Transition to Double Index Tag (DIT) Groups.
 - A doubling of hatchery production handled.
 - A doubling of CWTs purchased and applied.
- Requirements to mass mark greater percentages of hatchery production.
- Required expansion of tagging capacity.
 - e.g., tagging and marking trailers and crews

Puget Sound Hatchery Example

Hatchery Production of 800 thousand coho, with an indicator stock.

Core Program

45 Thousand CWT group (\$130/1000), for total cost of \$5,850.

Mass Marking Initiative

90 Thousand DIT (\$130/1000), for a total cost of \$11,700. 710 thousand mass marked (\$26/1000), for a total cost of \$18,460. Grand total \$30,160.

An Additional \$7.7 Million for CWT Sampling and Processing

- Acquisition of electronic sampling equipment.
- Increased sampling activity for fisheries, hatchery rack, and spawning grounds.
- Increased volume of CWTs collected and processed.

An Additional \$1.1 Million for Analysis and Reporting

- Required upgrades to analytical tools.
 - Regulatory Assessment Models
- Increased need for biometric support.
 - Development of new fishing mortality rates
 - Development of new sampling designs
- Increased reporting requirements and activity.
 - New fishery data and reporting formats

Full Implementation of the Mass Marking Legislative Directives will cost an estimated \$25.5 Million

- Two thirds of this cost, \$17.4 million is associated with capital equipment purchases.
- The remainder of this total, \$8.1 million reflects estimated increases in annual operations.
- The annual operating cost for the “core” CWT program is estimated at \$2.7 million.

Conclusions

- Conversion to electronic tag detection and DIT group coverage has resulted in significant changes and costs for the CWT Program coast wide.
- The review of the CWT Program should address the impacts associated with mass marking and mark-selective fisheries activities.
 - Evaluation of the adequacy of the indicator stock coverage and minimum tagging levels.
 - Assessment of the thoroughness of the monitoring and data recording standards associated with mark-selective fisheries.
 - Consideration of quantifying and accounting for the uncertainty interjected by mass marking and mark-selective fisheries into the management process.