

Overview of the PSC SFEC Lessons Learned Report

Mass Marking and Mark-Selective Fisheries Impacts on the CWT System

**By Ron Olson
NWIFC**

Coded Wire Tags & PST

- Basis for Chinook & Coho Model development and implementation of PST agreements
- Used to produce projections for abundance (e.g., forecasting & survival rates)
- Provides data for stock and fishery assessments
 - Stock-age-fishery exploitation rates
 - Maturation rates
 - Productivity (stock-recruitment)
 - Evaluate hatchery rearing and release strategies
- Monitoring impacts and consistency with fishery agreements

Mass Marking & Mark Selective Fishing Motivations

- Concern for natural stocks
 - ESA listings
 - Excessive exploitation Rates
 - Sustainability of fisheries and fishing infrastructure
- Hatchery Production
 - Artificial propagation to mitigate for habitat degradation, sustain fisheries, and supplement natural production
 - Impacts on natural stocks
 - Reduced ability to harvest hatchery fish due to natural stock management constraints

Objectives For Mass Marking and Mark Selective Fishing

- Mass Marking:
 - Visually distinguish natural from hatchery fish
 - Distinguish between hatchery and wild fish for broodstock selection and reduce impacts of straying on wild stock productivity
- Mark Selective Fishing
 - Selective removal of marked hatchery fish
 - Increase utilization
 - Decrease deleterious impacts on natural stocks
 - Increase fishing opportunity within constraints established to conserve natural stocks

Mark Selective Fishing Issues

- MM hatchery and wild fish undergo different patterns of exploitation
- Can no longer utilize hatchery releases as surrogates to provide information on fishery impacts on associated wild stocks
- Requires change to Electronic CWT detection
- Increases costs of fishery sampling, CWT recovery & reporting
- Requires retooling of models and analytical tools

PSC Background History

- PST signed in 1985
- 1985 MOU to PST on importance of CWT system to salmon management
- 1991 co-chairs of CTC write letter of concern regarding maintaining CWT system w/MM & MSFs
- 1995 Ad-Hoc SFEC issues report on MM and MSFs
- 1998 PSC “Understanding of the PSC Concerning Mass Marking and Selective Fisheries” and SFEC established as a permanent committee

1995 Ad-hoc SFEC Review

Focus on two general questions

1. Can selective fishery regulations reduce harvest rates on unmarked salmon and can total exploitation rates be reduced and spawning escapements increase as a result?
2. Can the viability of the existing coastwide CWT program for stock assessment and management planning be maintained if Selective Fisheries are implemented?

Recommendations of 1995 Ad-hoc SFEC Report

1. Selective fisheries should not be considered for Chinook at this time
2. Use the adipose clip for hatchery coho MSFs
3. Research to improve estimates of mark induced mortality and marked recognition error rates
4. Switch from external identifier for CWTs to Electronic detection in all areas where CWTs are expected to be recovered
5. Implement Double Index Tagging
6. Sample all fisheries for the proportion marked

Recommendations of 1995 Ad-hoc SFEC Report (cont.)

7. Ensure extensive inter-agency cooperation and coordination. Mass marking of hatchery fish should not be permitted until assurances are received from substantially affected jurisdictions that CWTs will be electronically sampled.
8. Management planning and stock assessment methods affected by selective fisheries must be modified prior to the implementation of these fisheries.

Focus of Lessons Learned Report

- What SFEC has learned about the Impact of Mass Marking and Mark-Selective Fisheries on the Viability of the CWT System
- Beyond SFEC's scope of responsibility to assess if objectives of MM and MSFs have been met

What do we mean by viability?

The PSC ASFEC (1995) defined viability of the CWT program as:

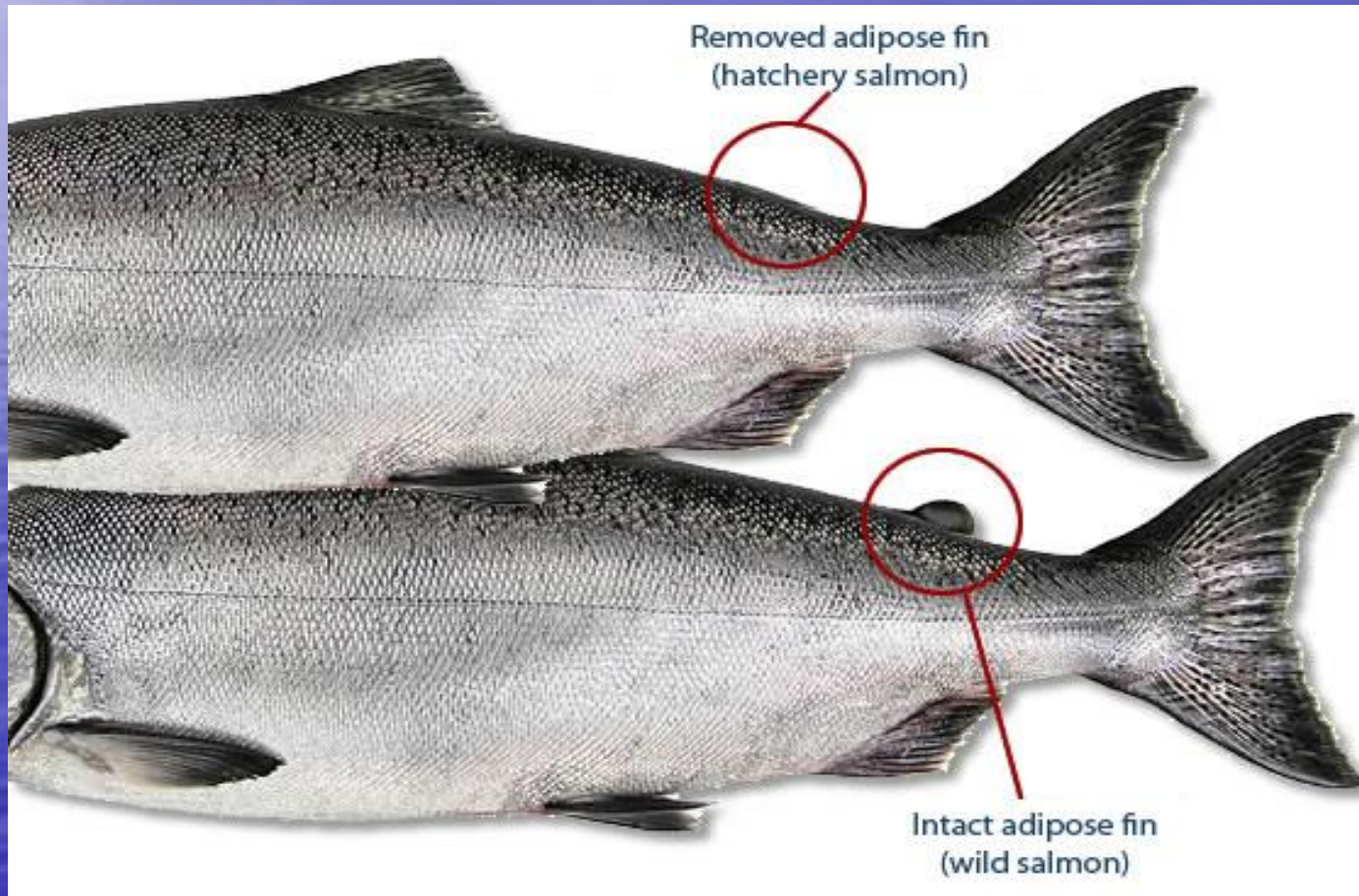
- The ability to use CWT data for assessment and management of wild stocks of Chinook and Coho salmon
- The ability to estimate stock-specific exploitation rates by fishery and age
- Maintain the program without increasing management risk from *uncertainty* to unacceptable levels.

Report Outline

- Executive Summary w/24 lessons
- Major Sections
 - Introduction
 - Mass Marking
 - Mark Selective Fishing
 - Planning and Assessment
 - Viability of CWT Program
 - Benefits and Costs of MM & MSF
 - Conclusions and Recommendations
 - References

Copies available from PSC Secretariat

1. No viable alternative to the Ad Clip



2. MSFs complicate implementation of PSC fishing regimes.



3. MSFs change the magnitude, distribution, and uncertainty of fishery mortalities for unmarked fish.



4. Estimation of the fishery mark rate is critical to harvest management involving MSFs.



5. MSFs require a coordinated and consistent approach to implementation of MM, MSFs, and coastwide sampling to enable accurate assessment and management of impacts to natural-origin fish.



6. Electronic sampling has not been employed coastwide, although it is required to recover DITs in all fisheries.



7 & 8. Mass marking combined with visual sampling increases the cost of CWT recovery, by increasing sampling effort, and costs for storage, transport and tag removal.



9. Visual sampling may adversely affect relations with salmon processors and First Nations, because it requires the removal of a large number of snouts or heads.

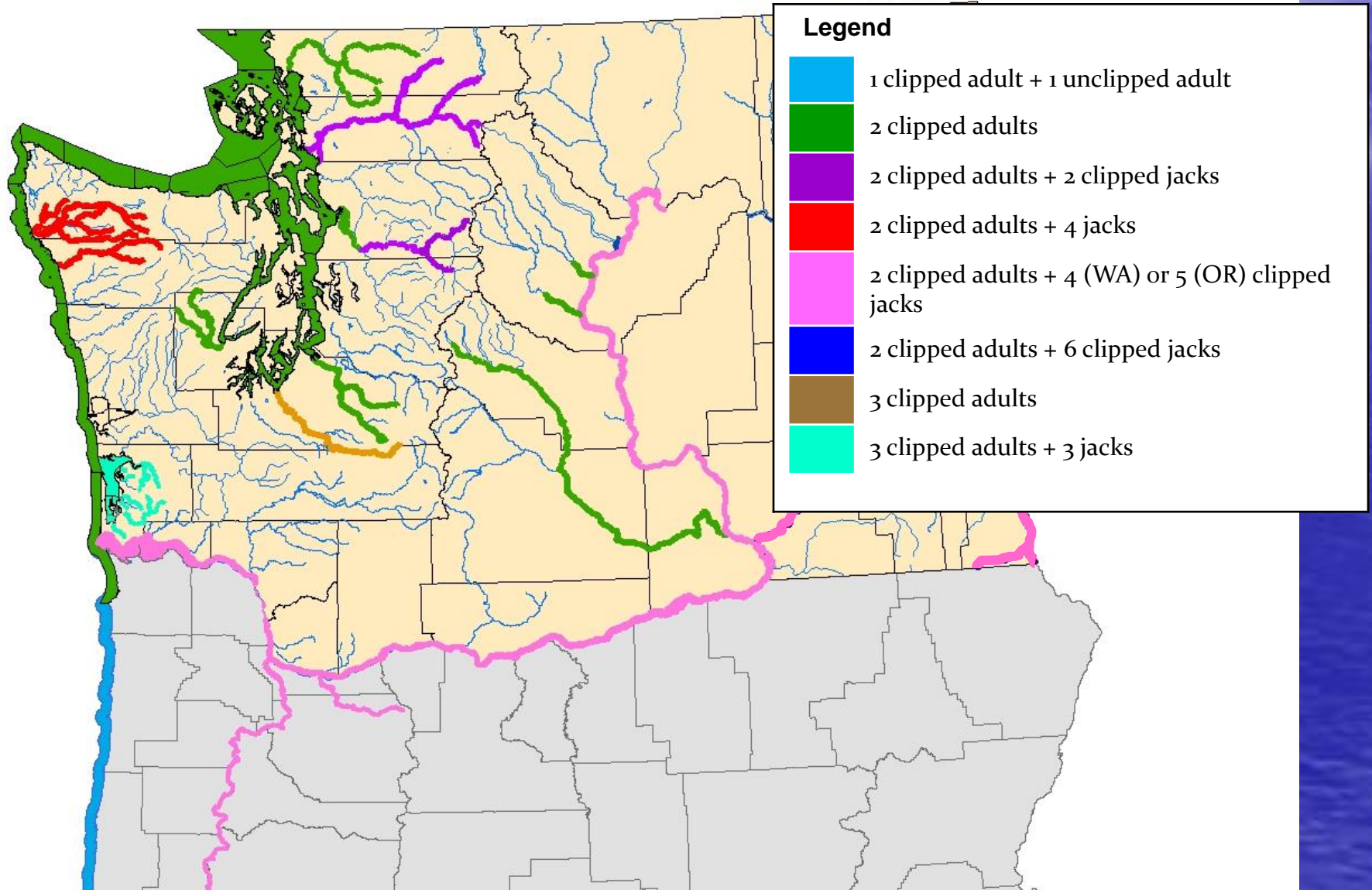


10 & 11. Improved coordination of harvest management regulations and sampling programs in needed.

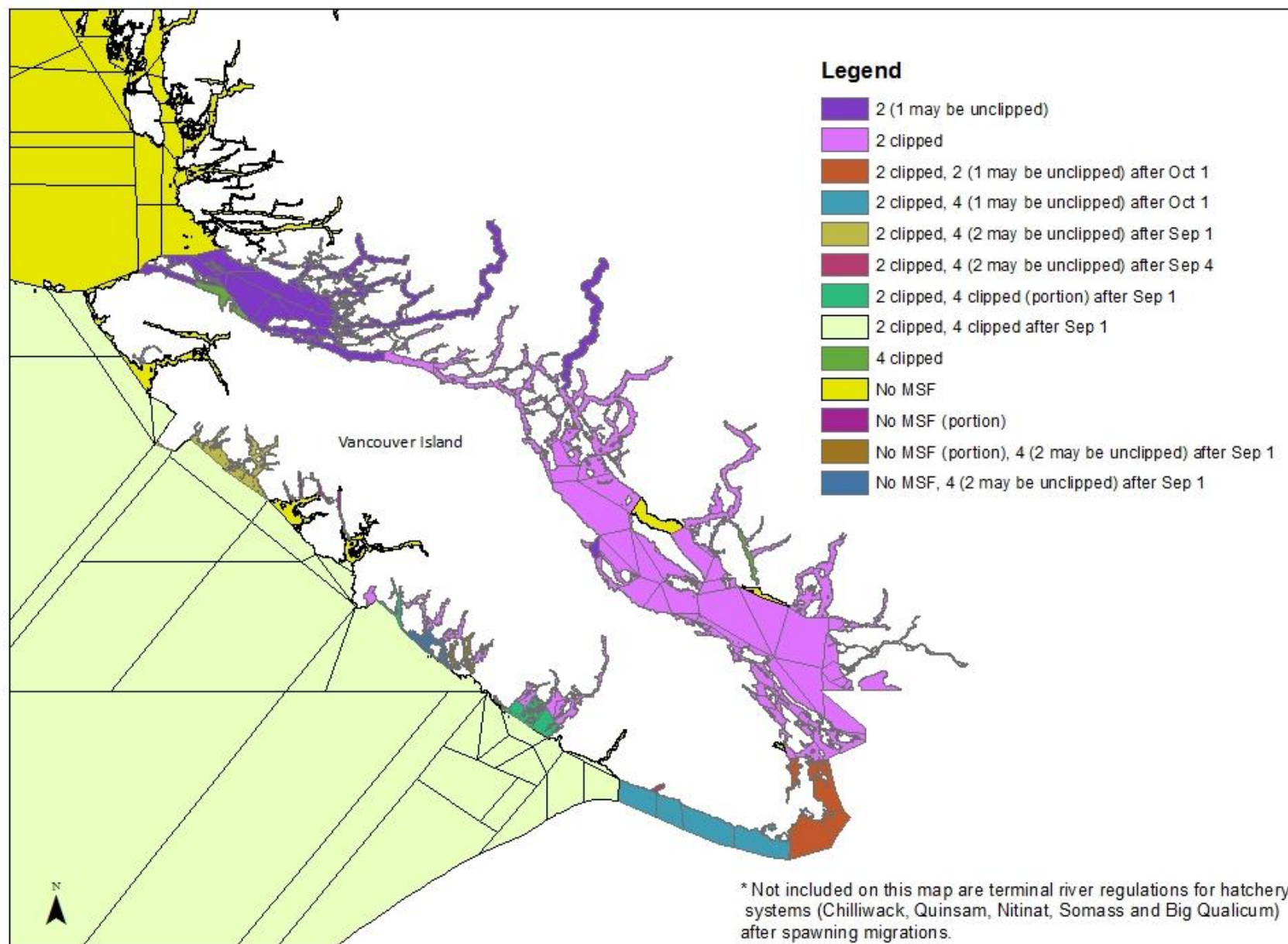


Bag Limits Proposed for 2016

Chinook Recreational Mark-Selective Fisheries



Proposed 2015 Bag Limits for Southern British Columbia Coho Recreational Fishery by PFMA Sub Area



12. Existing rates for release mortality, mark retention, and mark recognition errors are derived from studies that have indicated substantial variability.



13, 14 & 15.

Fishery planning and post-season assessments for MSFs rely upon assumption-based methods that do not account for uncertainty.

A bilateral model does not exist for pre-season planning or post-season evaluation of MSFs for Chinook.

Agencies currently rely on a modified FRAM model for Coho. However the uncertainty of projections of mark rates can vary wildly from year to year.

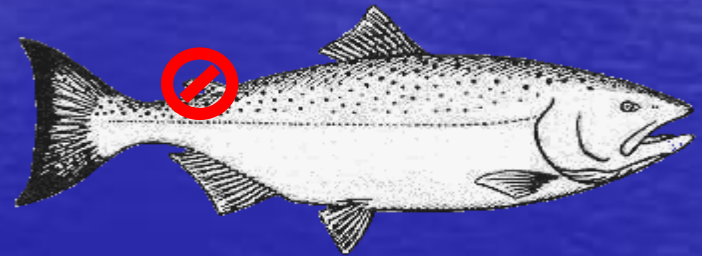
16. The SFEC has been unable to develop methods to estimate unbiased fishery-specific impacts of individual MSFs when multiple MSFs impact CWT release groups.



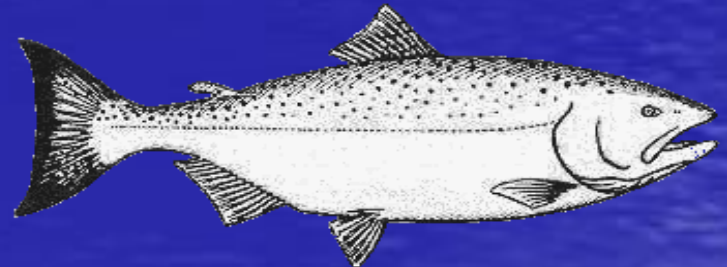
17. DIT programs have not been implemented as recommended.

18. Uncertainty of fishing impacts on unmarked fish not represented by a DIT group has reduced the ability to estimate impacts of MSFs on unmarked fish.

One group is marked



And the other is unmarked



20. Improvements in reporting and access to information about MSF regulations and impacts on unmarked fish are needed.

- **A prototype for electronic reporting of MSFs has been jointly developed by WDFW and NWIFC.**

21. Data standards have been developed for reporting of data for MM & DIT releases, and CWT recoveries from MSFs. These have been implemented by the RMPC in RMIS.



22. Agencies are providing complete MM proposals for the SFEC review.

23. MSF proposals are of limited value in assessing potential impacts on the CWT program because domestic fishery planning processes have not been completed.

24. Post-season reporting of MSFs remains problematic. In 2013 catch year, 3 post-season reports were received out of 16 coho MSFs implemented , and 4 post-season reports out of 26 Chinook MSFs were received.

Conclusions

- The CWT system remains the only tool available to estimate and monitor coastwide impacts on individual stocks of natural-origin fish and provide the data required to implement PST agreements for Chinook and Coho salmon.
- MM & MSFs Have:
 - Increased the cost and complexity of the CWT system
 - Adversely affected the viability of the CWT System
 - Decreased capacity to use CWTs for management of wild stocks
 - Increased uncertainty in estimates of stock-age-fishery exploitation rates on natural stocks

Recommendations

- **Maintain the CWT Program**
- **Ensure that CWT release groups represent MM groups**
- **Evaluate and Improve DIT Program**
- **Develop, evaluate, and support tools, models, and databases for MSFs**
- **Maintain and Enhance the RMIS**
- **Improve compliance with sampling and MSF data reporting requirements**
- **Alter the future focus of SFEC**

Issue – Budget Pressures

- Concerns for maintaining base sampling and tagging programs
- Elimination of DIT programs
- ETD not being implemented coast wide
- Additional funding needed to maintain stock and fishery assessment capabilities and maintain the viability of the CWT system

Issue: Data driven to Assumption-based Management

- Increasing dependence on assumption-based management with reduced ability for validation
- Uncertainty, risk, and precautionary approaches



The End