

REVIEW OF 2004 MASS MARKING PROPOSALS

REPORT SFEC (04)-1

**Report of the Regional Coordination Working Group
of the Selective Fishery Evaluation Committee**

December 2004

Membership of the Regional Coordination Working Group

Canadian Members

Sue Lehmann, Co-Chair, CDFO

U.S. Members

Ron Olson, Co-Chair, NWIFC

Ken Johnson, PSMFC

Ron Josephson, ADFG

Marianne McClure, CRITFC

Gregg Mauser, ODFW

Mark Kimbel, WDFW

Table of Contents

SFEC-RCWG Membership	ii
Introduction.....	2
Review Process	2
Results of Review	2
Issues and Concerns.....	5
Summary and Recommendations.....	10
References.....	12
Appendices.....	13
Appendix A. Understanding of the Pacific Salmon Commission Concerning Mass Marking and Selective Fisheries.....	13
Appendix B. Mass Marking Proposal Template	18
Appendix C. Criteria for Evaluating Mass marking Proposals.....	20
Appendix D. Status of Mass Marking Proposals.....	21
Appendix E. Coho Exploitation Rate Indicator Socks with DIT Pairs	22
Appendix F. Chinook Exploitation Rate Indicator Stocks with DIT Pairs	23

Review of 2004 Mass Marking Proposals

SFEC-Regional Coordination Work Group Report

Introduction

The PSC Selective Fishery Evaluation Committee (SFEC) is charged with evaluating proposals for Mass Marking (MM) and Mark Selective Fisheries (MSFs) for their potential impacts on the coastwide CWT program (Appendix A). The SFEC include two working groups: the Regional Coordination Work Group (RCWG) and the Analytical Work Group (AWG). The RCWG is tasked with reviewing MM proposals, and the AWG is tasked with reviewing MSF proposals. This report documents the RCWG review of agency MM proposals for 2004.

Agency proposals for 2004 mass marking plans were requested for all hatchery chinook and coho groups expected to be intercepted in Pacific Salmon Commission (PSC) fisheries. As stated in the *Understanding of the PSC concerning Mass Marking and Selective Fisheries* (Appendix A), proposals for continuing programs are requested no later than November 1 of the year prior to implementation. Proposals for new or substantially changed MM proposals are requested by June 1 of the year prior to implementation. A template for MM proposals was developed in 2002, and agencies were asked to provide their information to the SFEC in this format (Appendix B).

Review Process

A total of 22 MM proposals were received by the PSC for 2004(Appendix D). All of these proposals were for continuing chinook and coho MM programs. The RCWG used the criteria developed in 2002 for reviewing the MM proposals (Appendix C). Proposals were reviewed, discussed, and evaluated by RCWG members in December 2003. This review identified additional information required for the SFEC to complete its evaluation. Subsequently, SFEC sent requests for additional information to the proposing agencies. Final review and evaluation of the MM proposals occurred in early 2004. Evaluation of related sampling issues continued through September of 2004, as new developments occurred.

Results of Review

The Proposals were reviewed and rated for their impacts on the CWT system. The results are summarized in Table 1.

Table 1. Summary of review of 2004 mass-marking proposals.

Species	Area	Agency	DIT Groups	Rating ¹	Number to be Mass Marked	Recommendations
Coho	Southern BC	CDFO	7	No significant concerns	5,700,000	CDFO has reverted its recreational fishery sampling program to a voluntary recovery program. This program should be monitored to ensure adequate and unbiased recoveries. The impact of this program on DIT analysis should also be evaluated.
	Puget Sound	WDFW ²	7	Some concerns	10,639,000	Incomplete proposal. Anticipated fishery distribution and sampling rate information should be provided as requested in MM proposals.
		USFWS	1	No significant concerns	354,000	None
	Wash. Coast	USFWS	2	No significant concerns	440,000	None
		WDFW	3	Some concerns	5,895,000	Incomplete proposal. Anticipated fishery distribution and sampling rate information should be provided as requested in MM proposals.
	Columbia River	USFWS	2	No significant concerns	2,300,000	None
		WDFW	2	Some concerns	11,213,000	Incomplete proposal. Anticipated fishery distribution and sampling rate information should be provided as requested in MM proposals.
		ODFW	1	No significant concerns	3,975,000	The adequacy of the DIT program should be reviewed (now reduced to one DIT pair).
	Oregon Coast	ODFW	1	Some concerns	704,000	The adequacy of the DIT program should be reviewed – due to the lack of ETD in California.
	Spring Chinook	Columbia River	WDFW	1	Some concerns	2,500,000
ODFW			2	Some concerns	5,276,000	The impact of these fish on the Alaskan and Canadian sampling programs should continue to be monitored.
USFWS			0	No significant concerns	4,800,000	It is recommended that Columbia River co-managers reach agreement on the use of the adipose mark.

Species	Area	Agency	DIT Groups	Rating ¹	Number to be Mass Marked	Recommendations
Spring Chinook (cont.)	Columbia River (cont.)	IDFG	0	No significant concerns	5,300,000	Lack of marine recoveries minimize concerns to coastwide CWT program. It is recommended that Columbia River co-managers reach agreement on the use of the adipose mark.
	N. Oregon Coast	ODFW	0	Some concerns	387,000	The need for a DIT group from this region should be assessed.
	S. Oregon Coast	ODFW	1	Some concerns	2,164,000	The adequacy of the DIT program should be reviewed – due to the lack of ETD in California.
Summer Chinook	Puget Sound	WDFW ²	1	Some concerns	950,000	Incomplete proposal. Anticipated fishery distribution and sampling information should be provided in future MM proposals. It is recommended that the SFEC-AWG and CTC ³ assess the scope and utility of the chinook DIT program.
	Columbia River	IDFG	0	No significant concerns	1,600,000	Lack of marine recoveries minimize concerns to coastwide CWT program. It is recommended that Columbia River co-managers reach agreement on the use of the adipose mark.
Fall Chinook	Puget Sound	WDFW ²	5	Some concerns	30,800,000	Incomplete proposal. Anticipated fishery distribution and sampling information should be provided as requested in MM proposals. It is recommended that the SFEC-AWG and CTC ³ assess the scope and utility of the chinook DIT program.
	Idaho	IDFG	0	No significant concerns	500,000	The need for a DIT group from this region should be assessed. It is recommended that Columbia Basin co-managers reach agreement on the use of the adipose clip on fall chinook, to avoid conflicting uses.

¹ Rating of Impacts to the CWT System

- **No Significant Concerns:** adequate DIT representation and electronic tag detection programs are in place for the known distribution of the mass marked stocks
- **Some Concerns:** some technical concerns relating to DIT representation or sampling programs
- **Significant Concerns:** proposal likely to result in significant impacts to the viability to the CWT system. For example, electronic tag detection capability is inadequate for the stocks proposed for marking; or the marking would significantly impact the ability of a sampling program to meet their sampling goals.

² Includes mass marking programs at tribal facilities

³ Chinook Technical Committee

Issues and Concerns Raised by the Review of the Mass Marking Proposals

Process

- MM proposals were received for all anticipated MM activities. However, the Washington proposals were incomplete in regards to estimated encounter rates. Additionally, the methods of estimating fishery encounters were not standardized between agencies. These issues limited the ability to quantify sampling impacts.
- The MM Template includes a question asking if the proposal complies with other regional agreements on marking. The intent was to help identify potential conflicts with marking programs. This question highlighted the fact that there are unresolved inter-agency issues regarding the use of the adipose fin clip on chinook within the Columbia River Basin.

DIT Program

- Ad+CWT groups (tagged and adipose fin clipped) no longer represent unmarked groups and cannot be used to directly estimate exploitation of wild or unmarked stocks in the presence of MSFs. The double index tag (DIT) pair consists of two tag groups, one tagged and clipped and the second tagged but not clipped. This provides a group that can represent the unmarked and wild stocks in fisheries and the relationship between the clipped and unclipped tag group provides a means to estimate encounters of the unclipped group in MSFs.

The list of coho and chinook DIT pairs (Appendices E and F) needs further review by the SFEC-AWG, the Chinook Technical Committee (CTC), and the Coho Technical Committee (CoTC) to ensure that all stocks potentially encountered in proposed MSFs are adequately represented by DIT groups. For example, there are no DIT groups for chinook indicator stocks in the upper Columbia or the Snake River. Only one of potentially nine Canadian indicator stocks vulnerable to the proposed MSF in Washington Area 5/6 has DIT groups and Electronic Tag Detection (ETD) sampling in the escapement. There are also no chinook DIT groups for the Oregon coast. The previous list of Oregon coho DIT groups has also been reduced from seven to two.

- Uncertainties remain regarding the utility of DIT groups to accurately measure fishery and age specific exploitation rates for indicator stock cohorts. The annual cost of DIT tagging and associated ETD sampling in escapement and fisheries is high. A recent review of Washington coho DIT groups (*Joint Coho DIT Analysis Workgroup, 2003*) indicated that for coho salmon the DIT pairs can provide estimates of unmarked mortalities of tagged fish in MSFs. The review acknowledged the potential for bias, but stated that for coho salmon the direction and size of that bias can be evaluated with the DITs. Further analysis by marking agencies for all coho DIT groups is recommended. In regards to chinook salmon the complications of the multi-age structure will affect the potential for bias. Post-season DIT data for coho and chinook indicator stocks should continue to be analyzed by the SFEC-AWG to assess the method's efficacy.
- The adequacy of the number of tags per DIT group has not been reviewed by the SFEC-AWG. Agencies are currently tagging at different levels, for a given species, within a region.

For coho, the Washington DIT analysis (*Joint Coho DIT Analysis Workgroup, 2003*) indicated that at current fishery levels the tag group sizes are probably too small to detect a difference between the majority of clipped and unclipped groups.

Electronic CWT Sampling

- ETD has not been implemented throughout the entire geographical range of CWT sampling (*Mass Marking and Mark-Selective Fisheries For 2002*, PSC Report, in press). In general, ETD has become the standard CWT sampling method in Washington, Idaho, and Oregon (except for Oregon fall chinook coastal fisheries). Traditional visual CWT sampling (use of the adipose mark) remains the standard method in Alaska and California. In British Columbia the situation is more complex: recreational fisheries rely on voluntary recoveries of adipose clipped coho and chinook while the current restricted commercial fisheries are electronically sampled. However, if commercial fisheries expand, there will not be sufficient ETD equipment or funds to sample all fisheries electronically, especially chinook.

This lack of uniformity and certainty with sampling methods continues to raise questions and issues regarding the impact on CWT data integrity. For the majority of the current MM programs, the marking agencies have considered the impacts acceptable because of the following assumptions regarding the distribution and migration of the marked stocks: 1) The marked stocks are not significantly harvested in the areas without ETD; and/or 2) the number of fish of an un-marked DIT group recovered in these areas can be estimated by extrapolation of recoveries from the associated marked DIT group; and 3) fish that are subjected to a MSF will not then migrate back to an area without ETD, and be subjected to harvest. Assumption 1 is not valid for far-north or far-south migrating stocks. Assumptions 2 & 3 have not been thoroughly investigated by the SFEC. A lack of complete ETD coverage will also limit the ability to use CWT-only (non adipose marked) studies. This technique is becoming more widespread for monitoring rebuilding programs of highly depressed chinook stocks in Washington.

- Alaska currently has no plans to implement electronic sampling at any level. They are concerned about the large numbers of fish without tags that are showing in their traditional sampling programs. The percentage of chinook without tags has risen from an annual average of about 7%, to 26% in the main summer troll fishery and as high as 45% in the winter fishery. Alaska is still meeting their sampling goals. However, they caution that for each marked fish the samplers must take additional time to work up associated data. It naturally follows that with more marked fish a sampler will have less time to devote to sampling. As mentioned in the above paragraph, the ramifications of maintaining this traditional visual sampling have not been thoroughly investigated.
- Changes in harvest allocations, especially a reduction in Canadian coho commercial fisheries, have increased the importance of obtaining reliable recreational fishery CWT data. Within Canada, the recreational fishery now relies on voluntary submissions of adipose clipped heads to obtain CWTs. Methods to estimate CWT recoveries from voluntary head recovery programs may have increased uncertainty compared to direct sampling estimates. If

mixed-bag regulations are in effect, this adipose-only sampling may also affect DIT evaluation for coho.

- There is no ETD in California. However, significant numbers of Oregon coho and Oregon south coast spring chinook are recovered in California. Besides the impact to the California sampling program, this may also compromise the ability to utilize the Oregon DIT groups to assess the impact of MSFs.
- CDFO has also recently announced plans to alter their tag recovery procedures. This is due to budget problems. Beginning in 2004 they will no longer recover tags from chinook without an adipose mark (i.e. even if the presence of a tag is indicated, the head will not be removed for tag recovery if the fish is not adipose clipped), with the exception of freezer troll caught chinook; all heads from such fish that detect positive for a CWT were retained for CWT extraction. Beginning in 2003, electronic sampling of their chinook sport catch was curtailed due to problems with their samplers using the wands and low recovery numbers.

This change in sampling protocol has significant implications to the Chinook DIT program and to other U.S. chinook CWT programs. Specific impacts include the following:

1. The ability to use the unmarked DIT tag group as a representative of natural stocks: The change in Canadian sampling may prohibit the use of DIT for unmarked exploitation rate estimation in all fisheries, including MSFs, where DIT tag groups are heavily impacted by these Canadian fisheries. The ramifications of this sampling change, combined with the lack of ETD in U.S. regions, needs to be reviewed by the SFEC AWG.
2. The ability to evaluate U.S. hatchery rebuilding programs on ESA listed/depressed stocks: This change in sampling will impact many on-going CWT research projects focused on evaluating rebuilding programs. There are currently 14 groups of Washington chinook that are tagged without the adipose fin mark (non DIT groups). These groups were tagged in this manner because of the need to avoid being directly harvested in selective fisheries, and because of the assumed recovery of tags through electronic CWT sampling. These ongoing studies currently lack Alaskan recoveries, and without the Canadian data most of them would be rendered useless for estimation of fishery distributions, exploitation rates and survival rates. This would require new evaluation techniques for these wild stocks.
3. Cost Implications: As described above, the curtailment of electronic sampling coverage could render many of the ongoing U.S. unmarked CWT studies significantly impaired or useless. Therefore, the cost incurred to tag these un-marked groups would be lost. For chinook, the marine recovery period is generally 2 - 4 years after release. Therefore, a lack of sampling beginning in 2004 would affect groups tagged and/or released from 2000 on (i.e. 4 years of tagging studies). For U.S. DIT groups this would involve approximately 1,900,000 tagged fish. For evaluation studies on rebuilding stocks this would involve approximately 2,900,000 tagged fish. The combined marking costs for these studies is approximately \$1,920,000 US (\$4,800 K fish x \$100/K x 4 years). There may be additional costs incurred with the potential

impacts to coho DITs, the loss of analytical tools, and the costs of having data managers/analysts develop and adopt new methods for dealing with this selective sampling protocol.

Electronic Detection Equipment

- The recommended “mouth-wanding” technique for chinook ETD has not been widely incorporated into agency sampling programs (*Mass Marking and Mark-Selective Fisheries For 2002, PSC, in press*). Mouth wanding involves inserting the wand into the fish’s mouth to detect tags through the palate. This technique is used in conjunction with the standard wanding technique, where the wand is passed over the outside of the snout. Research has shown that some tags will be missed if the mouth-wanding technique is not used. Because the technique results in excessive abrasion of the wands (due to the sharp teeth of salmon), the wands must be retrofitted with a protective titanium sheath. This retrofit costs \$150 per wand. Only WDFW has converted any of their wands.
- There are continued concerns related to the durability and cost of maintaining ETD equipment (*Mass Marking and Mark-Selective Fisheries For 2002, PSC, in press*). Electronic equipment has been used since 1998, and the life span of existing equipment is unknown. Funds will be needed to repair and replace equipment as it ages. Additionally, agencies have experienced a shortage of backup equipment when equipment is in for repair during the sampling season.

Data Management

Mass marking and mark selective fisheries have introduced new complexity into CWT data reporting, exchange and analysis. Data analysts must now be aware of the marking status of CWT groups and the regulatory history of fisheries in order to consider MSF impacts in stock assessments. Unfortunately, the ability to report and exchange this new information has not kept pace with management actions. Although it is not the intent of this report to review all the data management issues resulting from MM and MSF proposals, a synopsis of outstanding issues in need of agency attention is listed below.

- Not all agencies have successfully converted from PSC data exchange format 3.2 to the new format 4.0 designed to capture information on mass marking. This has impacted timeliness of reporting and also resulted in frequent data processing delays. There have also been data reporting errors regarding the identification of selective fisheries and the type of sampling. It is imperative that all agencies report information in the correct format and that every effort be used to minimize reporting errors.
- A number of standardized and readily accessible RMIS queries have been requested to expedite the analyses of the Chinook and Coho Technical Committees. The Mark Center has been advised of these requests and has agreed to make the necessary enhancements to RMIS in order to produce the needed information.

- There is presently no system in place to share information needed to evaluate CWT recoveries affected by MSFs. This need derives from complications in constructing the exploitation rate histories of unmarked fish intercepted and then released in MSFs, as there is no way to directly sample the post catch release mortality. This necessitates an indirect method for estimating or imputing CWT mortalities of unmarked DIT fish in MSFs. These imputed mortalities are needed to estimate the impact of the MSF on CWT groups that represent wild fish. Imputed CWT recoveries are also needed for unmarked CWT fish landed in fisheries without ETD (e.g. Alaska). Algorithms to estimate these mortalities and recoveries have not been developed. The task of developing a mechanism for reporting these imputed recoveries has been referred to the PSC Data Standards Working Group (DSWG).
- There is a continuing need for a MSF regulations file. The analysis of mark selective fisheries requires access to the retention regulations in place during a fishery. Necessary information also includes opening and closing dates, location, species, catch limits, gear type, and any other restrictions. The DSWG discussed this request at some length in December, 2000. However, it was concluded that the exact requirements from an analytical perspective were too nebulous to proceed with the development of an all-encompassing and structured regulations file. As a stop gap measure, DSWG added a one character field in the CWT recovery file and the catch/sample file as a flag to indicate if the fishery was mark selective. There is growing urgency to implement this regulations file as MSFs are increasing in importance. For the immediate future, however, analysts will have to contact each agency directly for any needed MSF information.

Summary and Recommendations

The RCWG received 22 mass marking proposals from agencies in Canada, Washington, Oregon and Idaho. All of these proposals were for ongoing chinook and coho mass marking programs. Several of these programs were reviewed by the SFEC last year (PSC Report SFEC (03)-2, 2003). Based on the evaluation criteria used (Appendix C), no significant technical concerns were identified with any individual mass marking proposal received. However, numerous overarching unresolved issues, related to implementing MM and analyzing MSFs, continue to impact the integrity of the CWT system. Recommendations for specific MM proposals are listed in Table 1. Recommendations for the overarching, unresolved issues are summarized as follows:

Process

- The process of reviewing all agency proposals should be repeated in 2004, so that the impacts of all MM programs anticipated by agencies are reviewed at least once by the SFEC. A complete set of proposals, with the requested estimate of fishery encounters, is necessary to assess the cumulative effects of these programs. However, proposals for the spring and summer chinook stocks from the upper Columbia and Snake River do not seem necessary. This is due to the distinct lack of marine recoveries for these stocks, and hence a lack of impacts to the coastwide CWT program.
- The SFEC is aware that significant new chinook mass marking, resulting from recent U.S. Congressional language, is anticipated in Washington and Oregon in 2005. This would primarily involve the marking of fall chinook from the Columbia River and the coast of Washington. As stated in the *Understanding of the PSC concerning Mass Marking and Selective Fisheries*, agencies are requested to submit new or substantially changed MM and MSF project proposals by June 1 of the year prior to implementation. As recommended in the original PSC Ad Hoc SFEC report (ASFEC, 1995): “*mass marking of hatchery fish by removing adipose fins should not be permitted until assurances are received from substantially affected jurisdictions that CWTs will be electronically sampled... ” page xvi*”

DIT Program

- The list of chinook and coho DIT pairs needs further review by the marking agencies, SFEC, CTC, and CoTC to ensure that stocks likely to be encountered in potential MSFs are adequately represented.
- The number of tags per DIT group should be reviewed by the SFEC, the CTC and the CoTC.
- The impact of the Canadian sport sampling program (all volunteer recoveries of marked fish only) needs to be evaluated for its impacts on the DIT program.
- Numerous questions remain regarding the utility and performance of the DIT program. Analysis for coho salmon DIT (*Joint Coho DIT Analysis Workgroup, 2003*), indicate that estimates of unmarked mortalities in MSFs can be made and biases evaluated. To date there has been no analysis of chinook salmon DIT data. Therefore it is unsure whether the DIT

method will work in practice to achieve the goals and objectives of the 1999 PST Agreements for chinook. Additional analysis of the performance of DIT groups should be a high priority for the marking agencies and the SFEC. The annual cost of tagging these groups is substantial.

Electronic CWT Sampling

- The geographical range required for ETD for chinook needs to be determined to ensure that the lack of CWT-only (tagged and unmarked) recoveries in areas without ETD (e.g. Alaska, B.C. sport, coastal Oregon, and California) will not compromise the analysis and estimation of exploitation rates for wild stocks.
- There is no long-term commitment from Canada to electronically sample chinook. This issue needs resolution to protect the integrity of the CWT system.
- The recent announcement by CDFO to not recover tags from unmarked chinook needs to be reviewed and discussed at a policy level. This has serious and immediate implications to the chinook DIT program.
- Agencies need to complete the transition to the “mouth wanding” technique when using the wand for EDT on adult chinook salmon. Without this technique, studies have shown that 1 – 9% of tags will be missed from mature chinook sampled with wands.
- Current agency funding does not appear adequate to purchase, retrofit, and/or maintain adequate levels of EDT equipment.

Data Management

Numerous new data reporting requirements have been identified to the PSC Data Sharing Committee. An increase in agency attention is needed to resolve these outstanding issues:

- Agencies need to ensure that their reporting of mass marking, tagging, and sampling information is correctly reported in the new PSC data exchange formats.
- A number of standardized and readily accessible RMIS queries have been requested of PSMFC to expedite the analyses of the Chinook and Coho Technical Committees.
- SFEC should help develop tools for estimating the number of unmarked mortalities in MSFs and unmarked landed mortalities in fisheries without ETD. Each agency should be responsible for estimating and reporting of these mortalities for all DIT groups they release. The DSWG has been tasked with developing a database for compiling this information.
- A database is needed to record the regulatory history of fisheries. This is an outstanding request to the Data Sharing Committee.

Literature Cited

- ASFEC, 1995. *Pacific Salmon Commission Selective Fishery Evaluation*. Ad-hoc Selective Fishery Evaluation Committee. Pacific Salmon Commission, June 1995.
- Joint Coho DIT Analysis Workgroup, 2003. *Analysis of Coho Salmon Double Index Tag (DIT) Data for the Brood Years 1995-1997*. Northwest Fishery Resource Bulletin. Project Report Series No. 12, November 2003.
- SFEC, 2003. *Mass Marking and Mark-Selective Fisheries for 2000 and 2001 and Planned Activities for 2002*. Report of the Regional Coordination Working Group of the Selective Fishery Evaluation Committee. Pacific Salmon Commission Report SFEC (03)-1, June 2003.
- SFEC, 2003. *2003 Review of Mass Marking and Mark-Selective Fishery Proposals*. Report of the Regional Coordination Working Group of the Selective Fishery Evaluation Committee. Pacific Salmon Commission Report TCSFEC (03)-2, September 2003.
- SFEC, 2004. *Mass Marking and Mark-Selective Fisheries for 2002*. Report of the Regional Coordination Working Group of the Selective Fishery Evaluation Committee. Pacific Salmon Commission Report (in press).

Appendix A. Understanding of the Pacific Salmon Commission Concerning Mass Marking and Selective Fisheries (Revised February 2004).

**Understanding of the
Pacific Salmon Commission
concerning
Mass Marking and Mark Selective Fisheries**

February 2004 Policy Statement

The Pacific Salmon Treaty's Memorandum of Understanding (MOU) obliges the Parties to, among other things, "maintain a coded-wire-tag and recapture program designed to provide statistically reliable data for stock assessment and fishery evaluation." The Pacific Salmon Commission (PSC) recognizes that the selective fisheries for marked hatchery coho and chinook salmon can impact the coastwide coded-wire-tag (CWT) program. For the sole purpose of fulfilling this MOU obligation, the PSC has established the following policies and procedures. This policy does not preclude the PSC from evaluating the impacts of, and making recommendations concerning, mass marking or selective fishery plans as they affect the negotiation and establishment of Treaty annex provisions.

- It shall be the policy of the PSC to review proposals for mass marking and selective fisheries to determine consistency with the Parties' commitment to the MOU provisions regarding the reliability of data needed for management of salmon fisheries within the jurisdiction and management area of the Treaty, including whether they impose substantial cost increases for agencies to conduct required data collecting programs.
- The PSC shall establish a Selective Fishery Evaluation Committee (SFEC) to perform the activities set forth in the attached Terms of Reference.
- To facilitate the SFEC review, the Parties shall do their utmost to ensure that their domestic managers submit all proposals for mass marking (MM) and mark selective fisheries (MSF) which could potentially affect stocks or fisheries of concern to the PSC in accordance with the following schedule:
 - Not later than June 1 of each year. Provide early notice containing the agency's plans to consider conducting MSFs over the next 3-5 years.
 - Not later than June 1 of the year prior to implementation. Provide new or substantially changed MM or MSF project proposals.
 - Not later than November 1 of the year prior to implementation. Provide proposals for MM or MSF programs that are anticipated to continue annually without substantive change.
 - Upon completion of domestic fishery planning processes, agencies conducting MSFs are to provide final selective fishery plans.

- Upon completion of MM programs, agencies are to report the number of fish that were actually mass marked and the extent to which releases are (single and double index) tagged for assessment.
 - Agencies shall report results of MSFs conducted during a season in the annual post-season report provided, using a format specified by the SFEC.
 - Not later than November 30 of the year following conduct of MSFs. Agencies are to report fishery and stock-age-specific estimates of mortalities for unmarked fish impacted by MSFs to the PSC technical committees
- The PSC shall consider, by the annual February PSC meeting, the SFEC reviews of proposals for MM and MSFs and discuss potential actions to address concerns related to any MM or MSF proposals that the SFEC determines will significantly and adversely affect the CWT program.
 - The Parties will do their utmost to ensure that MM and MSF proposals are developed in consultation with domestic co-management agencies or processes, and that proposing agencies or entities provide information required by the SFEC and adhere to reporting requirements to enable the PSC technical committees to complete their assignments in a timely manner.
 - After the occurrence of a selective fishery and when the data are available, the PSC shall review the management agency report on the actual conduct of the fishery with respect to its impact on the CWT program, and recommend changes and improvements.

Terms of Reference for the Selective Fishery Evaluation Committee

- I. Reporting and Committee Structure: The Selective Fishery Evaluation Committee (SFEC) will report to the PSC and will be comprised of a Steering Committee and two working groups: the Regional Coordination Working Group (RCWG) and the Analytical Working Group (AWG). All official members of the Steering Committee and working groups will be considered members of the SFEC.
 - A. Steering Committee: The Steering Committee will be comprised of:
 1. the co-chairs of the PSC Coho Technical Committee, Chinook Technical Committee, and Data Sharing Technical Committee;
 2. the co-chairs of the two working groups;
 3. agency mass-marking/selective-fishery coordinators; and
 4. additional agency representatives approved by the responsible Party.
 - B. Regional Coordination Working Group (RCWG): The RCWG may be comprised of members of the Steering Committee and other PSC technical committees and of the agency representatives approved by the responsible Party. All RCWG members should contribute actively to the work of this group.
 - C. Selective Fishery Analysis Working Group (SFAWG): The SFAWG may be comprised of members of the Steering Committee and other PSC technical committees and of the agency representatives approved by the responsible Party. All SFAWG members should contribute actively to the work of this group.
- II. Duties of the SFEC
 - A. Serve as a coastwide clearinghouse to facilitate the appropriate level of coordination and reporting on MM and MSF programs among the Parties, affected agencies, and existing coastwide and regional committees established to monitor activities related to the coastwide CWT program;
 - B. Provide advice to the PSC regarding potential adverse impacts of MM and MSFs on the CWT program;
 - C. Assess and monitor the cumulative impacts of MSFs on stocks of concern to the PSC;
 - D. Provide MM or MSF project proponents with information regarding concerns for potential impacts of their projects on the CWT program.
 - E. Receive and review MM and MSF proposals from the proponent(s) as early in the planning process as possible to identify potential issues and concerns regarding impacts on the CWT program.
 - F. Establish a technical evaluation process that will:
 1. Review proposed mass-marking/selective-fisheries initiatives developed by the proponent(s) and identify potential impacts on other jurisdictions and the CWT program;

2. Review, in consultation with relevant PSC technical committees, procedures and protocols for marking, sampling, and evaluation developed by the proponent(s) and, if appropriate, develop and recommend alternative procedures to address potential concerns or measures that could be taken to mitigate for adverse impacts on the CWT program;
 3. Establish standard formats and reporting requirements for agencies conducting MSFs to use when providing post-season information. Review post-season agency evaluations of the performance of MSFs and their estimates of mortalities on stocks of concern to the PSC;
 4. Identify information needs or request modifications of proposals to meet concerns regarding impacts on the CWT program; and
 5. Conduct, at agreed intervals, technical evaluations of mass marking and selective fishery programs in order to assist the Parties to maintain the integrity of the CWT program.
- G. Work with PSC Technical Committees to establish formal standards and objectives for a viable CWT program to enable more precise evaluation of potential impacts of MM and MSFs on the viability of the coastwide CWT program and to guide the development of mitigation measures.
- H. Specific duties of the Steering Committee include being responsible for overall coordination and prioritization of the activities for the working groups and being the focal point for reporting to the PSC. The agency mass-marking/selective-fishery coordinators should ensure that mass marking and selective fishery proposals are provided to the SFEC in a timely manner.

III. Specific duties of the RCWG, among other related activities, include:

- A. Coordinate and report on continuing research on electronic detection and mass marking technologies;
- B. Collate and share information on CWT sampling procedures and programs; suggest modifications to sampling and monitoring programs to proponents;
- C. Review MM proposals to determine potential impacts on sampling and tagging programs;
- D. Provide agencies with a list of MM and MSF proposals received by the SFEC;
- E. Provide the necessary liaison with the Data Standards Working Group of the Data Sharing Technical Committee to ensure that necessary modifications are made to PSC data exchange formats to maintain the integrity of the CWT system; and
- F. Prepare an annual report summarizing mass marking statistics, index tag groups, and sampling programs for marks and CWTs.

- IV. Specific duties of the SFAWG, among other related activities, include:
- A. Design marking and sampling strategies that will achieve desired precision for CWT-based estimates;
 - B. Develop analytical tools for the evaluation, by the SFEC and MSF proponents, of MM programs and MSFs and their potential impacts on the coastwide CWT program;
 - C. Provide the necessary technical liaison with agencies and other coastwide committees working on selective fishery evaluation models;
 - D. Review and recommend parameter values for assessing impacts of MSFs;
 - E. Develop analytical tools for estimating the impacts of MSFs on escapements and exploitation rates for naturally spawning coho and chinook stocks based on post-season information;
 - F. Review MSF proposals and provide advice to the proponents regarding the design of MSFs and the conduct of sampling and monitoring programs; and
 - G. Recommend guidelines, procedures, and/or time frames necessary to evaluate the success of MSFs in conserving naturally spawning stocks.

L. Cassidy
Chair

J. Davis
Chair

Appendix B. Mass Marking Proposal Template

Mass Marking Proposal ID #
Date Received

TEMPLATE FOR ADIPOSE FIN MASS MARKING PROPOSALS

This template is intended for proposals to mass mark any release group of more than 100,000 fish from a hatchery complex or area that involves the following:

- 1) Chinook or coho salmon,
- 2) mass marked with an adipose clip, but untagged, and
- 3) expected to be intercepted in Pacific Salmon Commission fisheries.

Contact information

Proposing Agency:	
Contact Person:	
Mailing Address:	
Phone Number:	
Fax:	
Email:	

Is the proposal:

new	<input type="checkbox"/>
substantially changed	<input type="checkbox"/>
or a continuation of a previous proposal	<input type="checkbox"/>

Proposed Marking and Tagging

1. Purpose of mass marking:
 - a. Provide a brief description of the goals and objectives of the proposal (e.g. to obtain more information on hatchery straying to wild spawning grounds, to increase fishing opportunities, or to identify hatchery/wild compositions in fisheries).
 - b. If the proposal is not a new proposal, list the Mass Marking Proposal ID number(s) (assigned by the PSC Executive Secretary) corresponding to the previous proposal. In addition, describe any significant differences from previous proposals (i.e., additions or deletions of mass marked stocks or DIT groups).
 - c. Identify potential mark-selective fisheries targeting the proposed mass marked stocks that your agency might pursue in the future.
2. List all proposed mass marking and DIT plans (see attached example), including the following fields: area/region, hatchery, stock, number of fish to be tagged with and

without fin clip, number of fish to be untagged with and without fin clip, and ideal start time for marking to occur (month and year).

3. List any known reviews of the mass marking proposal that have been conducted (e.g., by the Mark Committee) and the outcome of those reviews. List any marking programs/agreements that this proposal may conflict with and briefly describe the possible conflict.
4. List any issues of concern previously identified by the SFEC related to this mass marking proposal and describe how those concerns have been addressed.

Fishery Distribution and CWT Sampling

5. Provide estimates of the anticipated number of mass marked fish that will be encountered using the Table below.

Fishery/Region	Anticipated number of marked fish that will be encountered	Electronic sampling currently in place Y/N?
List...		

Describe the source/data and methods used to make the estimates. Provide other information, if available, on the distribution, run timing and migration routes of the stocks proposed for marking and/or tagging.

Example Format for Marking and Tagging Information (Question 2)

List all proposed mass marking and tagging plans including the following information. Identify all DIT groups with an asterix (*).

Species:

Brood:

Release Year:

Area or Region	Hatchery	Stock	Number to be Tagged		Number Untagged		Proposed to be Marked This Brood Year (Y/N)	Marked Last Brood Year (Y/N)
			Ad Clipped	Unclipped	Ad Clipped	Unclipped		
		Total						

Appendix C. Criteria for evaluating mass marking proposals.

PROPOSED MARKING AND TAGGING

- 1) *Has the purpose of the mass-marking proposal been adequately described? If increasing fishing opportunities is an objective of the mass-marking proposal, have future potential mark-selective fisheries been identified?*
- 2) *DIT coverage*
 - a) *Does the proposal contain a list of relevant DIT groups previously identified by the SFEC for that agency?*
 - b) *Are there additional groups that should be DITed, if there is an associated MSF?*
- 3) *Coordination*
 - a) *Does the proposed marking comply with the other regional agreements on marking (from PSMFC Mark Committee and agency mark coordinators)?*
 - b) *Are there any unresolved regional marking policy issues associated with this proposal?*
- 4) *Technical Issues*
 - a) *Have previously identified issues with this marking been resolved?*
 - b) *Do the proposed changes raise any new issues?*

FISHERY DISTRIBUTION AND CWT SAMPLING

- 5) *Fisheries*
 - a) *Is the information provided on distribution of the marked stocks, and their occurrence in fisheries, adequately described?*
 - b) *Is electronic sampling adequate in all these fisheries?*
 - c) *If not, identify the impacts on the current assessment methods or programs and methods to eliminate or mitigate for those impacts.*

SUMMARY

Summarize concerns related to the mass-marking proposal and its effect on the viability of the CWT system.

RECOMMENDATIONS

What additional information is required to evaluate the mass-marking proposal.

Provide recommendations for program modifications that might avoid, or mitigate for negative impacts on the viability of the CWT system.

Appendix D. Status of 2004 Mass Marking proposals.

Description	New¹ or Continuation Proposal	SFEC Proposal Number	Revisions Received
Southern BC Coho - CDFO	Cont.	MM-FOC-01-2003	Yes
Washington Coho - WDFW	New / Cont.	MM-WDFW-01-2003	Partial
Makah Coho - USFWS	Cont.	MM-USFWS-01-2003	Yes
Quilcene Coho - USFWS	Cont.	MM-USFWS-02-2003	Yes
Quinault Coho - USFWS	Cont.	MM-USFWS-03-2003	Yes
Eagle Creek Coho - USFWS	Cont.	MM-USFWS-04-2003	Yes
Willard Coho - USFWS	Cont.	MM-USFWS-05-2003	Yes
Columbia River Coho - ODFW	New	MM-ODFW-04-2003	Yes
Oregon Coast Coho - ODFW	New	MM-ODFW-05-2003	Yes
Snake R. Spring Chinook – IDFG	New	MM-IDFG-01-2003	Yes
Snake R. Summer Chinook – IDFG	New	MM-IDFG-02-2003	Yes
Snake R. Fall Chinook – IDFG	New	MM-IDFG-03-2003	Yes
Carson Spring Chinook - USFWS	Cont.	MM-USFWS-05-2003	Yes
Little White Spring Chinook - USFWS	Cont.	MM-USFWS-06-2003	Yes
Dworshak & Kooskia Spring Chinook – USFWS	Cont.	MM-USFWS-08-2003	Yes
Entiat Spring Chinook - USFWS	Cont.	MM-USFWS-09-2003	Yes
Leavenworth Spr. Chinook - USFWS	Cont.	MM-USFWS-10-2003	Yes
Willamette Spring Chinook - ODFW	New	MM-ODFW-20-2003	Yes
Oregon North Coast Spring Chinook - ODFW	New	MM-ODFW-21-2003	Yes
Oregon South Coast Spring Chinook - ODFW	New	MM-ODFW-51-2003	Yes
Puget Sound Fall Chinook - WDFW	Cont.	MM-WDFW-02-2003	No
Columbia R. Spring Chinook - WDFW	Cont.	MM-WDFW-03-2003	No

¹ New proposal for SFEC review

Appendix E. Coho exploitation rate indicator stocks with DIT pairs.

Region	Natural/Unmarked Stock Representation	DIT Stock	Hatchery
Lower Fraser	East Coast Vancouver Island	Big Qualicum	Big Qualicum
	Lower Fraser	Chilliwack	Chilliwack
	East Coast Vancouver Island	Goldstream R.	Goldstream River
	Lower Fraser	Inch Creek	Inch Creek
	North Vancouver Island	Quinsam River	Quinsam River
West Coast Van Is.	West Coast Vancouver Island	Robertson Cr.	Robertson Creek
Puget Sound	Nooksack	Nooksack	WDFW Kendall Cr.
	Skagit	Skagit	WDFW Marblemount
	Stillaguamish/Snohomish	Skykomish	WDFW Wallace R.
	Mid Puget Sound	Green River	WDFW Soos Creek
	South Puget Sound	Puyallup	WDFW Voights Creek
	North Hood Canal	Quilcene	USFWS Quilcene Natl.
	Quilcene Net Pens (Hood Canal)	Quilcene	Quilcene Net Pens
	South Hood Canal	George Adams	WDFW George Adams
	Strait of Juan de Fuca	Elwha	Lower Elwha Tribal
Washington Coast	North Coast	Solduc	WDFW Solduc
	North Central Coast	Queets	Quinault Salmon R.
	Quinault	Quinault	USFWS Quinault R.
	Grays Harbor	Satsop	WDFW Bingham Cr.
	Willipa Bay	Forks Creek	WDFW Forks Creek
Columbia Basin	Lower Columbia River	Lewis River	WDFW Lewis River
	Lower Columbia River	Sandy	ODFW Sandy
Oregon Coast	Oregon South Coast	Rogue River	ODFW Cole River

Appendix F. Chinook exploitation rate indicator stocks with DIT pairs.

Region	Natural/Unmarked Stock Representation	DIT Stock	Hatchery
British Columbia	Fraser Lates	Chilliwack	Chilliwack
	Fraser summer-run age 0.3	Lower Shuswap	Shuswap
Puget Sound	Nooksack River springs	Nooksack spring fingerlings	WDFW Kendall Creek
	Skagit River springs	Skagit spring yearlings	WDFW Marblemount
	White River springs	(none)	
	North Puget Sound summer/fall	Skykomish summer fingerlings	WDFW Wallace River
	North Puget Sound fall	Samish fall fingerlings	WDFW Samish
	Mid Puget Sound fall	Green R. & Grovers Cr. fall fingerlings	WDFW Soos Cr. & Suquamish Grovers Cr.
	South Puget Sound fall	Nisqually fall fingerlings	Nisqually Hatchery at Clear Creek
	Hood Canal fall	George Adams fall fingerlings	WDFW George Adams
	Strait of Juan de Fuca	(none)	
Washington Coast	Washington coastal falls	(none)	
Columbia River	Lower Columbia spring	Lewis R. spring yearlings	WDFW Lewis River
	Willamette River spring	Clackamas spring yearlings	ODFW Clackamas R.
	Willamette River spring	McKenzie spring yearlings	ODFW McKenzie R.
	Upper Columbia River spring/summer	(none)	
	Snake River spring/summer	(none)	
Oregon Coast	Oregon coastal springs	Rogue River	ODFW Cole River
	Oregon coastal falls	(none)	