PACIFIC SALMON COMMISSION
SELECTIVE FISHERY EVALUATION COMMITTEE

REVIEW OF 2011 MASS MARKING AND MARK-SELECTIVE FISHERY PROPOSALS
REPORT SFEC (13)-1

January 2013

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LIST OF ACRONYMS WITH DEFINITIONS

ADFG	Alaska Department of Fish and Game	**NSF**	Non-Selective Fishery
AK	Alaska	**OR**	Oregon
BC	British Columbia	**ODFW**	Oregon Department of Fish and Wildlife
BY	Brood Year	**PS**	Puget Sound
CA	California	**PSC**	Pacific Salmon Commission
CDFG	California Department of Fish and Game	**PSMFC**	Pacific States Marine Fisheries Commission
CDFO	Canadian Department of Fisheries and Oceans	**PST**	Pacific Salmon Treaty
CTC	Chinook Technical Committee	**RMIS**	Regional Mark Information System
CoTC	Coho Technical Committee	**SFEC**	Selective Fishery Evaluation Committee
CWT	Coded-Wire Tag	**SFAWG**	SFEC- Analytical Work Group
DIT	Double-Index Tag	**SFEC-RCWG**	SFEC- Regional Coordination Work Group
ER	Exploitation Rate	**SHRP**	Sport Head Recovery Program
ETD	Electronic Tag Detection	**SJDF**	Strait of Juan de Fuca
ID	Idaho	**URB**	Upriver Bright (Fall Chinook)
IDFG	Idaho Department of Fish and Game	**US**	United States
MM	Mass Marking	**WA**	Washington
MOU	Memorandum of Understanding	**WCVI**	West Coast Vancouver Island
MSF	Mark-Selective Fishery	**WDFW**	Washington Department of Fish and Wildlife

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EXECUTIVE SUMMARY

Throughout this report a mass-marked fish refers to a fish from which the adipose fin has been removed. A proportion of the mass-marked fish will also contain an implanted coded-wire tag (CWT). A double-index-tag (DIT) group includes two related CWT groups, one with the adipose fin excised ("marked") and one with the adipose fin intact ("unmarked"). A variety of terms are in use to refer to marked and unmarked fish. In this report, the terms 'marked' and 'unmarked' are used for the most part with occasional use of the terms "clipped" and 'unclipped'.

Summary of 2011 Mass Marking Proposals

Marking Programs

Seventeen proposals (eight for Coho and 10 for Chinook) were received for mass marking (MM) occurring in 2011 (Appendix E). The Selective Fishery Evaluation Committee (SFEC) believes these proposals cover all but one MM program of relevance to the Pacific Salmon Commission (PSC).

Approximately 37 million Coho are proposed to be mass marked coastwide in 2011 (Table 2.1; Figure 2.1A), a level comparable to that proposed in 2010. Essentially all hatchery Coho production intended for harvest, from southern British Columbia (BC) and southern United States (US) hatcheries is now mass marked. Currently there are 19 Coho Salmon DIT groups (Table 2.1), of which the majority is released from Puget Sound (PS) or Washington (WA) coastal facilities. Two of the 19 are released from BC and four from the Columbia River Basin.

Approximately 106 million Chinook are proposed to be mass marked in 2011 from southern US Chinook hatcheries (Table 2.1; Figure 2.1B). This is approximately 4 million less than were proposed for 2010. Most all hatchery Chinook production from southern US hatcheries intended for harvest is now mass marked. Currently there are 15 Chinook Salmon DIT groups (Table 2.1), of which eight are released from PS facilities, two from the coastal facilities, and one spring and four fall stock releases from Columbia River facilities.

Sampling and DIT Programs

Assuming recent exploitation rates and sampling programs, the SFEC estimates the proposed MM of Coho stocks in 2011 will result in annual encounters of untagged marked Coho in sampling programs of approximately 1,400 Coho in Alaska (AK) and 8,000 Coho in Canada (Table 2.4). For southern US Chinook stocks, annual encounters of untagged marked Chinook in sampling programs are projected to be approximately 6,500 Chinook in AK, 22,600 Chinook in Canada, and 1,700 Chinook in California (Table 2.4).

Prior to MM, the adipose fin clip was employed as a visual indicator for fish containing a CWT. Consequently, sampling programs which were designed to collect heads from fish with missing adipose fins resulted in samples of heads, all which contained CWTs. With MM, a large number of marked fish do not contain CWTs; further, CWTs must be recovered from both marked and

unmarked fish to obtain data for DIT releases to estimate fishery impacts. Electronic tag detection (ETD) equipment has been developed as a means to efficiently identify marked and unmarked fish containing CWTs. However, ETD is not employed coastwide because of continuing reservations by some agencies regarding the cost, accuracy, and practical feasibility of incorporating this technology into their sampling programs. The Alaska Department of Fish and Game (ADFG), Canadian Department of Fisheries and Oceans (CDFO), Oregon Department of Fish and Wildlife (ODFW), and California Department of Fish and Game (CDFG) all conduct sampling programs which will not recover the unclipped component of DIT programs required to assess impacts of MSFs.

Considering sampling programs coastwide, some agencies already implement comprehensive electronic sampling strategies to recover CWTs from sport and commercial fisheries, while other agencies are still working to increase use of ETD. Washington State continues to fully implement electronic sampling statewide and consistently reports CWT recoveries of unmarked DIT releases in recreational marine and some freshwater MSFs, as well as in non-selective fisheries (NSFs). Starting in 2008, Canada also committed to full electronic sampling in all commercial fisheries for Chinook and reporting of all DIT CWTs. Coho in all Canadian commercial fisheries have also been electronically sampled with the exception of the Coho landed by the northern BC 'ice boat' fleet. Visual sampling only is used to recover CWTs in that fishery. Canada continues to rely on the Sport Head Recovery Program (SHRP) to recover CWTs from NSFs and MSFs alike and thus, no unmarked DIT recoveries are available from them. ODFW continues to use visual sampling of fall Chinook in the Columbia River and the Oregon (OR) coast fisheries, also resulting in no recoveries of unmarked DIT groups. Fisheries from which unmarked DIT recoveries should have been observed create gaps in analyses of fishery impacts on unmarked (wild) fish.

Encounters of large numbers of mass-marked Chinook are increasingly impacting catch sampling programs in northern fisheries; for example, approximately 30% of the Chinook caught in the south east Alaskan troll fishery with a missing adipose fin do not contain a CWT in recent years. With the MM of Columbia River fall Chinook stocks, the number of mass-marked Chinook encountered in California sampling programs is also estimated to significantly increase in 2011. The increased costs to deal with the additional marked fish (e.g., storage, and shipping to and sorting of heads in the dissection laboratories) are not quantified, but will impact the programs.

Summary of 2011 Mark- Selective Fishery Proposals

Forty-two proposals for MSFs (16 for Coho and 26 for Chinook) were received for fisheries in 2011 (Appendix F). The SFEC believes these proposals cover all MSFs planned for 2011 of relevance to the PSC. The proposals submitted to the SFEC for review are provided in Table 3.1. Further details describing the proposed MSFs and comments by the SFEC are provided in Table 3.2 and Table 3.3.

The majority of MSF proposals are for terminal marine or freshwater areas, each of which will impact mature fish of one to several stocks. Multiple MSFs for both Coho and Chinook are also expected to occur in ocean areas in 2011 in BC, WA (WA ocean areas 1 through 4 and the Columbia

River) and OR. These fisheries will impact many stocks and also multiple broods of Chinook. Table 2.4 provides estimates of projected encounters of mass-marked fish in 2011 regional fishery sampling programs based on the number of mass-marked fish released by each participating agency. Table 3.4 and Table 3.5 each provide historical information on encounters of marked and tagged fish for the run years 2006-8 and 2003-8 to identify Coho and Chinook tagged stocks that can be expected in these areas with MSFs.

Issues and Concerns

Proposals

All requested MM and MSF proposals were submitted prior to the annual meeting of the SFEC in November but most of these were not submitted by the deadline of November 1. Receiving the proposals by November 1 would give the SFEC membership time to review them prior to the meeting, allowing for more time for during the meeting to prepare timely commentary back to MSF proponents. In general all information requested was supplied for both the MM and MSF proposals.

Post-season Reports

Post-season reports on MSF are required for each MSF prosecuted. One of the basic functions of these reports is to provide a record of how fisheries were actually prosecuted (whether they took place) and whether there were any changes in the way the fisheries and sampling programs were conducted relative to the proposal. These reports are to be submitted in the form of three tables (Appendix I). The first two tables should be submitted by the annual PSC post-season meeting following the year of the fishery. Table I.3 of the three tables was included for Puget Sound MSFs for 2003 to 2009 in the "*Preliminary 2010 Post Season Report on United States Salmon fisheries of Relevance to the Pacific Salmon Treaty*" December 2010. No MSF post-season report/tables were found in the Canadian post-season report (Jan 6, 2011). No post-season reports for Table I.1 (sampling methods) or Table I.2 (MSFs actually implemented) were provided in either Party's post-season report.

New Chinook MSF proposals

SFEC received proposals for four existing fisheries; two for Coho and two for Chinook MSFs. These are for fisheries that have been prosecuted since 2003 (two of them), 2008, and 2009. No new MSFs that had not occurred previously were proposed for 2011.

Mixed-Bag Regulations

Regulations to implement MSFs are increasingly complex, making analyses difficult. Different types of mixed bag regulations are part of the MSFs proposed by BC, WA, and OR for recreational fisheries. In most cases this is a mixed bag, where only adults that are marked may be kept but both marked and unmarked juveniles may be retained, but as MSFs expand a variety of types of mixed bag regulations are being proposed (Table 4.3). The SFEC is not aware of adequate methods for estimating impacts on marked and unmarked fish under mixed bag regulations and the agencies proposing these mixed bag regulations should assist in developing the analytical tools to measure the impacts of these fisheries.

Recommendations and Issues Requiring PSC Direction

Proposal Review Process

It is recommended that the PSC request agencies to submit proposals for all potential 2012 MM and MSFs, and for agencies to provide both preliminary and final post-season reports on the conduct of MSFs within the timeframe adopted by the PSC. Agencies need to prioritize these tasks so that proposals and MSF post-season reports are completed and submitted in a timely manner.

Interagency Coordination and Cooperation

Mass marking, DIT, and CWT sampling programs are not sufficiently coordinated to support analysis by PSC technical committees. It is also not clear that agencies are collecting adequate and necessary data to permit correctly stratified, direct estimation of unmarked CWT recoveries in fisheries and escapements so that cohort reconstructions can be carried out on unmarked DIT releases. With the expansion of Chinook marine MSFs, the geographical range of electronic CWT sampling needs to be expanded and the number of DIT stocks needs to be increased. Specifically, ETD needs to be implemented by ODFW, beginning in 2011, for Oregon Coastal Chinook and Columbia River fall Chinook to recover DITs for Chinook exploitation rate indicator stocks. The SFEC recommends that DIT groups should be added for the following stocks:

Chinook DIT recommendations:

- Columbia River summers (Similkameen Ponds or Wells)
- Snake River fall subyearlings
- Willamette River springs (reinstate DIT program with electronic terminal sampling)
- North Oregon Coast (Salmon River)
- Mid Oregon Coast

Coho DIT recommendations:

- USFWS Eagle Creek – increase DIT release group size from 25,000 to the standard 50,000

The PSC should continue to support technical and policy processes to develop agreements to clarify responsibilities for maintaining a functional CWT system; these processes should build upon recommendations presented by the CWT Work Group in 2008.

1 INTRODUCTION

The Selective Fishery Evaluation Committee (SFEC) is charged with evaluating potential impacts of mass marking (MM) and mark-selective fisheries (MSFs) on the viability of the coded-wire-tag (CWT) system (Appendix A). The SFEC serves as a clearing house to facilitate coordination and reporting on MM and MSF programs among the Parties to the Pacific Salmon Treaty (PST), affected agencies, and existing coastwide and regional committees established to monitor activities related to the CWT program. The SFEC continues to review procedures and protocols for MM, fishery sampling plans, and the program evaluations developed by the proponents. Where appropriate, the SFEC develops and recommends alternative procedures in consultation with relevant technical committees of the Pacific Salmon Commission (PSC).

In addition, the SFEC has a role in developing and evaluating methods for analyses of CWT data in the presence of MM and MSFs, establishing database requirements, and developing tools for agency use in developing proposals and analyzing data. The SFEC includes two working groups: the Regional Coordination Work Group (RCWG) and the Analytical Work Group (SFAWG). The RCWG is tasked with reviewing MM proposals, and the SFAWG is tasked with reviewing MSF proposals and evaluating post-facto impacts of MSFs.

Beginning in 2002, agencies that intended to engage in MM or MSFs were requested to provide specific information on an annual schedule that would permit the SFEC to provide timely advice to the PSC. Agency proposals for MM plans were requested for all hatchery Chinook and Coho stocks expected to be encountered in fisheries affected by PSC regimes. 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. Agencies have been requested to provide their information to the SFEC in provided templates (Appendix B and Appendix C). In addition, a Microsoft Excel™ format has been developed as an alternative format for submitting MSF proposals (Appendix D).

The SFEC reviewed proposals for MM activities and MSFs that would occur in 2011. This report summarizes the results of the review of MM and MSF proposals received between October and December 2010. The report also identifies issues and concerns, and provides recommendations.

Throughout this report a mass-marked fish refers to a fish with an excised adipose fin and a double-index-tag (DIT) group refers to two related CWT groups, one marked and one unmarked. The terms ‘marked’ and ‘clipped’, and likewise ‘unmarked and ‘unclipped’, are used interchangeably.

2 REVIEW OF MASS MARKING PROPOSALS

2.1 Mass Marking Proposals Received

A total of 18 MM proposals (eight for Coho and 10 for Chinook) were received by the PSC for 2011 activities (Appendix E). This includes one new proposal, which describes the proposed marking of OR coast fall Chinook in 2011 by ODFW. Although this was a new proposal, these fish have been mass marked in previous years. All received proposals are summarized in Table 2.1; they represent all known MM programs that have international ramifications and/or sampling impacts on other agencies. Proposals were not requested for spring and summer Chinook stocks from the upper Columbia and Snake River Basins, given the lack of marine CWT recoveries from these groups as identified in previous reviews.

In order to evaluate the impacts of MM proposals on coast-wide sampling programs, marking agencies have been requested to provide projected fishery encounters of mass-marked fish in the proposals. A standardized method of estimating fishery encounters was provided to the agencies and this method is described in the MM proposal template in Appendix B.

2.2 Mass Marking Levels

Approximately 37 million Coho are proposed to be mass marked in 2011 from southern BC, WA, and OR, the region and stocks covered by the 2011 proposals (Table 2.1). Although there has been a gradual decline in coastwide Coho production, there have been no significant changes to proposed marking levels from brood year (BY) 2001 to BY 2010. The total BY 2010 Coho hatchery production from stocks covered by the 2011 proposals, is projected to be approximately 42 million fish, a slight decrease from 2010 due to program reductions. Annual trends in Coho MM and total production, for BYs 1997 to 2010, are shown in Figure 2.1A. Geographical details of the proposed BY 2010 releases, by mark and tag status, are displayed in Figure 2.2A. The vast majority of the coastwide Coho production, and essentially all Coho intended for harvest, is mass marked. For the production that is not mass marked, approximately 1.4 million are tagged and unmarked. These principally represent DIT groups.

The total BY 2010 southern US Chinook hatchery production from WA and OR, for the area and stocks covered by the 2011 proposals, is projected at approximately 135 million released fish. Annual trends in Chinook MM and total production, for BYs 1997 to 2010, are shown in Figure 2.1B. Geographical details of the proposed BY 2010 releases, by mark and tag status, are displayed in Figure 2.2B.

Approximately 106 million Chinook are proposed to be mass marked from southern US Chinook hatcheries in 2011 (Table 2.1). This is approximately 4 million less than the number proposed to be marked in 2010. However, this is primarily due to the removal of Priest Rapids Hatchery Upriver Brights (URBs) from the WA proposal. These fish were proposed for marking last year, but the marking did not occur. For the proposed production that is not mass marked, approximately 15.8 million will be both tagged and marked, approximately 5.7 million will be tagged and unmarked, and approximately 7.6 million will be intentionally left unmarked for restoration programs (Figure 2.2B). No MM of Chinook is anticipated for hatchery production by CA, BC, or AK.

2.3 Double-Index-Tag Groups

DIT groups provide information necessary for direct estimation of total MSF impacts on unmarked fish. Appendix G and Appendix H list the Coho and Chinook Salmon PSC indicator stocks, including those that are DITs. WDFW has maintained DIT groups for both species, but the number of DITs outside WA has declined in recent years (Table 2.1, Appendix G and Appendix H). As new MSFs are being proposed both in BC and in areas off the WA coast and in the Columbia River for fall Chinook, further evaluation of the DIT programs is necessary. The following Columbia Basin stocks are recommended for DIT consideration: 1) lower river Tules – Cowlitz or Washougal Hatchery; 2) summer Chinook – Wells Hatchery; 3) Upriver Brights – Priest Rapids Hatchery; 4) Snake River fingerlings – Lyons Ferry Hatchery.

Table 2.1. Mass marking of Coho and Chinook Salmon proposed for 2010 and 2011.

Species	Area	Run	Agency	DIT Groups	Mass Marking (millions) 2010	Mass Marking (millions) 2011	Significant Changes from 2010
Coho	Southern BC		CDFO	2	6.8	6.0	Program reductions
	Puget Sound		WDFW/Tribal	6	11.2	11.1	
			USFWS	1	0.3	0.3	
	WA Coast		USFWS	2	0.7	0.7	
			WDFW/Tribal	4	4.4	4.4	
	OR Coast		ODFW	0	0.6	0.4	
	Columbia Basin		USFWS	1	0.3	0.3	
			WDFW	2	8.5	8.5	
			ODFW	1	4.9	4.9	DIT program moved from Sandy to Tanner
Total Coho				19	37.7	36.7	
Chinook	Puget Sound	Spring	WDFW/Tribal	2	0.4	0.4	
		Summer	WDFW/Tribal	1	2.4	2.4	
		Fall	WDFW/Tribal	5	28.2	30.7	
	WA Coast	Spr./Sum.	WDFW/Tribal	0	0.4	0.3	
		Fall	USFWS	0	2.3	1.9	Quinault NFH program moved to Quinault Lake
			WDFW/Tribal	2	8.0	8.1	
	OR Coast	N. Spring	ODFW	0	0.4	0.5	
		S. Spring	ODFW	0	2.1	2.0	
		Fall	ODFW	0		1.6	No proposal received prior to this year
	Columbia Basin	Spring	ODFW	0	4.2	4.5	
			WDFW	1	2.7	2.6	
		Fall Tule	USFWS	1	11.3	11.3	
			WDFW	1	20.3	20.6	
			ODFW	1	8.2	7.9	
		Fall URB	WDFW	1	9.6	8.4	
			ODFW	0	7.6	4.3	
			USFWS	1	1.6	1.6	
		Snake R. Fall	IDFG	0	0.6		No proposal received
Total Chinook				**16**	**110.3**	**106.3**	

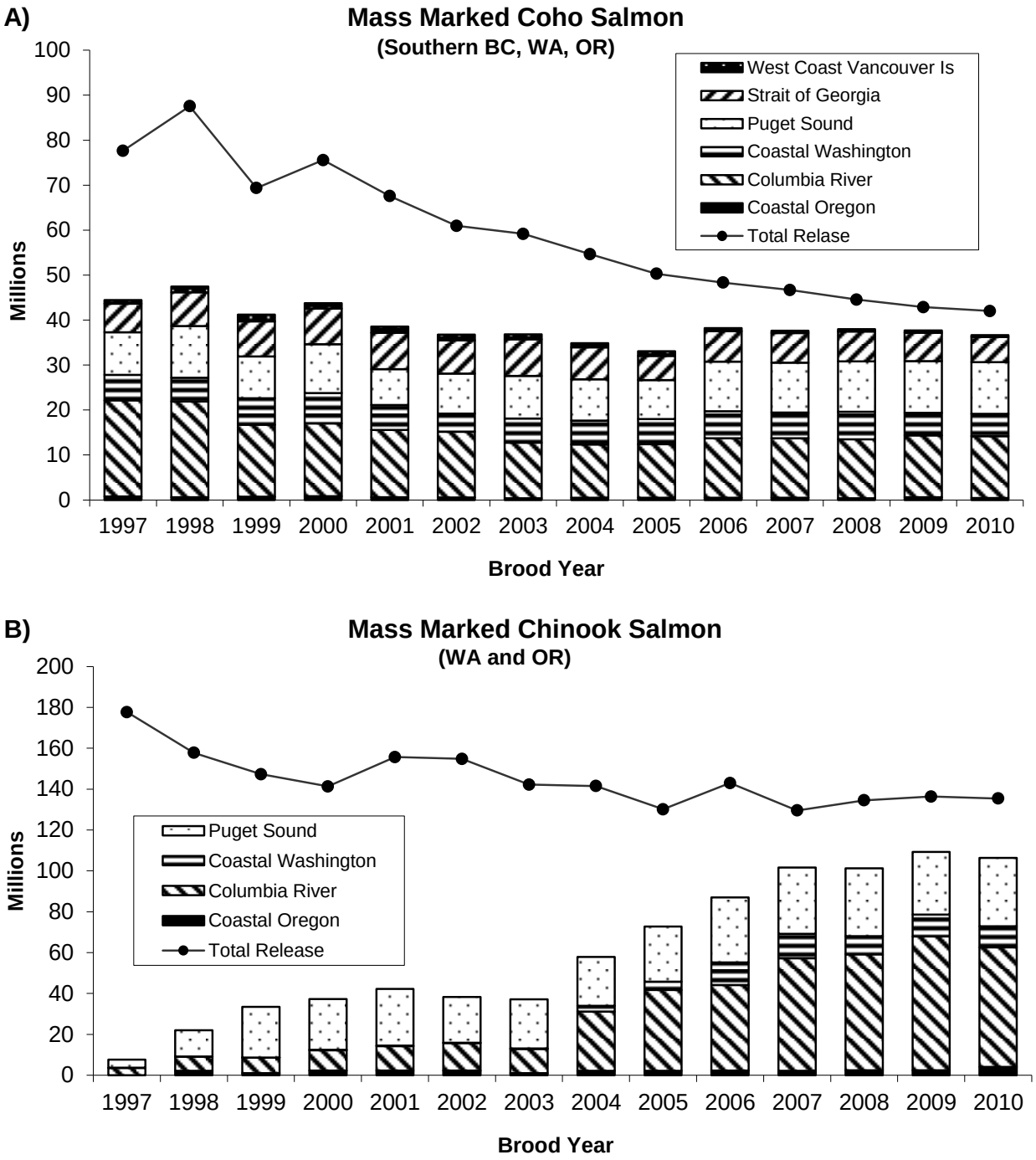

Figure 2.1 Number of Coho Salmon (panel A) and Chinook Salmon (panel B) mass marked and released by region and brood year, 1997-2010. The solid line represents total hatchery releases by brood year. Values used for brood years 2010 are proposed numbers of releases, not the actual release sizes.

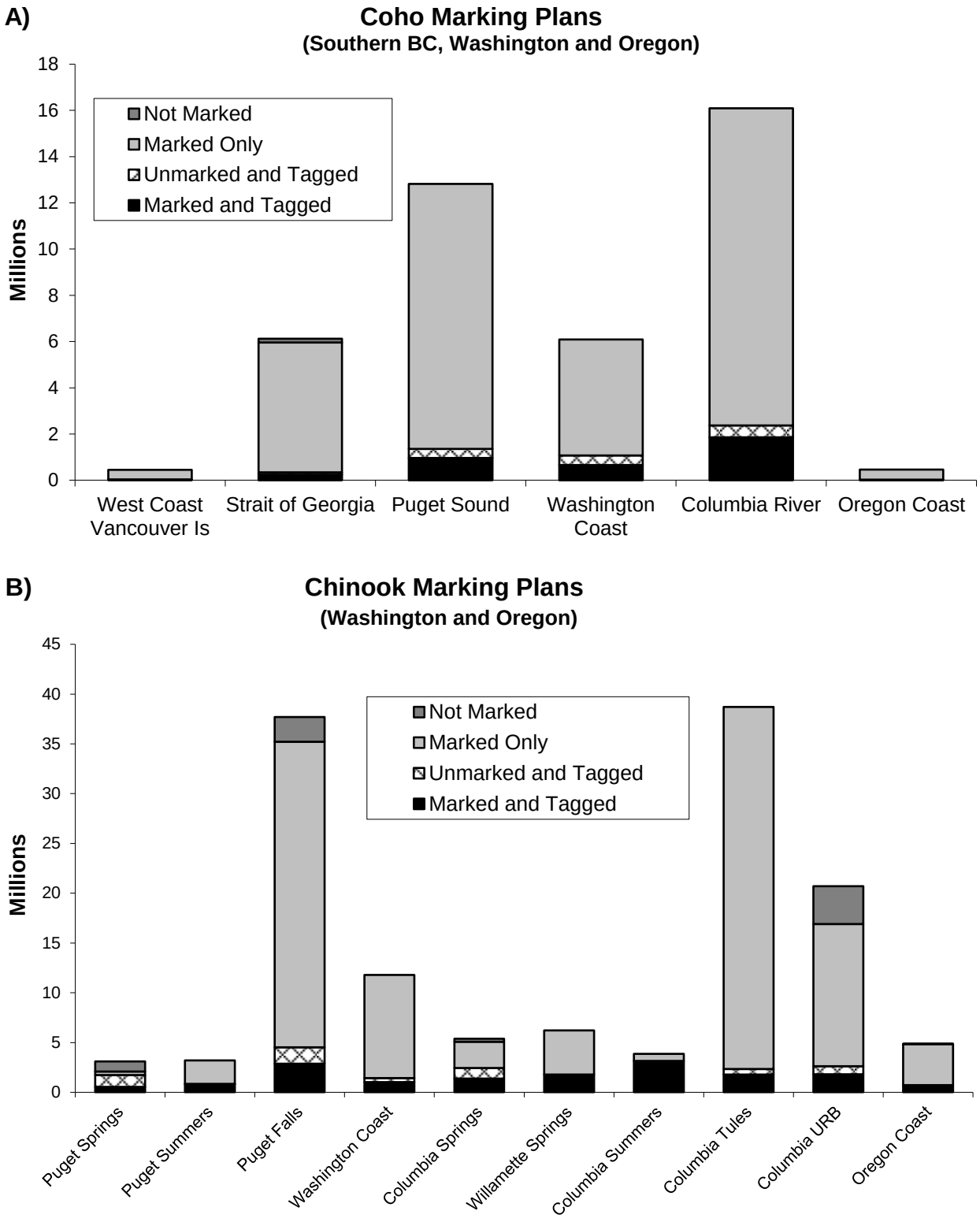

Figure 2.2. Projected Coho (panel A) and Chinook (panel B) salmon releases for brood year 2010 by region and mark status.

2.4 Sampling Methods

2.4.1 Current Agency Sampling Methods

Two methods are currently used to detect fish containing CWTs. The traditional visual sampling methodology relies upon the adipose fin clip as a visual indicator for a CWT. When visual sampling is used, only CWTs from marked fish will be detected. Electronic tag detection (ETD) uses electronic gear (hand-held wand or fixed-position tube) to detect CWTs in marked and unmarked fish. It should be noted that when marked fish are first visually separated in the sample and electronic gear is then used to detect tags in the marked fish, this is considered visual sampling because tags are only recovered from marked and tagged fish.

ETD has not been implemented for all fisheries encountering mass-marked fish. CWT sampling methods for Coho and Chinook are summarized in Table 2.2 and Table 2.3, respectively. In general, ETD has become the standard CWT sampling method in WA, ID, and OR (except for Columbia River and OR coast fall Chinook fisheries, where fish are sampled visually). Visual CWT sampling remains the standard method in AK and CA. In BC the situation is more complex, where sampling methods depend on species, location, and the type of fishery. The lack of recovery of the unmarked component of DIT release groups creates data gaps in the analysis of CWT data and results in uncertainty in the estimated impacts on unmarked (wild) fish. These gaps also require indirect estimation procedures to complete them thus making analyses more time consuming and the results more uncertain.

Alaska has no plans to convert to ETD sampling although the large numbers of marked fish without tags in their sampling programs have begun to cause concerns, e.g., the cost of shipping the additional heads to dissection laboratories has increased. There has been an increase from approximately 7% to 30% of marked and untagged Chinook caught in the troll fishery since the implementation of mass marking. The increased costs to deal with the additional marked fish are not quantified, but will impact the program.

Canada relies on voluntary recoveries of marked Coho and Chinook in recreational fisheries (regardless of whether mark-selective or non-selective regulations are used), while the current restricted commercial fisheries are electronically or visually sampled depending on species and location. As in AK, the program has seen an increase in the submission of heads without tags as well as a decrease in the submission rate of heads as fewer anglers turn in heads. Since 2008, only Coho landed by ‘ice’ or ‘day boats’ in the northern BC troll fishery are not subject to electronic sampling and recovery of unmarked DIT CWTs. In that fishery, Coho are sampled visually and CWTs from marked fish only are recovered. South of Cape Caution located just northward of the northern tip of Vancouver Island on the mainland coastline, electronic sampling is being used for both species in commercial fisheries.

California does not employ ETD. However, approximately 300 mass-marked Coho and 1,700 mass-marked Chinook are projected to be encountered in CA (Table 2.4), which could impact CA’s sampling program.

Table 2.2. Proposed fishery sampling methods for tagged Coho Salmon in 2011.

Region	Fishery	Type of Sampling	Comments
Alaska	Commercial Sport	Visual Visual	
Northern BC	Commercial Sport	Visual Voluntary (Visual)	Some terminal areas are not sampled. Anglers are encouraged to turn in heads from marked Coho only; therefore, tag recoveries of unmarked Coho are not expected.
West Coast Vancouver Island	Commercial Sport	Electronic Voluntary (Visual)	Incidental recoveries in fisheries on other species; non-retention of unmarked Coho Anglers are encouraged to turn in heads from marked Coho only; therefore tag recoveries of unmarked Coho are not expected.
Strait of Georgia	Commercial Sport	Electronic Voluntary (Visual)	Incidental recoveries in fisheries on other species; non-retention of unmarked Coho Anglers are encouraged to turn in heads from marked Coho only; therefore tag recoveries of unmarked Coho are not expected.
Puget Sound	Commercial Sport	Electronic Electronic	
Washington Coast	Commercial Sport	Electronic Electronic	
Oregon Coast	Commercial Sport	Visual Visual	All sport fisheries are MSF; therefore, recoveries of unmarked Coho are not expected.
Columbia River	Commercial Sport	Electronic Electronic	
California	Commercial Sport	Visual Visual	

Table 2.3. Proposed fishery sampling methods for tagged Chinook Salmon in 2011.

Region	Fishery	Type of Sampling	Comments
Alaska	Commercial Sport	Visual Visual	
Northern BC	Commercial Sport	Electronic Voluntary (Visual)	All Chinook are now electronically sampled and all tags are decoded (this has been the case since 2007). Anglers encouraged are to turn in heads from marked Chinook only; therefore tag recoveries of unmarked Chinook are not expected.
West Coast Vancouver Island	Commercial Sport	Electronic Voluntary (Visual)	Anglers are encouraged to turn in heads from marked Chinook only; therefore tag recoveries of unmarked Chinook are not expected.
Strait of Georgia	Commercial Sport	Electronic Voluntary (Visual)	Anglers are encouraged to turn in heads from marked Chinook only; therefore tag recoveries of unmarked Chinook are not expected.
Puget Sound	Commercial Sport	Electronic Electronic	
Washington Coast	Commercial Sport	Electronic Electronic	
Oregon Coast	Commercial Sport	Electronic Electronic	
Columbia River	Commercial Sport	Electronic/Visual Electronic	Spring and Summer Chinook fisheries are electronically sampled. Fall Chinook are visually sampled. CWTs from unmarked Chinook from other regions will not be recovered.
California	Commercial Sport	Visual Visual	

Table 2.4. Projected numbers of mass-marked Coho and Chinook in CWT sampling programs 2011 (actual number of fish encountered in samples will depend on survival rates, exploitation rates and sampling rates). For this analysis, CWT recoveries from the following brood years were used: 2003-2005 for Coho and 2000-2003 for Chinook. Tribal hatchery mass-marked production in WA is included with WDFW numbers.

Species	Area/Run		Agency	DIT Group	2011 MM	Projected Encounters in Future Fisheries													
						Alaska		NBC		SBC		WA (CST/PS)		Columbia R.		OR Coast		California	
						Com	Spt	Com	Spt	Com	Spt	Com	Spt	Com	Spt	Com	Spt	Com	Spt
Coho	Southern BC		CDFO	2	6,030,000	1,217	107	522	955	1,157	3,154	2,822	3,243	0	0	0	241	0	0
	Puget Sound		WDFW	6	11,146,000	29	0	55	0	14	1,238	33,538	9,961	0	0	42	558	0	0
			USFWS	1	320,000	0	0	0	0	0	39	1,723	309	0	0	0	5	0	0
	WA Coast		USFWS	2	660,000	6	0	19	2	4	39	2,311	619	0	2	26	195	0	0
			WDFW	4	4,350,000	73	0	66	14	29	237	3412	3083	7	44	172	878	0	0
	OR. Coast		ODFW	0	435,000	0	0	0	0	0	18	16	64	17	17	31	83	0	23
	Columbia R		USFWS	1	300,000	0	0	0	0	0	4	8	190	74	74	21	177	0	0
			WDFW	2	8,467,264	0	0	0	0	21	195	1,400	13,128	9,130	2,242	464	7,165	0	59
			ODFW	1	4,942,000	0	0	0	0	0	185	288	1,725	8,723	1,208	449	1,684	0	185
Total					**36,650,264**	**1,432**		**1,633**		**6,334**		**77,840**		**21,538**		**12,191**		**267**	
Chinook	Puget Sound	Spring	WDFW	2	350,000	encounters included with WDFW falls													
		Summer	WDFW	1	2,360,000	encounters included with WDFW falls													
		Fall	WDFW	5	30,700,000	245	1	239	46	5,846	1,678	26,482	4,958	0	0	351	0	0	0
	WA Coast	Spring	WDFW	0	320,000	17	0	40	2	7	7	37	5	0	0	7	0	0	0
		Fall	USFWS	0	1,940,000	118	18	215	13	5	21	37	16	0	0	0	0	0	0
			WDFW	2	8,100,000	1,482	169	2,041	217	38	36	804	214	0	0	0	0	0	0
	OR Coast	N. Spr.	ODFW	0	463,000	103	17	62	35	91	18	79	18	0	0	119	68	0	0
		S. Spr.	ODFW	0	2,042,000	87	0	129	0	196	0	182	98	84	0	1,678	153	934	147
		Fall	ODFW	0	1,627,600	911	101	978	122	231	45	170	75	8	30	503	775	433	155
	Columbia	Spring	ODFW	0	4,454,000	188	10	44	10	157	6	52	6	1,834	512	21	4	0	0
			WDFW	1	2,622,539	382	115	245	182	380	245	218	120	738	780	106	0	0	0
		Summer	WDFW	0	700,000	18	3	13	5	14	3	10	6	22	7	12	4	0	0
		Fall Tules	USFWS	1	11,330,000	0	0	0	0	3,481	370	1,720	790	8,682	450	880	260	10	10
			WDFW	1	17,117,500	691	31	827	73	838	189	356	377	555	367	199	73	0	0
			ODFW	0	7,900,000	206	0	138	20	776	206	501	481	5,168	501	1,749	206	19	20
		URBs	ODFW	0	4,300,000	encounters included with ODFW fall Tules													
			USFWS	1	1,600,000	211	14	91	8	11	0	5	8	217	33	0	0	0	0
			WDFW	1	8,400,000	1,231	135	1,518	125	148	75	87	118	2,025	416	31	13	0	0
Total					**106,326,639**	**6,504**		**7,438**		**15,118**		**38,030**		**22,429**		**7,212**		**1,728**	

Some controversy remains regarding the reliability of wands for detecting CWTs in Chinook. CDFO has adopted a policy of not using wands in either fishery or escapement sampling except in exceptional circumstances: 1) a tube detector fails or breaks down, or 2) a Chinook is too large to pass through the tube detector. A blind study carried out by CDFO over two years in the Fraser River Albion Chinook test fishery with trained staff using hand-held wands found that CWTs were missed when actually present and detected when not present at a rate significantly greater than expected by chance (Parken and Riddell 2007). Most importantly, missed detections and false detections occurred at higher rates in unmarked fish compared to marked fish. The results of the Canadian study contradict all other previous blind studies testing the efficacy of wands in detecting CWTs in Chinook, where detection rates ranged from 91 - 99% (Olson 2007).

The manufacturer of the wands (Northwest Marine Technology, Inc.) now has the ability to test and increase the detection range of wands to a new minimum standard (3.2 cm). Wands that meet this new standard are marked with a silver battery cap. Most agencies use a technique called "mouth wanding" on larger Chinook, that involves wanding the fish both externally (on the snout) and inside the mouth (on the palate). It is hoped that mouth wanding may no longer be needed on Chinook using these "improved" wands. Northwest Indian Fish Commission (NWIFC) conducted a field test of these newer wands on returning Chinook at three hatcheries in the fall of 2010. The study found high detection rates (99 % for all samples combined), but some of the missed tags were detected with subsequent mouth wanding. The manufacturer has also announced a new type of wand, the "T wand" that is even more sensitive with a detection range of 5.5 cm. These wands are now in production and will eliminate the need for mouth wanding.

2.4.2 Estimated Sampling Encounters

A summary of projected mass-marked Coho that may occur in agency CWT sampling programs is provided in Table 2.4. Planned MM will likely result in estimated encounters of approximately 1,400 untagged and marked recoveries in AK and approximately 300 encounters of untagged and marked Coho Salmon in CA – the two geographical areas where Coho are not mass marked or electronically sampled. It is also projected that approximately 2,000 untagged and mass-marked Coho recoveries will occur in Canadian fisheries that rely on visual sampling methods.

A summary of projected mass-marked Chinook that may occur in agency CWT sampling programs is provided in Table 2.4. Planned MM of southern US Chinook stocks will result in estimated mass-marked encounters of approximately 6,500 Chinook in AK, 22,600 Chinook in Canada, and 1,700 Chinook in CA, assuming recent exploitation rates and sampling programs. We emphasize these regions because agencies in these areas rely partially or completely on visual sampling to recover CWTs (Table 2.3). For example, in Alaskan troll fisheries where visual sampling is employed, the percent of marked Chinook Salmon encountered that are untagged has been much greater in the past eight catch years (Figure 2.3).

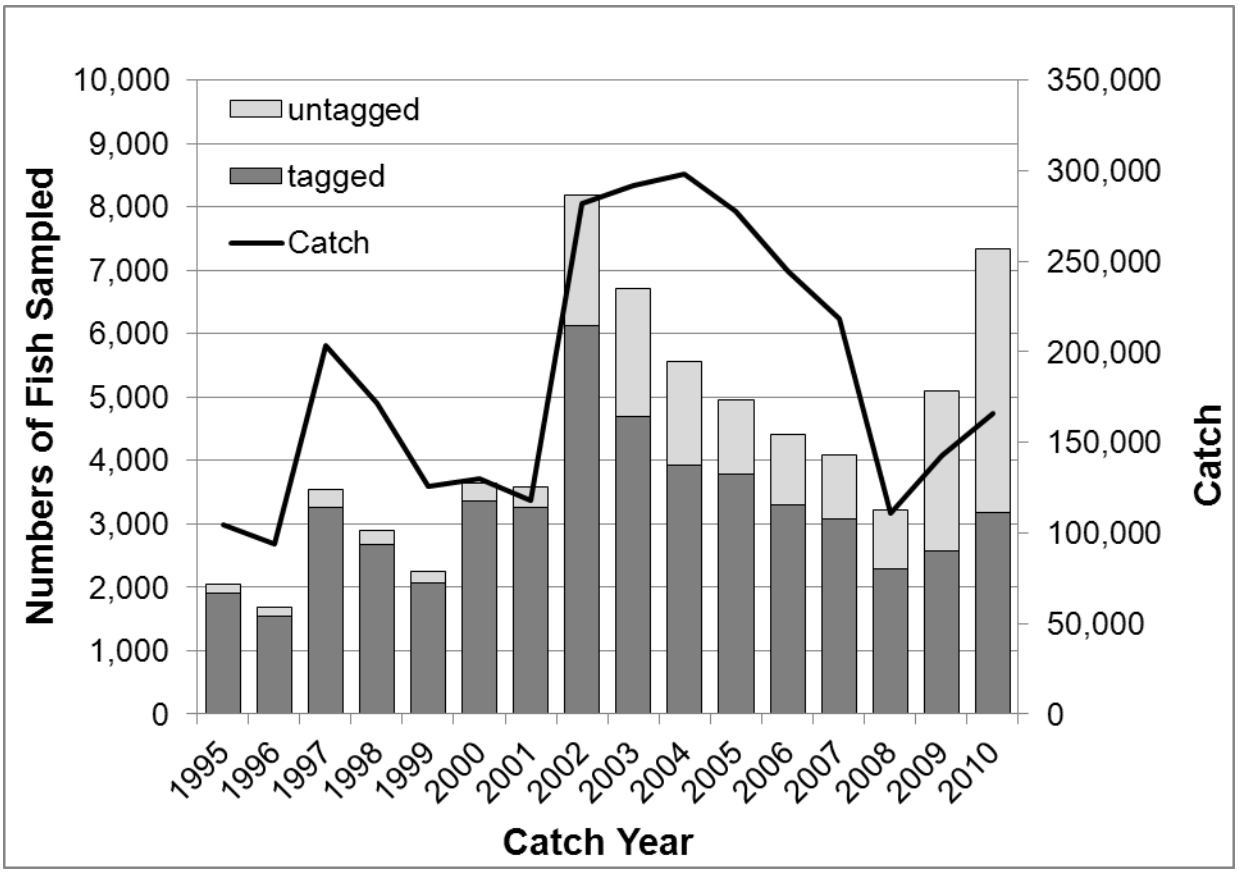

Figure 2.3. Numbers of sampled Chinook Salmon in Alaska's troll fishery by untagged and tagged, with catch numbers, 1995 – 2010.

3 REVIEW OF MARK-SELECTIVE FISHERY PROPOSALS RECEIVED

In 2006, the SFEC simplified the format of the template for MSF proposals to focus on the description of the fishery and the sampling plan and to identify the stocks likely to be impacted by the fishery (Appendix C and Appendix D). The information to be provided in the proposal template is required to estimate mortalities of unmarked fish from DITs.

3.1 2011 Mark-Selective Fishery Proposals

MSFs have been prosecuted for Coho since 1998 and for Chinook since 2003 (Table 3.1). For 2011, the SFEC received 42 MSF proposals for Coho and Chinook Salmon in CDFO, WDFW, and ODFW fisheries; these are summarized in Table 3.2 and Table 3.3. Agencies provided the majority of the requested information in each of the proposals and the proposals were submitted in time for the annual review meeting by the SFEC. A few proposals were not submitted in time for due date of November 1 in the year prior to the fishery (see Appendix A for annual proposal and post-season report deadlines).

- There was complete submission of MSF proposals for the second time and it appears that the process for obtaining proposals established by the PSC is now working as intended.
- The number of MSFs appears to be reaching a plateau, with only four new proposals for MSFs, these being in the freshwater zone of Washington's coast.
- Mixed bag regulations were again proposed for several of the MSFs (e.g., OR recreational marine and freshwater fisheries and Canadian marine recreational fisheries)

3.1.1 Coho Salmon MSFs

Sixteen proposals were received for Coho Salmon MSFs proposed to occur in 2011 (Table 3.1; Table 3.2). The SFEC received four proposals from CDFO for ongoing Coho MSFs in Canadian waters, including two in the lower Fraser River and two in southern BC; each proposal contained a variety of fishery openings distinguished by regulation variations. From Washington (WDFW), the SFEC received 10 proposals for ongoing Coho MSFs, of which two of these were new for the 2011 season (Grays Harbor commercial drift gill net and Quillayute River sport). Of the 10 WDFW proposals, four were for MSFs in freshwater and six for MSFs in marine waters. Seven of the Coho MSFs in WA have occurred since 2003, one since 2009, and two since 2010. SFEC has determined that proposals for all ongoing Coho MSFs in WA have been provided. Further, SFEC received a joint proposal from Oregon and Washington (ODFW and WDFW) for an ongoing sport MSF (since 2003) in the lower Columbia River. Additionally, one Coho MSF proposal was received from ODFW, for an ongoing sport fishery (since 2003) off the Oregon coast.

3.1.2 Chinook Salmon MSFs

Twenty-six proposals were received for Chinook Salmon MSFs proposed to occur in 2011 (Table 3.1; Table 3.3). These included two proposals from Canada (CDFO), 18 from Washington (WDFW), four submitted jointly by Oregon and Washington (ODFW and WDFW), and two from Oregon (ODFW). Of the Canadian MSF proposals, one was for an ongoing MSF in the Strait of Juan de Fuca (SJDF), where a fishery has occurred each year since 2008. A sport MSF off the west coast of Vancouver Island, which CDFO proposed in 2009 and 2010, was not proposed again in 2011. Of the 18 WDFW proposals, the number of proposals per WA location

were as follows: six in the freshwater systems of Puget Sound; three in Puget Sound marine waters; one in the marine waters off the WA coast; three in Willapa Bay or its tributaries; two in WA coastal river systems; and three in the Snake or Yakima rivers. WDFW had previously submitted a proposal for a commercial troll Chinook MSF in WA areas 1-4 during fishery seasons 2009 and 2010, but this fishery never occurred, and the proposal was not submitted again in 2011. Twelve of WDFW's Chinook MSFs started sometime between 2003 and 2008, while six started in 2010. In addition, four Chinook MSF proposals were submitted jointly by WDFW and ODFW for fisheries planned in the Columbia River; of these, three proposals were for ongoing MSFs that have occurred since 2003. The fourth joint ODFW-WDFW proposal was for a sport MSF on fall Chinook that SFEC has received each year since 2009, but the fishery has not yet occurred. It is not clear to the SFEC whether there are additional MSFs planned in the Columbia River for which proposals were not received. Finally, Oregon submitted two proposals for ongoing Chinook MSFs-- one in the Willamette River (started in 2003) and one off the Oregon coast (started in 2008).

Table 3.1. Status of mark-selective fishery (MSF) proposals, fishery implementation, and post-fishery reporting for years 2003 through 2011. “P” indicates the MSF proposal was submitted to the PSC-SFEC by the requested deadline. “F” indicates the MSF was conducted. “R” indicates the post-season report summarizing MSF results was submitted successfully to the PSC-SFEC. An "O" (third character) indicates that the post-season MSF report is still outstanding (i.e., SFEC has not yet received the report). An “X” indicates that a MSF proposal was not submitted to SFEC (first character) or the MSF was not conducted (second character). Finally, “-“ indicates the MSF was neither proposed nor conducted in a given year.

Fishery Name (SFEC Proposal ID)	**Catch Year**								
	2003	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
Targeting Marked Coho									
Sport, Southern BC marine and freshwater (MSF-FOC-02)	PFR	PFR	PFR	PFR	PFO	PFO	PFO	PFO	P
Commercial, Southern BC marine (MSF-FOC-05)	-	PX	PFR	PFR	XFO	PFO	PX	PFO	P
Sport, Lower Fraser R (MSF-FOC-06)	XFR	XFR	XFR	PFR	PFO	PFO	PFO	PFO	P
FSC, Lower Fraser R (MSF-FOC-03)	-	-	-	PFR	PFO	PFO	PFO	PFO	P
Sport, WA areas 1-4 and Buoy 10 (MSF-WDFW-06)	PFR	PFR	PFR	PFR	XFR	PFR	PFR	PFR	P
Commercial, WA areas 1-4 (MSF-WDFW-15)	XFO	XFO	XFO	XFO	XFO	PFO	PFO	PFO	P
Sport, Puget Sound areas 5-13 (MSF-WDFW-07)	XFR	PFR	PFR	PFR	XFR	PFR	PFR	PFR	P
Sport, Nooksack R (MSF-WDFW-18)	XFO	XFO	XFO	XFO	XFO	XFO	PFR	PFR	P
Sport, Willapa tributaries (MSF-WDFW-22)	XFO	XFO	XFO	XFO	XFO	XFO	XFO	PFO	P
Sport, Willapa Bay Area 2.1 (MSF-WDFW-29)	-	-	-	-	-	-	-	PFO	P
Sport, Grays Harbor Area 2.2 (MSF-WDFW-23)	-	-	-	-	-	-	-	PFO	P
Sport, Grays Harbor tributaries (MSF-WDFW-24)	XFO	XFO	XFO	XFO	XFO	XFO	XFO	PFO	P
Commercial, Grays Harbor Area 2A and 2D (MSF-WDFW-30)	-	-	-	-	-	-	XFO	XFO	P
Sport Quillayute R (MSF-WDFW-31)	XFO	XFO	XFO	XFO	XFO	XFO	XFO	XFO	P
Sport, Lower Columbia R (MSF-ODFW/WDFW-04)	XFR	XFR	XFO	XFO	XFO	PFO	PFO	PFR	P
Sport, Oregon coast (MSF-ODFW-03)	XFR	XFR	XFO	XFO	XFO	XFO	XFO	PFO	P

Table 3.1. Continued.

Fishery Name (SFEC Proposal ID)	Catch Year								
	2003	2004	2005	2006	2007	2008	2009	2010	2011
Targeting Marked Chinook									
Sport, Strait of Juan de Fuca subareas, BC (MSF-FOC-07)	-	-	-	-	-	XFO	PFO	PFO	P
Sport, WCVI subareas, mainly inside (MSF-FOC-08)	-	-	-	-	-	-	PX	-	P
Sport, Puget Sound areas 5&6, summer (MSF-WDFW-02)	PFR	PFR	PFR	PFR	PFR	PFR	PFR	PFR	P
Sport, Puget Sound areas 9-13, summer (MSF-WDFW-11)	-	-	-	-	PFR	PFR	PFR	PFR	P
Sport, Puget Sound areas 6-12, winter (MSF-WDFW-16, replaces 08 as of 2007)	-	-	PFR	PFR	PFR	PFR	PFR	PFR	P
Sport, Nooksack R (fall run) (MSF-WDFW-13)	-	PFO	PFO	PFO	PFO	PFO	PFR	PFR	P
Sport, Skykomish R (summer run) (MSF-WDFW-01)	PFO	PFO	XFO	XFO	PFO	PFO	PFR	PFR	P
Sport, Carbon & Puyallup R (fall run) (MSF-WDFW-09)	XFO	XFO	PFO	PFO	PFO	PFO	PFO	PFO	P
Sport, Upper Skagit R (spring run) (MSF-WDFW-12)	-	-	XFO	XFO	PFO	PFO	PFO	PFR	P
Sport, Nisqually R (fall run) (MSF-WDFW-14)	-	-	XFO	XFO	PFO	PFO	PFO	PFO	P
Sport, Skokomish R (fall run) (MSF-WDFW-20)	-	-	-	-	-	-	PX	PFO	P
Sport, Yakima R (spring run) (MSF-WDFW-03)	-	PFO	-	-	-	PFR	PX	PFR	P
Sport, Lower Snake R (fall run) (MSF-WDFW-05)	-	-	-	-	-	XFO	PFR	PFO	P
Sport, WA areas 1-4 (MSF-WDFW-19)	-	-	-	-	-	-	PX	PFR	P
Troll, WA areas 1-4 (MSF-WDFW-21)	-	-	-	-	-	-	PX	PX	X
Commercial, Willapa Bay (MSF-WDFW-25)	-	-	-	-	-	-	-	PFO	P
Sport, Willapa Bay Area 2.1 (MSF-WDFW-26)	-	-	-	-	-	-	-	PFO	P
Sport, Willapa Bay tributaries (fall run) (MSF-WDFW-27)	-	-	-	-	-	-	-	PFO	P
Sport, Lower Snake R (spring run) (MSF-WDFW-28)	-	-	-	-	-	-	-	PFO	P
Sport, Quillayute R (MSF-WDFW-32)	XFO	XFO	XFO	XFO	XFO	XFO	XFO	XFO	P
Sport, Hoh R (MSF-WDFW-33)	-	-	-	-	-	XFO	XFO	XFO	P
Sport, Columbia R (spring run) (MSF-ODFW/WDFW-01)	PFO	PFO	PFO	XFO	XFO	PFO	PFR	PFO	P

Table 3.1. Continued.

Fishery Name (SFEC Proposal ID)	Catch Year								
	2003	2004	2005	2006	2007	2008	2009	2010	2011
Targeting Marked Chinook (cont.)									
Sport, Columbia R (summer run) (MSF-ODFW/WDFW-02)	PFO	PFO	PX	XFO	-	PFO	PX	PFO	P
Commercial, Lower Columbia R (spring run) (MSF-ODFW/WDFW-03)	PFO	PFO	PFO	XFO	XFO	PFO	PFR	PFO	P
Sport, Columbia R (fall run) (MSF-ODFW/WDFW-05)	-	-	-	-	-	-	PX	PX	P
Sport, Willamette R (spring run) (MSF-ODFW-01)	PFR	PFR	PFO	PFO	XFO	PFR	PFR	PFR	P
Sport, Oregon coast (MSF-ODFW-02)	-	-	-	-	-	XFO	PFO	PFO	P

Table 3.2. Summary information for Coho Salmon proposals received in 2010 for 2011-2012 MSFs or past MSFs not proposed this year.

Location (Proposal ID)	Fishery Type and Period	Regulation	Sampling	Stocks Impacted	Comments and Concerns	Methods of Estimation
BC Management Areas 11-29, outer areas of 121-127. (MSF-FOC-02)	Sport Coastal waters June 1 to December 31. Fraser River Mid-October to December 31.	Daily bag limit of 2 (up to 4) marked Coho greater than 30 cm fork length. Barbless hooks. More regulations depend on maximum ER for interior Fraser River Coho. May have mixed bags.	CWTs obtained through voluntary sport head recovery program	Lists tagged Coho recoveries in 2000-2008. DIT stocks indicated.	Voluntary recovery program will not provide recoveries of unmarked and tagged; these would be few as unmarked fish would only be retained in error (non-compliance) except for fisheries with mixed bag limits.	Total catch using creel surveys and log books from lodges. Expansions are completed for areas/times not sampled. CWT estimates depend on awareness factors.
BC Management Areas 23-27 121-127. (MSF-FOC-05)	Commercial September to October	Retention of marked Coho allowed in a Chinook targeted fishery.	Sampled electronically for CWTs	Tagged stocks and DIT groups listed.		Total catch is from logbooks.
Fraser River (MSF-FOC-03)	First Nations October to November	Gillnet and beach seines. Chum and pink targeted fishery. Live wild Coho must be released.	No sampling	List of tagged stocks. Inch Creek (DIT).	No sampling for CWTs. Numbers of marked and unmarked are reported in some fisheries. Visual sampling only.	Catch estimate method unknown. CWT estimates cannot be made
Fraser River (MSF-FOC-06)	Sport Table shows periods by specific area.	Daily limit varies by time and area. Two per day or 4 per day, only two marked>35 cm.	Voluntary and creel	Coldwater, Salmon (Thompson), Dunn /Louis /Lemieux, Inch Cr. (DIT), Salmon R., other South Coast and US stocks.	Creel surveys and awareness factors for some times and areas, but no CWT sampling. Need an analysis to evaluate how many marked DIT fish taken.	Creel survey is a roving survey, with incomplete trip angler interviews. CWT estimates require an awareness factor.

Table 3.2. Continued.

Location (Proposal ID)	Fishery Type and Period	Regulation	Sampling	Stocks Impacted	Comments and Concerns	Methods of Estimation
Washington Ocean Areas 1-4 (MSF-WDFW-06)	Sport July to September	Two per day, Release unmarked Coho. Minimum size limit 16".	See WDFW 2009 Ocean Sampling Program Operating Plan.	All PSC CWT indicator stocks, primarily Columbia R.		Effort-CPUE from angler interviews, stratified by charter/private and weekday/ weekend. Mark rates from charter ride-alongs.
Washington Puget Sound Areas 5,6, 7 and 13 (MSF-WDFW-07)	Sport July to September	Release unmarked Coho, no minimum size limit.	Dockside sampling for CWTs, with ETD. Visual for mark rates.	All CWT indicator stocks from Puget Sound and southern BC.		Catch estimates from catch cards available November of following year. Creel surveys for Areas 5 (7/1-9/30), 9 and 10 (7/16-8/31), and 11 (6/1-9/30). Murthy-estimate.
Washington Ocean Areas 1-4 (MSF-WDFW-15)	Commercial July to September	Release unmarked Coho, minimum size 16".	Dockside sampling for CWTs.	All CWT indicator stocks from Washington and southern BC.	Need information comparing mark rates between troll and recreational fishery.	Catch estimates from fish tickets. Mark rates from sport fishery used for troll fishery.
Nooksack (MSF-WDFW-18)	Sport September 1 to December 31	2 marked adults	No creel or CWT catch sampling. There is escapement sampling.	Nooksack is no longer a DIT. Skookum Creek has a marked and tagged group.	There is no longer a tool to evaluate MSF impacts.	Catch is estimated using catch cards. Intend to apply hatchery tag rates to Nooksack sport harvest to estimate CWTs.

Table 3.2. Continued.

Location (Proposal ID)	Fishery Type and Period	Regulation	Sampling	Stocks Impacted	Comments and Concerns	Methods of Estimation
Quillayute River New proposal for fishery started in 2003 (MSF-WDFW-31)	Sport February 1 to December 31	Minimum size limit of 12". Bag limit of 6 salmon. Feb 1-Aug 31: up to 2 adult marked. Sep 1 – Dec 31: up to 2 adult unmarked and 2 adult marked.	CWT sampling of escapement, but not fishery.	Sol Duc Hatchery (DIT)	Mixed bag will cause problem in estimating CWT composition of mortalities.	Catch is estimated using catch cards. Mark rate from commercial fishery. CWTs estimated using tag ratios from tribal net fishery.
Willapa Bay MA 2.1 (MSF-WDFW-29)	Sport Aug 1 to January 31	Daily limit of 6. Up to 3 adults may be retained. Release Chum and unmarked Chinook. Minimum size limit of 12". From June 18-July 31, regulations concurrent with the ocean fishery (Area 2).	Dockside sampling for CWTs and VTRs.	Willapa (Forks Creek), Nemah, Naselle	Mixed bag will cause problem in estimating CWT composition of mortalities.	Catch estimates from catch cards. Mark rates from VTRs and commercial fishery. CWT estimates depend on tag ratios from commercial fishery.
Willapa Bay Tributaries (MSF-WDFW-22)	Sport August 1 to January 31	Daily limit of 6, of which 3 adults may be retained. Release unmarked Chinook, unmarked Coho, and Chum. Minimum size limit of 12".	Sept: Dockside sampling for CWTs.	Willapa (Forks Cr), Nemah, Naselle	Willapa (Forks Cr), Nemah, Naselle	Catch estimates from catch cards. Mark rates from estimates of escapement. CWT estimates depend on tag ratios and escapement estimate.
Grays Harbor Area 2.2 (MSF-WDFW-23)	Sport September 16 to November 30	Daily limit 2. Release Chum and unmarked Chinook. Minimum size limit of 12".	Dockside sampling for CWTs.	Skookumchuck Bingham Creek (DIT), Satsop Springs (DIT), Lake Aberdeen, Mayr Bros, and Humptulips hatcheries.	Mixed bag will cause problem in estimating CWT composition of mortalities.	Total catch is estimated from catch cards. Estimate mark rate from VTRs and commercial fishery. CWT estimates depend on tag ratios from commercial fishery.

Table 3.2. Continued.

Location (Proposal ID)	Fishery Type and Period	Regulation	Sampling	Stocks Impacted	Comments and Concerns	Methods of Estimation
Grays Harbor Tributaries (MSF-WDFW-24)	Sport October 1 to January 31	Daily limit of 6. Up to 2 adults may be retained; of which only 1 may be unmarked Coho. Release Chinook and Chum. Minimum size limit of 12".	No sampling for CWTs.	Skookumchuck, Bingham Creek (DIT), Satsop Springs (DIT), Lake Aberdeen, Mayr Bros, and Humptulips hatcheries.	Mixed bag will cause problem in estimating CWT composition of mortalities.	Total catch is estimated using catch cards. Mark rates from estimates of total escapement. CWT estimates depend on tag ratios and total escapement estimates.
Grays Harbor Area 2A and 2D New proposal for fishery started in 2009 (MSF-WDFW-30)	Commercial October	Release unmarked Chinook.	Mark rates from onboard observers. ETD in dockside sampling.	Skookumchuck, Bingham Cr. (DIT), Satsop Springs (DIT), Lake Aberdeen, Mayr Bros, and Humptulips hatcheries.		Total catch from fish tickets. Mark rate from onboard observers.
Lower Columbia River (MSF-ODFW/ WDFW-04)	Sport August 1 through December 31	Marked only. August 131: Bag limit of 1. September 1-30: Bag limit of 2. October 1December 31: Bag limit of 6, up to 2 adults. Minimum size limit of 16" for August –September, 12" for October December.	Creel survey with CWT sampling.	Big Creek, Grays, Elochoman, Cowlitz, Kalama, Toutle, Lewis, Washougal, Sandy, and Klickitat Rivers, Eagle Creek, and Bonneville Hatchery	Mixed bag will cause problem in estimating CWT composition of mortalities.	Total catch is estimated using creel survey. Effort is estimated with aerial surveys, CPUE is estimated from angler interviews.
Oregon coast from Leadbetter Pt to California (MSF-ODFW-03)	Sport June 20 to December 31	Mixed bag; 1-3 salmon/steelhead (depending on area) per day (Chinook>24 in., Coho >16 in., steelhead > 20 in.). Only marked Coho, with no seasonal limit. Up to 2 adult Chinook depending on date and area. Regulations do not apply to Chinook jacks (15-24").	Creel survey. Visual tag detection.	Stocks from BC, Puget Sound, Washington, Columbia R, and Oregon coast are all taken.	No VTR, test fishery or onboard observers for mark rates.	Effort estimated using boat counts and CPUE estimates from angler interviews.

Table 3.3. Summary information for Chinook proposals submitted in 2010 for 2011-2012 MSFs or past MSFs not proposed this year.

Location	Fishery Type and Period	Regulation	Sampling	Indicator Stocks Impacted	Comments and Concerns	Methods of Estimation
BC Strait of Juan de Fuca and WCVI, Areas 19-1 to 6, 18-4 and 20-5 (MSF-FOC-07)	Sport (barbless hooks). June 3 to18	Daily limit of 2 which can consist of any 2 between 45-67 cm or as many as 2 marked > 67 cm	Voluntary CWT recovery program. Creel survey and lodge log books for catch data.	Table of tagged groups impacted is included in proposal.	Mixed bag (slot limit type) regulations will cause a problem in estimating CWT composition of unmarked mortalities.	Total catch and mark rates by size category estimated from creel surveys and lodge log books. Effort from aerial surveys and CPUE from angler interviews used to get Effort/CPUE.
BC WCVI, (MSF-FOC-08) Proposed in 2009 and 2010, never took place. Not proposed in 2011.	Sport (barbless hooks) August 1 to October 15: Areas 23 and 24 July15 - October 15: Areas 25-27	Daily limit of 2/day between 45 -77cm. One marked fish >77 cm may be retained.	Voluntary CWT recovery program.	Table of tagged groups impacted is included in proposal.	Mixed bag (slot limit) regulations will cause a problem in estimating CWT composition of unmarked mortalities.	Catch and mark rates by size category from creel surveys and lodge log books. Effort from aerial surveys and CPUE derived from angler interviews.
Washington Puget Sound Areas 6-12 (MSF-WDFW-16)	Sport October April	Bag limit of 2 marked salmon. Minimum size limit 22” may be reduced	Sampling same as in 2010	Puget Sound, Southern BC, and Columbia R stocks.	This fishery will impact CTC indicator stocks that are not clipped or DIT.	Catch estimated from creel surveys and catch cards. Encounters by size and mark status from VTR or test fisheries.

Table 3.3. Continued.

Location	Fishery Type and Period	Regulation	Sampling	Indicator Stocks Impacted	Comments and Concerns	Methods of Estimation
Washington Areas 5 and 6 (MSF-WDFW-02)	Sport July August	Bag limit of 2 marked salmon. Minimum size limit of 22" may be reduced.	Sampling same as in 2010	Puget Sound, Southern BC, and Columbia R stocks.	This fishery will impact CTC indicator stocks that are not clipped or DIT.	Catch estimated from creel surveys and catch cards. Encounters by size and mark status from VTR or test fisheries.
Puget Sound Areas 9-13 (MSF-WDFW-11)	Sport May - September	Bag limit of 2 salmon per day; minimum size limit 22" may be reduced.	Sampling same as in 2010	Puget Sound, Southern BC, and Columbia R stocks.	This fishery will impact CTC indicator stocks that are not clipped or DIT.	Catch estimated from creel surveys and catch cards. Encounters by size and mark status from VTR or test fisheries.
Nooksack River (MSF-WDFW-13)	Sport September 1 to December 31	Bag limit of 2 marked adults. Minimum size limit of 12".	No sampling	Samish tagged fall Chinook are taken in this fishery		Estimate number of Samish fall Chinook using % hatchery on spawning grounds and tag rate at hatchery.
Skykomish River (MSF-WDFW-01)	Sport June 1 to July 31	Bag limit of 2 salmon per day, marked Chinook only. Minimum size limit of 12". Night closure and anti-snagging rule	Creel survey, depending on funding, including CWT sampling with ETD.	Skykomish (DIT)		Catch from creel survey. Effort/CPUE using effort from trailer and boat counts and CPUE from angler interviews. Auxiliary boat surveys used to expand trailer and boat counts for effort.

Table 3.3. Continued.

Location	Fishery Type and Period	Regulation	Sampling	Indicator Stocks Impacted	Comments and Concerns	Methods of Estimation
Upper Skagit River (MSF-WDFW-12) From Highway 530 to Cascade R. (RM 67.1-78.1) and lower Cascade R. to bridge (RM 0.0-0.9).	Sport June 1 to July 15	Bag limit of 4 Chinook, up to 2 adults (>24”). Minimum size limit of 12”.	Creel survey with CWT sampling and ETD.	Skagit Spring Chinook (DIT) Skagit Summer Chinook NF Nooksack Spring Chinook		Catch estimate from creel survey and CWTs. Effort/CPUE using effort from trailer and boat counts and CPUE from angler interviews. Auxiliary boat surveys used to expand trailer and boat counts for effort.
Washington Puyallup & Carbon Rivers (MSF-WDFW-09) Puyallup R. from 11th St. Bridge to Carbon R. and Carbon R. from mouth to Voights Creek	Sport Puyallup River: August 1 to December 31 Carbon River: August 1 or September 1 to November 30	Bag limit of 6 salmon. Puyallup: up to 2 adults, release unmarked adult Chinook Carbon: up to 4 adults, up to 2 marked Chinook. Release Chum and unmarked adult Chinook.	No sampling	Voights Creek tag group is not a CTC indicator at this time. Grovers Creek, Soos Creek, and White River springs are also encountered.	Need to compare estimates of mark rates and CWTs from creel survey and tribal net fishery.	Catch estimates from catch cards. Mark rate and tag ratios estimate from tribal net fishery.

Table3.3. Continued.

Location	Fishery Type and Period	Regulation	Sampling	Indicator Stocks Impacted	Comments and Concerns	Methods of Estimation
Nisqually River (MSF-WDFW-14)	Sport July 1 to January 31	Bag limit of 6 salmon, up to 3 adult (>24") Chinook. Marked only.	Creel survey with ETD for CWTs.	Clear Creek Hatchery fall Chinook (DIT)		Catch estimates from creel surveys and CWTs. Effort/CPUE using effort from trailer and boat counts and CPUE from angler interviews.
Skokomish River (MSF-WDFW-20)	Sport August 1-September 30	Bag limit of 2 salmon. Marked only, but retain first 2 legal catch. Minimum size limit of 12".	Creel survey with ETD for CWTs.	George Adams (DIT)		Catch estimates from creel surveys. Effort/CPUE using effort from trailer and boat counts and CPUE from angler interviews.
Ocean Areas 1 -4 (MSF-WDFW-19)	Sport May through June	Bag limit of 2 salmon per day, Marked only. Minimum size limit of 24".	Creel survey and charter boat observers (mainly Areas 1 and 2), VTRs	All indicator stocks listed in App. H table of proposal are expected to be encountered.		Creel survey is an effort/CPUE survey with boat exit counts and exit interviews. Stratified by private and charter boats and weekend/weekdays.
Quillayute River (incl. Bogachiel, Calawah, Dickey, and Sol Duc Rivers) (MSF-WDFW-32) New proposal for MSF begun in 2003.	Sport February 1 to December 31	Bag limit of 6, up to 2 adults. Release unmarked adult Chinook. Minimum size limit of 12".	No sampling	Sol Duc Hatchery Salmon River Hatchery. Queets (DIT).	Lack of direct sampling. Tribal CWT data needs to be brought up to date.	Catch from catch cards and CWTs. Tag ratios and mark rates from tribal net fishery.

Table 3.3. Continued.

Location	Fishery Type and Period	Regulation	Sampling	Indicator Stocks Impacted	Comments and Concerns	Methods of Estimation
Hoh River (MSF-WDFW-33) New proposal for MSF begun in 2008.	Sport May 1 to August 31	Bag limit of 6, up to 2 adults. Release unmarked adult Chinook. Minimum size limit of 12”.	No sampling	Sol Duc Hatchery Salmon River Hatchery, Queets (DIT).	Lack of direct sampling.	Catch from catch cards and CWTs. Tag ratios and mark rates from tribal net fishery.
Willapa Bay Areas 2G, 2H, 2K, 2J, 2M (MSF-WDFW-25)	Commercial August November	Gill net, with recovery boxes.	Dockside sampling and onboard observers	Forks Creek (DIT)		Catch from fish tickets. Standard CWT estimates.
Willapa Bay Area 2.1 (MSF-WDFW-26)	Sport July January	Bag limit of 6, up to 3 adults. Release unmarked adults. Minimum size limit of 12”. July regulations concurrent with ocean fishery.	No sampling for CWTs. VTRs.	Forks Creek (DIT)	Lack of sampling	Catch from catch cards. Mark rate and tag ratios from commercial fishery.
Willapa Bay Tributaries (MSF-WDFW-27)	Sport July January	Bag limit of 6, up to 3 adults. Release unmarked adults. Minimum size limit of 12”. July regulations concurrent with ocean fishery.	No sampling for CWTs. VTRs.	Forks Creek (DIT)	Lack of sampling.	Catch from catch cards. Mark rates and tag ratios from hatchery and spawning ground data.

Table 3.3. Continued.

Location	Fishery Type and Period	Regulation	Sampling	Indicator Stocks Impacted	Comments and Concerns	Methods of Estimation
Columbia River (MSF-ODFW/ WDFW-02) Columbia River from the mouth upstream to McNary Dam	Sport January - June	Marked only. Washington: Bag limit of 6, up to 2 adults. Minimum size limit of 12”. Oregon: Bag limit of 2 adults (>24") and 5 jacks (15"-24").	Sport fisheries in the Columbia River are sampled to provide catch estimates, recover CWTs, and collect age specific biological data	CWT stocks: Willamette*, Cowlitz*, Kalama, Lewis, Carson, Little White Salmon, Klickitat, Deschutes, Umatilla, Yakima, Leavenworth, Entiat, Methow, Wenatchee, and Snake River spring Chinook stocks. Indicator stocks have “*”.	Creel census below McNary does not cover the whole fishery, which extends to Priest Rapids; effort estimate will be underestimated. CWT sampling below McNary is adequate if composition is similar below and above McNary.	Creel survey and catch cards provide estimates of catch. Standard methods used for CWT estimates.
Sport, Columbia River (MSF-ODFW/ WDFW-01) From Mouth to Priest Rapids Dam	June 16 to July 31	Marked only. Washington: Bag limit of 6, up to 2 adults. Minimum size limit of 12”. Oregon: Bag limit of 2 adults (>24") and 5 jacks (15"-24").	Creel survey with ETD	Upper Columbia summer Chinook.	The summer Chinook indicator will be impacted but is not DIT. Creel census below McNary does not cover the whole fishery, which extends to Priest Rapids; effort estimate will be underestimated. CWT sampling below McNary is adequate if composition is similar.	Creel survey and catch cards provide estimates of catch. Mark rates observed at Bonneville Dam. Standard methods used for CWTs.

Table 3.3. Continued.

Location	Fishery Type and Period	Regulation	Sampling	Indicator Stocks Impacted	Comments and Concerns	Methods of Estimation
Columbia River (MSF-ODFW/ WDFW-03) Columbia River from mouth upstream to Bonneville Dam (Zones 1 – 5)	Commercial January -June 15	Limited to 8-9" minimum mesh gill net or 4¼" maximum mesh tangle net. Total net length restrictions. Duration of "soak times" of the net also restricted. Use of recovery boxes required during Chinook-directed fisheries.	Commercial harvest sampled at buying stations for CWTs using ETD.	Willamette Springs Other spring Chinook stocks impacted include: Cowlitz, Kalama, Lewis (DIT), Carson, Little White Salmon, Klickitat, Deschutes, Umatilla, Yakima, Leavenworth, Entiat, Methow, Wenatchee, and Snake R. stocks.	Willamette Springs are no longer a DIT group.	Total catch from fish tickets. Observers monitor incidental catch of unmarked Chinook and calculate a marked:unmarked ratio that is applied to landed catch to determine unmarked mortalities.
Yakima River (MSF-WDFW-03) Yakima River from Hwy. 223 bridge at Granger (RM 83) to Roza Dam (RM 127) north of Selah.	Sport. Late April to mid-June, if total run size and proportion of hatchery fish is sufficient for a MSF, while minimizing mortality of unmarked fish.	Marked only. Bag limit of 2/day. Open to bank and boat fishing, 7 days/week (night closure) until reaching a 7.5% exploitation rate based on the in-season total river mouth run size estimate.	Creel survey to estimate total catch, with ETD	Cle Elum Hatchery is 100% marked and tagged		Catch is estimated using creel survey information and standard methods for CWTs.

Table 3.3. Continued.

Location	Fishery Type and Period	Regulation	Sampling	Indicator Stocks Impacted	Comments and Concerns	Methods of Estimation
Columbia River (MSF-ODFW/ WDFW-05) Columbia River mouth upstream to McNary Dam	Sport August December	Marked only. Buoy 10: Bag limit of 2 adults (≥24”). Other areas in Washington: Bag limit of 6 salmon, up to 2 adults. Minimum size limit of 12”. Other Oregon areas: Bag limit of 2 adults (≥24") and 5 jacks (15"-24").	Creel Survey CWTs sampled with ETD.	Big Creek (DIT), Elochoman, Cowlitz, Kalama, Toutle, Washougal, Sandy, Klickitat, and Umatilla Rivers, and Spring Creek, Ringold, Priest Rapids, Oxbow, Nez Perce, Lyons Ferry and Bonneville hatcheries. Hanford Reach fall Chinook are also tagged. Lyons Ferry fall fingerlings are an indicator stock; but the DIT group is yearlings.	Need recommended DIT groups in Table 4.2. Mark rates are observed at Bonneville, after the lower river fishery. Should use VTRs. Fishery is mixed bag.	Creel survey and catch cards provide catch estimates and standard methods used for CWTs.
Lower Snake River (MSF-WDFW-28)	Sport April June	Bag limit of 2 marked adults, plus jacks. No night fishing. Barbless hooks.	Creel survey to estimate mark rate. Sampling for CWTs using ETD.	Spring Chinook returning to Idaho and Oregon. No indicator stocks.	No DIT group.	Creel survey for total catch and standard CWT methods.

Table 3.3. Continued.

Location	Fishery Type and Period	Regulation	Sampling	Indicator Stocks Impacted	Comments and Concerns	Methods of Estimation
Lower Snake River (MSF-WDFW-05)	Sport September 1 to October 31	Bag limit of 2 marked adults, plus jacks. No night fishing. Barbless hooks.	Creel survey to estimate mark rate. Sampling for CWTs using ETD.	Lyons Ferry fall fingerlings are an indicator stock; but the DIT group is yearlings.	Need DIT group. Need to coordinate sampling by IDFG, ODFW and WDFW.	Creel survey for total catch and standard CWT methods
Willamette River and tributaries (MSF-ODFW-01)	Sport January December	Marked only. Bag limit of 2 adults (>24”) and 5 jacks (15-24”). Must stop fishing once 2 adults retained.	Creel survey downstream of Willamette Falls with ETD, but not above falls.	Willamette Spring Chinook. Proposal lists hatchery stocks, DIT status, and number released for BY 1997-2002.	Need a DIT group. Willamette DIT was discontinued. No description of how mark rate will be obtained.	Catch estimates from creel survey and catch cards.
Oregon Coast (MSF-ODFW-02) Ocean terminal areas (within 3 miles of river mouth) of the Tillamook, Elk, and Chetco Rivers.	Sport August 1 to December 31	Bag limit of up to 2 salmon or steelhead, plus 1 marked fish (steelhead or Coho >20” or Chinook >24”), plus up to 5 jacks (15-24”) if adult limit has not been reached. Seasonal limit of 5-20 unmarked adult Chinook.	The Elk and Salmon rivers have creel surveys and visual CWT sampling. The Coos Bay fishery is also sampled at random.	Salmon and Elk River indicator stocks are caught in significant numbers in their river fisheries.	Salmon and Elk rivers need DIT groups. There will be no data available to estimate impacts in ocean or terminal area MSFs. The mixed bag regulations would cause problems for estimation.	Catch is estimated from creel surveys in Elk, Coos Bay and Salmon River and CRCs otherwise.

3.2 Expected Encounters of CWT Indicator Stocks in MSFs

Multiple MSFs are expected to occur during 2011 in BC, WA, and OR. Table 3.4 and Table 3.5 were constructed using historical information on encounters of tagged and marked fish to identify tagged stocks of Coho (run years 2006-08; Table 3.4) and Chinook (run years 2003-08; Table 3.5) that can be expected to be encountered in these areas with MSFs.

All tagged Coho stocks expected to be encountered are included in Table 3.4, as all are used by the CoTC for their analyses. MSFs in PS and Hood Canal largely exploit local stocks. However, tagged fish from all regions are encountered in MSFs in the SJDF, throughout southern BC, WA and OR coastal areas.

In 2007, there were 12 Chinook MSFs that occurred and they were largely restricted to PS and to the Columbia River with spring Chinook as the targeted group. Since then, Chinook MSFs have expanded substantially in marine and freshwater areas in 2010, with the number of Chinook MSFs doubling to 24 (Table 3.1). In 2010 and 2011, additional Chinook MSFs occurred and have been proposed in the marine waters of BC, PS, WA, ocean areas, and freshwater areas in PS and Columbia River. Further, Chinook MSFs that target later run fish have been added. Prior to 2008, the indicator stocks encountered in MSFs were largely of PS origin or were Columbia River spring stocks (Table 3.5). With the additional fisheries now proposed for Canadian waters, WA ocean areas, and Columbia River, a larger number of indicator stocks are will likely contribute in MSFs. In addition, MSFs have expanded substantially in PS, both geographically and temporally, with concomitant increases in catch in MSFs for Chinook Salmon (Figure 3.1).

In order to monitor the impacts of these expanding MSFs, the Chinook DIT program must be expanded to represent the new stocks that will be encountered. Agencies, however, have been discontinuing rather than expanding their DIT programs. Agencies should reevaluate their DIT programs and consider expanding DIT releases, not discontinuing the program. The CTC is now struggling to analyze the fishing mortalities attributed to Chinook MSFs because more DIT groups are needed.

Table 3.4. Number of tagged and marked Coho Salmon sampled (Obs) and 2006-2008 average percent of total estimated tags (expanded for the sample rate) in fisheries or in escapement. Note that Coho Salmon escapements are not available in the Regional Mark Information System (RMIS) database of the Pacific States Marine Fisheries Commission (PSMFC), so the percents shown for BC are only for fisheries.

Region		Hatchery / Release Location	MSF										NSF				Escapement		Total	
			BC		WA Coast		Puget Sound		OR Coast		Columbia R		Commercial		Sport					
			Obs	% of Est	Obs	% of Est	Obs	% of Est	Obs	% of Est	Obs	% of Est	Obs	% of Est	Obs	% of Est	Obs	% of Est	Obs	Estimated
BC	Coastal BC	Heiltsuk	2	77%	-	0%	-	0%	-	0%	-	0%	6	23%	-	0%	-	0%	8	102
		Snootli Cr	7	34%	-	0%	-	0%	-	0%	-	0%	43	63%	3	3%	-	0%	53	245
		Central BC	2	46%	-	0%	-	0%	-	0%	-	0%	18	53%	1	2%	-	0%	22	127
	Fraser R – Thompson R	Inch Cr	9	64%	9	7%	6	9%	1	1%	-	0%	14	17%	0	1%	-	0%	38	283
		Spius Cr	1	20%	7	26%	4	34%	2	9%	-	0%	3	11%	-	0%	-	0%	18	62
	Georgia Strait	Big Qualicum R	1	67%	1	5%	0	5%	-	0%	-	0%	3	23%	-	0%	-	0%	6	41
		Goldstream R	2	59%	1	5%	2	17%	-	0%	-	0%	5	16%	0	4%	-	0%	11	59
		Georgia Strait	-	0%	-	0%	-	0%	-	0%	-	0%	2	100%	-	0%	-	0%	2	8
	Johnstone Strait	Quinsam R	4	78%	1	1%	-	0%	0	1%	-	0%	6	20%	-	0%	-	0%	11	106
		Johnstone S	3	94%	1	2%	-	0%	-	0%	-	0%	1	4%	-	0%	-	0%	5	80
	Nass R – Skeena R	Tobaggan Cr	6	32%	-	0%	-	0%	-	0%	-	0%	94	64%	9	4%	-	0%	109	517
		Skeena	-	0%	-	0%	-	0%	-	0%	-	0%	8	100%	-	0%	-	0%	8	23
	Queen Charlotte Islands	Queen Charlotte Is	-	0%	-	0%	-	0%	-	0%	-	0%	44	100%	-	0%	-	0%	44	203
	W Vancouver Island	Robertson Cr	23	65%	13	7%	2	3%	1	0%	-	0%	27	25%	-	0%	-	0%	66	402
WA	Coastal Washington	Makah NFH	1	7%	8	7%	2	4%	2	2%	-	0%	20	10%	-	0%	64	70%	97	244
		Quinault NFH	6	2%	95	7%	6	1%	33	3%	-	0%	398	49%	-	0%	365	38%	902	2,860
		Salmon R	1	1%	34	10%	1	1%	11	3%	-	0%	178	61%	-	0%	155	23%	379	744
		Solduc H	11	7%	98	10%	3	1%	28	4%	0	0%	45	6%	1	0%	1,393	73%	1,579	2,042
	Grays Harbor	Bingham CR H	-	0%	10	4%	0	0%	0	0%	-	0%	21	16%	6	4%	338	76%	375	530
		Friends Landing	-	0%	1	2%	-	0%	0	0%	-	0%	13	33%	5	15%	59	49%	78	121
		Satsop Springs	-	0%	1	1%	-	0%	-	0%	-	0%	4	18%	1	2%	64	78%	70	89
		Chehalis R.	-	0%	16	6%	1	1%	7	3%	-	0%	38	21%	1	1%	364	68%	426	560
	Willapa R	Forks Creek H	2	7%	20	5%	-	0%	6	2%	1	0%	73	38%	3	2%	332	45%	437	741
		Naselle H	0	2%	8	12%	-	0%	4	5%	-	0%	25	60%	-	0%	30	21%	66	154
		Nemah H	1	3%	34	9%	1	0%	14	6%	1	0%	62	32%	0	0%	309	50%	422	676
		Willapa River	2	4%	28	13%	0	0%	13	8%	0	0%	34	22%	1	2%	223	52%	302	438

Table 3.4. Continued.

Region		Hatchery / Release Location	MSF										NSF				Escapement		Total	
			BC		WA Coast		Puget Sound		OR Coast		Columbia R		Commercial		Sport					
			Obs	% of Est	Obs	% of Est	Obs	% of Est	Obs	% of Est	Obs	% of Est	Obs	% of Est	Obs	% of Est	Obs	% of Est	Obs	Estimated
WA	Strait of Juan De Fuca	Dungeness H	-	0%	-	0%	-	0%	-	0%	-	0%	5	65%	-	0%	8	35%	13	24
		Lower Elwha H	1	15%	2	4%	1	3%	0	1%	-	0%	7	22%	-	0%	59	55%	70	107
	Puget Sound North	Bernie Gobin H	5	4%	28	4%	23	8%	5	1%	-	0%	254	77%	18	6%	1	0%	333	1,375
		Glenwood Springs	-	0%	-	0%	-	0%	-	0%	-	0%	1	100%	-	0%	-	0%	1	2
		Kendall Cr H	1	3%	8	4%	5	5%	-	0%	-	0%	119	67%	1	0%	44	22%	178	458
		Lummis Sea Ponds	6	16%	11	4%	2	2%	1	1%	-	0%	157	67%	1	2%	49	9%	228	550
		Skookum Cr H	4	4%	17	4%	7	4%	1	0%	-	0%	235	66%	0	0%	198	22%	463	912
		Wallace R H	7	5%	24	3%	10	3%	4	1%	-	0%	44	10%	7	2%	1,129	77%	1,225	1,540
	Skagit R	Marblemount H	5	4%	24	3%	12	4%	1	0%	-	0%	144	18%	15	5%	879	67%	1,080	1,528
	Puget Sound Mid	Cowskull & Rushwater	1	6%	2	4%	3	12%	-	0%	-	0%	36	68%	3	9%	0	1%	46	139
		Cowskull	4	4%	14	4%	20	10%	1	0%	-	0%	174	67%	31	13%	6	2%	251	979
		Crisp Cr	11	3%	38	2%	35	4%	4	0%	-	0%	412	41%	30	4%	1,689	47%	2,219	4,174
		Elliot Bay NP	7	2%	36	3%	30	4%	4	0%	-	0%	643	83%	37	6%	63	2%	819	2,977
		Soos Creek H	3	3%	9	2%	7	3%	1	0%	-	0%	150	52%	5	3%	307	37%	483	1,219
		Voights Cr H	5	4%	11	2%	9	4%	0	0%	-	0%	210	48%	12	6%	177	36%	424	1,157
		Green R	2	4%	8	3%	7	5%	2	1%	-	0%	67	37%	5	3%	299	47%	389	642
	Puget Sound South	Clear Creek H	1	16%	2	6%	1	5%	-	0%	-	0%	17	63%	1	2%	5	9%	26	62
		Kalama Cr H	1	2%	5	3%	7	9%	1	0%	-	0%	57	38%	4	4%	155	44%	229	364
		Minter Cr H	1	4%	3	4%	1	4%	-	0%	-	0%	18	27%	2	3%	111	58%	136	195
		South Sound NP	5	3%	17	3%	13	6%	2	0%	-	0%	274	84%	9	3%	3	1%	323	1,167
	Hood Canal	George Adams H	4	3%	17	3%	7	3%	2	0%	-	0%	69	24%	7	4%	716	63%	822	1,189
		Port Gamble Bay	5	7%	14	5%	10	8%	0	0%	-	0%	131	73%	9	7%	7	1%	175	662
		Quilcene Bay	8	5%	25	4%	17	5%	2	0%	-	0%	228	52%	13	5%	292	29%	584	1,528
		Quilcene NFH	5	5%	20	4%	14	5%	1	0%	-	0%	234	53%	8	6%	267	28%	549	1,394
OR	Coastal Oregon, North	Nehalem H	0	1%	7	4%	-	0%	3	2%	2	0%	1	0%	-	0%	331	92%	343	361
		Salmon R H	-	0%	4	5%	-	0%	5	11%	-	0%	1	1%	-	0%	108	82%	117	132
	Coastal Oregon, South	Butte Falls H	-	0%	3	17%	-	0%	4	29%	-	0%	2	26%	-	0%	8	28%	16	27
		Cole Rivers H	-	0%	-	0%	-	0%	1	1%	0	0%	0	0%	1	0%	299	98%	302	304
		Rock Cr H	-	0%	2	12%	-	0%	13	69%	-	0%	1	12%	1	2%	2	5%	19	47
COLR	Central Columbia R	Cascade H	-	0%	12	9%	-	0%	8	8%	6	5%	28	49%	-	0%	82	29%	135	293
		Klickitat H	2	6%	79	36%	1	1%	37	23%	5	2%	74	33%	-	0%	0	0%	198	425
		Oxbow H	-	0%	0	2%	-	0%	0	1%	1	10%	4	71%	-	0%	5	16%	12	34
		Washougal H	-	0%	17	35%	-	0%	8	21%	2	3%	13	30%	-	0%	11	11%	52	105

Table 3.4. Continued.

Region		Hatchery / Release Location	MSF										NSF				Escapement		Total	
			BC		WA Coast		Puget Sound		OR Coast		Columbia R		Commercial		Sport					
			Obs	% of Est	Obs	% of Est	Obs	% of Est	Obs	% of Est	Obs	% of Est	Obs	% of Est	Obs	% of Est	Obs	% of Est	Obs	Estimated
COLR (cont.)	Columbia R, general	Washougal Washougal H	-	0%	7	29%	-	0%	2	9%	-	0%	8	42%	0	13%	3	7%	20	40
		Wells H	-	0%	2	1%	-	0%	-	0%	0	0%	67	95%	0	0%	14	4%	84	415
	Lower Columbia R	Big Cr H	0	0%	18	5%	-	0%	15	7%	3	1%	93	33%	0	0%	343	53%	473	667
		Bonneville H	-	0%	41	6%	-	0%	34	7%	10	3%	23	5%	-	0%	1,066	79%	1,174	1,365
		Cascade H	-	0%	10	3%	0	0%	7	3%	6	2%	268	91%	-	0%	9	1%	300	705
		Youngs Bay	-	0%	2	2%	-	0%	1	1%	1	2%	70	92%	-	0%	4	2%	78	194
		Cowlitz Salmon H	2	2%	98	11%	1	0%	48	7%	6	5%	79	9%	1	0%	1,095	66%	1,329	1,759
		Deep R NP - Lower	-	0%	3	1%	0	0%	7	3%	4	2%	208	91%	-	0%	23	4%	246	678
		Deep R NP - Upper	-	0%	9	8%	-	0%	8	9%	1	0%	98	81%	-	0%	5	2%	120	248
		Eagle Cr NFH	0	0%	17	9%	-	0%	14	10%	4	3%	8	6%	-	0%	110	71%	154	385
		Elochoman H	1	3%	27	13%	0	0%	17	11%	2	1%	43	19%	0	0%	217	53%	308	439
		Fallert Cr H	-	0%	23	10%	-	0%	21	12%	6	4%	10	8%	-	0%	299	66%	358	467
		Grays River H	0	0%	16	12%	-	0%	17	16%	5	4%	40	33%	-	0%	105	35%	184	310
		Kalama Falls H	1	4%	32	11%	1	1%	18	8%	1	4%	45	16%	-	0%	302	56%	401	546
		Lewis River H	3	1%	231	11%	4	0%	123	7%	27	6%	185	8%	0	0%	2,920	67%	3,493	4,393
		North Toutle H	-	0%	33	9%	-	0%	29	10%	10	13%	13	5%	-	0%	426	64%	511	847
		Oxbow H	-	0%	9	3%	-	0%	6	3%	5	1%	20	8%	-	0%	562	85%	603	665
		Sandy H	1	1%	47	10%	0	0%	34	10%	15	5%	126	29%	-	0%	386	44%	609	944
		Washougal H	1	2%	39	14%	1	1%	16	8%	3	2%	41	17%	0	0%	285	56%	386	510

Table 3.5. Average number of tagged and marked Chinook Salmon sampled (Obs) and percent of total estimated CWTs (% of Est) in fisheries or in escapement averaged over years 2005-2009. The number of observed escapement recoveries is not available for BC stocks. MSF = mark-selective fisheries; NSF = non-selective fisheries; ESC = escapement.

		MSF										NSF							
		WAPS		WACST		ColR		TERM		Total MSF		COMM		SPORT		ESC		Total	
Jurisdiction	Stock	Obs	Est	Obs	Est	Obs	Est	Obs	Est	Obs	Est	Obs	Est	Obs	Est	Obs	Est	Obs	Est
Alaska	Alaska	-		-		-		-		-		1,716	40.6%	228.0	6.5%	222.0	65.4%	2,1656	10,649
British Columbia	Atnarko Summer	-		-		-		-		-		45.2	21.4%	11.8	13.2%		65.7%	75	592
	Big Qualicum	0.6	0.7%	-		-		-		0.6	0.7%	24.2	13.9%	20.0	19.7%		73.2%	84	517
	Chehalis (Harrison Fall Stock)	1.2	0.5%	1.0	0.3%	-		-		2.2	0.8%	54.2	16.3%	18.4	9.6%		72.8%	85	1,006
	Chilliwack (Harrison Fall Stock)	2.6	0.4%	2.2	0.3%	-		-		4.8	0.7%	115.6	12.8%	57.0	13.6%		38.5%	193	2,788
	Cowichan Fall	-		0.2	0.3%	-		-		0.2	0.3%	25.0	26.9%	14.8	34.3%		30.8%	63	268
	Dome Creek Spring	-		-		-		-		-		2.6	52.7%	2.0	16.5%		61.5%	8	71
	Kitsumkalum Summer	-		-		-		-		-		96.2	21.7%	42.8	16.9%		75.3%	154	1,236
	Nanaimo River Fall	-		0.2	0.1%	-		-		0.2	0.1%	11.8	5.9%	20.4	18.7%		76.7%	42	549
	Nicola River Spring	-		0.2	0.2%	-		-		0.2	0.2%	6.2	4.8%	17.0	18.2%		74.8%	35	317
	Puntledge Summer	-		-		-		-		-		9.6	9.3%	9.4	15.9%		61.1%	43	277
	Quinsam Fall	-		-		-		-		-		43.0	21.0%	21.8	17.9%		31.9%	105	613
	Robertson Creek	-		-		-		-		-		257.8	42.4%	104.2	25.7%		53.9%	403	2,142
	Lower Shuswap River Summers	-		0.2	0.1%	-		-		0.2	0.1%	85.2	23.7%	49.0	22.3%		66.0%	156	1,112
Columbia R	Cowlitz Fall Tule	-		0.6	0.9%	-		-		0.6	0.9%	16.6	19.2%	8.8	13.9%	139.0	26.4%	165	228
	Hanford Wild	-		-		-		-		-		60.8	51.8%	12.6	21.8%	12.2	38.4%	86	330
	Columbia Lower Rr Hatchery	0.2	0.5%	1.0	1.1%	-		-		1.2	1.7%	51.8	43.6%	13.8	16.3%	119.6	46.1%	186	325
	Lewis River Wild	-		-		-		-		-		40.2	35.0%	6.6	18.9%	63.2	70.3%	110	291
	Lyons Ferry Yearling	0.2	0.0%	17.6	1.0%	1.2		-		19.0	1.0%	659.0	28.6%	245.8	13.0%	1,553.8	37.4%	2,478	6,513
	Spring Creek Tule	1.8	0.4%	4.6	1.0%	-		-		6.4	1.3%	271.2	51.9%	43.2	9.4%	294.0	37.2%	615	1,652
	Columbia Summers	-		0.6	0.1%	4.6	0.2%	-		5.2	0.3%	505.4	45.3%	111.2	17.3%	639.4	35.1%	1,261	3,318
	Upriver Brights	-		0.8	0.2%	-		-		0.8	0.2%	192.0	45.5%	41.0	19.2%	303.0	59.7%	537	1,205
	Willamette Spring	-		0.6	0.1%	44.6	4.2%	62.2	12.7%	107.4	17.0%	194.2	16.1%	32.6	7.1%	949.6	56.1%	1,284	2,221
OR Coast	Elk River	-		-		0.2		-		0.2		254.0	25.3%	154.6	18.6%	837.8	35.4%	1,247	2,965
	Salmon River	-		-		-		-		-		241.6	29.7%	200.0	35.0%	194.6	62.6%	636	2,345
WA Coast	Hoko Fall Fingerling	-		0.8	0.6%	-		-		0.8	0.6%	44.6	24.3%	11.8	12.4%	96.6		154	507
	Queets Fall Fingerling	-		-		-		-		-		235.2	49.3%	27.4	7.9%	20.2	48.1%	283	1,368
	Sooes Fall Fingerling	-		0.2	0.3%	-		-		0.2	0.3%	41.4	38.6%	8.2	13.0%	75.6	51.9%	125	289

Table 3.5. Continued.

		MSF										NSF							
		WAPS		WACST		ColR		TERM		Total MSF		COMM		SPORT		ESC		Total	
Jurisdiction	Stock	Obs	Est	Obs	Est	Obs	Est	Obs	Est	Obs	Est	Obs	Est	Obs	Est	Obs	Est	Obs	Est
WA Puget Sound	George Adams Fall Fingerling	13.0	3.7%	6.2	1.7%	-		-		19.2	5.3%	90.8	23.3%	40.0	19.5%	682.8	42.8%	833	1,395
	Green River Fall Fingerling	12.6	3.4%	3.6	1.2%	-		-		16.2	4.6%	216.8	40.2%	31.0	12.5%	473.0	60.2%	737	1,129
	Grovers Creek Fall Fingerling	24.2	4.5%	5.2	1.1%	-		-		29.4	5.6%	137.6	21.5%	42.6	12.7%	969.6	40.5%	1,180	1,706
	Nisqually Fall Fingerling	21.8	3.8%	5.6	1.1%	-		-		27.4	4.8%	318.4	45.8%	32.6	8.9%	715.4	47.2%	1,094	1,946
	Nooksack Spring Fingerling	3.0	1.6%	1.0	0.5%	-		0.8	0.2%	4.8	2.3%	65.0	27.6%	22.6	22.9%	167.8	25.5%	260	732
	Samish Fall Fingerling	10.8	2.7%	6.2	1.5%	-		0.2	0.0%	17.2	4.3%	305.8	50.3%	47.2	19.9%	179.2	54.8%	549	1,434
	Skagit Spring Fingerling	6.6	1.4%	1.4	0.3%	-		102.6	14.7%	110.6	16.5%	122.6	14.2%	38.6	14.5%	741.8	47.0%	1,014	1,604
	Skagit Spring Yearling	9.0	4.0%	1.2	0.6%	-		60.0	18.2%	70.2	22.9%	46.6	10.6%	26.0	19.5%	353.8	65.6%	497	756
	Skykomish Fall Fingerling	4.4	2.2%	1.8	1.1%	-		-		6.2	3.3%	35.8	17.1%	16.0	14.0%	386.8	25.1%	445	664
	South Puget Sound Yearling	8.2	14.5%	0.4	0.7%	-		-		8.6	15.2%	20.0	21.2%	16.4	38.4%	56.0	65.8%	101	227
	Skagit Summer Fingerling	1.6	0.5%	0.8	0.3%	-		0.2	0.0%	2.6	0.8%	146.0	24.1%	18.4	9.3%	82.0	64.5%	249	1,140
	Stillaguamish Fall Fingerling	5.8	2.9%	1.6	0.7%	-		-		7.4	3.6%	44.4	15.2%	17.8	16.7%	162.2	31.7%	232	700

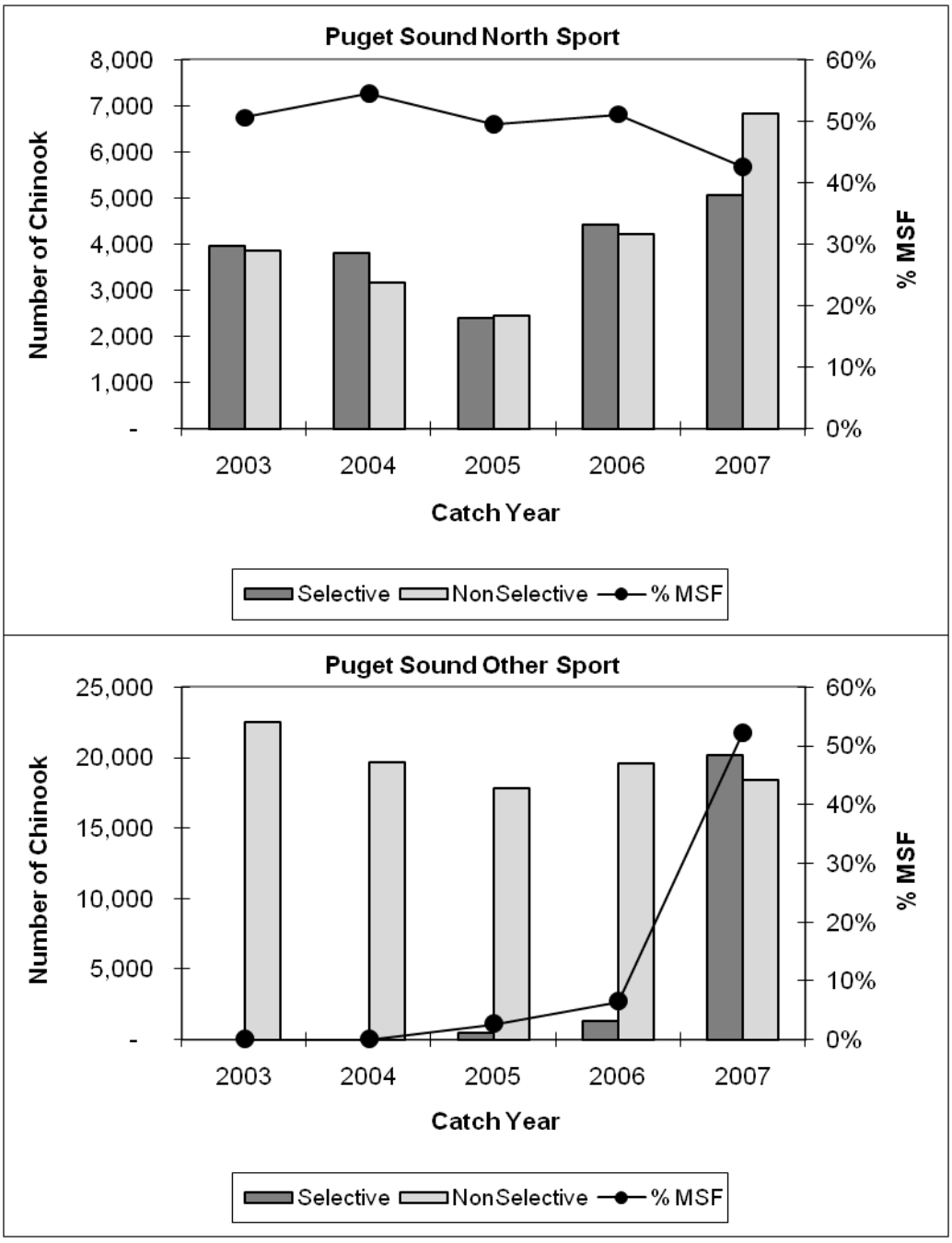

Figure 3.1. Total landed catch in MSFs and NSFs in Puget Sound for catch years 2003-2007.

4 ISSUES, CONCERNS, AND RECOMMENDATIONS

4.1 MSF Proposals

Proposals are due by November 1 of the year before the MSFs being proposed; e.g., November 1, 2010 for fisheries proposed to occur in 2011-2012. Although final decisions on fisheries are generally made by agencies after this time period (e.g., January-April of 2011 for 2011 fisheries), MSF proposals should be submitted for any fisheries that are planned and should include information or options known at that point in time. SFEC believes that most MSFs now being implemented are represented by proposals, although some Columbia River mark MSFs may not be represented. The SFEC recommends that agencies prioritize the task of developing proposals in a timely manner for any planned MSF in marine or freshwater. Timely submission of proposals allows for timely identification of issues which can be conveyed to the PSC and to agencies while the annual fishery planning activities are occurring.

The MSF proposal template in an Excel format is now accepted by SFEC. The SFEC suggests that this spreadsheet format can be used if desired instead of the original document template provided. An example of the spreadsheet format is presented in Appendix D.

4.2 MSF Reports

The PSC has requested that management agencies provide SFEC with three reports on MSFs. The first is a table (Appendix Table I.1) that provides information on sampling methods used to recover CWTs in all fisheries and escapement locations, not just in the MSFs. Information on sampling procedures is needed because estimating impacts for the unmarked group encountered in MSFs depends on the method of sampling (electronic or visual) and the CWT processing protocol (i.e., are all tagged fish sampled also processed for CWT extraction in the lab). The second report is a table (Appendix Table I.2) that provides post-fishery information on MSFs that have occurred, where and when they occurred, fishery regulations, and what sampling occurred. This table provides the information on whether MSFs that were proposed did actually occur and how these fisheries were sampled. These first two tables should be completed by the PSC post-season meeting of the year following the fishery year. For instance, reports on fisheries occurring in 2009-2010 should be available by the post-season meeting in 2011. The post-season annual reports produced by the U.S. and Canadian sections for PSC's 2010 post-season review meeting did not include this information for most MSFs.

The third report is also in table format (Appendix Table I.3) and is intended to provide final results on the estimated total mortalities and mark rates in MSFs that have been prosecuted. This information is required for evaluation of the fishery. For Chinook Salmon, the PSC Chinook Technical Committee (CTC) requires that total fish retained and total mortalities are reported for MSFs for use in the PSC Chinook Model. It should be noted that the template provided in Appendix Table I.3 was new in 2007, and the previous template should not be used as it was inadequate for CTC needs.

Table 4.1 shows this report template with an example for the summer MSFs in Washington Areas 5/6, with estimates taken from the WDFW draft multi-year reports.

Table 4.1. Completed template for the third post-season report providing estimates of fish retained in MSFs by mark status and total mortalities by mark and size category. Data are taken from draft multi-year report for WA Area 5/6 (Strait of Juan de Fuca) for 2003-2007.

Region	Fishery	Catch Year	Retained Marked Fish	Retained Unmarked fish	Encounters Marked	Encounters Unmarked	% Marked	Legal-sized Marked fish Landed & Release Mortalities	Legal-sized Unmarked fish Landed & Release Mortalities	Sub-Legal-sized Marked fish Landed & Release Mortalities	Sub-Legal-sized Unmarked fish Landed & Release Mortalities
WA	Area 5/6	2003	3,417	76	5,327	8,626	38%	3,287	140	225	0
WA	Area 5/6	2004	3,571	5	5,102	6,365	44%	3,476	477	366	385
WA	Area 5/6	2005	2,024	53	3,412	3,237	51%	1,981	373	351	237
WA	Area 5/6	2006	3,641	25	5,008	5,095	50%	3,546	63	199	15
WA	Area 5/6	2007	3,971	124	5,784	3,839	60%	3,794	432	540	301

Agencies have generally not provided these reports in the format requested by SFEC, and by the requested deadline; however, SFEC representatives have been stepping up efforts in recent years to coordinate with key staff within the agencies in order to acquire these post-season reports. Although the information may be available in larger agency reports, this does not provide access to the summarized information required by the SFEC and the CTC. It is recommended that agencies prioritize this task and work with their SFEC representatives to develop these reports annually and provide them to the PSC in the required time frame.

4.3 Chinook Salmon MSFs and DITs

A DIT group is needed for each PSC indicator stock in order to evaluate the impacts of MSFs on each natural stock represented by an indicator stock (Appendix H). Comparison of the escapement of the unmarked and marked DIT groups provides a measure of the total impact of MSFs. MSFs have doubled in number since 2007; new areas and stocks are being fished under mark-selective regulations. The PSC indicator stocks expected to be encountered in the WA Ocean Areas 1 and 2 and the Columbia River MSFs targeting fall Chinook are shown in Table 4.2. Some of these stocks are currently DIT stocks, but the SFEC recommends that further stocks be considered for inclusion as DITs.

Table 4.2. PSC Chinook indicator stocks expected to be encountered in MSFs in WA Ocean Areas 1 and 2 and in the Columbia River. The table indicates recommended DITs, which stocks are currently a DIT group, and which age groups of Chinook DITs could be encountered in 2011 fisheries.

Indicator Stocks		DIT		DIT by Age, Available to 2011 Fisheries				
Stock	**Release Hatchery**	**Recommended**	**Current**	**2**	**3**	**4**	**5**	**6**
Chilliwack River falls			Yes					
Columbia River springs	Lewis River	Yes	Yes	x	x	x	x	x
Lower River tules	Big Creek	Yes	Yes	x	x			
	Cowlitz	Yes	No					
Mid-Columbia tules	Spring Cr. NFH	Yes	Yes	x	x	x	x	
Summer Chinook	Wells	Yes	No					
Upper Columbia River summers	Simalkameen							
Upriver bright falls	Priest Rapids	Yes	No					
Snake River yearlings	Lyons Ferry		Yes	x	x	x	x	x
Snake River fingerling	Lyons Ferry	Yes	No					
Oregon coast	Elk River	Yes	No					
	Salmon River	Yes	No					

It is recommended that agencies review their indicator stock programs in light of these new MSFs and any other new MSFs likely to be proposed in future years and evaluate the need for including additional DITs. Such an evaluation should be included in the agencies' MSF proposals submitted to SFEC. It is recommended that agencies add or resume the DIT groups recommended in Table 4.2.

4.4 Chinook Salmon MSFs and Sampling Methods

Electronic tag detection (ETD) is necessary for sampling fisheries and escapement where unmarked and tagged fish are present in the samples. In order to carry out the exploitation rate analysis for unmarked stocks, aside from estimation of unmarked mortalities in MSFs, it is necessary to have estimates of harvest of unmarked and tagged DIT groups in NSFs. This requires ETD be used in NSFs, where unmarked and tagged fish are present, in particular if the stock has been subjected to MSFs in other areas or periods. Until 2008, MSFs for Chinook Salmon were largely prosecuted in PS where ETD is used for all fisheries. ETD has not been used consistently by CDFO in northern fisheries until 2007 and has not been used at all by ADFG. As Puget Sound DIT groups taken in these fisheries were unlikely to have been subject to preceding MSFs (either the same year or at younger ages), indirect methods (other than direct sampling with ETD) could be used for achieving unbiased estimates of unmarked encounters from marked landings. However, with MSFs now proposed for fisheries off of WCVI and WA Ocean Areas 1 and 2 and MM of far-north migrating Chinook, it is no longer reasonable to assume that fish taken in NSFs in all northern coastal areas have not been subject to prior MSFs.

The SFEC recommends that agencies review their sampling methods with respect to the current expansion of MSFs into coastal fisheries. It is specifically recommended that ETD be implemented by ODFW, beginning in 2011, for Oregon Coastal Chinook and Columbia River fall Chinook to recover DITs for Chinook exploitation rate indicator stocks.

4.5 Mixed-Bag Regulations in MSFs

Regulations to implement MSFs for recreational fisheries are becoming increasingly complex. At this time we are concerned about monitoring, sampling, and estimation methods keeping pace with increases in regulation complexity. MSFs are being proposed for much finer time/area strata than are being used for CWT expansions which will result in an inability to separate impacts in MSFs and NSFs.

Different types of mixed bag regulations have been part of the MSFs proposed by Canada, OR and OR. In most cases this is a mixed bag, where only marked adults may be kept but marked and unmarked juveniles may be retained (Table 4.3). In addition, in 2009 BC proposed two variations of the 'standard' mixed bag. For the SJDF fishery, both marked and unmarked Chinook could be retained within slot limits (45 – 67 cm) but marked only at sizes above the upper limit of the slot. For the WCVI fishery, marked fish of any size above 45 cm can be retained but the daily bag limit of two Chinook can include one unmarked fish between 45 and 77 cm. In OR there is a seasonal limit on unmarked Chinook Salmon. These mixed bag regulations present a problem in estimating mortalities of unmarked DIT groups and associated wild stocks. The agencies proposing these mixed regulations should assist in developing the analytical tools to measure the impacts of these fisheries or provide documentation if methods have been developed and employed.

Table 4.3. Mixed bag regulations proposed for Chinook MSFs. Details on regulations are found in Table 3.3.

Regulation Type	Examples	Location
Mixed bag, marked only above maximum size.	2/day, keep all between 45-67 cm, only marked over 67 cm	BC Strait of Juan de Fuca (SJF)
Mixed bag, marked within size range.	2/day either only those fish that are hatchery marked regardless of size or one unmarked >77cm. A combination is allowed.	BC WCVI
Mixed bag, adults only marked and juveniles marked or unmarked	Bag limit of 6, up to 2 adults, which must be marked. Minimum size limit 12".	Puget Sound, Snake River fall Chinook and Oregon coastal
Differing mixed bag, adults and juveniles between state regulations	*Washington* sport daily limit of 6 salmon, of which only 2 may be adults (marked only), minimum size limit of 12". *Oregon* sport daily limit is 2 marked only adult Chinook (>24" total length) and 5 marked jacks (15"-24" total length). The daily limit for adult Chinook is the same between the states, but the daily limit on jack Chinook is different.	Columbia River Chinook recreational fisheries
Seasonal limit on unmarked fish	There is a seasonal limit of 5 unmarked adult Chinook coastwide, see Oregon regulations.	Oregon coastal Chinook

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Parken, C., and B. Riddell. 2007. Operational issues with mass marking and mark-selective fisheries. Presentation at AFS Annual Meeting. Available from: www.rmpc.org/mass-marking-and-selective-fisheries-presentations.html. (May 2008).

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APPENDICES

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:

1. 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.

2. Not later than June 1 of the year prior to implementation. Provide new or substantially changed MM or MSF project proposals.

3. 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.

4. Upon completion of domestic fishery planning processes, agencies conducting MSFs are to provide final selective fishery plans.

5. 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.

6. Agencies shall report results of MSFs conducted during a season in the annual post-season report provided, using a format specified by the SFEC.

7. 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 (SFAWG). 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

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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.

PROPOSAL TITLE:

Contact information

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

Is the proposal:

new _____
substantially changed _____
or a continuation of a previous proposal _____

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 example format below), 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 prior marking status.

Example format for proposed mass marking and tagging plans. DIT groups identified with an asterisk (*).

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						

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 in fishery CWT sampling programs using the format below. In order to standardize estimates between agencies, we would prefer the following methods be used:
   - Use actual CWT recoveries from representative CWT groups (e.g., key or indicator stocks from each region) as basis of estimate
   - Calculate the average recovery rate of tags (# recoveries / # releases), using the following three brood years: Coho = BYs 2003-2005, Chinook = BYs 2000-2003
   - Multiply the # of proposed mass marked fish, by production region, by this recovery rate, for the appropriate indictor stock
   - Apportion the mass marked fish to the region/fisheries (see table below) based on the average distribution for the indicator codes
   - The PSMFC RMIS will provide a standardized report that summarizes recoveries in the requested region/fisheries. Simply provide them with a vertical text listing of the tag codes.

Region	Fishery	Estimated number of marked fish that will be encountered in fishery sampling programs.	Electronic sampling currently in place Y/N?
Alaska	Commercial		
	Sport		
Northern BC	Commercial		
	Sport		
Southern BC	Commercial		
	Sport		
Washington (Coast & PS)	Commercial		
	Sport		
Columbia Basin	Commercial		
	Sport		
Oregon Coast	Commercial		
	Sport		
California	Commercial		
	Sport		

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

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Appendix C. Template for Mark-Selective Fishery Proposals.

Mark-Selective Fishery Proposal ID #_____
Date Received _____

TITLE FOR MARK-SELECTIVE FISHERY PROPOSALS

Contact information

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

Is the proposal:

new or not yet reviewed by PSC-SFEC _____
substantially changed _____

Purpose/management objective

Describe the management objective of the proposed mark-selective fishery.

Location and time of the proposed mark-selective fishery

Please include any information when there are breaks or changes in regulations that might impact sampling stratification (see Question 7b below)

1. Location of the fishery:

2. Year and month(s) when the fishery is proposed to occur:

Other information about the fishery:

3. Target species/stocks (including nontarget PSC species/stocks of concern):

4. Gear to be used:

5. Other regulation details (e.g., size restrictions, bag limits, mixed bag information):

Projected impacts BY the fishery

6. Identify all (coastwide) CWT stocks likely to be encountered in this fishery (including

individual tag codes if available), whether those stocks were Double Index Tagged (DIT). Appendices F and G provide tables of tagged indicator stocks for Coho and Chinook for your convenience. Please note we are interested in tagged impacts alone, untagged hatchery production should not be included.

In-season management

7. Describe your sampling program for sampling for: CWTs, marks and estimation of total catch. Attach your sampling plan if available. At a minimum, include descriptions for the following:
    a. CWT recoveries.
        i. Will there be *random* sampling of CWTs (i.e., fishers exiting fisheries contacted for biological sampling of harvest) or will you be using voluntary programs?
        ii. If *random* will there be ETD or visual identification of tagged fish?
        iii. If ETD in *random* samples, will all tagged fish (marked and unmarked) be processed?
        iv. If *random* what is the expected sample rate for CWTs?
        v. If voluntary programs are used, how is the awareness factor estimated?
    b. Monitoring for retained catch by sample strata for sample expansions. The sample strata and the strata of catch estimation must match the location/time/regulation strata (i.e., whenever there is a change in regulation such as from MSF to non-selective, or change in bag limits, the sampling strata should also change).
    c. Monitoring of mark rate in the MSF (this is the total mark rate, percent marked in the harvest from the fishery).
    d. Other information, e.g., retained unmarked fish (mixed bag fisheries, or mark recognition error in MSF)

Other information.

8. Please include any other information that will be useful for estimation of unmarked tagged mortalities in your MSF. For instance, sources of estimates of unmarked to marked ratios for DIT tagged groups (e.g., in a test fishery, nearby hatchery, non-selective fishery). Please provide any input you wish on approach to estimate the unmarked tagged mortalities for DIT groups, or for appropriate release mortality rates to be used.

Appendix D. Spreadsheet Template for MSF Proposals.

Agency and Contact Information:													
Fishery Information				**Other regulations**			**CWT stocks**		**Sampling program**				**Other sources of info for estimation of unmarked mortalities and mark ratios**
Region and Fishery Area	**Period (Yr/ Mon)**	**Fishery type (EO, FSC, Com, Rec) and Gear**	**Species (Target and Mark-selective)**	**Bag limits adult and juvenile by mark status**	**Lower Size Limit**	**Other regulations comments (e.g., upper limits, gear restrictions, mesh size)**	**Hatchery and Stock Name**	**Indicator or DIT**	**CWT sampling method (e.g., random /direct or voluntary)**	**Tag Detection Method**	**Are All Tags Processed?**	**Other sampling (mark rate, release mortality rate, compliance)**	

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Appendix E. Status of Mass Marking Proposals Received in 2010 for Mass Marking to Occur in 2011.

Description of Proposal and Agency	New or Continuation Proposal	SFEC Proposal Number
Coho Salmon		
Southern BC Coho – CDFO	Continuation	MM-FOC-01-2011
Puget Sound Coho – WDFW/Tribal	Continuation	MM-WDFW-01-2011
Washington Coast Coho – WDFW/Tribal	Continuation	MM-WDFW-04-2011
Washington Columbia River Coho – WDFW	Continuation	MM-WDFW-05-2011
Makah, Quilcene, Quinault NFH Coho – USFWS	Continuation	MM-USFWS-018-2011
Eagle Creek NFH Coho – USFWS	Continuation	MM-USFWS-04-2011
Columbia River Coho – ODFW	Continuation	MM-ODFW-04-2011
Oregon Coast Coho – ODFW	Continuation	MM-ODFW-05-2011
Chinook Salmon		
L. White Salmon R. and Spring Cr. NFH Fall Chinook – USFWS	Continuation	MM-USFWS-17-2011
Makah NFH Fall Chinook – USFWS	Continuation	MM-USFWS-19-2011
Willamette Spring Chinook – ODFW	Continuation	MM-ODFW-01-2011
Oregon North Coast Spring Chinook – ODFW	Continuation	MM-ODFW-02-2011
Oregon South Coast Spring Chinook – ODFW	Continuation	MM-ODFW-03-2011
Oregon Columbia River Fall Chinook – ODFW	Continuation	MM-ODFW-06-2011
Oregon Coast Fall Chinook – ODFW	New	MM-ODFW-07-2011
Puget Sound Chinook – WDFW/Tribal	Continuation	MM-WDFW-02-2011
Columbia R. Chinook – WDFW/CRITFC	Continuation	MM-WDFW-03-2011
Washington Coastal Chinook – WDFW/Tribal	Continuation	MM-WDFW-06-2011

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Appendix F. MSF Proposals Received in 2010 for Fisheries Occurring in 2011. Table lists all MSF proposal numbers assigned by SFEC and current status of each proposal (√ = Submitted; X = Discontinued).

Unique ID	Fishery and Location	HM Target Species	2011 status	First yr. proposal	First yr. fishery
Fisheries and Oceans Canada					
MSF-FOC-01	*Subdivided into other proposals*				
MSF-FOC-02	Sport, Southern BC	Coho	√	2003	2003
MSF-FOC-03	FSC, Lower Fraser freshwater	Coho	√	2006	2006
MSF-FOC-04	*code no longer used*				
MSF-FOC-05	Commercial, Southern BC	Coho	√	2004	2005
MSF-FOC-06	Sport, Lower Fraser freshwater	Coho	√	2006	2003
MSF-FOC-07	Sport, Strait of Juan de Fuca, BC, selected subareas	Chinook	√	2009	2008
MSF-FOC-08	Sport, WCVI, selected subareas, mainly inside	Chinook	**X**	2009	none
Oregon Department of Fish and Wildlife					
MSF-ODFW-01	Sport, Willamette R (on spring run)	Chinook	√	2003	2003
MSF-ODFW-02	Sport, Oregon coast	Chinook	√	2009	2008
MSF-ODFW-03	Sport, Oregon coast	Coho	√	2010	2003
Oregon and Washington Departments of Fish and Wildlife					
MSF-ODFW/WDFW-01	Sport, Lower Columbia R (on spring run)	Chinook	√	2003	2003
MSF-ODFW/WDFW-02	Sport, Columbia R (on summer run)	Chinook	√	2003	2003
MSF-ODFW/WDFW-03	Commercial, Lower Columbia R (on spring run with tangle or large net)	Chinook	√	2003	2003
MSF-ODFW/WDFW-04	Sport, Lower Columbia R (since 1999)	Coho	√	2008	2003
MSF-ODFW/WDFW-05	Sport, Col. R. fall Chinook	Chinook	√	2009	None
Washington Department of Fish and Wildlife					
MSF-WDFW-01	Sport, Skykomish R	Chinook	√	2003	2003
MSF-WDFW-02	Sport summer, WA area 5&6	Chinook	√	2003	2003
MSF-WDFW-03	Sport, Yakima R (on spring run)	Chinook	√	2004	2004
MSF-WDFW-04	*code no longer used*				
MSF-WDFW-05	Sport, Lower Snake R fall Chinook	Chinook	√	2009	2008
MSF-WDFW-06	Sport, WA areas 1-4 and Buoy 10	Coho	√	2003	2003
MSF-WDFW-07	Sport, Puget Sound	Coho	√	2004	2003
MSF-WDFW-08	*old proposal Area 5&6*	Chinook	X		
MSF-WDFW-09	Sport, Carbon & Puyallup R	Chinook	√	2005	2003

Unique ID	Fishery and Location	HM Target Species	2011 status	First yr. proposal	First yr. fishery
Washington Department of Fish and Wildlife (cont.)					
MSF-WDFW-10	*code no longer used*				
MSF-WDFW-11	Sport summer, WA area 5-13	Chinook	√	2007	2007
MSF-WDFW-12	Sport, Upper Skagit R	Chinook	√	2007	2005
MSF-WDFW-13	Sport, Nooksack R	Chinook	√	2004	2004
MSF-WDFW-14	Sport, Nisqually R, Jul-Jan	Chinook	√	2007	2005
MSF-WDFW-15	Commercial, WA areas 1-4	Coho	√	2008	2003
MSF-WDFW-16	Sport winter, WA area 6-10	Chinook	√	2005	2005
MSF-WDFW-17	*code no longer used*				
MSF-WDFW-18	Sport, Nooksack R	Coho	√	2009	2003
MSF-WDFW-19	Sport, WA Coast Chinook, Areas 1-4	Chinook	√	2009	2010
MSF-WDFW-20	Sport, Skokomish Chinook	Chinook	√	2009	2010
MSF-WDFW-21	Troll, WA Coast Chinook Areas 1-4	Chinook	X	2009	None
MSF-WDFW-22	Sport, Willapa tributaries	Coho	√	2010	2003
MSF-WDFW-23	Sport, Grays Harbor, Area 2.2	Coho	√	2010	2007
MSF-WDFW-24	Sport, Grays Harbor tributaries	Coho	√	2010	2003
MSF-WDFW-25	Commercial, Willapa Bay	Chinook	√	2010	2010
MSF-WDFW-26	Sport, Willapa Bay, Area 2.1	Chinook	√	2010	2010
MSF-WDFW-27	Sport, Willapa Bay tributaries	Chinook	√	2010	2010
MSF-WDFW-28	Sport, Snake River, spring Chinook	Chinook	√	2010	2010
MSF-WDFW-29	Sport, Willapa Bay MA 2.1	Coho	√	2010	2010
MSF-WDFW-30	Commercial, Grays H Area 2C	Coho	√	2011	2009
MSF-WDFW-31	Sport, Quillayute River	Coho	√	2011	2003
MSF-WDFW-32	Sport, Quillayute River, spring/summer Chinook	Chinook	√	2011	2003
MSF-WDFW-33	Sport, Hoh River, spring Chinook	Chinook	√	2011	2008

Appendix G. Current PSC Coho CWT Exploitation Rate Indicator Stocks and DIT Groups.

Region	Exploitation Rate Indicator Stocks	Natural/Unmarked Stock Representation	DIT[1]
BC North Coast	Lachmach	North Coast Wild	
	Toboggan	Skeena	
Interior Fraser	Coldwater	Thompson River	
	Salmon	Thompson River	
	Lemieux	Thompson River	
Georgia Basin	Big Qualicum	East Coast Vancouver Island	
	Goldstream River	East Coast Vancouver Island	
	Black Creek	East Coast Vancouver Island Wild	
	Inch Creek	Lower Fraser	√
	Salmon River	Lower Fraser Wild	
	Quinsam River	North Vancouver Island	√
West Coast Van Is.	Robertson Creek	West Coast Vancouver Island	
Puget Sound	Skookum Creek	Nooksack	
	Lummi Bay Ponds	Nooksack	
	Skagit (Marblemount)	Skagit	√
	Skykomish (Wallace River)	Stillaguamish/Snohomish	√
	Bernie Gobin	Stillaguamish/Snohomish	
	Green River (Soos)	Mid Puget Sound	√
	Puyallup (Voights)	South Puget Sound	√
	Puyallup Tribal (Rushing)	South Puget Sound	
	Squaxin Net Pens	South Puget Sound	
	Kalama Creek (Nisqually)	South Puget Sound	
	Quilcene	North Hood Canal	√
	Quilcene	Quilcene Net Pens (Hood Canal)	
	Quilcene	Port Gamble Net Pens (Hood Canal)	
	George Adams	South Hood Canal	√
	Dungeness	Dungeness	
	Lower Elwha	Strait of Juan de Fuca	√
Washington Coast	Makah	North Coast	√
	Solduc (falls)	North Coast	√
	Queets Wild[2]	North Central Coast	√
	Quinault	Quinault	√
	Satsop Springs	Grays Harbor	
	Satsop (late)	Grays Harbor	
	Satsop (Bingham)	Grays Harbor	√
	Forks Creek (late)	Willapa Bay	
	Forks Creek	Willapa Bay	√
	Nasell	Willapa Bay	
Columbia Basin	Lewis River (Type N and S)	Lower Columbia River	√
	Eagle Creek	Lower Columbia River	√
	Sandy River	Lower Columbia River	**(dropped)**√
	Tanner Cr.	Lower Columbia River	√ **new**
Oregon Coast	Rogue River (Cole Rivers)	Oregon South Coast	

[1] Proposed for 2011
[2] DIT stock released from Salmon River Hatchery.

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Appendix H. Current PSC Chinook CWT Exploitation Rate Indicator Stocks and DIT Groups.

Area	Exploitation Rate Indicator Stocks	Natural/Unmarked Stock Representation	Run Type	DIT
S.E. Alaska	Alaska Spring	Southeast Alaska	Spring	
British Columbia	Kitsumkalum	North/Central BC	Summer	
	Robertson Creek	West Coast Vancouver Is	Fall	
	Quinsam	Georgia Strait	Fall	
	Puntledge	Georgia Strait	Summer	
	Big Qualicum	Georgia Strait	Fall	
	Cowichan	Georgia Strait	Fall	
	Chehalis (Harrison Stock)[1]	Lower Fraser River	Fall	
	Chilliwack (Harrison Stock)	Lower Fraser River	Fall	√
Puget Sound	Nooksack Spring Fingerling	North Puget Sound	Spring	√
	Skagit Spring Yearling	Central Puget Sound	Spring	√
	Skagit Spring Fingerling	Central Puget Sound	Spring	
	White River Spring Yearling[3]	South Puget Sound	Spring	
	Skagit Summer Fingerling	Central Puget Sound	Summer	
	Skykomish Summer Fingerlings[2]	Central Puget Sound	Fall	√
	Stillaguamish Summer/Fall Fingerling	Central Puget Sound	Fall	
	George Adams Fall Fingerling	Hood Canal	Fall	√
	Samish Fall Fingerling	North Puget Sound	Fall	√
	Green River Fall Fingerling	South Puget Sound	Fall	√
	Grover Creek Fall Fingerling	South Puget Sound	Fall	√
	Nisqually Fall Fingerling	South Puget Sound	Fall	√
	South Puget Sound Fall Yearling	South Puget Sound	Fall	
	Hoko Fall Fingerling	Strait of Juan de Fuca	Fall	
Washington Coast	Sooes Fall Fingerling	North Wash. Coast	Fall	
	Queets Fall Fingerling	North Wash. Coast	Fall	
	Quinault Lake Fall Fingerling[2]	North Wash. Coast	Fall	√
	Forks Creek Fall Fingerlings[2]	Willapa Bay	Fall	√
Columbia Basin	Cowlitz Tule	Columbia R. (WA)	Fall Tule	**(dropped)**
	Spring Creek Tule	Columbia R. (WA)	Fall Tule	√
	Little White Salmon[2]	Columbia R. (WA)	Fall Bright	√
	Columbia Lower River Hatchery	Columbia River (OR)	Fall Tule	√
	Columbia Upriver Bright	Upper Columbia R.	Fall Bright	
	Hanford Wild	Upper Columbia R.	Fall Bright	
	Priest Rapids			**√ new**
	Lewis River Wild	Lower Columbia R.	Fall Bright	
	Lyons Ferry	Snake River	Fall Bright	
	Willamette Spring	Lower Columbia R.	Spring	(dropped)
	Lewis River Spring[2]	Lower Columbia R.	Spring	√
	Columbia Summers	Columbia R. (WA)	Summer	
Oregon Coast	Salmon River	North Oregon Coast	Fall	

[1] These stocks are CWT-tagged, but there is no quantitative CWT escapement data, useful for distribution only.
[2] DIT group not currently an indicator stock.
[3] No longer adipose fin clipped.

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Appendix I. Post-Season Report Templates

Templates with examples are provided below in Appendix Tables I.1, I.2 and I.3.

Appendix Table I.1. Sampling methods and processing of tags in all fisheries and escapement locations. Required for choice of estimation of impacts on unmarked fish.

Region	Sampling Location	CWT Sample Method	Detection Method	Tags Processed
North	Net	Direct	Electronic	All
	Troll	Direct	Electronic	All
	Sport	Voluntary	Visual	All
Outside	Net	Direct	Electronic	All
	Troll	Direct	Electronic	All
	Sport	Voluntary	Visual	All
Inside	Net	Direct	Electronic	All
	Troll	Direct	Electronic	All
	Sport	Voluntary	Visual	All

Appendix Table I.2. Information on MSFs that have occurred, locations, periods and locations and what sampling and monitoring was conducted to recover CWTs and estimate total encounters and unmarked mortality and compliance in these MSFs. Compliance includes estimation of mark recognition error (marked fish released) and unmarked retention error (unmarked fish retained and landed). Provides information on actual implementation of MSFs proposed for season.

Region	Fishery Area	Fishery Period	Regulations	Sampling and Monitoring Conducted to Estimate:			
				CWTs	Encounters	Unmarked Mortality	Compliance
Species							
Alaska	No MSF						
Canada	St of Georgia Sport						
	WCVI sport			Creel & voluntary	Creel, guide logbook, test fishing	No	No
Puget Sound	Area 5,6 sport Coho			Creel & voluntary	Creel, guide logbook, test fishing	No	No
	Area 7 sport Coho			Creel @ 22.6%	Creel, test fishing	no	yes
	Area 7 Reef net Coho			Creel @ 15.2%	Creel	no	yes
	Area 13 sport Coho			Creel @ 0%	No	no	yes
Coastal Washington	Area 1 sport Coho			Creel @ 11.3%	Creel	no	yes
	Area 2 sport Coho			Creel @47%	Creel, observers	no	yes

Region	Fishery Area	Fishery Period	Regulations	Sampling and Monitoring Conducted to Estimate:			
				CWTs	Encounters	Unmarked Mortality	Compliance
	Area 3 sport Coho			Creel @ 45%	Creel, observers	no	yes
	Area 4 sport Coho			Creel @73%	Creel, logbooks	no	yes
	Area 1 troll Coho			Creel @ 42%	Creel, test fishing, observers	no	yes
Coastal Oregon	Sport Troll			Creel @ 42%	Creel	no	yes
Columbia R	Columbia R			Electronic Electronic	Observer & Creel	yes no	yes no
Columbia River	Buoy 10 sport Coho			Electronic	Creel	yes	yes
				Creel @ 38%	Creel , observer	no	yes

Appendix Table I.3. Estimated catch, encounters, and mortalities by size and mark status in MSF.

Region	Fishery	Year	Retained Marked Fish	Retained Unmarked fish	Encounters Marked	Encounters Unmarked	% Marked	Legal-sized Marked fish Landed & Release Mortalities	Legal-sized Unmarked fish Landed & Release Mortalities	Sub-Legal-sized Marked fish Landed & Release Mortalities	Sub-Legal-sized Unmarked fish Landed & Release Mortalities
WA	Area 5/6	2003	3,417	76	5,327	8,626	38%	3,287	140	225	0
WA	Area 5/6	2004	3,571	5	5,102	6,365	44%	3,476	477	366	385
WA	Area 5/6	2005	2,024	53	3,412	3,237	51%	1,981	373	351	237
WA	Area 5/6	2006	3,641	25	5,008	5,095	50%	3,546	63	199	15
WA	Area 5/6	2007	3,971	124	5,784	3,839	60%	3,794	432	540	301