PACIFIC SALMON COMMISSION
SELECTIVE FISHERY EVALUATION COMMITTEE

REVIEW OF MASS MARKING AND MARK-SELECTIVE FISHERY ACTIVITIES PROPOSED TO OCCUR IN 2014

REPORT SFEC (15)-2

July 2015

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[1] Past committee members who provided input to this report include: Mr. Kirt Hughes, WDFW; and Ms. Laurie Peterson, WDFW.

LIST OF ACRONYMS WITH DEFINITIONS

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

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EXECUTIVE SUMMARY

This report provides a summary of the proposed coastwide plans for mass marking (MM) of Coho and Chinook salmon and the conduct of mark-selective fisheries (MSFs) in 2014. Issues with implications for maintenance of the coastwide coded-wire tag program are identified and recommendations are proposed.

Summary of 2014 Mass Marking Proposals

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

Mass Marking and DIT Programs

Twenty-three proposals (8 for Coho and 15 for Chinook) were received for mass marking (MM) occurring in 2014 (Appendix E). Of these, one was received from southern British Columbia (BC) and 22 from southern United States (US). The Selective Fishery Evaluation Committee (SFEC) believes these proposals cover all MM programs of relevance to the Pacific Salmon Commission (PSC).

Within the MM proposals received from southern BC and southern US, approximately 34 million Coho are proposed to be mass-marked in 2014 (Table 2-1; Figure 2-1A), a level comparable to that proposed in 2013. Essentially all hatchery Coho production intended for harvest, from southern BC and southern US hatcheries will be mass marked. Currently there are 18 proposed Coho salmon DIT groups (Table 2-1), of which two will be released from southern BC, seven from Puget Sound, five from the Washington (WA) coast, and four from the Columbia River Basin. These DIT groups are unchanged from the 2013 proposals.

Approximately 119 million Chinook are proposed to be mass marked in 2014 from southern US Chinook hatcheries (Table 2-1; Figure 2-1B). This is approximately five million more than were proposed for 2013. Most all hatchery Chinook production from southern US hatcheries intended for harvest will be mass marked. Currently there are 14 proposed Chinook salmon DIT groups (Table 2-1, Appendix H), of which seven are from Puget Sound facilities, two from coastal facilities, and five from Columbia River facilities. The number of DIT groups is unchanged from the 2013 proposals; however, CDFO discontinued the Fraser River DIT with the 2011 brood and WDFW is proposing a new DIT program at Priest Rapids.

Sampling Programs

Assuming recent exploitation rates and sampling programs, the SFEC estimates the proposed mass marking of Coho stocks in 2014 will result in annual encounters of untagged marked Coho in sampling programs of approximately 300 Coho in Alaska (AK) and 4,100 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 10,200 Chinook in AK, 19,000 Chinook in Canada, and 200 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 designed to collect heads from fish with missing adipose fins were appropriate for obtaining CWT samples. 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 Wildlife (CDFW) all conduct sampling programs which will not recover the unclipped component of DIT groups required to assess impacts of MSFs. Unsampled fisheries from which unmarked DIT CWT recoveries should have been observed create gaps in analyses of fishery impacts on unmarked (wild) fish.

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 the unmarked components of DIT groups in their fisheries. Starting in 2008, Canada also committed to full electronic sampling and reporting of all CWTs in all commercial fisheries for Chinook. Coho in Canadian commercial fisheries are visually sampled, except for heads delivered by northern 'freezer' trollers, which are electronically sampled. Canada continues to rely on the Sport Head Recovery Program (SHRP) to recover CWTs from marked fish in NSFs and MSFs alike and thus no unmarked coded-wire-tagged recoveries are available from them. Oregon Department of Fish and Wildlife continues to use visual sampling for fall Chinook and electronic sampling for spring Chinook and Coho in the Columbia River. Beginning in 2011, ODFW initiated electronic sampling of all ocean recreational and commercial salmon fisheries off the coast of Oregon (OR).

Encounters of large numbers of mass-marked Chinook are increasingly impacting catch sampling programs in northern fisheries; for example, approximately 68% of the Chinook caught in 2013 in the southeast Alaskan troll fishery with a missing adipose fin did not contain a CWT (Figure 2-3). 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.

A new type of wand, the "T-wand" is now available with a greater detection range. The manufacturer believes that if used correctly these wands should detect all CWTs and would no longer require "mouth-wanding" for Chinook.

Summary of 2014 Mark-Selective Fishery Proposals

MSFs have been prosecuted for Coho since 1998 and for Chinook since 2003. For 2014, the SFEC received 47 MSF proposals for Coho and Chinook salmon in CDFO, WDFW, IDFG, and ODFW fisheries. The SFEC believes these proposals cover all MSFs planned for 2014 of relevance to the PSC. Agencies provided the majority of the requested information in each of the proposals and the proposals were submitted on time. One proposal was received for a commercial Coho and Chinook MSF to occur in the lower Columbia River, 17 proposals were received for Coho Salmon MSFs, and 29 proposals were received for Chinook Salmon MSFs. Of these, two were new proposals from WDFW for Coho mark-selective fisheries in the Skagit and Samish rivers. All proposals submitted to the SFEC for review are listed in Table 3-1 (also see Appendix F). Further details describing the proposed MSFs and comments by the SFEC are provided in Table 3-3.

Up until 2008, Chinook MSFs were largely restricted to Puget Sound and Columbia River spring Chinook. Since then, Chinook MSFs have expanded substantially in marine and freshwater areas. In 2007, 12 Chinook MSFs were prosecuted; in 2010, that number doubled to 24 Chinook MSFs and a larger number of indicator stocks are now vulnerable to being encountered in MSFs.

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 2014 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 3-4 and Table 3-5 each provide historical information on encounters of tagged and marked fish to identify Coho and Chinook tagged stocks that can be expected in these areas with MSFs.

Issues and Concerns

Post-season Reports

Post-season reports on MSFs 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 two tables (Appendix I). The first table should be submitted by the annual PSC post-season meeting following the year of the fishery. No SFEC MSF post-season report/tables were found in the US or Canadian post-season reports (Jan 2014). Although these tables are not included in the PSC post-season reports, CDFO and WDFW do provide fishery regulations and preliminary landed catch estimates for mark-selective fisheries in their country's post-season reports. In addition, post season estimates for all Chinook MSFs in all WA marine waters (Areas 1–13) are available in the Recreational Angling Impact Database (RAID) hosted on the NWIFC's website. WDFW has also made available reports of some of their MSFs on their website.

Mixed-Bag Regulations

Regulations to implement MSFs are increasingly complex, making analyses to estimate impacts challenging in a number of ways. As MSFs expand, different types of mixed bag regulations are part of the MSFs proposed by Canada, Washington, and Oregon for recreational fisheries. The regulations include a range of rules that specify when and how anglers may retain various combinations of adult and juvenile marked and unmarked fish in their daily bag limits. The SFEC is not aware of reliable 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 2015 MM and MSFs by November 2014, 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, double-index tagging, and CWT sampling programs continue to be insufficiently coordinated to support analysis by PSC technical committees. It is also not clear that agencies are collecting adequate and necessary data to permit estimation of unmarked CWT recoveries in fisheries and escapements so that cohort reconstructions can be carried out on the unmarked component of the DIT group releases. With the expansion of Chinook marine MSFs, the geographical range of electronic CWT sampling needs to be expanded and the number of double-index-tagged stocks needs to be increased. Specifically, ETD needs to be implemented by ODFW for Oregon Columbia River fall Chinook fisheries and escapement to recover DIT groups for Chinook indicator stocks. In addition, DIT groups should be added for the following Chinook stocks:

- Lower Columbia River tule fall Chinook (possibly Washougal);
- Columbia River summers (Wells Hatchery);
- Snake River fall subyearlings (Lyons Ferry Hatchery);
- Willamette Spring (reinstate DIT program with electronic terminal sampling);
- North Oregon Coast (Salmon River); and,
- Mid Oregon Coast.

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 (Appendices B and 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 anticipated by agencies to occur in 2014. This report summarizes the results of the review of MM and MSF proposals received between November and December 2013. Issues and concerns identified during the review, and recommended further actions are also provided in this report.

Throughout this report a mass-marked fish refers to a fish with a clipped 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 23 MM proposals (8 Coho and 15 Chinook) were received by the PSC for 2014 marking activities (Appendix E). Of these, one was received from southern British Columbia (BC) and 22 from southern United States (US). All proposals are summarized in Table 2-1 and details on the proposed releases are summarized in Appendix J. These proposals represent all known MM programs that have international ramifications and/or sampling impacts on other agencies. These 23 proposals 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 Snake River Basin, because, as identified in previous reviews, there is a lack of marine recoveries from these groups.

In order to evaluate the impacts of MM proposals on coastwide sampling programs, marking agencies were requested to provide representative CWT groups for each stock proposed to be mass-marked. The RCWG members then used the recoveries of these tag groups to estimate projected future encounters of mass marked fish in sampling programs.

2.2 Mass Marking Levels

Approximately 34 million Coho are proposed to be mass marked in 2014 from southern BC, Washington, and Oregon (Table 2-1). Southern BC also plans to release an additional four million Coho fry, the majority of which are unclipped. Although there has been a gradual decline in coastwide Coho hatchery production since brood year 1997, there have been no significant changes to proposed marking levels from brood year (BY) 2001 to BY 2013. Annual trends in Coho MM and total production, for BYs 1997 to 2013, are shown in Figure 2-1A. Geographical details of the fish to be released in 2014, 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, will be mass marked. For the production that will not be adipose-clipped, approximately 3.7 million (81% of the unmarked fish) will be tagged and unmarked. All proposed releases included in the mass marking proposals received are summarized in Appendix J.

The total BY 2013 southern US Chinook hatchery production from Washington and Oregon, for the area and stocks covered by the 2014 proposals, is projected at approximately 150 million released fish. Annual trends in Chinook MM and total production, for BYs 1997 to 2013, are shown in Figure 2-1B. Geographical details of the proposed BY 2013 releases, by mark and tag status, are displayed in Figure 2-2B.

Approximately 119 million Chinook are proposed to be mass marked from southern US Chinook hatcheries in 2014 (Table 2-1). This is approximately five million more than the number proposed to be marked in 2013. For the production that will not be mass marked, approximately 20 million will be both tagged and marked, 7.4 million will be tagged and unmarked, and 3 million will be intentionally left unmarked for restoration programs (Figure 2-2B). No mass marking of Chinook is anticipated for hatchery production from CA and BC.

2.3 Double-Index-Tag Groups

Double-index-tag 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 DIT groups. Currently, there are 18 proposed Coho Salmon DIT groups (Table 2-1), of which two will be released from southern BC, seven from Puget Sound (PS), five from the Washington (WA) coast, and four from the Columbia River Basin. Chinook Salmon DIT groups currently total 14 (Table 2-1, Appendix H), of which seven will be released from Puget Sound facilities, two from WA coastal facilities, and one spring and four fall stocks from Columbia River facilities. All proposed releases included in the mass marking proposals received are summarized in Appendix J.

WDFW has maintained DIT groups for both species, but the number of DIT groups outside WA has declined in recent years. For example, the fall Chinook DIT program at Chilliwack Hatchery ended with BY 2011. 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 stocks are recommended to be double-index tagged: 1) lower Columbia River tule fall Chinook – Washougal Hatchery; 2) Columbia River summer Chinook – Wells Hatchery; 3) Snake River fall Chinook subyearlings – Lyons Ferry Hatchery; 4) Willamette Spring Chinook (reinstate DIT program with electronic terminal sampling); 5) North Oregon Coast Chinook (Salmon River); and, 6) Mid Oregon Coast Chinook. These recommendations have not been implemented by the associated agencies due to a lack of funding and conflicting marking and evaluation priorities.

Table 2-1. Mass marking of Coho and Chinook salmon and number of DIT groups proposed for 2013 and 2014.

Species	Area	Run	Agency	DIT Groups	Mass Marking (millions) 2013	Mass Marking (millions) 2014	Significant Changes from 2013
Coho	Strait of Georgia		CDFO	2	5.1	4.5	
	W. Coast of Vanc. Isl.		CDFO	0	0.5	0.5	
	Puget Sound		WDFW/Tribal	6	10.2	9.8	
			USFWS	1	0.3	0.3	
	WA Coast		USFWS	1	0.7	0.7	
			WDFW/Tribal	4	4.3	4.3	
	Columbia Basin		USFWS	1	0.5	0.4	
			WDFW	2	7.9	8.2	
			ODFW	1	5.1	5.1	
	OR Coast		ODFW	0	0.5	0.5	
	Total Coho			**18**	**35.1**	**34.2**	
Chinook	Lower Fraser River	Fall	CDFO	0	---	---	Discontinued with BY2011
	Puget Sound	Spring	WDFW/Tribal	1	0.7	0.7	
		Summer	WDFW/Tribal	1	2.7	2.7	
		Fall	WDFW/Tribal	5	29.8	30.5	
	WA Coast	Spr/Sum	WDFW/Tribal	0	0.2	0.2	
		Fall	USFWS	0	1.0	2.1	
			WDFW/Tribal	2	8.2	7.9	
	Columbia Basin	Summer	USFWS	0	0.2	0.2	
		Spring	ODFW (Willamette)	0	5.3	5.0	
			ODFW (Col. R)	0	0.6	0.6	
			USFWS	0	3.2	3.2	
			WDFW/Tribal	1	3.6	3.4	
		Fall-Tule	USFWS	1	11.2	11.2	
			WDFW	0	16.7	14.1	
			ODFW	1	7.9	9.1	
		Fall URB	WDFW	1	8.8	12.7	1 million increase at Priest Rapids, new DIT
			ODFW	0	4.3	2.4	
			USFWS	1	3.1	5.6	
		Snake R. Fall[1]	IDFG	0	---	0.7	Previously reported by ODFW
			ODFW	0	0.6	---	Reported by IDFG
		Snake R. Spring	ODFW	0	0.5	0.3	
			USFWS	0	1.5	1.5	
			IDFG			---[2]	
	OR Coast	N. Spring	ODFW	0	0.4	0.3	
		S. Spring	ODFW	0	2.1	2.1	
		Fall	ODFW	0	2.0	3.2	
	Total Chinook			**14**	**114.4**	**119.4**	

[1] The proposed mass marking of fall Chinook at Irrigon Hatchery was reported by ODFW for 2013 and by both IDFG and ODFW for 2014. For 2014, the proposed numbers are listed under IDFG.

[2] Did not request or receive a proposal; however, these stocks are not expected to significantly contribute to PST fisheries.

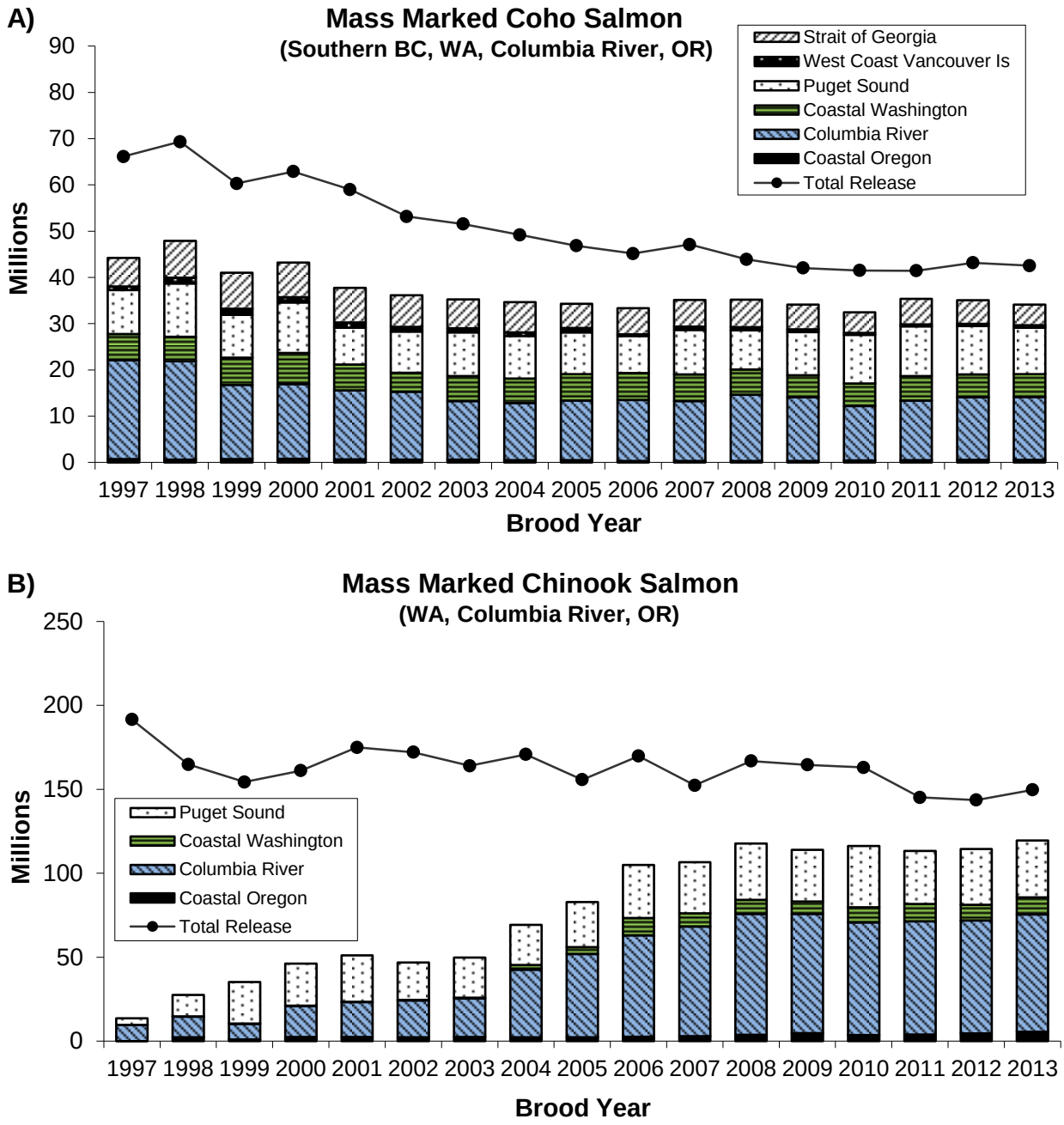

Figure 2-1. Number of mass marked Coho (panel A) and Chinook salmon (panel B) released by region and brood year, 1997–2013. The solid line represents total hatchery releases by brood year with the exception that fry releases of Coho are not included. Values used for brood years 1997–2010 are actual release sizes; values for brood years 2011–2013 are proposed release sizes. Releases of spring and summer Chinook into the Snake River by IDFG are not included in this figure for brood years 2011–2013, as no mass mark proposals were received for these programs.

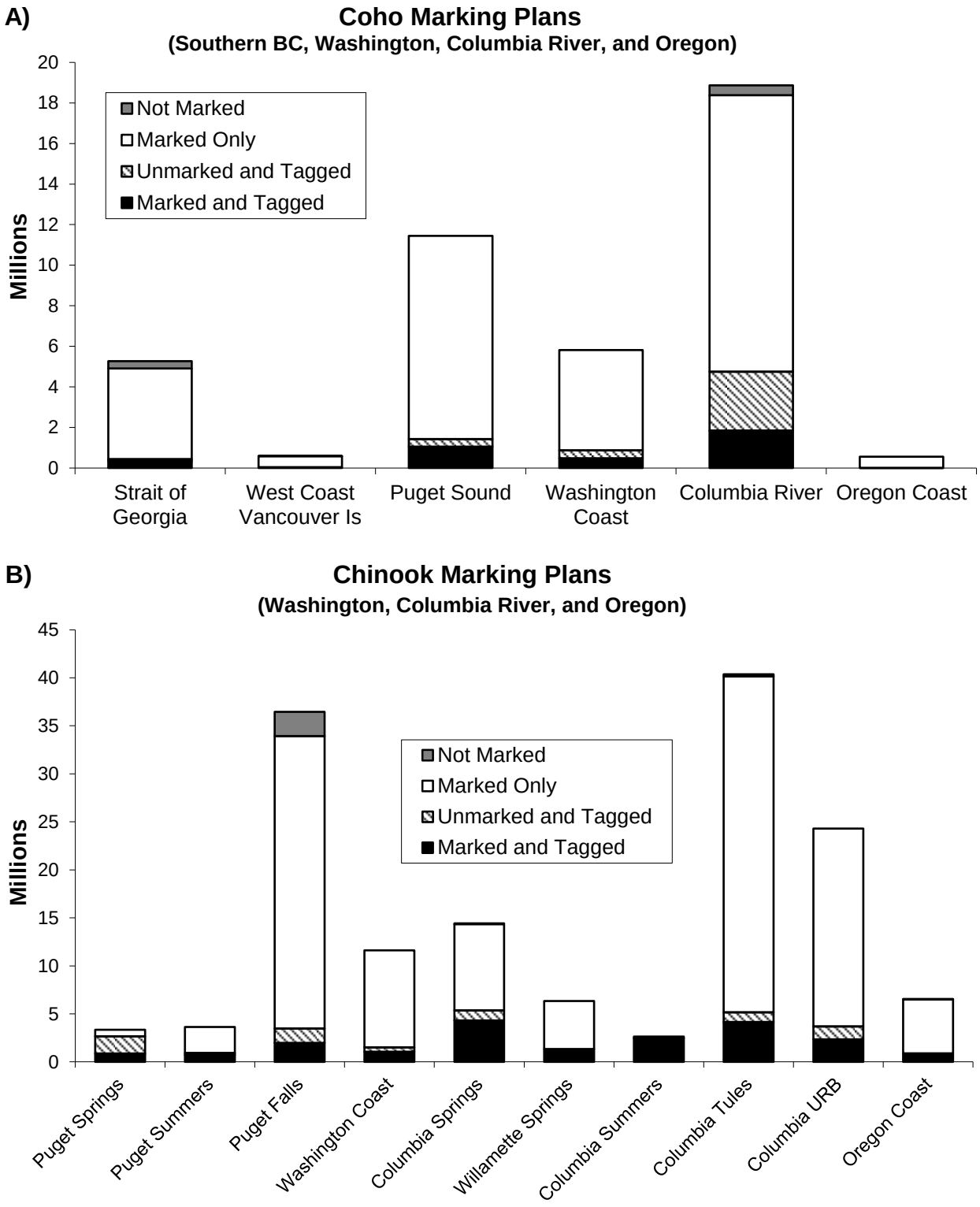

Figure 2-2. Projected Coho (panel A) and Chinook (panel B) salmon releases for brood year 2013, by region and mark status.

2.4 Fishery and Escapement Sampling Methods

2.4.1 Current Agency Sampling Methods

Two methods are currently used to detect fish containing CWTs. The traditional visual sampling method 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. During electronic sampling, every fish in the sample is scanned for the presence of a CWT. 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. Visual sampling results in a lack of recovery of the unmarked component of DIT release groups, creating data gaps in the analysis of CWT data and increased 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.

Current coded-wire-tag sampling methods for Coho and Chinook are summarized in Table 2-2 and Table 2-3, respectively. Electronic tag detection has not been implemented for all fisheries encountering mass-marked fish. In general, ETD has become the standard CWT sampling method in WA and ID. Visual CWT sampling remains the standard method in AK and CA. In BC and OR the situation is more complex, where sampling methods depend on species, location, and the type of fishery.

Alaska Department of Fish and Game has no plans to convert to ETD sampling although there is growing concern about the large numbers of clipped fish without CWTs encountered in sampling programs. Of the marked Chinook caught in Alaska's troll fishery since the implementation of MM, the proportion of fish with no tags has increased from approximately 7% to 68% (Figure 2-3). The increased cost to deal with the additional marked fish is not quantified, but impacts the program. Costs to ship all the heads, including those with no CWTs, from sampling locations to the dissection lab are substantial.

California does not employ ETD; however, less than 200 mass-marked Chinook are projected to be encountered annually in CA (Table 2-4).

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 (Table 2-2). As in AK, the CDFO SHRP 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, Coho landed by 'ice' or 'day boats' in the northern BC troll fishery are not subject to electronic sampling. In that fishery, Coho are sampled visually and CWTs from marked fish only are recovered. Electronic sampling is being used for both species in commercial fisheries South of Cape Caution, located just northward of the northern tip of Vancouver Island on the mainland coastline.

Coded-wire-tag sampling in Oregon hatcheries is predominantly electronic; however, CWT sampling at most freshwater traps and on spawning grounds remains visual. Since 2011, ETD has been used to CWT sample both the sport and commercial troll Chinook and Coho fisheries that occur off the coast of Oregon. However, the impacts of large abundances forecasted for Sacramento and Klamath River fall Chinook combined with the 25% fractional marking program in CA could reduce sampling rates of the commercial troll fisheries when high-volume loads are encountered by samplers.

The Oregon ocean sport Chinook fishery is mostly non-selective, with the exception of a 2-week season in June between Leadbetter Pt., WA and Cape Falcon, OR. The majority of the sport Coho fishery is mark-selective; however, a limited non-selective quota fishery occurs in September from Cape Falcon to Humbug Mountain. Oregon's ocean commercial troll fishery is non-selective for Chinook and mark-selective for Coho North of Cape Falcon. From Cape Falcon southward to the OR/CA border, the commercial Chinook fishery is non-selective. Coho retention in the commercial troll fishery is prohibited from Cape Falcon to the OR/CA border.

Columbia River sport and commercial fisheries are electronically sampled for spring and summer Chinook (January–July) and also Coho. Fall Chinook (August–October) fisheries (commercial and sport) are visually sampled by Oregon (only adipose-clipped fish are wanded to determine if CWT present), except for the Buoy 10 sport fishery in the estuary where electronic sampling has been used in recent years.

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 when a tube detector fails or a Chinook is too large to pass through the tube detector. CDFO carried out a blind study over a 2-year period in the Fraser River Albion Chinook test fishery with trained staff using hand-held wands and 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. However, 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 to 99% (Olson 2007). The difference in the results of these studies is disconcerting, and it has yet to be determined whether this difference is due to sampling technique or equipment.

The manufacturer of the wands (Northwest Marine Technology, Inc.) 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. The Northwest Indian Fish Commission (NWIFC) conducted a field test of these newer wands on returning Chinook at three hatcheries in the fall of 2010 (Olson 2010). The study found high detection rates (99% for all samples combined) with just external wanding. In addition, some of the missed tags were detected with subsequent wanding in the mouth. The technique of "mouth wanding" (wanding the fish both externally on the snout and inside the mouth on the palate) is therefore still recommended with these wands.

Table 2-2. Proposed fishery sampling methods for tagged Coho Salmon in 2014.

Region	Fishery	Type of Sampling	Comments
Alaska	Commercial Sport	Visual Visual	
Northern BC	Commercial	Electronic/Visual	Some terminal areas are not sampled. Freezer troll is sampled electronically; other catches are sampled visually.
	Sport	Visual (Voluntary)	Anglers are encouraged to turn in heads from marked Coho only; therefore, tag recoveries of unmarked Coho are not expected (fisheries are non-selective).
West Coast Vancouver Island	Commercial	Electronic	Incidental recoveries in fisheries on other species; non-retention of unmarked Coho.
	Sport	Visual (Voluntary)	Anglers are encouraged to turn in heads from marked Coho only; therefore, tag recoveries of unmarked Coho are not expected (fisheries are mostly mark-selective).
Strait of Georgia	Commercial	Electronic	Incidental recoveries in fisheries on other species; non-retention of unmarked Coho.
	Sport	Visual (Voluntary)	Anglers are encouraged to turn in heads from marked Coho only; therefore, tag recoveries of unmarked Coho are not expected (fisheries are mostly mark-selective).
Puget Sound	Commercial Sport	Electronic Electronic	
Washington Coast	Commercial Sport	Electronic Electronic	
Oregon Coast	Commercial	Electronic	The only commercial Coho fishery on the Oregon coast proposed to occur is North of Cape Falcon and is mark-selective; therefore, recoveries of unmarked Coho are not expected.
	Sport	Electronic	The ocean sport fishery is mark-selective except for a non-selective season during the first few weeks of September. Tag recoveries from unmarked Coho are anticipated in September.
Columbia River	Commercial Sport	Electronic Electronic	
California	Commercial Sport	Visual Visual	

Table 2-3. Proposed fishery sampling methods for tagged Chinook Salmon in 2014.

Region	Fishery	Type of Sampling	Comments
Alaska	Commercial Sport	Visual Visual	
Northern BC	Commercial Sport	Electronic Visual (Voluntary)	All Chinook are now electronically sampled and all tags are decoded (this has been the case since 2007). Anglers are encouraged to turn in heads from marked Chinook only; therefore, tag recoveries of unmarked Chinook are not expected.
West Coast Vancouver Island	Commercial Sport	Electronic Visual (Voluntary)	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 Visual (Voluntary)	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	CWTT funds are used to implement current electronic sampling programs.
Columbia River	Commercial Sport	Electronic/Visual Electronic/Visual	Spring and Summer Chinook fisheries are electronically sampled. Fall Chinook are visually sampled by Oregon. CWT recoveries from unmarked fall Chinook will be incomplete. Spring and Summer Chinook fisheries are electronically sampled. Fall Chinook are visually sampled by Oregon. CWT recoveries from unmarked fall Chinook will be incomplete. The Buoy 10 fishery is electronically sampled.
California	Commercial Sport	Visual Visual	

In November of 2011, Northwest Marine Technology (NMT) announced the availability of a "T-wand". T-wands are more sensitive than the previous wands and have a detection range of 5.5 cm. Field tests indicate that for most Coho and Chinook, CWTs can be readily detected with a single quick up and down swipe on the top of the snout. However, for large fish, particularly male Chinook or Coho > 1 m in length, three up and down swipes on the snout are recommended - one down the middle and one on each side of the snout. The manufacturer believes that if used correctly, these wands should detect all tags. An advantage of these wands is that mouth wanding is not required on large Chinook. These wands are now being sold to agencies and ADFG, WDFW, and ODFW all purchased wands with 2012 Coded Wire Tag Improvement Funds. CDFO carried out testing of these wands in 2013. Prior to the fish entering the processing plants, ADFG has begun to use these wands in Alaska to identify tagged fish in the marked fish that were visually sampled; thus, reducing the number of heads removed and sent to the CWT lab. NMT also believes T-wands are very durable. Of the 300 wands sold to-date, only 5 have been returned for repairs. Because of the increased sensitivity of the T-wands, WDFW and ODFW have reported that there are a few sites where they were not useable due to interference from metal structures or equipment. The manufacturer has conveyed that the sensitivity could be turned down if this was desired by the agencies.

2.4.2 Estimated Sampling Encounters

A summary of projected mass-marked Coho and Chinook salmon that may occur in agency CWT sampling programs is provided in Table 2-4.

Coho Salmon

Planned mass marking in 2014 will likely result in estimated future encounters of approximately 300 untagged and marked recoveries in AK and few 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 4,100 untagged and mass-marked Coho recoveries will occur in Canadian fisheries, some of which are visually sampled.

Chinook Salmon

Planned mass marking of southern US Chinook stocks will result in estimated mass-marked encounters of approximately 10,200 Chinook in AK, 19,000 Chinook in Canada, and 200 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 or voluntary sampling to recover CWTs (Table 2-3). For example, in Alaskan troll fisheries where visual sampling is employed, the proportion of marked Chinook salmon encountered that is untagged has been much greater in recent years (Figure 2-3).

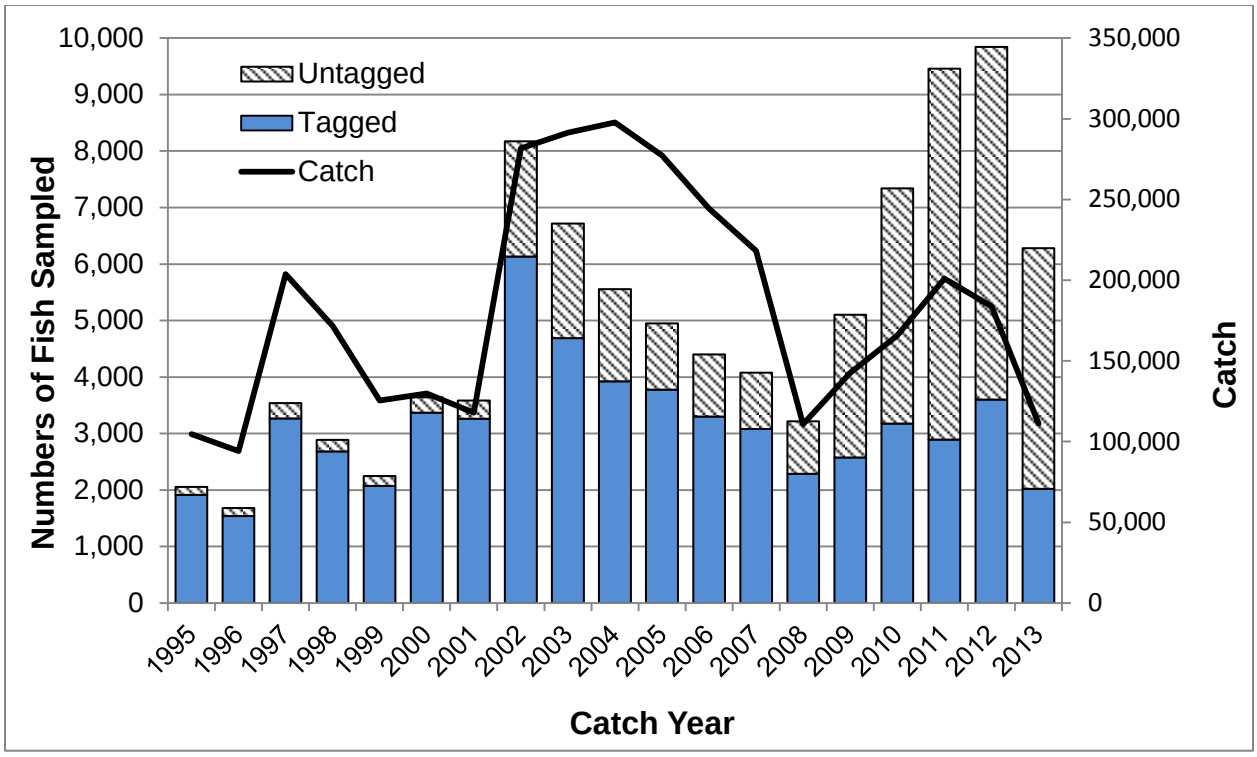

Figure 2-3. Numbers of marked Chinook Salmon sampled in Alaska's troll fishery by untagged and tagged status, with catch numbers, 1995–2013.

Table 2-4. Numbers of mass-marked Coho and Chinook projected to be encountered in future CWT sampling programs (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: 2005–2007 for Coho and 2003–2005 for Chinook. Tribal hatchery mass-marked production in WA is included in the WDFW numbers.

Species	Area/Run		Agency	Proposed 2014 MM	Estimated Encounters in Future Fishery Sampling Programs													
					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	Strait of Georgia		CDFO	4,472,000	132	5	172	51		330	238	270				19		
	W. Coast of Vanc. Island		CDFO	535,000		11		125	22	15	923	56	59					
	Puget Sound		WDFW	9,772 ,200	30		39	25		1,776	25,778	11,557		2	37	435		
			USFWS	256,000						44	982	329				21		
	WA Coast		USFWS	685,000	2		12	6		87	5,195	1,132		4	17	170		
			WDFW	4,270,000	133		87	33	2	210	11,720	5,055		19	88	1,062		
	Columbia River		USFWS	400,000							22	184	58	128	7	223		
			WDFW	8,178,000					25	123	2,229	18,195	8,955	5,994	483	10,041		24
			ODFW	5,050,000						5	130	1,955	3,542	2,160	60	2,760		
	OR Coast		ODFW	535,000	2					2	34	194		4	63	745		
			Total	**34,153,200**	**315**		**572**		**3,542**		**85,314**		**20,866**		**16,237**		**24**	
Chinook	Puget Sound	Spring	WDFW	660,000	28	1	3		131	79	126	83						
		Summer	WDFW	2,700,000	21		7	7	303	224	170	562						
		Fall	WDFW	30,470,000	63	6	117	11	3,360	2,288	27,008	6,550			293	8		
	WA Coast	Spr/Sum	WDFW	170,000			6		7	2	19	1			2			
		Fall	USFWS	2,100,000	84	3	85	24		21	12	9						
			WDFW	7,850,000	2,149	203	2,046	384	50	74	1,549	163				11		
	OR Coast	N. Spr.	ODFW	308,000	45		8	1	35	11	52	3			21	68		1
		S. Spr.	ODFW	2,122,000	10		2		23		51	17		8	58	37	61	31
		Fall	ODFW	3,210,000	1,452	127	1,121	194	100	132	268	72			123	821	48	11
	Columbia River	Spring	ODFW	5,616,000	384	38	69	33	117	56	157	24	719	1,955	31	2		
			WDFW	3,408,529	25	1	20		9	9	17	10	69	94	1	2		
			USFWS	3,170,000	2	1							2,590	1,749				
		Summer	USFWS	200,000	43	3	10	5	27	9	16	5	85	33	10			
		Fall-Tule	USFWS	11,190,000				17	512	336	698	631	3,925	236	219	34		
			WDFW	14,110,000	612	61	539	139	1,177	432	526	388	505	345	74	33		
			ODFW	9,050,000	13			6	404	232	475	436	3,208	252	136	52	13	6
		URB	ODFW	2,350,000	405	44	190	32	89	51	89	57	791	101	13	19	6	
			USFWS	5,600,000	1,399	157	586	244	158	72	108	35	1,775	172	16	8		
			WDFW	12,675,543	2,499	291	1,447	268	260	238	206	217	3,040	618	66	21	3	
	Snake River	Fall	ODFW	600,000	48	3	46	27	126	151	263	183	607	102	110	11	3	5
		Spring	ODFW	333,000					1		2		81	55	1			
			USFWS	1,480,000									359	742				
			Total	**119,373,072**	**10,221**		**7,694**		**11,306**		**41,258**		**24,216**		**2,301**		**188**	

3 REVIEW OF MARK-SELECTIVE FISHERY PROPOSALS

The current templates for MSF proposals focus on the description of the fishery and the sampling plan and identifying the stocks likely to be impacted by the fishery (see templates in Appendix C and Appendix D). The information to be provided in the proposal template is required to estimate mortalities of unmarked fish.

3.1 Mark-Selective Fishery Proposals Received

Mark-selective fisheries have been prosecuted for Coho since 1998 and for Chinook since 2003 (Table 3-1; Appendix F). For the 2014 fishery season, the SFEC received a total of 47 MSF proposals for Coho and Chinook salmon in CDFO, WDFW, ODFW, and IDFG fisheries. 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. Two new mark-selective fisheries were proposed for 2014. Mixed bag regulations were again proposed for several of the MSFs (e.g., Oregon recreational marine and freshwater fisheries, WDFW recreational freshwater fisheries, and Canadian marine recreational fisheries).

3.1.1 Coho Salmon MSFs

Eighteen proposals were received for Coho Salmon MSFs occurring in 2014 (Table 3-1; Appendix F). 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. A total of ten Coho MSF proposals were submitted from WDFW. Of these, six were for freshwater locations and four for marine waters. New proposed fisheries include freshwater sport fisheries in the Samish and Skagit rivers. SFEC believes that proposals have been submitted for all ongoing Coho MSF in WA. SFEC received an ODFW/WDFW joint Coho MSF proposal for an ongoing sport fishery (since 1999) from Hood River downstream to the mouth of the Columbia River, one for a commercial tangle net fishery in the lower Columbia River, and one for a commercial sein net fishery targeting Chinook and Coho in the lower Columbia River. One additional Coho MSF proposal was received from ODFW for the OR coast, an ongoing fishery since 2003.

3.1.2 Chinook Salmon MSFs

Thirty proposals were received for Chinook Salmon MSFs occurring in 2014 (Table 3-1; Appendix F). These included one proposal from Canada (CDFO), 20 from Washington (WDFW), six submitted jointly by Oregon and Washington (ODFW and WDFW), one from Idaho (IDFG), and two from Oregon (ODFW). The Canadian proposal was for an ongoing (since 2008) sport fishery located in the Strait of Juan de Fuca subareas. Of the 20 WDFW proposals, the number of proposals per WA location were as follows: seven in the freshwater systems of Puget Sound; two in Puget Sound marine waters; two in the marine waters off the WA coast; three in Willapa Bay or its tributaries; one commercial MSF in Grays Harbor (areas 2A, 2B, 2C, and 2D); two ongoing MSFs in WA coastal river systems (Hoh and Quillayute rivers); one in the Snake River; one in the Yakima River; and one fishery in the lower Grand Ronde River. In addition, six Chinook MSF proposals were submitted jointly by ODFW and WDFW for fisheries planned in the Columbia River, three of which are sport fisheries and the remaining three are Commercial fisheries in the lower river. Idaho submitted a proposal for a

sport fishery in the Snake River. Oregon submitted two proposals for Chinook MSFs – one ongoing in the Willamette River (started in 2003) and the other, started in 2008, is an ocean terminal area bubble fishery for fall Chinook, adjacent to the mouths of the Tillamook, Elk, and Chetco rivers.

Table 3-1. Status of mark-selective fishery (MSF) proposals, fishery implementation, and post-fishery reporting for years 2003 through 2014.

"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	**Catch Year[1,2]**											
(SFEC Proposal ID)	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Targeting Marked Coho and Chinook												
Commercial, Lower Columbia R. (MSF-ODFW/WDFW-07)											PFO	P[3]
Targeting Marked Coho												
Sport, Southern BC marine and freshwater (MSF-FOC-02)	PFR	PFR	PFR	PFR	PFO	PFO	PFO	PFO	PFO	PFO	PFO	P
FSC, Lower Fraser R (MSF-FOC-03)	-	-	-	PFR	PFO	PFO	PFO	PFO	PFO	PFO	PFO	P
Commercial, Southern BC marine (MSF-FOC-05)	-	PX	PFR	PFR	XFO	PFO	PX	PFO	PFO	PFO	PFO	P
Sport, Lower Fraser R (MSF-FOC-06)	XFR	XFR	XFR	PFR	PFO	PFO	PFO	PFO	PFO	PFO	PFO	P
Sport, Puget Sound Areas 5-13 (MSF-WDFW-07)	XFR	PFR	PFR	PFR	XFR	PFR	PFR	PFR	PFR	PFR	PFR	P
Sport, Nooksack R (MSF-WDFW-18)	XFO	XFO	XFO	XFO	XFO	XFO	PFR	PFO	PFO	-	-	-
Sport, Skagit River (MSF-WDFW-40)												P
Sport, Samish River (MSF-WDFW-41)												P
Sport, WA Areas 1-4 and Buoy 10 (MSF-WDFW-06)	PFR	PFR	PFR	PFR	XFR	PFR	PFR	PFR	PFR	PFR	PFR	P
Commercial, WA Areas 1-4 (MSF-WDFW-15)	XFO	XFO	XFO	XFO	XFO	PFO	PFO	PFO	PFO	PFO	PFO	P
Sport Quillayute R (MSF-WDFW-31)	XFO	XFO	XFO	XFO	XFO	XFO	XFO	XFO	PFO	PFO	PFO	P
Sport, Grays Harbor tributaries (MSF-WDFW-24)	XFO	XFO	XFO	XFO	XFO	XFO	XFO	PFO	PFO	PFO	PFO	P
Commercial, Grays Harbor Area 2C (MSF-WDFW-30)	-	-	-	-	-	-	XFO	XFO	PX	-	-	
Sport, Grays Harbor Area 2.2 (MSF-WDFW-23)	-	-	-	-	-	-	-	PFO	PFO	PFO	PFO	P
Sport, Willapa tributaries (MSF-WDFW-22)	XFO	XFO	XFO	XFO	XFO	XFO	XFO	PFO	PFO	PFO	PFO	P

[1] Catch year 2003 was the first year SFEC received requested MSF proposals from agencies. Some Coho MSFs began as early as 1998.
[2] Summary of MSFs are available for many of these fisheries for catch years 2005–2009 in SFEC 2012 (http://www.psc.org/pubs/SFEC12-1.pdf)
[3] Proposal **MSF-ODFW/WDFW-07** was originally submitted as **MSF-ODFW-04** in 2013 but the proposal ID was changed to continue the joint proposal numbering sequence.

Table 3–1. (Continued) Status of mark-selective fishery (MSF) proposals, fishery implementation, and post-fishery reporting for years 2003 through 2013.

Fishery Name	**Catch Year[1,2]**											
(SFEC Proposal ID)	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**
Targeting Marked Coho (continued)												
Sport, Willapa Bay Area 2.1 (MSF-WDFW-29)[3]	-	-	-	-	-	-	-	PFO	PFO	PFO	PFO	P
Sport, Lower Columbia R (MSF-ODFW/WDFW-04)	XFR	XFR	XFO	XFO	XFO	PFO	PFO	PFR	PFO	PFO	PFO	P
Commercial, Lower Columbia R (Buoy 10 to Beacon Rock) (MSF-ODFW/WDFW-06)	-	-	-	-	-	-	-	-	-	-	PFO	P[4]
Sport, Oregon coast (MSF-ODFW-03)	XFR	XFR	XFO	XFO	XFO	XFO	XFO	PFR	PFR	PFR	PFR	P
Targeting Marked Chinook												
Sport, Strait of Juan de Fuca subareas, BC (MSF-FOC-07)	-	-	-	-	-	XFO	PFO	PFR	PFO	PFO	PFO	P
Sport, WCVI subareas, mainly inside (MSF-FOC-08)	-	-	-	-	-	-	PX	-	PX	-	-	-
Sport, Puget Sound Areas 5&6, summer (MSF-WDFW-02)	PFR	PFR	PFR	PFR	PFR	PFR	PFR	PFR	PFR	-	-	-
Sport, Puget Sound Areas 9-13, summer (MSF-WDFW-11)	-	-	-	-	PFR	PFR	PFR	PFR	PFR	-	-	-
Sport, Puget Sound Areas 5-13, summer (MSF-WDFW-35; combines proposals 02 and 11 as of 2012)	-	-	-	-	-	-	-	-	-	PFR	PFR	P
Sport, Puget Sound Areas 5-13, winter (MSF-WDFW-36; replaces 16 as of 2012; old proposal 08 [Area 8-1/8-2 Winter MSF] combined into 16 in 2007)	-	-	PFR	PFR	PFR	PFR	PFR	PFR	PFR	PFR	PFR	P
Sport, Nooksack R (fall run) (MSF-WDFW-13)	-	PFO	PFO	PFO	PFO	PFO	PFR	PFR	PFO	PFO	PFO	P
Sport, Upper Skagit R (spring run) (MSF-WDFW-12)	-	-	XFO	XFO	PFO	PFO	PFO	PFR	PFO	PFO	PFO	P
Sport, Skykomish R (summer run) (MSF-WDFW-01)	PFO	PFO	XFO	XFO	PFO	PFO	PFR	PFR	PFO	PFO	PFO	P
Sport, Snohomish R (summer run) (MSF-WDFW-37)	-	-	-	-	-	-	-	-	-	-	PX	P
Sport, Puyallup & Carbon R (fall run) (MSF-WDFW-09)	XFO	XFO	PFO	PFO	PFO	PFO	PFO	PFO	PFO	PFO	PFO	P
Sport, Nisqually R (fall run) (MSF-WDFW-14)	-	-	XFO	XFO	PFO	PFO	PFO	PFO	PFO	PFO	PFO	P
Sport, Skokomish R (fall run) (MSF-WDFW-20)	-	-	-	-	-	-	PX	PFO	PFO	PFO	PFO	P
Sport, WA areas 1-4 (MSF-WDFW-19)	-	-	-	-	-	-	PX	PFR	PFR	PFR	PFR	P

[1] Catch year 2003 was the first year SFEC received requested MSF proposals from agencies. Some Coho MSFs began as early as 1998.
[2] Summary of MSFs are available for many of these fisheries for catch years 2005–2009 in SFEC 2012 (http://www.psc.org/pubs/SFEC12-1.pdf)
[3] Prior to September, MSFs within the Willapa Bay are included in the MSF-WDFW-06.
[4] Proposal **MSF-ODFW/WDFW-06** was originally submitted as **MSF-ODFW-05** in 2013 but the proposal ID was changed to continue the joint proposal numbering sequence.

Table 3–1. (Continued) Status of mark-selective fishery (MSF) proposals, fishery implementation, and post-fishery reporting for years 2003 through 2013.

Fishery Name	Catch Year[1,2]											
(SFEC Proposal ID)	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Targeting Marked Chinook (continued)												
Troll, WA areas 1-4 (MSF-WDFW-21)	-	-	-	-	-	-	PX	PX	-	-	-	-
Sport, Quillayute R (spr/summer run) (MSF-WDFW-32)	XFO	XFO	XFO	XFO	XFO	XFO	XFO	XFO	PFO	PFO	PFO	P
Sport, Hoh R (MSF-WDFW-33)	-	-	-	-	-	XFO	XFO	XFO	PFO	PFO	PFO	P
Commercial, Grays Har. 2A,2B,2C,2D (MSF-WDFW-38)	-	-	-	-	-	-	-	-	-	-	PFO	P
Commercial, Willapa Bay (MSF-WDFW-25)	-	-	-	-	-	-	-	PFO	PFO	PFO	PFO	P
Sport, Willapa Bay Area 2.1 (MSF-WDFW-26)	-	-	-	-	-	-	-	PFO	PFO	PFO	PFO	P
Sport, Willapa Bay tributaries (fall run) (MSF-WDFW-27)	-	-	-	-	-	-	-	PFO	PFO	PFO	PFO	P
Sport, Lower Grand Ronde R (spring run) (MSF-WDFW-39)	-	-	-	-	-	-	-	-	-	-	PX	P
Sport, Yakima R (spring run) (MSF-WDFW-03)	-	PFO	-	-	-	PFR	PX	PFR	PFO	PFO	PFO	P
Sport, Snake R (fall run) (MSF-IDFG-04)	-	-	-	-	-	-	XFO	XFO	XFO	PFO	PFO	P
Sport, Snake R (spring run) (MSF-WDFW-28)	-	-	-	-	-	-	-	PFO	PFO	PFO	PFO	P
Sport, Lower Snake R (fall run) (MSF-WDFW-05)	-	-	-	-	-	XFO	PFR	PFO	PFO	PFO	PFO	P
Sport, Lower Columbia R (spring run) (MSF-ODFW/WDFW-01)	PFO	PFO	PFO	XFO	XFO	PFO	PFR	PFO	PFO	PFO	PFO	P
Sport, Columbia R (sum. run) (MSF-ODFW/WDFW-02)	PFO	PFO	PX	XFO	-	PFO	PX	PFO	PFO	PFO	PFO	P
Commercial, Lower Columbia R (spring run) (MSF-ODFW/WDFW-03)	PFO	PFO	PFO	XFO	XFO	PFO	PFR	PFO	PFO	PFO	PFO	P
Sport, Columbia R (fall run) (MSF-ODFW/WDFW-05)	-	-	-	-	-	-	PX	PX	PFO	PFO	PFO	P
Sport, Willamette R (spring run) (MSF-ODFW-01)	PFR	PFR	PFO	PFO	XFO	PFR	PFR	PFR	PFO	PFO	PFO	P
Sport, Oregon coast (fall run) (MSF-ODFW-02)	-	-	-	-	-	XFO	PFO	PFR	PFR	PFR	PFR	P

[1] Catch year 2003 was the first year SFEC received requested MSF proposals from agencies. Some Coho MSFs began as early as 1998.
[2] Summary of MSFs are available for many of these fisheries for catch years 2005–2009 in SFEC 2012 (http://www.psc.org/pubs/SFEC12-1.pdf)

3.2 Evaluating MSF Proposals

The SFEC-AWG employs a two-stage approach to summarize the results of its evaluation of MSF proposals. First, each proposal is characterized in regard to the following eight categories (Table 3-2):

1) Fishery regulation
2) CWT sampling method
3) CWT detection method
4) CWT composition estimation method
5) Alignment of time/area strata boundaries of regulations and catch estimation and CWT sampling programs
6) Catch estimation by size/mark/retention status
7) Indicator stocks expected to be impacted by the fishery
8) DIT release groups expected to be impacted by the fishery

Alternative characteristics for each category are listed by codes and described in Table 3-2. For example, Table 3-2 lists three possible characteristics for the first category (Fishery Regulation) including "MSF", "Mark-mixed bag", and "Mark and size-mixed bag".

Second, each MSF proposal is assigned a Green-Yellow-Red level of concern for each characteristic (green- no concern, yellow- moderate concern, red- major concern). Table 3-3 presents the results of the evaluation. Each colored cell contains codes referencing the descriptions of characteristics provided in Table 3-2. For instance, if a particular proposal involved a Mark-mixed bag fishery, then for the category Fishery Regulation, the numeric index for that characteristic (2) was entered in the column labeled Fishery Regulation. Further, since Mark-mixed bag fisheries generally pose challenges for estimation of fishery impacts, the cell would be colored yellow or red, the chosen color depending on other qualifiers such as the magnitude of the fishery. Table 3-3 also includes narrative columns to provide additional information regarding the nature of concerns identified by SFEC.

Table 3-2. List of characteristics that describe proposed MSFs, organized by Subject Category. This table is used as a reference table by Table 3-3.

Subject Category	Characteristic	How the Characteristic Influences Evaluation of MSF Impacts	Concern for Evaluation of Fishery Impacts on Indicator Stocks
Fishery Regulation: mark-bag limit type	1) MSF (i.e., for mark-selective species, only marked fish can be retained)	The regulation influences what method needs to be used to estimate mortalities by size and mark status.	Note that SFEC has not been able to develop direct means to allocate non-landed mortalities under mixed-bag regulations.
	2) Mark-mixed bag limit (i.e., for mark-selective species, a portion of total bag limit can be unmarked)		
	3) Mark and size-mixed bag limit (size-range-specific allowances for retention of unmarked fish)		
CWT Sampling Method	1) Direct sample in creel surveys and dockside sampling programs.	Direct sampling programs are statistically designed programs in which technicians collect information.	If sample expansions are not available due to lack of total catch estimates in direct sampling no estimate of CWTs recovered by fishery can be made.
	2) Voluntary Recovery Program - fishers submit heads, e.g., in BC sport fishers send in heads from clipped fish.	For the voluntary recovery program it is necessary to estimate the total CWT recoveries from an estimated submission rate.	Submission rate estimation depends on a catch estimation program that estimates total clipped catch. If this is unavailable, submission rates from other areas or periods have to be used, potentially biasing estimates of CWT recoveries.
	3) No CWT sampling	Proxy will be needed.	

Table 3–2. (Continued) List of characteristics that describe proposed MSFs, organized by Subject Category. This table is used as a reference table by Table 3-3.

Subject Category	Characteristic	How the Characteristic Influences Evaluation of MSF Impacts	Concern for Evaluation of Fishery Impacts on Indicator Stocks
CWT Detection Method	1) Electronic detection will be implemented. All fish (marked and unmarked) will be checked for CWT using electronic gear (wands, tube detectors)	Electronic detection will result in recoveries of all tagged fish in the sample, both unclipped and clipped.	
	2) Visual detection will be implemented. All adipose fin-clipped (marked) fish in sample are checked for tags, but unmarked fish in the sample are not.	Visual detection results in recoveries of tagged and marked fish only. Any unmarked and tagged fish will not be detected.	Unmarked and tagged fish in the fishery will not be sampled and estimates of total CWT recoveries will be biased. (Affects recoveries of both unmarked but tagged DIT and conservation groups).
CWT Composition Estimation Method	1) Standard method using CWTs sampled from fishery.	Estimates of CWT recoveries in fisheries and escapement are used for cohort analysis, estimation of exploitation rates and other stock parameters	
	2) Non-standard or Indirect, using CWT ratios from proxy (i.e., hatchery or fishery, where relationship has been established)		If estimates of total CWT recoveries are biased all CWT based estimates will also be biased
	3) Non-standard or Indirect, with poorly or unestablished proxy		
	4) None proposed		If no CWT estimates are made all CWT based estimates will be biased.

Table 3–2. (Continued) List of characteristics that describe proposed MSFs, organized by Subject Category. This table is used as a reference table by Table 3-3.

Subject Category	Characteristic	How the Characteristic Influences Evaluation of MSF Impacts	Concern for Evaluation of Fishery Impacts on Indicator Stocks
Alignment of time/area strata boundaries of regulations and catch estimation and CWT sampling programs.	1) Common strata boundaries across fishery regulations and catch estimation and CWT sampling programs.	Estimating total catch and sampling fractions require that sampling strata and regulation strata align. Without such alignment, estimates of CWT recoveries will be biased. Information on strata employed enables interpretation of the extent of such biases.	For example, if one sample stratum includes both NSF and MSF regulations in different areas and/or periods, then separate estimates of CWTs recovered in the different regulations cannot be made without additional assumptions.
	2) Lack of alignment between fishery regulation and sampling/catch estimation strata boundaries.		
	3) Strata boundaries are unclear or undefined for the sampling program and/or fishery regulations.		
Catch estimation by size / mark / retention status.	1) Will provide separate estimates of catch in all size category-clip status combinations for both kept and released catch. May include bias correction (e.g., Conrad and McHugh 2008) method for estimating encounters, if applicable.	Need to estimate exploitation rate by stock using CWT indicators, which requires estimates of fishery-total encounters and associated impacts, including landed mortalities as well as handling-and-release mortalities by size/mark category.	SFEC postseason reports request that total retained and released fish in MSFs are estimated and reported by size (legal or sublegal) and mark category (marked [adipose fin-clipped] or unmarked [adipose fin intact])
	2) Will provide separate estimates of catch for all size category-clip status combinations for kept catch but not released catch.		
	3) Did not describe catch estimation.		
	4) No catch estimates will be done.		

Table 3–2. (Continued) List of characteristics that describe proposed MSFs, organized by Subject Category. This table is used as a reference table by Table 3-3.

Subject Category	Characteristic	How the Characteristic Influences Evaluation of MSF Impacts	Concern for Evaluation of Fishery Impacts on Indicator Stocks
Are CWT indicator stocks expected to be impacted in the fishery?	0) No, CWT indicator stocks are not expected.	Estimate anticipated stock-age-specific encounters of coded-wire-tagged fish in the fishery. Determine potential significance of MSF to indicator stocks.	Lack of information to determine potential significance of MSF to indicator stocks.
	1) Yes, CWT indicator stocks are expected, and a complete list of indicator stocks was provided.		
	2) Yes, CWT indicator stocks are expected, and an incomplete list of indicator stocks was provided.		
	3) Yes, CWT indicator stocks are expected, but a list of indicator stocks was not provided.		
Are double-index-tagged (DIT) fish expected to be impacted in the fishery?	0) No, DIT stocks are not expected.	Estimate anticipated stock-age-specific encounters of DIT fish in the fishery. Determine potential significance of MSF to DIT stocks.	Lack of information to determine potential significance of MSF to DIT indicator stocks.
	1) Yes, DIT stocks are expected, and a complete list of DIT stocks was provided.		
	2) Yes, DIT stocks are expected, and an incomplete list of DIT stocks was provided.		
	3) Yes, DIT stocks are expected, but a list of DIT stocks was not provided.		

Table 3-3. Summary of SFEC's evaluation of Coho and Chinook MSFs proposed for the 2014 fishery season, for which proposals were submitted by agencies in 2013 (see Table 3-2 for definitions of numeric codes).

Color coding key:

#	Of least concern to SFEC as an issue in the MSF proposal
#	Of moderate concern to SFEC as an issue in the MSF proposal
#	Of most concern to SFEC as an issue in the MSF proposal

Proposal ID	Location	Fishery Type	Regulations	CWT Sampling Method	CWT Detection Method	CWT Composition Estimation Method	Alignment	Catch Estimation	Indicator Stocks	DIT Stocks	Comments and Concerns	Methods of Estimation
Coho & Chinook Salmon												
MSF-ODFW / WDFW-07 **NEW**	Columbia R, Mouth upstream to Bonneville Dam. (Fall)	Commercial Purse seine & Beach seine	1	1	1	1	1	1	1	1	Directed MSF Chinook fishery with incidental MSF Coho retention.	Random onboard monitoring will record encounters by mark and size status. Catch estimates from fish tickets. Electronic sampling of landings for CWTs.
Coho Salmon												
MSF-FOC-02	BC Management Areas 11-29, outer areas of 121-127.	Pre-terminal and Terminal Recreational (MSF)	1	2	2	1	2	2,4	1	1	Voluntary recovery program will not provide recoveries of unmarked and tagged fish in any fishery. Low CWT submission rates.	Total catch using creel surveys in some areas and times and log books from lodges. No catch estimate for area/times with no creel or lodge logbook
MSF-FOC-02	BC Management Areas 11-29	Terminal Recreational, (Mixed Bag)	2	2	2	1	2	2,4	1	1	Voluntary recovery program will not provide recoveries of unmarked and tagged fish in any fishery. Low CWT submission rates.	Total catch using creel surveys in some areas and times and log books from lodges. No catch estimate for area/times with no creel or lodge logbook

Table 3–3. (Continued) Summary of SFEC's evaluation of Coho and Chinook MSFs proposed for the 2014 fishery season, for which proposals were submitted by agencies in 2013 (see Table 3-2 for definitions of numeric codes).

Proposal ID	Location	Fishery Type	Regulations	CWT Sampling Method	CWT Detection Method	CWT Composition Estimation Method	Alignment	Catch Estimation	Indicator Stocks	DIT Stocks	Comments and Concerns	Methods of Estimation
Coho Salmon (continued)												
MSF-FOC-03	Lower Fraser River	Terminal, First Nations (Mixed Bag)	1	3	2	4	1	2	1	0,1	This fishery is mixed bag because unmarked Coho that are mortally wounded or dead can be retained. Low CWT submission rates. Numbers of ad-clipped and unclipped Coho are reported in some fisheries.	Total catch estimate using creel survey or census.
MSF-FOC-05	BC Management Areas 23-27, 121-127	Pre-terminal Commercial (MSF)	1	1	1	1	1	1	1	1		Total catch is from fisher reported log books and phone-in catch reports.
MSF-FOC-06	Lower Fraser River	Terminal Recreational (MSF)	1	2	2	1	2	2	1	0,1	Voluntary submission of samples from clipped fish, but fishery is fully mark selective. Creel surveys and awareness factors for some times and areas.	Catch estimates from creel surveys. CWT estimation for areas/times with no catch estimation program relies on submission rates in other strata.
MSF-WDFW-06	Ocean Areas 1-4 & Col R Buoy 10	Recreational	1	1	1	1	1	1	1	1		Catch estimate from creel surveys, based on an effort/CPUE survey with boat exit counts and exit interviews. Stratified by boat type (private or charter boats) and day type (weekend or weekdays). On-water encounter rates and mark rates obtained from charter ride-along trips and voluntary trip reports (VTRs).

Table 3–3. (Continued) Summary of SFEC's evaluation of Coho and Chinook MSFs proposed for the 2014 fishery season, for which proposals were submitted by agencies in 2013 (see Table 3-2 for definitions of numeric codes).

Proposal ID	Location	Fishery Type	Regulations	CWT Sampling Method	CWT Detection Method	CWT Composition Estimation Method	Alignment	Catch Estimation	Indicator Stocks	DIT Stocks	Comments and Concerns	Methods of Estimation
Coho Salmon (continued)												
MSF-WDFW-07	Puget Sound Areas 5-13	Recreational	1	1	1	1	1	1	1	1		Total catch estimates from CRCs, and creel surveys in some areas. On-water encounter rates and mark rates obtained from VTRs and dockside samplers.
MSF-WDFW-15	Ocean Areas 1-4	Commercial Troll	1	1	1	1	1	2	1	1	No estimates of encounters or mark rate.	Catch estimates from fish tickets.
MSF-WDFW-22	Willapa tributaries (North, Smith, Willapa, Niawiakum, Palix, Nemah, Naselle, Bear)	Recreational	3	1,3	1	3	2	2	1	1	There will be a problem in estimating CWT composition of mortalities due to mark and size-mixed bag regulation. Dockside sampling for CWTs in September only; therefore, CWT sampling and estimation is not uniform across fishery regulation period.	Total catch is estimated using CRCs. Mark rates obtained from estimates of total escapement. CWT estimates depend on tag ratios and total escapement estimate.
MSF-WDFW-23	Grays Harbor, Marine Area 2.2	Recreational	3	1,3	1	3	2	2	1	1	There will be a problem in estimating CWT composition of mortalities due to mark and size-mixed bag regulation. Dockside biological sampling Sept-Oct but none in Nov-Jan. CRC for effort estimates.	Total catch is estimated from CRCs. Estimate mark rate from VTRs and commercial fishery. CWT estimates depend on tag ratios from commercial fishery.

Table 3–3. (Continued) Summary of SFEC's evaluation of Coho and Chinook MSFs proposed for the 2014 fishery season, for which proposals were submitted by agencies in 2013 (see Table 3-2 for definitions of numeric codes).

Proposal ID	Location	Fishery Type	Regulations	CWT Sampling Method	CWT Detection Method	CWT Composition Estimation Method	Alignment	Catch Estimation	Indicator Stocks	DIT Stocks	Comments and Concerns	Methods of Estimation
Coho Salmon (continued)												
MSF-WDFW-24	Grays Harbor tributaries (Chehalis, Elk, Hoquiam, Humptulips, Johns, Newaukum, Satsop, Wynoochee, Skookumchuch, Van Winkle, Wishkah, Quigg Lake)	Recreational	3	3	1	3	2	2	1	1	There will be a problem in estimating CWT composition of mortalities due to mark and size-mixed bag regulation. Some direct sampling in Lower Chehalis only; indirect CWT sampling via electronic sampling of escapement.	Total catch is estimated using CRCs. Mark rates obtained from estimates of total escapement. CWT estimates depend on tag ratios and total escapement estimates.
MSF-WDFW-29	Willapa Bay, Marine Area 2.1	Recreational	3	1	1	1	1	2	1	1	There will be a problem in estimating CWT composition of mortalities due to mark and size mixed bag regulation.	Angler surveys and VTRs to get mark rate and sublegal proportion. Direct electronic sampling for CWTs.
MSF-WDFW-31	Quillayute R system (Bogachiel, Calawah, Dickey, Quillayute, Sol Duc)	Recreational	3	3	1	3	3	2	1	1	There will be a problem in estimating CWT composition of mortalities due to mark and size mixed bag regulation. Lack of direct sampling; instead CWT composition from electronic sampling in tribal net fishery is used.	Total catch is estimated using CRCs. Mark rate estimates obtained from commercial fishery.

Table 3–3. (Continued) Summary of SFEC's evaluation of Coho and Chinook MSFs proposed for the 2014 fishery season, for which proposals were submitted by agencies in 2013 (see Table 3-2 for definitions of numeric codes).

Proposal ID	Location	Fishery Type	Regulations	CWT Sampling Method	CWT Detection Method	CWT Composition Estimation Method	Alignment	Catch Estimation	Indicator Stocks	DIT Stocks	Comments and Concerns	Methods of Estimation
Coho Salmon (continued)												
MSF-WDFW-40 **NEW**	Skagit River	Recreational	2	3	1	3	1	2	1	1	Due to mark mixed-bag regulations, current methods of CWT estimation do not apply. Proposal proposes to use CWT composition estimated from hatchery to estimate CWT impacts in fishery. No evaluation has been performed for this method for Coho.	Catch estimates from CRCs. Indirect estimates of CWTs via electronic sampling at hatchery
MSF-WDFW-41 **NEW**	Samish River	Recreational	1	3	1	4	1	2	0	0	No sampling for CWTs is planned and estimates of CWT impacts will not be made. There will be no opportunity to estimate mark rates or CWT impacts.	
MSF-ODFW / WDFW-04	Columbia R, Mouth upstream to Hood R Bridge, includes Buoy 10	Recreational	1	1	1	1	1	1	1	1		Creel survey and CRCs provide estimates of catch. Aerial surveys provide effort counts. Standard methods used for CWT estimates. Observed mark rates at Bonneville Dam for upriver stocks.
MSF-ODFW / WDFW-06	Lower Columbia River (Buoy 10 upstream to Beacon Rock)	Commercial	1	1	1	1	1	2	1	1	Tangle Net, test fishery.	Potential for random on-board monitoring. Biological sampling of landed catch at processing plants. Release mortality rate 5%

Table 3–3. (Continued) Summary of SFEC's evaluation of Coho and Chinook MSFs proposed for the 2014 fishery season, for which proposals were submitted by agencies in 2013 (see Table 3-2 for definitions of numeric codes).

Proposal ID	Location	Fishery Type	Regulations	CWT Sampling Method	CWT Detection Method	CWT Composition Estimation Method	Alignment	Catch Estimation	Indicator Stocks	DIT Stocks	Comments and Concerns	Methods of Estimation
Coho Salmon (continued)												
MSF-ODFW-03	Oregon coast from Leadbetter Pt to CA border	Recreational	2	1	1	1	2	2	1	1	Coho ocean fishery sampled at boat docks for CWTs. Total landed catch estimated from survey information. All releases assumed unmarked and legal size (over 16") which allows estimate of mark rate in fishery.	Effort estimated using boat counts and CPUE estimates from angler interviews. Released fish number used to determine mark rate.
Chinook Salmon												
MSF-FOC-07	BC Strait of Juan de Fuca and WCVI, Areas 19-1 to 6, 18-4 and 20-5	Pre-terminal Recreational (Mixed Bag)	3	2	2	1	2	2	1	1	Voluntary recovery program will not provide recoveries of unmarked and tagged fish in any fishery. Low CWT submission rates.	Total catch using creel surveys in some areas and times and log books from lodges. No catch estimate for area/times with no creel or lodge logbook
MSF-WDFW-01	Skykomish River (mouth to Wallace River)	Recreational	1	3	1	3	1	2	1	1	The "indirect" method using hatchery tag compositions to estimate CWTs caught in the MSFs was evaluated using CWTIT funding. Results indicate that the direct estimates made using fishery sampling were significantly different. Recommend a sampling program which samples CWTs.	Catch estimates from catch record cards. Indirect estimates of CWTs via electronic sampling at hatchery & associated tribal net fisheries.
MSF-WDFW-03	Yakima River	Recreational	1	1	1	1	1	1	0	0	This is a MSF impacting Yakima R. experimental tag groups in the Yakima R.	Catch is estimated using creel survey information and standard methods used for CWTs.
MSF-WDFW-05	Lower Snake River (Fall)	Recreational	1	1	1	1	1	1	1	1		Catch and mark rate estimated using creel survey. Sampling for CWTs using electronic tag detection.

Table 3–3. (Continued) Summary of SFEC's evaluation of Coho and Chinook MSFs proposed for the 2014 fishery season, for which proposals were submitted by agencies in 2013 (see Table 3-2 for definitions of numeric codes).

Proposal ID	Location	Fishery Type	Regulations	CWT Sampling Method	CWT Detection Method	CWT Composition Estimation Method	Alignment	Catch Estimation	Indicator Stocks	DIT Stocks	Comments and Concerns	Methods of Estimation
Chinook Salmon (continued)												
MSF-WDFW-09	Puyallup / Carbon River	Recreational	1	3	1	2	1	2	1	1	Lack of direct sampling; only indirect CWT estimates, via electronic sampling at hatchery. These are substantial Chinook freshwater sport fisheries, averaging 1,000 and 400 fish in the Puyallup and the Carbon.	Catch estimates from catch record cards. Indirect estimates of CWTs via electronic sampling at hatchery & associated tribal net fisheries.
MSF-WDFW-12	Upper Skagit River (Spring Chinook)	Recreational	1	3	1	2	1	2	1	1	Due to lack of direct sampling CWT electronic sampling at hatchery will be used for indirect estimates of CWTs impacted in fishery. If there is a CWT survey in the fishery, then a direct estimate would be made using CRC estimates. Also release by anglers interviewed would be available to estimate mark rate and total encounters.	Catch estimates from catch record cards. Some angler interviews for CWT sampling and biological data.
MSF-WDFW-13	Nooksack River	Recreational	1	3	1	3	1	2	1	1	Lack of direct sampling. This is a small fishery, with a five year average of 50 fish kept.	Catch estimates from CRCs. Estimate number of Samish fall Chinook using % hatchery from spawning grounds and tag rate from hatchery.
MSF-WDFW-14	Nisqually River	Recreational	1	1	1	1	1	2	1	1	Creel surveys were conducted for 3 years but are no longer funded. CWT sampling is conducted in the Nisqually MSF. As this is an indicator and a DIT program, it is recommended that CWT sampling continued.	Catch estimates from CRC.

Table 3–3. (Continued) Summary of SFEC's evaluation of Coho and Chinook MSFs proposed for the 2014 fishery season, for which proposals were submitted by agencies in 2013 (see Table 3-2 for definitions of numeric codes).

Proposal ID	Location	Fishery Type	Regulations	CWT Sampling Method	CWT Detection Method	CWT Composition Estimation Method	Alignment	Catch Estimation	Indicator Stocks	DIT Stocks	Comments and Concerns	Methods of Estimation
Chinook Salmon (continued)												
MSF-WDFW-19	Ocean Areas 1-4	Recreational	1	1	1	1	1	1	1	1		Catch estimate from creel survey, based on an effort/CPUE survey with boat exit counts and exit interviews. Stratified by boat type (private or charter boats) and day type (weekend or weekdays). On-water encounter rates (by mark status/size) obtained from charter ride-along trips and VTRs.
MSF-WDFW-20	Skokomish River	Recreational	1	1	1	1	1	2	1	1	Creel surveys were conducted for 3 years but are no longer funded. CWT sampling is conducted in the Skokomish MSF. As this is an indicator and a DIT program, it is recommended that CWT sampling continue, even if the creel survey for total estimates is not implemented.	Catch estimates from CRC.
MSF-WDFW-25	Willapa Bay 2K,2M,2N,2R,2T,2U - (new area designations for 2G, 2H, 2J, 2K, and 2M)	Commercial	1	1	1	1	1	1	1	1	Live boxes are used and the condition of released unmarked and marked Chinook and Coho are recorded.	Catch from fish tickets. Standard CWT estimates.
MSF-WDFW-26	Willapa Bay MA2.1	Recreational	3	1	1	1	2	2	1	2	There will be a problem in estimating CWT composition of mortalities due to mark and size-mixed bag regulation. There is a mismatch between fishery regulation and sampling/catch estimation strata boundaries.	Catch estimates from CRCs. Angler surveys provide data needed to estimate CWT ratios and mark rates; additionally, VTRs provide data to estimate size/mark status of encounters.

Table 3–3. (Continued) Summary of SFEC's evaluation of Coho and Chinook MSFs proposed for the 2014 fishery season, for which proposals were submitted by agencies in 2013 (see Table 3-2 for definitions of numeric codes).

Proposal ID	Location	Fishery Type	Regulations	CWT Sampling Method	CWT Detection Method	CWT Composition Estimation Method	Alignment	Catch Estimation	Indicator Stocks	DIT Stocks	Comments and Concerns	Methods of Estimation
Chinook Salmon (continued)												
MSF-WDFW-27	Willapa Tributaries (Willapa, Niawiakum, Palix, Nemah, Naselle, Bear)	Recreational	3	1	1	1	1	1	1	1	There will be a problem in estimating CWT composition of mortalities due to mark and size-mixed bag regulation.	Catch estimates from CRC. Mark rates and tag ratios from hatchery and spawning ground data.
MSF-WDFW-28	Lower Snake R (spring)	Recreational	1	1	1	1	1	1	1	1		Catch and mark rate estimated using creel survey. Sampling for CWTs using electronic tag detection; standard CWT estimation methods.
MSF-WDFW-32	Quillayute River system (Bogachiel, Calawah, Dickey, Quillayute, and Sol Duc)	Recreational	3	3	1	3	3	2	0	0	There will be a problem in estimating CWT composition of mortalities due to mark and size mixed bag regulation. Estimates of CWTs are made using hatchery and tribal net estimates of CWT composition. There are no data evaluating this method for the coastal fisheries.	Catch estimates from CRC. CWT ratios and mark rates from tribal net fishery.
MSF-WDFW-33	Hoh River system	Recreational	3	3	1	3	3	2	0	0	There will be a problem in estimating CWT composition of mortalities due to mark and size mixed bag regulation. Estimates of CWTs are made using hatchery and tribal net estimates of CWT composition. There are no data evaluating this method for the coastal fisheries.	Catch estimates from CRC. CWT ratios and mark rates from tribal net fishery.

Table 3–3. (Continued) Summary of SFEC's evaluation of Coho and Chinook MSFs proposed for the 2014 fishery season, for which proposals were submitted by agencies in 2013 (see Table 3-2 for definitions of numeric codes).

Proposal ID	Location	Fishery Type	Regulations	CWT Sampling Method	CWT Detection Method	CWT Composition Estimation Method	Alignment	Catch Estimation	Indicator Stocks	DIT Stocks	Comments and Concerns	Methods of Estimation
Chinook Salmon (continued)												
MSF-WDFW-35	All Puget Sound Areas 5–13 (summer)	Recreational	1	1	1	1	1	1	1	1		Total catch estimates from creel surveys and CRCs. On-water Chinook encounter rates, estimated via test fisheries and/or VTRs, provide estimates of encounters by size and mark status.
MSF-WDFW-36	All Puget Sound Areas 5–13 (winter)	Recreational	1	1	1	1	1	1	1	1		Total catch estimates from creel surveys and CRCs. On-water Chinook encounter rates, estimated via test fisheries and/or VTRs, provide estimates of encounters by size and mark status.
MSF-WDFW-37	Snohomish River (mouth to confluence of Skykomish and Snoqualmie rivers, including all channels.)	Recreational	1	3	1	3	1	1	1	1	Lack of direct sampling; only indirect CWT estimates, via electronic sampling at hatchery. No study indicating quality of proxy.	Creel surveys will estimate releases by size and mark status.
MSF-WDFW-38	Grays Harbor 2A, 2B, 2C, 2D	Commercial	1	1	1	1	1	1	1	1	Live boxes are used and the condition of released unmarked and marked Chinook and Coho are recorded.	Catch from fish tickets. Standard CWT estimates.
MSF-WDFW-39	Lower Grande Ronde R	Recreational	1	1	1	1	1	1	1	0		Catch and mark rate estimated using creel survey. Sampling for CWTs using electronic tag detection; standard CWT estimation methods.

Table 3–3. (Continued) Summary of SFEC's evaluation of Coho and Chinook MSFs proposed for the 2014 fishery season, for which proposals were submitted by agencies in 2013 (see Table 3-2 for definitions of numeric codes).

Proposal ID	Location	Fishery Type	Regulations	CWT Sampling Method	CWT Detection Method	CWT Composition Estimation Method	Alignment	Catch Estimation	Indicator Stocks	DIT Stocks	Comments and Concerns	Methods of Estimation
Chinook Salmon (continued)												
MSF-IDFG-04	Lower Clearwater River, Snake River and lower Salmon River	Recreational	1	1	2	1	1	1	1	1		Kept and released catch will be estimated by clip and size category using stratified roving creel and effort surveys. Creel surveys will also collect CWT samples.
MSF-ODFW / WDFW-01	Columbia R, Mouth upstream to McNary Dam, and Ringold Hatchery Area	Recreational	1	1	1	1	1	2	1	1	There is no information on whether and how release number, mark and size status will be obtained.	Creel survey and CRCs provide estimates of catch. Aerial surveys provide effort counts. Standard methods used for CWT estimates. Mark rates are observed at Bonneville Dam, after the lower river fishery.
MSF-ODFW / WDFW-02	Columbia R, Mouth upstream to Chief Joseph Dam	Recreational	1	1	1	1	2	2	1	1	Creel census below McNary does not cover the whole fishery, which extends to Priest Rapids; therefore, effort estimate will be underestimated. There is no information on whether and how release number, mark and size status will be obtained.	Creel survey and CRCs provide estimates of catch. Aerial surveys provide effort counts. Standard methods used for CWT estimates. Mark rates are observed at Bonneville Dam, after the lower river fishery.

Table 3–3. (Continued) Summary of SFEC's evaluation of Coho and Chinook MSFs proposed for the 2014 fishery season, for which proposals were submitted by agencies in 2013 (see Table 3-2 for definitions of numeric codes).

Proposal ID	Location	Fishery Type	Regulations	CWT Sampling Method	CWT Detection Method	CWT Composition Estimation Method	Alignment	Catch Estimation	Indicator Stocks	DIT Stocks	Comments and Concerns	Methods of Estimation
Chinook Salmon (continued)												
MSF-ODFW / WDFW-03	Columbia R, Mouth upstream to Bonneville Dam	Commercial Gillnet / Tanglenet	1	1	1	1	1	2	1	1		Catch from fish tickets. Biological sampling of landed catch at processing plants, plus random on-board monitoring. Standard methods used for CWT estimates. Mark rates are observed at Bonneville Dam, after the lower river fishery.
MSF-ODFW / WDFW-05	Columbia R, Mouth upstream to McNary Dam, includes Buoy 10	Recreational	1	1	1	1	1	2	1	1	There is no information on whether and how release number, mark and size status will be obtained.	Creel survey CRCs provide estimates of catch. Aerial surveys provide effort counts. Standard methods used for CWT estimates. Mark rates are observed at Bonneville Dam, after the lower river fishery.
MSF-ODFW-01	Willamette River	Recreational	2	3	1	3	3	3	1	1	Problems due to: mixed bag by size, lack of information in creel survey downstream where releases are reported for adults, jacks, marked and unmarked combined, no sampling of harvest upstream. Punch cards do not require recording of jacks or releases. Therefore, encounters by size and mark status cannot be estimated for either location (down or upstream).	Catch estimates from creel/angler interviews downstream of Willamette Falls; catch record cards used upstream of the falls. Upstream estimates of mark rate, jacks and adults calculated from window counts.

Table 3–3. (Continued) Summary of SFEC's evaluation of Coho and Chinook MSFs proposed for the 2014 fishery season, for which proposals were submitted by agencies in 2013 (see Table 3-2 for definitions of numeric codes).

Proposal ID	Location	Fishery Type	Regulations	CWT Sampling Method	CWT Detection Method	CWT Composition Estimation Method	Alignment	Catch Estimation	Indicator Stocks	DIT Stocks	Comments and Concerns	Methods of Estimation
Chinook Salmon (continued)												
MSF-ODFW-02	Ocean Terminal areas (within 3 miles of the river mouth) Tillamook, Elk, and Chetco	Recreational	2	1	1	1	2	2	1	1	Mark and size-mixed bag regulations present problems in estimating CWT mortalities. Not able to separate terminal Chinook fishery catch from non-terminal ocean fishery. Fishery proposed for several years but not implemented.	All fish landed/sampled as one stratum. Angler recall of released fish used to determine mark rate; no sublegal estimates.

3.3 Expected Encounters of CWT Indicator Stocks in MSFs

Multiple MSFs are expected to occur during 2014 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 (brood years 2003–08; Table 3-4) and Chinook (catch years 2006–10; Table 3-5) that can be expected to be encountered in these areas with MSFs.

Tagged Coho stocks expected to be encountered are included in Table 3-4, all of which are used by the CoTC for their analyses. Mark-selective fisheries in Puget Sound (PS) and Hood Canal largely exploit local stocks. However, tagged fish from all regions are encountered in MSFs in the Strait of Juan de Fuca (JDF), throughout southern BC, and 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, with the number of Chinook MSFs more than doubling to 29 (Table 3-1). From 2010 to 2014, 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. With the most recent additional fisheries proposed for Canadian waters, WA ocean areas, and Columbia River, a larger number of indicator stocks are likely to be encountered in MSFs (Table 3-5). In addition, MSFs have expanded substantially in PS, both geographically and temporally, with concomitant increases in catch in MSFs for Chinook Salmon.

In order to monitor the impacts of these expanding MSFs, Chinook DIT programs must be expanded to represent the new indicator 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 groups, not discontinuing the programs.

Table 3-4. Number of tagged and marked Coho Salmon sampled (Obs) and percent of total estimated tags (expanded for the sample rate) in fisheries or in escapement, averaged over brood years 2003–2008. Some estimates are based on less than six years of data because some stocks were not tagged in all years. Coho Salmon escapements are not available in the Regional Mark Information System (RMIS) database for BC stocks; therefore, percentages shown for BC are only for fishery recoveries.

Region		Hatchery / Release Location	# Years Tagged	Mark-Selective Fisheries										Non-Selective Fisheries				Escapement		Total	
				BC		Puget Sound		WA Coast		Columbia R		OR Coast		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	Est
BC	Nass R - Skeena	Toboggan Creek H	6	10	17%	-	-	-	-	-	-	-	-	152	67%	16	16%	-	-	177	672
	Coastal BC	Snootli Creek H	4	1	2%	-	-	-	-	-	-	-	-	84	61%	15	37%	-	-	99	367
		McLaughlin Bay SP	1	-	-	-	-	-	-	-	-	-	-	23	23%	6	77%	-	-	29	306
	Johnstone Strait	Quinsam River H	6	6	47%	-	-	1	1%	-	-	-	-	9	23%	2	28%	-	-	18	120
		Johnston Est Seapen	2	1	1%	-	-	-	-	-	-	-	-	29	25%	23	74%	-	-	52	220
	Georgia Strait	Big Qualicum River H	6	1	35%	1	8%	1	4%	-	-	-	-	4	31%	<1	22%	-	-	7	36
		Goldstream River H	6	3	34%	4	17%	4	13%	-	-	-	-	6	19%	1	15%	-	-	17	74
		Lang Creek H	2	24	50%	4	4%	3	2%	-	-	-	-	22	13%	11	30%	-	-	64	310
	W Vancouver Isl	Robertson Creek H	6	44	83%	2	1%	7	3%	-	-	-	-	22	11%	1	1%	-	-	76	578
	Fraser R -	Inch Creek H	6	13	66%	4	8%	6	6%	-	-	1	1%	11	15%	1	4%	-	-	36	227
	Thompson R	Spius Creek H	6	4	26%	5	21%	11	24%	-	-	2	6%	9	22%	<1	1%	-	-	31	105
WA	Strait of Juan de Fuca	Dungeness H	4	7	15%	2	2%	5	2%	-	-	-	-	53	32%	2	1%	192	47%	260	432
		Lower Elwha H	6	2	9%	2	3%	4	4%	-	-	-	-	11	25%	1	1%	94	56%	113	182
	Puget Sound North	Bernie Gobin H	6	4	5%	18	6%	22	4%	-	-	3	1%	230	71%	18	8%	38	4%	333	1106
		Glenwood Springs	1	-	-	-	-	-	-	-	-	-	-	2	100%	-	-	-	-	2	7
		Kendall Creek H	5	4	4%	5	2%	8	2%	-	-	-	-	171	72%	1	<1%	101	18%	289	735
		Lummi Sea Ponds	4	7	12%	4	2%	8	3%	-	-	2	1%	170	69%	3	6%	44	7%	237	613
		Skookum Creek H	6	6	4%	10	3%	17	3%	-	-	3	<1%	340	77%	2	<1%	183	13%	560	1,403
		Wallace R H	6	8	5%	13	3%	21	3%	-	-	4	1%	39	8%	13	4%	860	76%	959	1,661
		Marblemount H	6	8	5%	15	3%	23	3%	-	-	2	<1%	177	21%	39	6%	642	62%	906	1,793
	Puget Sound Mid	Elliott Bay TR NP	4	9	3%	31	4%	33	3%	-	-	3	<1%	597	79%	42	9%	53	2%	768	2,795
		Voights Creek H	6	9	8%	23	6%	17	3%	-	-	1	<1%	191	45%	26	11%	187	27%	454	1,288
		Keta Creek	3	13	4%	39	4%	36	3%	-	-	4	<1%	397	41%	62	9%	847	39%	1,399	3,292
		Soos Creek H	6	6	4%	16	3%	15	2%	-	-	3	<1%	171	38%	16	4%	524	48%	750	1,715
		Cowskull	3	5	4%	25	10%	14	3%	-	-	1	<1%	211	68%	35	13%	62	2%	353	1,114
		Crisp Creek Rearing	3	11	3%	40	4%	34	2%	-	-	4	<1%	413	41%	30	4%	1,690	47%	2,222	4,172

Table 3–4. (Continued) Number of tagged and marked Coho Salmon sampled (Obs) and percent of total estimated tags (expanded for the sample rate) in fisheries or in escapement, averaged over brood years 2003–2008.

Region		Hatchery / Release Location	# Years Tagged	Mark-Selective Fisheries										Non-Selective Fisheries				Escapement		Total	
				BC		Puget Sound		WA Coast		Columbia R		OR Coast		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	Est
WA	Puget Sound South	Minter Creek H	2	2	4%	3	4%	6	4%	-	-	1	<1%	30	28%	4	4%	186	55%	230	337
		Clear Creek H	1	2	16%	2	4%	5	5%	-	-	-	-	50	63%	2	2%	19	10%	80	188
		Kalama Creek H	6	1	3%	7	9%	3	2%	-	-	1	<1%	41	39%	5	7%	122	40%	178	311
		South Sound Net Pens	6	4	4%	10	5%	13	4%	-	-	1	<1%	211	79%	16	8%	2	<1%	257	864
	Hood Canal	George Adams H	6	4	3%	9	3%	13	3%	-	-	1	<1%	74	23%	9	4%	662	65%	771	1,206
		Quilcene Bay Sea Pen	6	10	5%	23	4%	21	2%	-	-	2	<1%	219	52%	14	5%	425	31%	713	1,901
		Quilcene NFH	6	6	4%	20	4%	17	3%	-	-	2	<1%	186	53%	7	4%	375	31%	613	1,501
		Port Gamble Bay Pens	6	4	6%	13	7%	11	4%	-	-	1	<1%	123	76%	7	6%	11	2%	169	650
	N. WA Coast	Makah NFH	6	3	3%	3	1%	22	6%	-	-	6	2%	26	3%	2	1%	309	84%	370	961
		Quinault NFH	6	8	2%	5	<1%	120	6%	-	-	27	2%	606	53%	1	<1%	479	37%	1,246	4,632
		Salmon R Fish Culture	6	2	1%	2	<1%	50	8%	-	-	12	2%	263	57%	1	<1%	204	31%	534	1,573
		Solduc H	6	9	3%	5	1%	124	10%	-	-	30	3%	61	6%	6	1%	1,206	76%	1,440	2,796
	Grays Harbor	Bingham Creek H	6	2	1%	1	<1%	41	5%	-	-	7	1%	51	7%	12	3%	939	83%	1,052	2,362
		Friends Landing NP	3	1	2%	1	<1%	49	17%	-	-	6	2%	102	51%	16	10%	129	18%	304	940
		Satsop Springs Ponds	5	<1	1%	1	1%	8	9%	-	-	3	2%	11	8%	2	1%	209	78%	234	402
		Humptulips H	1	3	2%	1	<1%	53	13%	-	-	11	3%	161	48%	4	2%	320	31%	553	1,086
		Skookumchuck H	3	1	1%	3	<1%	64	11%	-	-	9	1%	87	13%	15	5%	1,093	69%	1,271	1,869
	Willapa	Forks Creek H	6	3	2%	1	<1%	56	7%	1	<1%	21	3%	126	27%	6	2%	652	59%	865	1,879
		Naselle H	6	2	2%	1	<1%	46	12%	-	-	14	4%	131	73%	2	1%	84	9%	279	994
		Nemah H	4	3	2%	2	<1%	76	14%	-	-	28	7%	110	41%	1	1%	412	35%	632	1,278
CR	Mid and Upper	Oxbow H	4	-	-	-	-	8	3%	5	2%	6	3%	36	18%	1	<1%	445	73%	500	610
		Klickitat H	6	1	1%	1	1%	90	40%	8	4%	42	21%	61	26%	4	5%	2	<1%	208	510
		Cascade H	5	-	-	-	-	27	9%	14	5%	21	8%	198	65%	1	<1%	102	13%	362	819
		Washougal H	6	2	1%	2	1%	89	24%	10	5%	43	14%	64	19%	2	1%	286	35%	498	840
		Wells H	2	-	-	-	-	3	1%	1	<1%	-	-	103	95%	1	<1%	26	4%	133	622

Table 3–4. Number of tagged and marked Coho Salmon sampled (Obs) and percent of total estimated tags (expanded for the sample rate) in fisheries or in escapement, averaged over brood years 2003–2008.

Region		Hatchery / Release Location	# Years Tagged	Mark-Selective Fisheries										Non-Selective Fisheries				Escapement		Total	
				BC		Puget Sound		WA Coast		Columbia R		OR Coast		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	Est
CR	Lower CR	Big Creek H	6	-	-	-	-	18	6%	5	3%	15	7%	70	32%	1	1%	317	51%	424	632
		Bonneville H	5	-	-	-	-	47	7%	16	3%	46	8%	26	5%	2	<1%	1418	77%	1,555	1,856
		CEDC Youngs Bay Net	4	-	-	-	-	32	8%	11	4%	27	8%	293	80%	1	<1%	16	1%	379	1,118
		Cowlitz Salmon H	6	8	2%	4	<1%	374	28%	40	6%	163	15%	178	13%	19	2%	792	34%	1,578	2,893
		Deep River NP	6	-	-	-	-	16	6%	5	2%	15	6%	225	83%	-	-	20	2%	281	728
		Eagle Creek NFH	6	-	-	-	-	15	7%	6	4%	17	11%	22	27%	-	-	104	51%	165	481
		Elochoman H	5	<1	2%	-	-	23	14%	3	2%	18	14%	38	22%	1	1%	159	44%	243	369
		Faller Creek H	6	-	-	-	-	22	12%	7	8%	18	12%	11	10%	-	-	252	57%	310	431
		Grays River H	6	1	1%	1	<1%	34	18%	8	5%	31	18%	44	26%	1	<1%	180	31%	298	495
		Kalama Falls H	6	1	2%	1	<1%	40	13%	5	7%	23	9%	51	16%	1	1%	351	52%	472	694
		Klaskanine H	3	-	-	-	-	7	6%	2	2%	5	5%	42	56%	-	-	95	31%	151	312
		Klaskanine S FK Pond	3	-	-	-	-	28	9%	10	4%	21	7%	140	63%	1	<1%	141	16%	341	908
		Lewis River H	6	3	1%	6	<1%	261	12%	61	9%	148	8%	174	8%	4	<1%	2,507	62%	3,164	5,055
		North Toutle H	6	-	-	-	-	34	11%	15	11%	30	12%	14	6%	1	<1%	414	60%	508	810
		Sandy H	6	1	<1%	1	<1%	49	11%	16	5%	38	10%	75	16%	2	<1%	665	58%	845	1,174
OR	OR Coast North	Nehalem H	4	1	<1%	-	-	12	2%	-	-	20	5%	3	1%	1	<1%	1,023	91%	1,060	1,129
		Salmon River H	3	-	-	-	-	4	5%	-	-	5	11%	1	1%	1	3%	110	80%	121	139
		Trask River H	2	-	-	2	<1%	18	4%	-	-	65	14%	4	1%	1	<1%	1,102	81%	1,191	1,379
	OR Coast South	Butte Falls H	1	-	-	1	2%	8	13%	-	-	11	24%	5	21%	2	15%	23	24%	50	98
		Cole Rivers H	6	-	-	-	-	-	-	-	-	1	2%	-	-	1	1%	182	97%	185	187
		Rock Creek H	3	-	-	-	-	4	9%	-	-	32	76%	1	5%	2	7%	2	2%	42	113

Table 3-5. Number of tagged and marked Chinook Salmon sampled (Obs) and percent of total estimated CWTs (% of Est) in fisheries or in escapement averaged over brood years 2001–2006.

		Mark-Selective Fisheries										Non-Selective Fisheries							
		PS		WA CST		COLR		TERM		Total		Commercial		Sport		Escapement		Total	
Region	Stock	Obs	%Est	Obs	%Est	Obs	%Est	Obs	%Est	Obs	%Est	Obs	%Est	Obs	%Est	Obs	%Est	Obs	Est
British Columbia	Atnarko Summer	-	-	-	-	-	-	-	-	-	-	52	36%	12	18%	19	46%	83	352
	Big Qualicum	1	1%	-	-	-	-	-	-	1	1%	23	21%	20	32%	44	46%	88	305
	Chehalis (Harrison Fall Stock)	2	1%	3	1%	-	-	-	-	5	2%	58	24%	26	17%	11	56%	99	704
	Chilliwack (Harrison Fall Stock)	5	1%	5	1%	-	-	-	-	11	2%	116	20%	67	25%	18	53%	212	1,725
	Cowichan Fall	1	1%	<1	<1%	-	-	-	-	1	1%	27	28%	25	46%	28	24%	81	297
	Dome Creek Spring	-	-	-	-	-	-	-	-	-	-	1	52%	1	30%	2	18%	4	24
	Kitsumkalum Summer	-	-	-	-	-	-	-	-	-	-	91	30%	48	27%	17	43%	156	820
	Nanaimo River Fall	-	-	-	-	-	-	-	-	-	-	8	9%	19	33%	8	58%	35	259
	Nicola River Spring	<1	<1%	1	<1%	-	-	-	-	1	1%	10	12%	16	14%	12	73%	39	346
	Puntledge Summer	-	-	-	-	-	-	-	-	-	-	12	19%	12	27%	28	54%	52	171
	Quinsam Fall	-	-	-	-	-	-	-	-	-	-	37	28%	20	29%	48	43%	105	344
	Robertson Creek	-	-	-	-	-	-	-	-	-	-	200	46%	97	33%	44	21%	341	1,356
	Lower Shuswap River Summers	-	-	<1	<1%	-	-	-	-	<1	<1%	99	36%	57	29%	22	34%	178	899
WA Puget Sound	George Adams Fall Fingerling	20	7%	9	3%	-	-	5	2%	34	12%	99	36%	37	21%	706	30%	876	1,026
	Green River Fall Fingerling	15	5%	5	2%	-	-	-	-	20	7%	208	51%	32	16%	510	25%	770	862
	Grovers Creek Fall Fingerling	30	9%	10	3%	-	-	-	-	40	12%	118	28%	46	18%	1,047	42%	1,251	1,133
	Nisqually Fall Fingerling	28	6%	7	2%	-	-	1	1%	36	9%	333	61%	31	10%	686	20%	1,086	1,604
	Nooksack Spring Fingerling	4	3%	1	1%	-	-	1	0%	6	4%	65	38%	28	31%	146	27%	245	543
	Samish Fall Fingerling	15	4%	9	2%	-	-	-	-	24	6%	326	59%	57	22%	264	13%	671	1,385
	Skagit Spring Fingerling	8	2%	2	1%	-	-	107	23%	117	26%	162	22%	40	19%	758	32%	1,078	1,155
	Skagit Spring Yearling	9	7%	1	1%	-	-	58	32%	68	40%	50	15%	20	22%	251	23%	389	463
	Skykomish Fall Fingerling	5	4%	2	2%	-	-	-	-	7	7%	30	24%	15	22%	385	47%	437	385
	South Puget Sound Fall Yearling	9	23%	1	1%	-	-	-	-	10	25%	16	24%	10	35%	63	16%	99	165
	Skagit Summer Fingerling	1	1%	1	1%	-	-	-	-	2	1%	145	40%	19	15%	80	43%	246	655
	Stillaguamish Fall Fingerling	8	5%	2	1%	-	-	-	-	10	7%	51	24%	24	27%	177	42%	262	513
	White River Spring Fingerling	4	12%	<1	2%	-	-	-	-	4	14%	17	39%	7	30%	39	16%	67	101

Table 3–5. (Continued) 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 2006–2010.

		Mark-Selective Fisheries										Non-Selective Fisheries							
		PS		WA CST		COLR		TERM		Total		Commercial		Sport		Escapement		Total	
Region	Stock	Obs	%Est	Obs	%Est	Obs	%Est	Obs	%Est	Obs	%Est	Obs	%Est	Obs	%Est	Obs	%Est	Obs	Est
WA Coast	Hoko Fall Fingerling	-	-	1	1%	-	-	-	-	1	1%	36	33%	11	17%	161	49%	209	311
	Queets Fall Fingerling	-	-	-	-	-	-	-	-	-	-	188	66%	37	12%	20	22%	244	947
	Sooes Fall Fingerling	-	-	1	1%	-	-	-	-	1	1%	23	38%	9	20%	117	41%	149	173
Columbia R	Cowlitz Fall Tule	-	-	1	2%	<1	<1%	-	-	1	2%	22	30%	12	23%	193	45%	228	187
	Hanford Wild	-	-	-	-	-	-	-	-	-	-	52	59%	12	26%	13	16%	76	261
	Columbia Lower R. H.	<1	<1%	3	3%	-	-	-	-	4	3%	65	60%	23	21%	150	16%	242	403
	Lewis River Wild	-	-	-	-	-	-	-	-	-	-	27	43%	7	30%	49	27%	83	175
	Lyons Ferry	-	-	5	1%	-	-	-	-	5	1%	185	39%	74	16%	280	44%	545	1,564
	Lyons Ferry Yearling	-	-	23	2%	1	<1%	-	-	24	2%	567	44%	233	20%	1,168	34%	1,992	4,125
	Spring Creek Tule	3	<1%	7	2%	-	-	-	-	10	2%	290	70%	61	14%	256	14%	616	1,480
	Columbia Summers	-	-	1	<1%	5	<1%	-	-	5	1%	304	55%	84	24%	478	21%	870	1,749
	Upriver Brights	-	-	1	<1%	-	-	-	-	1	<1%	135	53%	36	23%	428	23%	601	807
	Willamette Spring	-	-	2	<1%	43	5%	142	35%	187	40%	236	22%	56	11%	955	27%	1,433	2,100
OR Coast	Elk River	-	-	-	-	-	-	-	-	<1	<1%	241	35%	164	25%	913	40%	1,318	2,032
	Salmon River	-	-	-	-	-	-	-	-	-	-	180	35%	156	46%	155	19%	491	1,460

4 ISSUES, CONCERNS, AND RECOMMENDATIONS

4.1 Submissions of Mark-Selective Fishery Proposals

Proposals are due by November 1 of the year before the MSFs being proposed; e.g., November 1, 2013 for fisheries proposed to occur in 2014–2015. Although final decisions on fisheries are generally made by agencies after this time period (e.g., January–April of 2014 for 2014 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 MSFs may still 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.

4.2 Status of Mark-Selective Fishery Reports

The PSC has requested that management agencies provide SFEC with two 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, what sampling occurred, and estimated total mortalities and mark rates in the fisheries. 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.

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 no SFEC MSF post-season report/tables were found in the US or Canadian post-season reports (Jan 2014), CDFO and WDFW do provide fishery regulations and preliminary landed catch estimates for mark-selective fisheries in their country's post-season reports. ODFW submits preliminary landed catch estimates to their SFEC representatives for MSF fisheries conducted off the Oregon coast. In addition, post season estimates for all Chinook MSFs in all WA Marine Areas (Areas 1–13) are available in the Recreational Angling Impact Database (RAID) hosted on the NWIFC's website. WDFW has also made available reports of some of their MSFs on their website, including the following 2013 fishery reports:

- 2012-13 Winter Mark-Selective Recreational Chinook Fisheries in Marine Areas 6, 7, 8-1, 8-2, 9, 10, 11 and 12 (Baltzell et al. 2013)
- 2013 Summer Mark-Selective Recreational Chinook fisheries in Marine Areas 5, 6, 9, 10, 11, 12 and 13 (Baltzell et al. 2014)
- 2013 Ocean Mark-Selective Fishery Report; Marine Areas 1-4 (WDFW 2014)

Although the information may be available in larger agency reports, the SFEC needs agencies to submit the post-season MSF information directly to SFEC using the report templates provided (Appendix I), which will enable more efficient dissemination of post-season data to PSC's technical committees such as the CTC and CoTC. 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 Incomplete Representation of CWT Indicators by DIT Groups

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 G and Appendix H). Comparison of the escapement of the unmarked and marked components of a DIT group provides a measure of the total impact of MSFs. MSFs have more than doubled in number since 2007; new areas and stocks are being fished under mark-selective regulations. 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 DIT groups. In 2011, to improve the CWT system while under declining budgets, Northwest Marine Technology offered free CWTs to agencies. Analyses of coded-wire tagging levels were completed by CoTC and CTC members for many of the indicator stocks and recommendations for increased tagging were made for some of these stocks. Subsequently, a few agencies requested and received free tags from Northwest Marine Technology.

4.3.1 Coho Salmon Double-Index-Tag Groups

At present, the utility of the DIT program and the CWT program in general for Coho is reduced due to low tagging rates, insufficient Management Unit (MU) representation, low recovery rates, and incomplete coastwide coverage of electronic sampling programs (PSC-CWTW 2008; CoTC 2013). Indicator stocks that have been encountered in mark-selective fisheries are listed in Table 3-4. Several Coho MUs do not have DIT groups to permit independent estimation of impacts of MSFs (Appendix G). For example, Canada currently has two DIT programs for the four MUs in the treaty (Inch Creek and Quinsam River). Even where DIT programs have been implemented, the reliability of results is affected by the lack of electronic tag detection throughout the migratory ranges of the MUs (CoTC 2013). In addition, tagging levels of DIT groups are not high enough to provide sufficient numbers of recoveries for statistically-robust estimates of non-landed mortalities in MSFs. Estimation of ERs or effects of MSFs on natural stocks requires the collection of CWTs from both the marked and unmarked DIT groups. The lack of direct sampling and electronic tag detection in intercepting fisheries throughout the stock migration results in biased estimates of ERs.

4.3.2 Chinook Salmon Double-Index-Tag Groups

Chinook indicator stocks that have been encountered in WA mark-selective fisheries are listed in Table 3-5. Some of these stocks are currently double-index tagged (Appendix H), but many are not. The SFEC continues to recommend that consideration be given to implementing more DIT programs.

4.4 Chinook 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 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. Electronic tag detection was not 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 within the Strait of Juan de Fuca and off of the WA coast (WA Ocean Areas 1–4) 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. In 2011, Oregon began using ETD for ocean sampling of both sport and commercial fisheries. It is specifically recommended that ODFW implement ETD in 2014 for Columbia River fall Chinook to recover DIT release groups for Chinook exploitation rate indicator stocks.

The new T-wands should also improve the efficiency of electronically sampling Chinook. As described earlier, because of the increased detections range, it is believed that mouth wanding of larger Chinook is no longer needed when using T-wands.

4.5 Mixed-Bag Regulations in MSFs

Regulations to implement MSFs for recreational fisheries have become more complex. We continue to be concerned about monitoring, sampling, and estimation methods keeping pace with increases in regulation complexity. Mark selective fisheries continue to be 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.

Further, different types of mixed bag regulations have been part of the MSFs proposed by Canada and Oregon. In most cases these are mark-mixed bag limits in which, for mark-selective species, a portion of the total bag limit for that species can be unmarked (Table 4-1). However, more complex mixed-bag regulations are proposed as well. For example, beginning in 2009, BC proposed two variations of a mark and size-selective mixed bag limit (Table 4-1) for the early-timed JDF fishery, in which Chinook within a slot limit can be retained regardless of mark status and larger fish can only be retained if they are marked. The two variations differ in the slot limit size range, with a range of 45-67 cm applying in the March-June period, and a range of 45-85 cm applying from late June to mid-July (depending on in-season abundance estimates). In Oregon there is a seasonal limit on unmarked Chinook and Coho salmon but not on marked salmon. In addition, there is a more restrictive seasonal limit on unmarked Coho that varies from river to river on the Oregon coast. Ocean recreational catch and some river catch is sampled at estuary boat ramps. Ocean catch estimates are calculated from angler interviews, whereas river catch is

estimated from harvest cards. 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 4-1. Types of MSF regulations proposed for MSFs.

Regulation Complexity	Description	Examples	Location & Fishery
Simple MSF	Only marked fish can be retained	Retain up to 2 fish per day, any size, marked only. Bag limit of 6, of which only 2 may be adults, all fish must be marked	WA Areas 1-4 & 5-13 Coho and Chinook fisheries WA Columbia River Chinook sport fisheries
Mark-mixed bag limit	A portion of total bag limit can be unmarked. This can be a daily limit bag or a seasonal bag limit	Retain up to 4 fish per day, of which no more than 2 may be wild Seasonal limit on unmarked fish may range from 1-10 unmarked Chinook depending on the river system. The catch of marked Chinook has no seasonal limit.	Skagit River Coho and Chinook sport fisheries Oregon coastal Coho and Chinook fisheries
Mark and size-mixed bag limit	Size-range-specific allowances for retention of unmarked fish	2 fish per day, retain all between 45–67 cm, only marked fish over 67 cm *OR Coast*: Some areas are partially MSF, where an angler may retain 1unmarked Chinook Salmon as part of the 2 fish daily bag limit. Adjacent areas may be non-selective or entirely mark selective. *OR Coast al rivers*: variable because of a seasonal limit of 10 unmarked Chinook. These regulations do not apply to Chinook jacks (15”-24”).	BC Strait of Juan de Fuca Snake River fall Chinook, and Oregon coastal fisheries

5 REFERENCES

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6 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 J. Davis
Chair Chair

Appendix B. Mass Marking Proposal Template.

2014 Template for Mass Marking Proposals

Mass Marking Proposal ID #
Date Received

PROPOSAL TITLE:

This template is intended for proposals to mark any release group from a hatchery complex or area that meets all of the following conditions:

1) Chinook or Coho Salmon;
2) 100,000 or more fish in release group
3) fish are marked with an adipose clip, but untagged; and
4) expected to be intercepted in Pacific Salmon Commission fisheries.

CONTACT INFORMATION

Proposing Agency	
Contact Person	
Mailing Address	
Phone Number	
Fax	
Email	

IS THE PROPOSAL:

New	
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 information on hatchery straying to wild spawning grounds, to increase fishing opportunities, or to identify hatchery/wild compositions in fisheries).

    b. If this 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 that your agency may pursue in the future that will target these proposed mass marked stocks.

2. **Proposed 2014 Marking and Tagging Levels**

   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. Identify all DIT groups with an asterisk (*).

   ***Species**:*
   ***Brood Year**:*
   ***Release Year**:*

Area or Region	Hatchery	Stock	Number to be Tagged (CWTs)		Number to be Untagged		Marked Last Brood Year? (Y/N)
			Ad+CWT	CWT Only	Ad Only	No Clip	
Total for Region							

3. **Concerns Regarding the Proposal**
   a. **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.

   b. **List any issues of concern previously identified** by the SFEC, PSMFC Mark Committee, or fishery management forums related to this mass marking proposal; and describe how those concerns have been addressed

(*new this year*)

4. **Information to Support Estimation of Projected Encounters**

   In order to standardize methods used to estimate projected future encounters of mass-marked fish in sampling programs, SFEC requests the following information:

   - Identify representative CWT groups (e.g., key or indicator stocks from each region) for each mass-marked stock for the following three brood years:

     Coho = BYs 2006–2008, Chinook = BYs 2004–2006.

Example format for providing representative CWT groups:

Mass-Marked Stock	Brood Year	Tag Code(s)	Comments

Appendix C. Mark-Selective Fishery Proposal Template.

2014 TEMPLATE FOR MARK-SELECTIVE FISHERY PROPOSALS (WORD VERSION)

Mark-Selective Fishery Proposal ID #_____
Date Received _____

MARK-SELECTIVE FISHERY PROPOSALS - TITLE

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 (coast wide) 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 methods to estimate the unmarked tagged mortalities for DIT groups, or for appropriate release mortality rates to be used.**

Appendix D. Mark-Selective Fishery Proposal Spreadsheet Template.

Template 2 for MSF Proposals Year 2014

Fishery Information						Other regulations			CWT stocks		Sampling program						Other sources of info for estimation of unmarked mortalities and mark ratios
Agency	Contact Information	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 (direct or voluntary)	Tag Detection method	Are All Tags Processed?	Mark Rate	Legal/ Sublegal	Other sampling (release mortality rate, compliance)	

Appendix E. Status of Mass Marking Proposals Received in 2013 for Mass Marking to Occur in 2014.

Description of Proposal and Agency	New or Continuation Proposal	SFEC Proposal Number
Coho Salmon		
Southern BC Coho – CDFO	Continuation	MM-FOC-01-2014
Puget Sound Coho – WDFW/Tribal	Continuation	MM-WDFW-01-2014
Washington Coast Coho – WDFW/Tribal	Continuation	MM-WDFW-04-2014
Washington Columbia River Coho – WDFW	Continuation	MM-WDFW-05-2014
Columbia River Coho – USFWS	Continuation	MM-USFWS-04-2014
Puget Sound and WA Coast Coho – USFWS	Continuation	MM-USFWS-18-2014
Columbia River Coho – ODFW	Continuation	MM-ODFW-04-2014
Oregon Coast Coho – ODFW	Continuation	MM-ODFW-05-2014
Chinook Salmon		
Alaska Cook Inlet Chinook - ADFG	Continuation	MM-ADFG-01-2014
Columbia River Chinook – USFWS	Continuation	MM-USFWS-17-2014
WA Coast Fall Chinook – USFWS	Continuation	MM-USFWS-19-2014
Willamette River Spring Chinook – ODFW	Continuation	MM-ODFW-01-2014
OR North Coast Spring Chinook – ODFW	Continuation	MM-ODFW-02-2014
OR South Coast Spring Chinook – ODFW	Continuation	MM-ODFW-03-2014
Columbia River Fall Chinook – ODFW	Continuation	MM-ODFW-06-2014
OR Coast Fall Chinook – ODFW	Continuation	MM-ODFW-07-2014
Mid-Columbia R Spring Chinook – ODFW	Continuation	MM-ODFW-08-2014
Snake River Fall Chinook – ODFW	Continuation	MM-ODFW-09-2014
Snake River Spring Chinook – ODFW	Continuation	MM-ODFW-10-2014
Puget Sound Chinook – WDFW/Tribal	Continuation	MM-WDFW-02-2014
Columbia R. Chinook – WDFW/CRITFC	Continuation	MM-WDFW-03-2014
Washington Coastal Chinook – WDFW/Tribal	Continuation	MM-WDFW-06-2014
Snake River Fall Chinook – IDFG[1]	Continuation	MM-IDFG-05-2014

[1] The mass marking proposed by IDFG was included in ODFW's proposal #MM-ODFW-09-2014.

Appendix F. Status of Annual Pre-season Proposals for Mark-Selective Fisheries.

Fishery, Location, Target Stock by Agency[1]	Proposal ID[2]	Most Recent Proposal[3]	Years with MSF since 2003[4]
Fisheries and Oceans Canada			
Sport, Southern BC, on hatchery Coho	MSF-FOC-02	2014	2003-2013
FSC, Lower Fraser freshwater, on hatchery Coho	MSF-FOC-03	2014	2006-2013
Commercial, Southern BC, on hatchery Coho	MSF-FOC-05	2014	2005-2013
Sport, Lower Fraser freshwater, on hatchery Coho	MSF-FOC-06	2014	2003-2013
Sport, Strait of Juan de Fuca, on hatchery Chinook	MSF-FOC-07	2014	2008-2013
Sport, WCVI, selected subareas, mainly inside, Chinook	MSF-FOC-08	2011	none
Oregon Department of Fish and Wildlife			
Sport, Willamette R, on hatchery Willamette spring Chinook	MSF-ODFW-01	2014	2003-2013
Sport, Oregon Coast, on hatchery fall Chinook Salmon	MSF-ODFW-02	2014	2008-2013
Sport, Oregon coast, on hatchery Coho	MSF-ODFW-03	2014	2003-2013
Commercial, Lower Columbia River (from Buoy 10 upstream to Beacon Rock), on hatchery Chinook.[5]	MSF-ODFW-04	2013	2003-2013
Commercial, Lower Columbia River (from Buoy 10 upstream to Beacon Rock), on hatchery Coho.[5]	MSF-ODFW-05	2013	2013
Washington Department of Fish and Wildlife			
Sport, Skykomish R, on hatchery Chinook	MSF-WDFW-01	2014	2003-2013
Sport, Yakima River, spring Chinook	MSF-WDFW-03	2014	2004,2008, 2010-2013
Sport, L Snake River, hatchery fall Chinook	MSF-WDFW-05	2014	2008-2013
Sport, Washington coast areas 1-4 & Col R Buoy 10, on hatchery Coho	MSF-WDFW-06	2014	2003-2013
Sport, Puget Sound, on hatchery Coho	MSF-WDFW-07	2014	2003-2013
Sport, Puyallup & Carbon R, on hatchery Chinook	MSF-WDFW-09	2014	2003-2013
Sport, Upper Skagit R on hatchery Chinook	MSF-WDFW-12	2014	2005-2013
Sport, Nooksack R, on hatchery Chinook	MSF-WDFW-13	2014	2004-2013
Sport, Nisqually R on hatchery Chinook	MSF-WDFW-14	2014	2005-2013
Commercial, WA areas 1-4, on hatchery Coho	MSF-WDFW-15	2014	2003-2013

1 Fishery, location, target stock for each Agency: Name of fishery, its location, and which stock is targeted under mark selective fishery regulations.

2 Proposal ID: The proposal number assigned by the PSC secretariat on receipt of pre-season MSF proposal from agency. This ID number remains the same for MSFs that are conducted with little change every year.

3 Most recent MSF proposal: Most recent year that a proposal was received from the agency for this particular MSF.

4 This indicates the years (after 2002, the year SFEC began requested proposals from agencies) that each MSF actually occurred and, therefore, a post-season report is required to be submitted to SFEC. Some Coho fisheries began as early as 1998.

5 2014 Fisheries now included in MSF-ODFW/WDFW-07 joint proposal.

Fishery, Location, Target Stock by Agency[1]	Proposal ID[2]	Most Recent Proposal[3]	Years with MSF since 2003[4]
Sport, Nooksack River, hatchery Coho	MSF-WDFW-18	2011	2003-2011
Sport, WA Coast Area 1-4, hatchery fall Chinook	MSF-WDFW-19	2014	2010-2013
Sport, Skokomish River, hatchery Chinook	MSF-WDFW-20	2014	2010-2013
Sport, Willapa Bay, tributaries, Coho	MSF-WDFW-22	2014	2003-2013
Sport, Grays Harbor, Marine Area 2.2, Coho	MSF-WDFW-23	2014	2010-2013
Sport, Grays Harbor, tributaries, Coho	MSF-WDFW-24	2014	2003-2013
Commercial, Willapa Bay, Chinook	MSF-WDFW-25	2014	2010-2013
Sport, Willapa Bay, Marine Area 2.1, Chinook	MSF-WDFW-26	2014	2010-2013
Sport, Willapa Bay, tributaries, Chinook	MSF-WDFW-27	2014	2010-2013
Sport, Snake River, spring Chinook	MSF-WDFW-28	2014	2010-2013
Sport, Willapa Bay, Marine Area 2.1, Coho	MSF-WDFW-29	2014	2010-2013
Commercial, Grays Harbor, Marine Area 2C, Coho	MSF-WDFW-30	2011	2009-2010
Sport, Quillayute River, Coho	MSF-WDFW-31	2014	2003-2013
Sport, Quillayute River system, hatchery spr/sum Chinook	MSF-WDFW-32	2014	2003-2013
Sport, Hoh River, hatchery spring Chinook	MSF-WDFW-33	2014	2008-2013
Sport summer, WA areas 5-13, on hatchery Chinook[6]	MSF-WDFW-35	2014	2003-2013[7]
Sport winter, WA areas 5-13, on hatchery Chinook[8]	MSF-WDFW-36	2014	2005-2013[9]
Sport, Snohomish R., on hatchery Chinook	MSF-WDFW-37	2014	2013
Commercial, Grays Harbor areas 2A,2B,2C,2D, Chinook	MSF-WDFW-38	2014	2013
Sport, Lower Grand Ronde, spring Chinook	MSF-WDFW-39	2014	2013
Sport, Skagit R., hatchery Coho	MSF-WDFW-40	2014	**New**
Sport, Samish R., hatchery Coho	MSF-WDFW-41	2014	**New**
Oregon and Washington Departments of Fish and Wildlife (jointly for Columbia River)			
Sport, Lower Columbia R, on hatchery spring Chinook	MSF-ODFW/WDFW-01	2014	2003-2013
Sport, Columbia R, on hatchery Columbia sum Chinook	MSF-ODFW/WDFW-02	2014	2003-2013
Commercial, Lower Columbia R, on hatchery spring Chinook (large and tangle net)	MSF-ODFW/WDFW-03	2014	2003-2013
Sport, Lower Columbia R on hatchery Coho (since 1999)	MSF-ODFW/WDFW-04	2014	2003-2013
Sport, Columbia R., on hatchery fall Chinook	MSF-ODFW/WDFW-05	2014	2011-2013

6 Proposals **MSF-WDFW-02** (Areas 5 and 6) and **MSF-WDFW-11** (Areas 9, 10, 11 and 13) were both incorporated into **MSF-WDFW-35** in 2012. This proposal covers all summer sport MSFs for Puget Sound (Areas 5-13).

7 Actual implementation of summer MSFs for Chinook in Puget Sound was step-wise over time, with areas added over the years as follows: Areas 5 and 6 summer sport MSF began in 2003 (proposal ID: **MSF-WDFW-02)**; Areas 9, 10, 11, and 13 began in summer 2007 (proposal ID: **MSF-WDFW-11**). Each of these MSFs has continued each summer thereafter.

8 Proposal **MSF-WDFW-36** in 2012 covers all sport MSF areas of Puget Sound (Areas 5-13) during the winter time period (October-April); whereas, in previous years (2005-2011) of WDFW's equivalent winter sport MSF proposal for Puget Sound (proposal ID number: **MSF-WDFW-16**), fewer marine areas were included – i.e., limited to areas 6, 7, 8-1, 8-2, 9 & 10.

9 Actual implementation of winter MSFs for Chinook in Puget Sound was step-wise over time, with areas added over the years as follows: Areas 8-1 and 8-2 winter sport MSF began in October 2005-April 2006 (proposal ID: **MSF-WDFW-08**); Area 10 began in December 2007-January 2008; Area 7 began in February 2008; and Area 9 began in January 16-April 15, 2008. Each of these MSFs has continued each winter thereafter.

Fishery, Location, Target Stock by Agency[1]	Proposal ID[2]	Most Recent Proposal[3]	Years with MSF since 2003[4]
Commercial, Lower Columbia River (from Buoy 10 upstream to Beacon Rock), on hatchery Coho[10]	MSF-ODFW/WDFW-06	2014	2013
Commercial, Lower Columbia River (from Buoy 10 upstream to Beacon Rock), on hatchery Chinook (Coho, secondarily)[11]	MSF-ODFW/WDFW-07	2014	2013
Idaho Department of Fish and Game			
Sport, Snake River, on fall Chinook	MSF-IDFG-04	2014	2009-2013

[10] Proposal **MSF-ODFW/WDFW-06** was originally submitted as **MSF-ODFW-05** in 2013 but the proposal ID was changed to continue the joint proposal numbering sequence.

[11] Proposal **MSF-ODFW/WDFW-07** was originally submitted as **MSF-ODFW-04** in 2013 but the proposal ID was changed to continue the joint proposal numbering sequence.

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

Region	Stock Representation	Indicator Stocks	DIT
BC North Coast	North Coast Wild	Zolzap	
	Skeena	Toboggan	
Interior Fraser	Thompson River	Coldwater (Spius Hatchery) Eagle River	
Georgia Basin	East Coast Vancouver Island	Big Qualicum Goldstream River	
	Lower Fraser	Inch Creek	√
	North Vancouver Island	Quinsam River	√
	North Vancouver Island Wild	Keogh	
West Coast Van Is.	West Coast Vancouver Island	Robertson Creek	
Puget Sound	Nooksack	Skookum Creek H. Lummi Bay Ponds	
	Skagit	Skagit (Marblemount H.) Baker River Wild	√
	Stillaguamish/Snohomish	Skykomish (Wallace River) Tulalip Bay (Bernie Gobin)	√
	Mid Puget Sound	Green River (Soos Creek H.)	√
	South Puget Sound	Puyallup (Voights Creek H.) Peale Pass (Squaxin Net Pens) Nisqually (Kalama Creek H.)	√
	Hood Canal Wild	Big Beef Creek	
	North Hood Canal	Quilcene NFH Quilcene Net Pens Port Gamble Net Pens	√
	South Hood Canal	George Adams H.	√
	Dungeness	Dungeness H.	
	Strait of Juan de Fuca	Lower Elwha H.	√
Washington Coast	North Coast	Makah NFH Solduc (fall run)	**(dropped)** √
	North Central Coast	Queets Wild Queets (Salmon R. Fish Culture)	 √
	Quinault	Quinault NFH	√
	Grays Harbor	Chehalis R. Wild Satsop Springs Ponds Satsop (Bingham Cr. H, late) Satsop (Bingham Cr. H., early)	 √
	Willapa Bay	Forks Creek H. (late fall run) Forks Creek H. Nemah R. H. Naselle H.	 √
Columbia Basin	Lower Columbia River	Lewis River (Type N and S) Eagle Creek Sandy River Tanner Cr.	√ √ √ **new in 2012**
Oregon Coast	Oregon South Coast	Rogue River (Cole Rivers)	

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

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

Appendix I. Mark-Selective Fishery Post-Season Report Templates.

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

Appendix Table I.1. Coded-wire-tag sampling methods and processing of tags in all fisheries and escapement locations. This information is required for choice of estimation of impacts on unmarked fish.

B2: Agency		***WDFW***		**E2: Year** ***2011***			
		Chinook Salmon			**Coho Salmon**		
Region	**Sector**	**CWT Sampling Method**	**Tag Detection Method**	**Tags Processed**	**CWT Sampling Method**	**Tag Detection Method**	**Tags Processed**
Ocean	Troll	Direct	Electronic	All	Direct	Electronic	All
Strait of Juan De Fuca	Troll	Direct	Electronic	All	Direct	Electronic	All
Strait of Juan De Fuca	Sport	Direct	Electronic	All	Direct	Electronic	All
Puget Sound	Net	Direct	Electronic	All	Direct	Electronic	All
Area 8/8A	Sport	Direct	Electronic	All	Direct	Electronic	All
Freshwater	Sport	None	None	NA	None	None	NA
Freshwater	Net	Direct	Electronic	All	Direct	Electronic	All

Instructions for Table I.1:

Cell	**Description**
B2	Enter Agency Name
E2	Enter Fishing Year

Sampling information is to be provided in two sections. The sampling programs described in Section 1 are presumed to apply, unless specifically noted in Section 2.

One entry per region and fishery sector as appropriate

Column	**Description**
Region	Fishery Reporting Region
Sector	Troll, Sport, Net, First Nations, or Personal Use
CWT Sampling Method	Direct, Voluntary, or None
CWT Detection Method	Visual or Electronic
Heads Processed	All, Only Marked Fish, or Other (describe)

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). This table provides information on actual implementation of MSFs proposed for season.

B2: Agency			F2: Year									I2: Estimate Type													
Fishery Information						MSF Regulations						Sampling program						Estimated Catches and Releases								Release Mortality Rates	
																		Marked Fish				Unmarked Fish					
Contact Information	Fishery Area	Fishery type	Start Date (MM/DD/YY)	End Date (MM/DD/YY)	Target Species for Fishery	MSF Species	Bag limits adult and juvenile by mark status	Lower Size Limit	Upper Size Limit	Other	CWT sampling method	CWT Detection method	Heads Processed	Mark Rate	Method for Catch Estimation	Method for Release Estimation	Retained	Legal Sized Fish Released	Sub-Legal Sized Fish Released	Extra-Legal Sized Fish Released	Retained	Legal Sized Fish Released	Sub-Legal Sized Fish Released	Extra-Legal Sized Fish Released	Legal and Extra-Legal Sized Fish	Sub-Legal Sized Fish

Instructions for Table I.2:

Cell	Description
B2	Enter Agency Name
F2	Enter Fishing Year
I2	Preliminary
	Final

One entry per each MSF regulation (e.g., revision in retention or gear restrictions)

FISHERY INFORMATION	
Column	**Description**
Contact Information	Name, phone number, email address for additional information
Fishery Area	Area covered by MSF regulation
Sector	Troll
	Sport
	Gillnet
	Seine
	Personal Use
	Other
Start Date (MM/DD/YY)	Starting date for MSF regulation
End Date (MM/DD/YY)	Ending Date for MSF Regulation
Target Species for Fishery	Chinook
	Coho
	Other
MSF REGULATIONS	
Column	**Description**
MSF Species	Chinook
	Coho
	Other
Bag limits adult and juvenile by mark status	Describe retention limits (e.g., marked fish only, marked only adults, 1 marked adult, 2 jacks regardless of mark status)
Minimum Size Limit	Minimum size limit for retention. Specify unit of measurement (inches, centimeters) and type of measurement (e.g., total length, fork length)
Maximum Size Limit	Maximum size limit for retention if applicable). Specify unit of measurement (inches, centimeters) and type of measurement (e.g., total length, fork length)
Other regulations	Enter information on other applicable restrictions (e.g., barbless hooks, live boxes, tangle nets, mesh size)

CWT SAMPLING	
Column	**Description**
CWT Sampling Method	Direct
	Voluntary
	None
CWT Detection Method	Visual
	Electronic
Heads Processed	All
	Only Marked Fish
	Other (describe)
Mark Rate	Enter method to estimate mark rate (None, Observer, Angler interviews, Samplers)
Method For Catch Estimation	Enter method to estimate catches (None, Catch Slips/Tickets, Phone survey, Observer, Angler interviews, Creel Census, Catch Record Card, Log Books)
Method For Release Estimation	Enter method to estimate releases (None, Catch Slips/Tickets, Phone survey, Observer, Angler interviews, Creel Census, Catch Record Card, Log Books)
(UN)MARKED FISH	
Column	**Description**
Retained	Number of fish retained (if unavailable, enter NA)
Legal Sized Fish Released	Number of legal-sized fish released (if unavailable, enter NA)
Sub-Legal Sized Fish Released	Number of Sub-Legal Sized fish released (if unavailable, enter NA)
Extra-Legal Sized Fish Released	Number of fish above the maximum size limit released (as applicable, (if unavailable, enter NA).
Extra-Legal Sized Fish Released	Number of fish above the maximum size limit released (as applicable, (if unavailable, enter NA).
RELEASE MORTALITY RATES	
Column	**Description**
Legal and Extra Legal Sized Fish	Assumed total mortality rate for fish larger than the minimum size limit that are released (immediate and delayed)
Sub-Legal	Assumed total mortality rate for fish smaller than the minimum size limit that are released (immediate and delayed)

Appendix J. Hatchery fish proposed to be released in 2014, by mark and tag status, for Southern B.C., Washington, Columbia River, Snake River, and Oregon Coast.

These summaries include only stocks listed in the mass mark proposals received; therefore, Chinook releases in B.C. are not listed below. Double index tag groups are highlighted green and also denoted by an asterisk.

Coho Salmon				Number to be Tagged (CWTs)		Number to be Untagged	
Region	**Sub-Area**	**Hatchery**	**Stock**	**Ad+CWT**	**CWT Only**	**Ad Only**	**No Clip**
Georgia Strait	Lower Fraser	Alouette R	Alouette R S			25,000	
		Chehalis R	Chehalis R			700,000	
		Chilliwack R	Chilliwack R			800,000	
		Hoy Cr	Hoy Cr			5,000	
		Hyde Cr/LWFR	Hyde Cr/LWFR			5,000	
		Inch Cr	Inch Cr*	50,000	50,000	50,000	
		Inch Cr	Norrish Cr			150,000	
		Inch Cr	Stave R			76,000	
		Kanaka Cr	Kanaka Cr			28,000	
		L Chilliwack	Chilliwack R			10,000	
		Poco Hatchery	Coquitlam R			20,000	
		Ravine Pk	Chilliwack R			10,000	
	Georgia Basin East	Capilano R	Capilano R			525,000	
		Chapman Cr	Chapman Cr			110,000	
		Noons Cr	Noons Cr			10,000	
		Reed Point/Ioco	Seymour R/GSMN			7,500	
		Seymour R	Seymour R/GSMN			40,000	
		Tenderfoot Cr	Cheakamus R			90,000	
		Tenderfoot Cr	Mamquam R			60,000	
		Tenderfoot Cr	Tenderfoot Cr			150,000	
		Westridge Term	Seymour R/GSMN			7,500	
		Inch Cr	Nicomekl R			75,000	
		Inch Cr	Serpentine R			75,000	
		L Campbell R	L Campbell R			30,000	
	Georgia Basin West	Big Qualicum R	Big Qualicum R	40,000		560,000	
		Fanny Bay/GSVI	Coal Cr			8,000	
		Fanny Bay/GSVI	Rosewall Cr			100,000	
		Goldstream R	Goldstream R				150,000
		Little R/GSVI	Little R/GSVI			30,000	
		Nanaimo R	Chase R				7,500
		Nanaimo R	Nanaimo R				84,000
		Oyster R	Oyster R				40,000
		Saanich Seapens	Goldstream R			25,000	
	Johnstone St	P Hardy/Quatse	Cluxewe R			100,000	
		P Hardy/Quatse	Quatse R			100,000	
		Quinsam R	Quinsam R*	120,000	40,000	490,000	
		Woss Comm H	Nimpkish R				23,350
	Interior Fraser	Spius Cr	Eagle R	65,000			
		Spius Cr	Salmon R/TOMF				35,000
		Thompson R N	Dunn Cr				20,000
		Spius Cr	Coldwater R	65,000			
	Georgia Strait Total			**340,000**	**90,000**	**4,472,000**	**359,850**

Coho Salmon (continued)				Number to be Tagged (CWTs)		Number to be Untagged	
Region	**Sub-Area**	**Hatchery**	**Stock**	**Ad+CWT**	**CWT Only**	**Ad Only**	**No Clip**
West Coast Vancouver Island	NW Vancouver Is	Conuma R	Conuma R			50,000	
		P Hardy/Quatse	Waukwaas Cr			100,000	
	SW Vancouver Is	Juan de Fuca SRS	Sooke R				5,000
		Nitinat R	Nitinat R			200,000	
		Robertson Cr	Robertson Cr	40,000		160,000	
		Thornton Cr	Thornton Cr			25,000	
	WCVI Total			**40,000**		**535,000**	**5,000**
Puget Sound	N. Puget Sound	Baker Lake	Baker River			60,000	
		Glenwood Springs	Glenwood Springs			100,000	
		Lummi Bay Sea Pens	Lummi Bay	50,000		950,000	
		Skookum Creek	Skookum Creek	50,000		950,000	
		Marblemount	Skagit (Clark Cr)*	45,000	45,000	160,000	
		NF Stillaguamish	Fortson Creek	50,000			
		Wallace River	Skykomish (May)*	45,000	45,000	60,000	
		Bernie Gobin	Skykomish (May Cr)	50,000		950,000	
		NWSSC Everett NP	Skykomish (May Cr)			20,000	
		NWSSC - Eagle Creek	Skykomish (May Cr)			54,000	
		Laebugten Net Pens	Issaquah Creek			25,000	
		Issaquah	Issaquah Creek	50,000		400,000	
		Soos Creek	Green R (Soos Cr)*	45,000	45,000	510,000	
		Keta Cr / Crisp Cr	Green R (Soos Cr)	50,000		450,000	
		Elliott Bay Net Pens	Green R (Soos Cr)	50,000		345,000	
		NWSSC Des Moines	Green R (Soos Cr)			30,000	
		Marine Tech Center	MTC / Soos Creek			10,000	
	S. Puget Sound	Voights Creek	Puyallup (Voights)*	45,000	45,000	690,000	
		Clarks Creek	Puyallup (Voights)			3,200	
		Puyallup Tribal	Puyallup (Voights)	100,000			
		Minter Creek	Minter Cr	50,000		450,000	
		SSNP/Squaxin NP	Skykomish (May Cr)	50,000		1,750,000	
		Kalama Creek	Kalama Cr	45,000		355,000	
	Hood Canal	Quilcene	Big Quilcene*	72,000	72,000	256,000	
		Quilcene Bay NP	GA (Purdy Creek)	40,000		110,000	
		Port Gamble NP	Big Quilcene R	45,000		355,000	
		George Adams	GA (Purdy Creek)*	45,000	45,000	210,000	
	Strait of Juan de Fuca	Dungeness	Dungeness			500,000	
		Lower Elwha	Elwha River*	75,000	75,000	275,000	
	Puget Sound Total			**1,052,000**	**372,000**	**10,028,200**	**0**
WA Coast	North Coast	Makah NFH	Makah	55,000		185,000	
		Quinault	Quinault*	80,000	80,000	500,000	
		Educket Creek	Sooes River			40,000	
		Solduc	Solduc summers			100,000	
		Solduc	Solduc falls*	75,000	75,000	250,000	
		Salmon River	Salmon River*	75,000	75,000	500,000	
	Grays Harbor	Humptulips	Humptulips			400,000	
		Humptulips	Humptulips lates			100,000	
		Friends Landing	Satsop River			25,000	
		Mayr Brothers	Wishkah River			300,000	
		Buzzard Creek	Wishkah River			25,000	
		Lake Aberdeen	Van Winkle			30,000	
		Bingham Creek	Satsop River*	75,000	75,000		
		Bingham Creek	Satsop Lates			150,000	
		Satsop Springs	Satsop River			450,000	

Coho Salmon (continued)				Number to be Tagged (CWTs)		Number to be Untagged	
Region	**Sub-Area**	**Hatchery**	**Stock**	**Ad+CWT**	**CWT Only**	**Ad Only**	**No Clip**
WA Coast	Grays Harbor	Skookumchuck	Satsop River			50,000	
		Skookumchuck	Satsop lates	50,000			
		Carlisle Lake	Satsop River			50,000	
		Carlisle Lake	Satsop lates			50,000	
		Eight Creek	Satsop lates			100,000	
		Westport Net Pens	Humptulips River			100,000	
	Willapa	Forks Creek	Willapa River*	75,000	75,000	50,000	
		Forks Creek	Willapa lates			100,000	
		Naselle	Naselle River			1,200,000	
		Naselle	Naselle River lates			200,000	
	WA Coast Total			**485,000**	**380,000**	**4,955,000**	**0**
Columbia River	Washington	Deep River Net Pens	Type S	30,000		970,000	
		Grays River	Grays R-Type N	45,000		105,000	
		Cowlitz	Cowlitz-Type N (w)	978,000			
		Cowlitz	Cowlitz-Type N			1,200,000	
		N Toutle	Toutle-Type S	45,000		105,000	
		Kalama Falls	Kalama F.-Type N	45,000		555,000	
		Fallert Creek	Kalama Falls-Type S	45,000		55,000	
		Speelyai Bay NP	Lewis River-Type S			475,000	
		Lewis River	Lewis R-Type N*	75,000	75,000	275,000	
		Lewis River	Lewis R-Type S*	75,000	75,000	950,000	
		Washougal	Washougal-Type N	45,000		105,000	
		Washougal (Klick.)	Washougal-Type N	70,000		2,430,000	
		Klickitat	Klickitat-Type N	47,000		953,000	
		Twisp Acc. Pond	Mid-CR Type S		90,000		
		Rolfings Pond	Mid-CR Type S		100,000		
		Nason Wetlands	Mid-CR Type S		105,000		
		Coulter Pond	Mid-CR Type S		125,000		
		Butcher Pond	Mid-CR Type S		148,000		
		Beaver C Acc. Pond	Mid-CR Type S		97,000		
		Winthrop NFH	Wenatchee		250,000		
		Cascade Hatchery	Wenatchee		650,000		
		Willard NFH	Wenatchee		550,000		
	Oregon	Eagle Creek NFH	Eagle Creek*	25,000	25,000	300,000	
		Eagle Creek NFH	Clearwater River		30,000		245,000
		Eagle Creek NFH	Clearwater River		30,000		245,000
		Eagle Creek NFH	Eagle Cr/ Yakima R		400,000	100,000	
		Big Creek	Big Creek 13	25,000		510,000	
		Klaskanine	Big Creek 13	25,000		725,000	
		Salmon R	Big Creek 13	25,000		175,000	
		Cascade	Tanner 14	175,000		2,070,000	
		Oxbow	Tanner 14*	50,000	50,000	395,000	
		Sandy	Sandy 11	25,000		275,000	
		Cascade	Umatilla 91		100,000	900,000	
	Columbia River Total			**1,850,000**	**2,900,000**	**13,628,000**	**490,000**
OR Coast		Nehalem	Nehalem 32			100,000	
		Trask	Trask 34			200,000	
		Cole Rivers	Rogue R 52	25,000		175,000	
		Rock Creek	Cow Cr 18			60,000	
	OR Coast Total			**25,000**	**0**	**535,000**	**0**

Chinook Salmon – Spring and Summer Runs				**Number to be Tagged (CWTs)**		**Number to be Untagged**	
Region	**Sub-Area**	**Hatchery**	**Stock**	**Ad+CWT**	**CWT Only**	**Ad Only**	**No clip**
Puget Sound	Puget Sound	Kendall Creek	NF Nooksack springs	200,000		550,000	
		Skookum Creek	SF Nooksack springs		1,000,000		
		Marblemount	Skagit River springs *	277,500	200,000	110,000	
		Hupp Springs	White River springs	400,000			
		White River	White River springs		340,000		
		White River	White River springs 1+		55,000		
	Strait of Juan de Fuca	Dungeness	Dungeness R springs		50,000		
		Hurd Creek	Dungeness R springs 1+		50,000		
		Greywolf Acc.	Dungeness R springs 0+		50,000		
		Up Dungeness Acc	Dungeness R springs 0+		50,000		
	Puget Sound Spring Chinook Total			**877,500**	**1,795,000**	**660,000**	
	Puget Sound	Marblemount	Skagit R summers	200,000			
		Whitehorse	NF Stillaguamish summers	220,000			
		Bernie Gobin	Skykomish R summers	100,000		1,600,000	
		Wallace River	Skykomish R summers *	200,000	200,000	600,000	
		Wallace River	Skykomish R summers 1+			500,000	
	Puget Sound Summer Chinook Total			**720,000**	**200,000**	**2,700,000**	
WA Coast	WA Coast	SolDuc	SolDuc summers 0+	70,000			
		SolDuc	SolDuc summers 1+	80,000		170,000	
		Bear Springs	SolDuc spring/summers		50,000		
	WA Coast Spring/Summer Chinook Total			**150,000**	**50,000**	**170,000**	
Colum-bia R.	WA	Entiat NFH	Entiat - summers 1+	200,000		200,000	
		Chelan Falls	Wells - summers 1+	576,000			
		Dryden Pond	Wenatchee - summers 1+	500,001			
		Wells	Wells - summers	484,000			
		Wells	Wells - summers 1+	320,000			
		Carlton Pond	Methow/Okanogan sum 1+	200,000			
		Similkameen Pond	Methow/Okanogan sum 1+	167,000			
	Columbia River Summer Chinook Total			**2,447,001**	**0**	**200,000**	**0**
	WA	Cathlamet NP	Cowlitz - springs 1+	50,000		200,000	
		Cowlitz	Cowlitz - springs fall release	100,000		400,000	
		Cowlitz	Cowlitz - springs 1+	200,000		1,093,529	
		Frds of the Cowlitz	Cowlitz - springs 1+			55,000	
		Fallert Creek	Kalama - springs 1+	125,000			
		Gobar Pond	Kalama - springs 1+	125,000		250,000	
		Lewis River	Lewis River - springs 1+ *	150,000	150,000	800,000	
		Speelyai	Lewis River - springs 1+				15,000
		Muddy R Acc Pond	Lewis River - springs 1+		50,000		
		Echo Net Pens	Lewis River - springs 1+			150,000	
		Clear C Acc Pond	Lewis River - springs 1+		35,000		
		Carson NFH	Carson - springs 1+	75,000		1,045,000	
		Carson NFH	Carson - springs 1+	50,000		200,000	

Chinook Salmon – Spring and Summer Runs (continued)				**Number to be Tagged (CWTs)**		**Number to be Untagged**	
Region	**Sub-Area**	**Hatchery**	**Stock**	**Ad+CWT**	**CWT Only**	**Ad Only**	**No clip**
Colum-	WA	Willard NFH	L White Salmon springs 1+	25,000		232,000	
bia R.		L White Salm. NFH	L White Salmon springs 1+	75,000		693,000	
		L White Salm. NFH	White - Wenatchee Spr 1+		150,000		
		Klickitat	Klickitat - springs 1+	140,000		460,000	
		Tucannon	Tucannon - springs 1+		225,000		
		Chiwawa Pond	Chiwawa - springs 1+	204,452			
		Leavenworth NFH	Leavenworth - springs 1+	200,000		1,000,000	
		Winthrop NFH	Methow - springs 1+	610,000			
		Methow	Methow - springs 1+		135,000		
		Twisp	Twisp - springs 1+		30,000		
	OR	Willamette	So. Santiam 24 springs	60,000		661,000	
		Willamette	Willamette 22 springs	575,000		1,839,000	
		So. Santiam	So. Santiam 24 springs	50,000		250,000	
		Eagle Cr	Clackamas 19 springs	40,000		176,000	
		Bonneville	Clackamas 19 springs	100,000		545,000	
		Marion Fk	No. Santiam 21 springs	155,000		1,080,000	
		McKenzie	McKenzie 23 springs	333,000		475,000	
		Warm Springs NFH	Warm springs - springs 1+	770,000			
		Umatilla	Umatilla 91 springs	130,000	170,000	580,000	
		Round Butte	Hood River 50 springs	80,000		10,000	
		Round Butte	Deschutes 66 springs	264,000			
	Columbia River Spring Chinook Total			**4,686,452**	**945,000**	**12,194,529**	**15,000**
	Snake	Irrigon	Lookingglass 81	136,000		136,000	
	River	Lookingglass	Catherine 201	94,000		47,000	
		Lookingglass	Up.Grande Ronde 80	120,000	120,000		
		Lookingglass	Lostine 200	135,000		100,000	
		Lookingglass	Imnaha 29	234,000		50,000	
		Kooskia NFH	Kooskia - Spr 1+	100,000		550,000	50,000
		Dworshak NFH	Dworshak - Spr 1+	120,000		930,000	
	Snake River Spring Chinook Total			**939,000**	**120,000**	**1,813,000**	**50,000**
OR	North	Cedar Creek	Nestucca 47	25,000		85,000	
Coast		Trask River	Trask 34	30,000		223,000	
	South	Cole Rivers	Rogue R 52	90,000		1,782,000	
		Rock Creek	Umpqua R 55			340,000	
	OR Coast Spring Chinook Total			**145,000**	**0**	**2,430,000**	**0**

Chinook Salmon – Fall Run				**Number to be Tagged (CWTs)**		**Number to be Untagged**	
Region	**Sub-Area**	**Hatchery**	**Stock**	**Ad+CWT**	**CWT Only**	**Ad Only**	**No clip**
Puget Sound	Puget Sound	Glenwood Springs	Glenwood Springs falls	100,000		450,000	
		Lummi Sea Ponds	Samish River falls			500,000	
		Whatcom Creek	Samish River Cr falls			500,000	
		Samish	Samish River falls *	200,000	200,000	3,600,000	
		Soos Creek	Big Soos Creek falls *	200,000	200,000	2,800,000	
		Icy Creek	Big Soos Creek falls 1+			300,000	
		Palmer Pnd / Keta C	Big Soos Creek falls			1,000,000	
		Issaquah	Issaquah Creek falls			2,000,000	
		Minter Creek	Minter Creek falls 0+			1,400,000	
		Hupp Springs	Minter Creek falls 1+	75,000		45,000	
		Gorst Creek	Grovers Creek falls			1,580,000	
		Grovers Creek	Grovers Creek falls *	200,000	200,000	25,000	
		Clarks Creek	Puyallup River falls	180,000		220,000	
		Voights Creek	Voights Creek falls	90,000		1,510,000	
		Garrison Springs	Garrison Springs falls			850,000	
		Clear Creek	Clear Creek falls *	200,000	200,000	3,100,000	
		Kalama Creek	Kalama Creek falls	100,000		500,000	
		Tumwater Falls	Deschutes River falls			3,800,000	
	Hood Canal	George Adams	George Adams falls *	225,000	225,000	3,350,000	
		RFEG 6	George Adams falls		80,000		
		Hoodsport	Hoodsport falls	200,000		2,600,000	
		Hoodsport	Hoodsport falls 1+			120,000	
	Strait of Juan de Fuca	Morse Creek	Elwha River falls 1+		200,000		
		Elwha	Elwha River falls				2,500,000
		Elwha	Elwha River falls 1+		200,000		
		Hoko Falls	Hoko River falls	200,000		220,000	
	Puget Sound Fall Chinook Total			**1,970,000**	**1,505,000**	**30,470,000**	**2,500,000**
WA Coast		Makah NFH	Sooes River	200,000		2,100,000	
		Educket Creek	Sooes River falls			100,000	
		Salmon River	Queets River falls	200,000			
		Quinault River	Quinault River falls *	200,000	200,000		
		Humptulips	Humptulips River falls			500,000	
		Lake Aberdeen	Van Winkle Creek falls			50,000	
		Wishkah (Mayr B)	Wishkah River falls			200,000	
		Bingham Creek	Satsop River falls			200,000	
		Satsop Springs	Satsop River falls			300,000	
		Forks Creek	Willapa River falls *	200,000	200,000	2,800,000	
		Nemah	Nemah River falls			3,000,000	
		Naselle	Naselle River falls	100,000		700,000	
	WA Coast Fall Chinook Total			**900,000**	**400,000**	**9,950,000**	**0**
Colum-bia R.	Washington	Beaver Creek	Elochoman - Wild Falls		190,000		
		Deep R Net Pens	Elochoman - Falls	90,000		910,000	
		Cowlitz	Cowlitz - Falls	1,100,000			
		Cowlitz	Cowlitz - Falls			400,000	
		Cowlitz	Cowlitz - Falls	100,000		1,900,000	
		N Toutle	Toutle - Falls	100,000		1,300,000	
		Kalama Falls	Kalama - Falls	125,000		3,375,000	
		Fallert Creek	Kalama - Falls	125,000		3,375,000	

Chinook Salmon – Fall Run (continued)				**Number to be Tagged (CWTs)**		**Number to be Untagged**	
Region	**Sub-Area**	**Hatchery**	**Stock**	**Ad+CWT**	**CWT Only**	**Ad Only**	**No clip**
Colum-bia R.	WA	Lewis River	Lewis River - Falls (wild)	100,000			
		Washougal	Washougal - Falls	150,000		2,850,000	
		Spring Creek NFH	Spring Creek - Tule *	405,000	405,000	9,690,000	
		L White Salm NFH	Spring Creek - Tule Falls	200,000		1,500,000	
		L White Salm NFH	L White Salm - URBs *	200,000	200,000	4,100,000	
		L White Salm NFH	L White Salmon - URBs	200,000		1,500,000	
		Klickitat	Klickitat - falls	450,000		3,600,000	
		Hanford Reach	Hanford - Wild	200,000			
		Ringold	URBs	200,000		3,250,000	
		Priest Rapids	Priest Rapids – URBs *	600,000	600,000	5,825,543	
	Oregon	Big Creek	Big Creek Tule 13 *	200,000	200,000	4,750,000	
		Big Creek	Big Creek Tule 13	50,000			
		Bonneville	Spring Cr Tule 60	150,000		4,300,000	
		Bonneville	URB LW Salmon 95	150,000		2,350,000	
		Bonneville	Umatilla 91	240,000	240,000		
	Columbia River Fall Chinook Total			**5,135,000**	**1,835,000**	**54,975,543**	**0**
Snake River		Lyons Ferry	Lyons Ferry - Falls	400,000			
		Lyons Ferry	Lyons Ferry - Falls 1+	225,000	225,000		
		Irrigon (LSRCP)	Snake River (Hells Can)	200,000	0		200,000
		Irrigon (IDFG)	Snake River	228,054	156	651,123	413
		Umatilla	Umatilla 91	300,000	300,000[1]		
	Snake River Fall Chinook Total			**1,353,054**	**525,156**	**651,123**	**200,413**
OR Coast		Trask River	Trask R 34	30,000		108,000	
		Salmon River	Salmon R 36	200,000			
		Cedar Creek	Nestucca 47			100,000	
		Millicoma	Coos River 37	30,000		70,000	
		Noble	Coos River 37	30,000		570,000	
		Morgan	Coos River 37	60,000		1,032,500	
		Rock Creek	Cow Creek 18			225,000	
		Gardiner STEP	Smith R 151			170,000	
		Bandon	Coos River 37			300,000	
		Elk River	Elk River 35	315,000			10,000
		Elk River	Chetco 96	35,000		200,000	
		Indian Creek	Lower Rogue 61			90,000	
		Cole Rivers	Coos River 37	30,000		170,000	
		Cole Rivers	Coquille 44			174,500	
	OR Coast Fall Chinook Total			**730,000**	**0**	**3,210,000**	**10,000**

[1] Agency-only wire.