PACIFIC SALMON COMMISSION
SELECTIVE FISHERIES EVALUATION COMMITTEE

MASS MARKING AND MARK SELECTIVE FISHERIES FOR 2002

REPORT SFEC (04)-2

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

June 2004

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1 EXECUTIVE SUMMARY

This report provides information on mass marking, mark-selective fisheries and fishery sampling for Oregon, Washington, British Columbia, and Alaska during 2002. The information includes numbers of mass marked fish released, Double Index Tagging, electronic tag detection capabilities, and implementation of mark-selective fisheries .

Releases of mass marked coho in 2002 (2000 brood) from Canadian and U.S. hatcheries occurred largely as planned. Releases totaled 46.6 M compared to 45.3M in 2001. Participating facilities extend from the Columbia and Snake Rivers to the north end of Vancouver Island. There is no mass marking in California, north/central BC or Alaska.

Mass marking of 2000 and 2001 brood chinook from U.S. hatcheries occurred largely as planned. Yearling releases of mass marked chinook continued to increase (from 12.3M 1999 brood to 22.5M 2000 brood). Sub-yearling releases were similar to the 34.1M 2000 brood mass marked chinook released in 2001. Participating facilities extend from the Columbia and Snake Rivers to Puget Sound. There is no mass marking in California, British Columbia or Alaska.

Coho Mark-Selective Fisheries occurred from the Columbia River, along coastal Oregon and Washington, within Puget Sound, within the Strait of Georgia and along the west coast of Vancouver Island. Chinook Mark-Selective Fisheries are much more restricted, with MSFs only occurring in selected areas of the Columbia River and Puget Sound.

Sampling for coded-wire tags in the presence of mass marked fish requires the implementation of electronic detection programs. Not all areas have implemented electronic detection protocols. In particular, Alaska maintains a visual sampling program and Canada relies on the Voluntary Head Recovery Program to obtain tags from anglers.

There are a number of outstanding data management issues related to the implementation of mass marking and mark-selective fisheries. These include the need for reporting imputed mortalities of unmarked CWT recoveries, validation of historic data, standardized data queries and a fisheries regulations file.

2 INTRODUCTION

This report provides information on mass marking (MM), mark-selective fisheries (MSF) and fishery sampling for Oregon, Washington, British Columbia, and Alaska during

2002. This report did not cover releases from the Idaho Department of Fish and Game facilities. The information includes numbers of mass marked fish released, Double Index Tagging (DIT), electronic tag detection (ETD) capabilities, and implementation of mark-selective fisheries.

Information is included for Canadian Department of Fisheries & Oceans (CDFO), Washington Department of Fish & Wildlife (WDFW), Member Tribes of the Northwest Indian Fisheries Commission (NWIFC), U.S. Fish & Wildlife Service (USFWS), Alaska Department of Fish and Game, and Oregon Department of Fish & Wildlife (ODFW).

The information and data presented in this report was compiled by informal means by members of the Regional Coordination Working Group (RCWG) of the PSC Selective Fisheries Evaluation Committee (SFEC). It is anticipated that preparation of future reports will be greatly facilitated by the implementation of the protocols and procedures for mass marking and mark-selective fisheries which were adopted by the PSC in November 2002.

3 COHO

3.1 Releases of Mass Marked Coho in 2002 (2000 Brood)

3.1.1 Summary of Mass Marking

Releases of mass marked 2000 brood coho from Canadian and U.S. hatcheries occurred largely as planned. Approximately 78.3% of the 59.5M releases were marked. There were no significant changes from previous years (45.3M mass marked coho were released in 2001 vs. 46.6M in 2002). Participating facilities extend from the Columbia and Snake Rivers to the north end of Vancouver Island. There is no mass marking in California, north/central BC or Alaska. The majority of coho were released as smolts in 2002, with relatively small numbers released as fry in 2001. Fry releases are generally not mass marked, although some groups may be tagged with or without an adipose clip.

Smolt releases, by agency, are summarized in the following table. Adipose mark numbers include both mass marked and adipose-clipped coded-wire tagged releases. Details of individual releases can be found in the Regional Mark Information System (RMIS) database maintained by the Pacific States Marine Fisheries Commission.

Regional Summary of Coho Mass Marked Releases in 2002 (2000 Brood)

Area	Agency	Actual Releases (millions)		Planned Releases (millions)	
		Total Release	Total Adipose Marks	Total Release)	Total Adipose Marks
Straight of Georgia	CDFO	10.0	7.8	7.7	6.6
West Coast Vancouver Island	CDFO	1.4	1.3	1.2	1.1
Puget Sound	WDFW	7.2	6.8	6.6	6.2
	NWIFC	6.9	4.3	6.6	5.0
	USFWS	0.4	0.4	0.5	0.4
Coastal Washington	WDFW	5.7	5.5	6.3	6.1
	NWIFC	1.0	0.2	1.0	0.4
	USFWS	0.9	0.7	1.0	0.7
Columbia River	WDFW	12.1	9.5	12.2	9.4
	USFWS	5.0	3.0	4.8	2.9
	ODFW	7.5	5.8	6.9	4.9
Coastal Oregon	ODFW	1.4	1.3	0.9	0.7
TOTAL ALL AREAS		59.5	46.6	55.7	44.4

3.1.1.1 Canada

Within Canada, 18% more fish were clipped than originally planned. Experience with mass marking and selective fisheries resulted in fewer fish being left unclipped at mass marking sites and several small sites were added. Previously there were concerns that effort may be high on hatchery stocks so some hatcheries did not mark 100% to ensure adequate escapement. The original plan only included total releases for those sites participating in mass marking. Actual releases show all enhanced smolt releases (an extra 1.3M).

3.1.1.2 Puget Sound

Marking occurred essentially as planned.

3.1.1.3 Coastal Washington

Marking occurred essentially as planned.

3.1.1.4 Coastal Oregon

Marking and releases were higher than planned.

3.1.1.5 Columbia River

At WDFW facilities, marking occurred as planned. One group of 2.5M coho released into the Klickitat River was not mass marked due to a tribal / state agreement. Marking and total releases from ODFW facilities were also lower than planned.

3.1.2 Summary of Coho DIT Releases in 2002

Marking of Coho Double Index Tag stocks

Region	Natural/Unmarked Stock Representation	DIT Stock	Hatchery	Clipped	Unclipped
Strait of Georgia	East Coast Vancouver Island	Big Qualicum	Big Qualicum	41,543	40,890
	Lower Fraser	Chilliwack	Chilliwack	38,726	38,821
	East Coast Vancouver Island	Goldstream River	Goldstream River	19,556	19,874
	Lower Fraser	Inch Creek	Inch Creek	39,998	40,157
	North Vancouver Island	Quinsam R.	Quinsam River	42,665	42,972
Thompson River	Thompson River	Coldwater R.	Spius Cr.	39,490	31,303
West Coast Vancouver Is.	West Coast Vancouver Island	Robertson Cr.	Robertson Cr.	40,317	40,834
Puget Sound	Nooksack	Nooksack	WDFW Kendall Cr.	47,137	48,990
	Skagit	Skagit	WDFW Marblemount	32,142	32,892
	Stillaguamish/Snohomish	Skykomish	WDFW Wallace R.	39,558	39,344
	Mid Puget Sound	Green River	WDFW Soos Cr.	42,078	43,775
	South Puget Sound	Puyallup	WDFW Voights Cr.	37,556	41,580
	North Hood Canal	Quilcene	USFWS Quilcene Natl.	49,313	48,793
	Quilcene Net Pens (Hood Canal)	Quilcene	Quilcene Net Pens	48,280	45,880
	South Hood Canal	George Adams	WDFW George Adams	43,687	43,518
	Strait of Juan de Fuca	Elwha	Lower Elwha Tribal	71,192	71,362
Washington Coast	North Coast	Solduc	WDFW Solduc	72,532	73,114
	North Central Coast	Queets	Quinault Salmon R.	72,223	71,585
	Grays Harbour	Satsop	WDFW Bingham Cr.	71,665	71,016
	Willipa Bay	Forks Creek	WDFW Forks Creek	73,031	73,402
Columbia River	Lower Columbia River	Lewis River	WDFW Lewis River	144,605	147,207
	Lower Columbia River	Tanner Creek	ODFW Youngs Bay	0	0
	Lower Columbia River	Sandy	ODFW Sandy	26,997	27,883
	Umatilla River	Tanner Creek	ODFW Cascade	26,505	26,487
	Yakima River	Tanner Creek	ODFW Cascade	0	0
Oregon Coast	Oregon North Coast	Nehalem R.	ODFW Nehalem	47,686	49,539
	Oregon North Central Coast	Salmon River	ODFW Salmon River	24,880	24,753
	Oregon South Central Coast	Rock Creek	ODFW Rock Cr.	0	0
	Oregon South Coast	Rogue River	ODFW Cole River	33,560	33,121

The only changes from 2001 DIT stocks involve the dropping of three groups previously tagged by ODFW:

- Tanner Creek stock -Young's Bay: Coho DIT groups formerly released in Young's Bay were eliminated because there was no capability for escapement accounting.
- Tanner Creek stock –Umatilla River: Coho DIT groups eliminated at request of the tribes.
- Rock Creek: Coho DIT groups were eliminated due to limited freshwater sampling and budget constraints.

3.2 Fisheries Sampling for Coded-Wire Tagged Coho in 2002

This section summarises all fisheries (MSF and non-MSF) and the associated coded-wire tag sampling programs.

3.2.1 Alaska

ADFG continues traditional (adipose-mark) visual CWT sampling for coho salmon, with no plans to convert to electronic sampling. Catch and Sample information is summarized in the table below.

Region	Fishery	Estimated Catch	Sampled for CWT	Type of Sampling (electronic, visual, voluntary)
SEAK	Ocean Net	812,645	162,198 (20%)	Visual
SEAK	Ocean Troll	1,308,649	473,497 (36%)	Visual
SEAK	Ocean Sport	277,150	42,634 (15%)	Visual

3.2.1.1 Problems/Issues

None identified.

3.2.2 Canada

Canada's management objective for coho in 2002 was to limit the exploitation rate on Thompson River coho to a ceiling of 3% across all Canadian fisheries. There was no retention of unclipped coho in southern BC recreational or commercial fisheries, apart from some terminal sport fisheries along the WCVI and a very limited experimental fishery in the terminal portion of Area 23 (Alberni Inlet). Some First Nations retained unclipped coho, usually caught incidental to another target species.

Wands were used to sample the few coho that were landed in commercial fisheries. Recreational coho fisheries in southern BC were direct sampled with wands by Creel Survey staff for the presence of CWT. Anglers continued to submit heads to the Voluntary Head Recovery Program for all areas of BC.

Catch and Sample information is summarized in the table below. The North Region is all areas north of Vancouver Island. The Outside Region is all areas on the west coast of Vancouver Island. The Inside Region is all areas on the east side of Vancouver Island.

Region	Fishery	Estimated Catch	Sampled for CWT	Type of Sampling (electronic, visual, voluntary)
North	Net	2,636	3,173 (120.4%)	Electronic
	Troll	127,315	13,406 (10.5%)	Electronic
	Sport	20,257	2,191 (10.8%)	Visual/Voluntary
Outside	Net	1,082	16 (1.5%)	Electronic
	Troll	0	0	Electronic
	Sport	27,794	3,063 (11%)	Electronic/Voluntary
Inside	Net	443	492 (111%)	Electronic
	Troll	8	17 (212.5%)	Electronic
	Sport	4,562	125 (2.7%)	Electronic/Voluntary

3.2.2.1 Problems/Issues

Estimates of catch are preliminary. If the sample is greater than catch, the most likely reason is misidentification/retention during coho non-retention periods. Samplers report the catch, even if it is not reported on the saleslip. When the sample exceeds catch a value of 1.0 is assigned to any random recoveries in the stratum.

Sport sample rates are those reported sampled for CWT by creel surveyors. However, there were many problems with wanding, including anecdotal reports of unreliable wands. In 2003, the plan is to collect heads from all coho sampled, not just those which "beep". It is suggested that wands generally work, but that they may not be suited to the sport sampling environment.

- Low volume of fish, so not a lot of practice for samplers to get a feel for the device.
- The work area is not wand friendly, with metal everywhere.
- The samplers also multi-task. They cover all species and have only a few minutes to complete an interview.
- Some wands have needed to be repaired, requiring sufficient numbers of wands for back-up. Corrosion, continuous beeping, not beeping, no audio or light are the most frequent reasons for repair.

Of the tags recovered, the majority came from heads turned in by anglers to the Voluntary Head Recovery Program (visual sample) rather from the Creel Surveyors. Few unclipped DIT coho were recovered in B.C. sport fisheries (8 in 2002) which were not mark-selective.

3.2.3 Puget Sound

Fisheries in Puget Sound were limited by impacts on Canada's Thompson River coho and Stillaguamish River coho. The coastal mark-selective fisheries extended through the Washington side of the Strait of Juan de Fuca into Puget Sound to Port Townsend (Areas 5 and 6) in 2002. The most southern portion of Puget Sound (Area 13) was also mark-selective for coho as was the San Juans (Area 7) from August 1 through September 30. Reef net fisheries in the San Juans (Areas 7 and 7A) targeting sockeye salmon between July 1 and Oct 6 were allowed to retain marked coho salmon, but had to release unmarked coho.

Region	Fishery	Estimated Catch	Sampled for CWT	Type of Sampling (electronic, visual, voluntary)
Puget Sound	Puget Sound Sport	73,196	20%	Electronic
	Puget Sound Net	305,492	34%	Electronic

3.2.3.1 Problems/Issues

No major problems were encountered with the electronic detection equipment. However, some wands continue to exhibit the problem with becoming hypersensitive.

3.2.4 Washington Coast

Washington ocean fisheries were limited by impacts on Oregon coastal coho and Columbia River Wild coho. Selective recreational fisheries for retention of marked hatchery coho salmon (2000 brood) occurred in all four ocean areas from Cape Falcon, Oregon to the U.S./Canada border. The area from Cape Falcon, Oregon to Leadbetter Point had a small (5,000 coho quota) non-treaty commercial troll mark-selective fishery for coho.

Region	Fishery	Estimated Catch	Sampled for CWT	Type of Sampling (electronic, visual, voluntary)
Ocean	Ocean Sport	77,205	48%	Electronic
	Troll	17,749	26%	Electronic
	Coastal Sport	1,806	25%	Electronic
	Coastal Net	66,288	29%	Electronic

3.2.4.1 Problems/Issues

None identified.

3.2.5 Oregon Coast

Coho recovered at hatcheries, on spawning grounds and in commercial or recreational fisheries were sampled electronically. R9500 tube detectors were used at hatchery facilities. Wands were used in all sampling programs.

Monitoring of Oregon selective fisheries was conducted onboard fishing boats and dockside with the emphasis on estimating catch and effort, the ratio of marked to unmarked coho, the number of coho that dropped-off the hook prior to being brought to the boat, and the number of unmarked coho handled and released. These data were used to estimate mortalities that could be attributed to the fish that dropped-off and unmarked fish that were released.

Oregon also collected information to characterize fishing gear and methods, and hook wound locations. The Oregon Department of Fish and Wildlife and the Oregon State

Police worked cooperatively to enforce mark-selective fishery regulations and collect data on illegal harvest of unmarked fish.

Region	Fishery	Estimated Catch	Sampled for CWT	Type of Sampling (electronic, visual, voluntary)
Oregon Coast	Sport	36,537	13,269 (36.0%)	Electronic
	Troll	1,515	346 (22.8%)	Electronic

3.2.5.1 Problems/Issues

Some wands exhibited hypersensitivity resulting in unnecessary snout collection.

3.2.6 Columbia River

Region	Fishery	Estimated Catch	Sampled for CWT	Type of Sampling (electronic, visual, voluntary)
Columbia R. (Or)	Buoy 10	3,113	1,325 (42.6%)	Electronic
	Lower River	3,011	484 (16.1%)	Electronic
Columbia R. (Wa)	Buoy 10 Sport	3,033	(34%)	Electronic

3.2.6.1 Problems/Issues

None identified

3.3 Coho Mark-Selective Fisheries in 2002

3.3.1 Summary of MSF Sampling and Monitoring

Sampling and monitoring programs conducted for Mark-Selective Fisheries are summarized in the following table. Non-MSF fisheries are not included.

Region	Fishery	Sampling & Monitoring Conducted				
		CWT	Encounter	Observers	Mortality	Compliance
Alaska	No MSF					
Canada	St of Georgia Sport	Creel & voluntary	Creel, guide logbook, test fishing	no	no	no
	WCVI sport	Creel & voluntary	Creel, guide logbook, test fishing	no	no	no
Puget Sound	Area 5,6 sport coho	Creel @ 22.6%	Creel, test fishing	no	no	yes
	Area 7 sport coho	Creel @ 15.2%	Creel	no	no	yes
	Area 7 Reefnet coho	Creel @ 0%	No	no	no	yes
	Area 13 sport coho	Creel @ 11.3%	Creel	no	no	yes
Coastal Washington	Area 1 sport coho	Creel @47%	Creel, observers	yes	no	yes
	Area 2 sport coho	Creel @ 45%	Creel, observers	yes	no	yes
	Area 3 sport coho	Creel @73%	Creel, logbooks	no	no	yes
	Area 4 sport coho	Creel # 42%	Creel, test fishing, observers	yes	no	yes
	Area 1 troll coho	Creel @ 42%	Creel	no	no	yes
Coastal Oregon	Sport Troll	Electronic Electronic	Observer & Creel	yes no	yes no	yes no
Columbia R.	Columbia R	Electronic	Creel	no	yes	Yes
Columbia R.	Buoy 10 sport coho	Creel @ 38%	Creel , observer	yes	no	yes

3.3.2 Alaska

There are no MSF fisheries occurring in Alaska.

3.3.3 Canada

There were no MSF commercial fisheries in Canadian waters. For recreational fisheries, there was non-retention of unclipped coho in the mixed stock areas of southern BC. There was a gradual expansion of hatchery mark-selective fisheries in 2002. Coho MSF were implemented in most of southern BC, including Johnstone Strait, the Strait of Georgia, Juan de Fuca Strait and the West Coast of Vancouver Island. Selective hatchery

mark fisheries were implemented in these areas from August 1 to December 31. MSF in some terminal areas started as early as June 1. Some terminal and freshwater areas included retention of unclipped coho. There are anecdotal reports of anglers selectively keeping adipose clipped coho in areas with mixed bag limits, but no substantiating data.

Further details of fisheries can be found in the post-season report to the Pacific Salmon Commission http://www.psc.org/Pubs/18thAnnualReport.pdf

Region	Fishery	Fishery Period	Regulations	Estimated Catch (retention)	Estimated Mark Rate*
West Coast Vancouver Island	Outside surfline (123, 124)	Aug 1-Sep 30	2 coho, 1 may be unclipped	1722 Clipped / 95 Unclipped	36%
	Outside surfline (125, 126)	Aug 1-Sep 30	2 coho, 1 may be unclipped	68 Clipped / 129 Unclipped	19%
	Inside surfline (23B, 24, 25)	Jun 1-Sep30	2 coho, 1 may be unclipped	4911 Clipped / 9690 Unclipped	30%
	Northern Alberni Inlet (23A)	June 1 – Sep 30	4 coho, 1 may be unclipped	Unknown	Unknown
	Kyuquot (26)	Aug 1-Oct 31	2 coho, 1 may be unclipped	122 Clipped / 12 Unclipped	33%
East Coast Vancouver Island	Georgia St (13-19, 28,29) & Johnstone St (12 & parts of 13)	Aug 1-Oct 31	2 clipped coho	4152 Clipped / 109 Unclipped	33%
	Juan de Fuca (19-20)	Aug 1-Dec 31	2 clipped coho	2918 Clipped / 370 Unclipped	33%
	Terminal Georgia StST (portions of 14, 16, 29)	Jun 1-Dec 31	2 clipped coho	975 Clipped / 0 Unclipped	60%

* mark rate from total legal sized coho encountered

3.3.4 Puget Sound

Region	Fishery	Fishery Period	Regulations	Estimated Catch (retention)	Estimated Mark Rate*
Puget Sound	Area 5,6 sport	Jul 1 – Sep 30	2 fin clipped coho	34,033	35.6%
	Area 7 sport	Aug 1 – Sep 30	2 fin clipped coho	1,762	31%
	Area 7 Reef Net	July 1 – Oct 6 during sockeye	fin clipped coho only	11	unknown
	Area 13 sport	July 1 – Oct 31	2 fin clipped coho	618	87%

* mark rate from total legal sized coho encountered

3.3.5 Coastal Washington

Region	Fishery	Fishery Period	Regulations	Estimated Catch (retention)	Estimated Mark Rate*
Ocean	Area 1 sport	Jul 7 – Sep 30	2 fin clipped coho	59,400	58%
	Area 2 sport	Jun 30 – Aug 19	2 fin clipped coho	19,100	57%
	Area 3 sport	Jul 7 – Sep 8	2 fin clipped coho	1,650	46%
	Area 4 sport	Jul 7 – Sep 8	2 fin clipped coho	8,400	40%
	Area 1 troll	Aug 1 – Sep 8	fin clipped coho only	1,700	58%

* mark rate from total legal sized coho encountered

3.3.6 Coastal Oregon

Selective sport fisheries occurred in ocean areas from Leadbetter Point (WA) to Humbug Mountain and in coastal rivers. Commercial troll fisheries for marked coho occurred in the ocean north of Cape Falcon.

Region	Fishery	Fishery Period	Regulations	Estimated Catch (retention)	Estimated Mark Rate*
Ocean	Sport	July-September	adipose only	36,537	56%
	Troll	July-September	adipose only	1,515	Unknown

* mark rate from total legal sized coho encountered

3.3.7 Columbia River

Selective sport fisheries occurred in the Columbia River in 2002.

Region	Fishery	Fishery Period	Regulations	Estimated Catch (retention)	Estimated Mark Rate*
Columbia R (Or)	Sport	August-October	adipose only	3,011	83.1%
Columbia R. (Wa)	Buoy 10 Sport	Aug 1 – Dec 31	2 fin clipped coho	6,200	74%

* mark rate from total legal sized coho encountered

4 CHINOOK

4.1 Releases of Mass Marked Chinook in 2002 (2000 and 2001 Broods)

4.1.1 Summary of Mass Marking

Mass marking of 2000 and 2001 brood chinook from U.S. hatcheries occurred largely as planned. Yearling releases of mass marked chinook continued to increase (12.3M 1999 brood to 22.5M 2000 brood). Sub-yearling releases were similar to the 34.1M 2000 brood mass marked chinook released in 2001. Participating facilities extend from the Columbia and Snake Rivers to Puget Sound. There is no chinook mass marking in California, British Columbia or Alaska. Adipose mark numbers include both mass marked and adipose-clipped coded-wire tagged releases. Details of individual releases can be found in the Regional Mark Information System (RMIS) database maintained by the Pacific States Marine Fisheries Commission.

Regional Summary Table of Chinook Mass Marked Releases in 2002 – Yearling Smolts (2000 Brood)

Area	Agency	Actual Releases (millions)		Planned Releases (millions)	
		Total Release	Total Adipose Marks	Total Release)	Total Adipose Marks
Puget Sound	WDFW	2.4	1.5	2.0	1.9
	NWIFC	0.2	0.1	0.2	0.1
	USFWS	0	0	0	0
Coastal Washington	WDFW	0.2	0.2	0.2	0.2
	NWIFC	0	0	0	0
	USFWS	0	0	0	0
Columbia River	WDFW	6.4	5.7	7.8	7.3
	USFWS	7.7	7.3	7.8	7.4
	ODFW	7.5	6.2	9.0	8.6
Snake River	USFWS	1.6	1.5	1.7	1.6
Coastal Oregon	ODFW	1.5	0	4.0	?
TOTAL ALL AREAS		27.5	22.5	32.7	28.2

Regional Summary Table of Chinook Mass Marked Releases in 2002 – Sub-Yearling Smolts (2001 Brood)

Area	Agency	Actual Releases (millions)		Planned Releases (millions)	
		Total Release	Total Adipose Marks	Total Release	Total Adipose Marks
Puget Sound	WDFW	34.0	19.8	32.4	27.8
	NWIFC	13.0	10.1	10.0	7.5
	USFWS	0	0	0	0
Coastal Washington	WDFW *	7.9	0	10.6	0
	NWIFC	1.0	0.3	0.4	0.2
	USFWS	3.4	0.5	3.8	0.5
Columbia River	WDFW	33.1	2.5	35.2	2.9
	USFWS	20.0	0.5	20.0	0.5
	ODFW	9.9	3.6	16.7	1.0
Snake River	USFWS	0	0	0	0
Coastal Oregon	ODFW	1.5	0	4.0	1.1
TOTAL ALL AREAS		123.8	37.3	133.1	41.5

* not all releases have been reported.

4.1.1.1 Puget Sound

Tribal releases of fall chinook were higher than planned. This was due to better than expected returns in 2001. Hood Canal chinook were not marked again this year due to lack of agreement between WDFW and the Hood Canal tribes. Otherwise marking for WDFW went as planned.

4.1.1.2 Coastal Washington

For WDFW, marking went as planned. No fall chinook were mass marked.

4.1.1.3 Coastal Oregon

There were no mass marked chinook released, and total releases were below expected.

4.1.1.4 Columbia River

For WDFW facilities, marking went as planned. Fewer fish were released from ODFW facilities, but more were marked than planned.

4.1.2 Summary of Chinook DIT Releases in 2002

Region	Natural/Unmarked Stock Representation	DIT Stock	Hatchery	Clipped	Unclipped
Southern B.C.	Lower Fraser	Chilliwack	Chilliwack	99,171	97,227
	Interior Fraser	Lower Shuswap	Shuswap	101,178	100,338
Puget Sound	Nooksack River spring	Nooksack spring fingerlings	WDFW Kendall Creek	196,282	197,922
	Skagit River springs	Skagit spring yearlings	WDFW Marblemount	74,091	73,356
	White River springs	(none)			
	North Puget Sound summer/fall	Skykomish summer fingerlings	WDFW Wallace River	196,023	197,946
	North Puget Sound fall	Samish fall fingerlings	WDFW Samish	173,971	169,452
	Mid Puget Sound fall	Grovers Cr. fall fingerlings	Suquamish Grovers Cr.	204,413	203,840
		Green R. fall fingerlings	WDFW Soos Cr.	178,119	162,160
	South Puget Sound fall	Nisqually fall fingerlings	Nisqually Hatchery at Clear Creek	216,070	214,059
	Hood Canal fall	George Adams fall fingerlings	WDFW George Adams	223,933	210,039
	Strait of Juan de Fuca	(none)			
Washington Coast	Washington Coast fall fingerling	(none)			
Columbia River	Lower Columbia spring	Lewis R. spring yearlings	WDFW Lewis River	138,374	149,451
	Willamette River spring	Clackamas spring yearlings	ODFW Clackamas River	46,330	48,597
	Willamette River spring	McKenzie spring yearlings	ODFW McKenzie River	45,631	46,464
	Upper Columbia spring/summer	(none)			
	Snake River spring/summer	(none)			
	Snake River fall	(none)			
Oregon Coast		(none)			

4.2 Fisheries Sampling for Coded-Wire Tagged Chinook in 2002

This section summarizes all fisheries (MSF and non-MSF) and the associated coded-wire tag sampling programs.

4.2.1 Alaska

ADFG continues traditional (adipose-mark) visual CWT sampling for chinook salmon, with no plans to convert to electronic sampling

Region	Fishery	Estimated Catch	Sampled for CWT	Type of Sampling (electronic, visual, voluntary)
SEAK	Ocean Net	8,723	1,391 (16%)	Visual
SEAK	Ocean Troll	283,178	111,956 (40%)	Visual
SEAK	Spring Troll	37,610	18,514 (49%)	Visual
SEAK	Ocean Sport	69,537	15,008 (22%)	Visual

4.2.1.1 Problems/Issues

No issues reported.

4.2.2 Canada

The Mark Recovery Program (MRP) conducted electronic sampling in a variety of chinook fisheries. Electronic sampling for both coho and chinook is currently possible because of restricted fisheries. If there is an improvement in commercial fisheries (i.e. more liberal catches of either coho or chinook) the equipment and infrastructure presently in place will be inadequate to support electronic sampling. The program will require an infusion of capital to maintain electronic sampling capability. It should be noted that even with the current fisheries, the equipment support systems in the north will require enhancement, including the purchase or manufacture of support/grading tables and possibly additional sampling technicians.

Region	Fishery	Estimated Catch	Sampled for CWT	Type of Sampling (electronic, visual, voluntary)
North	Net	15,890	8,547 (53.8%)	Electronic
	Troll	103,433	23,153 (22.4%)	Electronic
	Sport	54,669	2,380 (4.4%)	Visual/Voluntary
Outside	Net	11,153	1,274 (11.4%)	Electronic
	Troll	142,915	46,053 (32.2%)	Electronic
	Sport	82,377	7,005 (8.5%)	Electronic/Voluntary
Inside	Net	8,037	4,744 (59.0%)	Electronic
	Troll	632	43 (6.8%)	Electronic
	Sport	52,837	1,968 (3.7%)	Electronic/Voluntary

4.2.2.1 Problems/Issues

Estimates of catch are preliminary. Sport sample numbers are what the creel surveyors reported as being sampling for CWT. However, there were many problems with wanding, including anecdotal reports of unreliable wands. The majority of the tags recovered came from heads turned in by anglers to the Voluntary Head Recovery Program (visual sample).

4.2.3 Puget Sound

The only selective fishery in this area for chinook in 2002 was the Skykomish River fishery. All CWT sampling is electronic.

Region	Fishery	Estimated Catch	Sampled for CWT	Type of Sampling (electronic, visual, voluntary)
Puget Sound	Skykomish River sport	258	0	Not sampled
	Marine Sport	31,140	19%	Electronic
	Net	111,938	30%	Electronic
	Freshwater Sport	4,341	25%	Electronic

4.2.3.1 Problems/Issues

No issues reported.

4.2.4 Washington Coast

There were no mark-selective fisheries for chinook in this area.

Region	Fishery	Estimated Catch	Sampled for CWT	Type of Sampling (electronic, visual, voluntary)
Washington Coast	Coastal Net	9,518	41%	Electronic
	Coastal Sport	2,346	30%	Electronic
	Ocean Sport	66,343	44%	Electronic
	Troll	101,744	28%	Electronic

4.2.4.1 Problems/Issues

No major issues were encountered with ETD. However, repairs and maintenance require back-up equipment for emergency replacement during sampling periods.

WDFW has an inventory of over 300 wands, 25 R-detectors and 15 V-detectors. For the July 2002- June 2003 period, a total of 47 wands, 5 R-detectors and 3 V-detectors were sent into NMT for some type of repair or maintenance. This equates to approximately a 15% annual repair/maintenance rate for the wands.

For this one-year period WDFW spent $16,434.12 on the repair and maintenance of this electronic tag detection equipment. Of this amount, $11,181.42 was spent on nose replacements for 4 wands and $3,349 was spent converting two R-detectors. The remaining $1,904 was spent on battery related items (10 wands and 2 R-detectors), alarm replacements (7 wands), balance, reseal and test (19 wands) and replacing knobs on V-detectors (3). An additional $318 was spent on shipping.

4.2.5 Oregon Coast

Electronic detection is utilized in Oregon in hatchery and spawning areas where mass marked spring chinook return. On some spawning surveys, snouts from all carcasses are removed for later electronic detection in the lab. Additionally, fisheries in Oregon that target mass marked spring chinook are sampled electronically. Oregon has not fully converted to electronic sampling of chinook salmon and in some areas visual sampling was employed.

Region	Fishery	Estimated Catch	Sampled for CWT	Type of Sampling (electronic, visual, voluntary)
Ocean	Sport	47,480	17,742 (37.0%)	Visual
	Troll	319,274	97,392 (30.5%)	Visual

4.2.5.1 Problems/Issues

Visual detection is still used in sampling ocean chinook-directed salmon fisheries, which are not selective for fin mark and largely occur after maturing spring chinook have entered terminal areas. The bulk of the catch is comprised of chinook stocks originating from the Oregon coast and California, which are not mass marked. This allows better utilization of available electronic detection equipment in areas where mass marked salmon are targeted and where they spawn.

4.2.6 Columbia River

Selective fisheries occurred in the Columbia River for spring chinook and minor fisheries occurred for summer chinook in the mainstem of the river. Spring chinook sport fisheries occurred in the area from the mouth upstream to McNary Dam (January through mid-May) and in the Snake River from late April through May. Commercial spring chinook fisheries occurred downstream of Bonneville Dam during late February and early March.

Region	Fishery	Estimated Catch	Sampled for CWT	Type of Sampling (electronic, visual, voluntary)
Columbia R. (Wa)	Sport<Bonneville	20,464 springs	19.1%	Electronic
	Sport<Bonneville	1,352 summers	17.9%	Electronic
	Sport>Bonneville	7,996 springs	2.2%	Electronic
	Sport>Bonneville	60 summers	30.0%	Electronic
	Commercial	14,200 springs	37.2%	Electronic
Willamette R.	Sport	10,457	13.6%	Electronic
Columbia R. (Or)	Sport	20,464	18.0%	Electronic
	Tangle Net	14,238	36.7%	Electronic

4.2.6.1 Problems/Issues

No issues reported.

4.2.7 Chinook Mouth Wanding

The recommended mouth wanding technique was not implemented on all chinook sampled with wands. This was due to the fact that the protective shields were not yet available. However, in Washington and British Columbia, the majority of chinook > 80 cm FL (approx. 20 lbs) encountered by samplers with wands were mouth wanded. This was done as a compromise to minimize the number of potentially missed tags, but to keep the wear on wands to a reasonable level. Inconsistency in wanding technique may affect analysis, raising the potential for the need for a technique field to be reported in RMIS.

4.3 Summary of 2002 Chinook Mark-Selective Fisheries

4.3.1 Summary of MSF Sampling and Monitoring

This section summarizes sampling and monitoring conducted for Mark-Selective Fisheries. Non-MSF fisheries are not included.

Region	Fishery	Sampling & Monitoring Conducted				
		CWT	Encounter	Observers	Mortality	Compliance
Puget Sound	Skykomish River Sport	no	no	no	no	yes
Coastal Washington	none					
Coastal Oregon	none					
Columbia River (Wa)	Sport<Bonneville Spring Chinook	Creel @ 19.1 %	Creel	no	no	yes
	Sport<Bonneville Summer Chinook	Creel @ 17.9%	Creel	no	no	yes
	Sport>Bonneville Spring Chinook	Creel @ 2.2%	Creel	no	no	yes
	Sport>Bonneville Summer Chinook	Creel @ 30%	Creel	no	no	yes
Coastal Oregon	none					
Columbia River (Or)	Willamette R CR Sport Commercial	yes yes yes	yes yes yes	No No yes	yes yes yes	yes yes yes

4.3.2 Canada

There were no MSF commercial or recreational fisheries during 2002 in Canadian waters.

4.3.3 Puget Sound

Region	Fishery	Fishery Period	Regulations	Estimated Catch (retention)	Estimated Mark Rate*
Puget Sound	Skykomish River	Jun 1 – Jul 31	2 fin clipped chinook	258	39.1%

* mark rate from total legal sized chinook encountered

4.3.4 Coastal Oregon

There were no MSF commercial or recreational fisheries during 2002 in Coastal Oregon.

4.3.5 Columbia River

Oregon held recreational mark-selective fisheries for spring chinook salmon in the Columbia River and various tributaries including the Willamette River. Oregon also held an experimental commercial mark-selective fishery for spring chinook in the Columbia River using tangle-net (or tooth-net) gear.

Region	Fishery	Fishery Period	Regulations	Estimated Catch (retention)	Estimated Mark Rate*
Columbia River (Wa)	Sport<Bonneville	Jan. 1 – May 15	2 Fin clipped chinook only	20,464 spring chinook	59%
	Sport<Bonneville	June 28 – July 31	2 Fin clipped chinook only	1,352 summer chinook	59%
	Sport>Bonneville	Jan. 1 – May 15	2 Fin clipped chinook only	7,996 spring chinook	55%
	Sport>Bonneville	July 9 - 31	2 Fin clipped chinook only	60 summer chinook	59%
	Commercial – Tangle Net	Feb. 25- Mar. 27	Fin clipped chinook only	14,238 spring chinook	50%
Willamette R.	Sport	Jan. 1 – July 31	Fin clipped chinook only	10,457	76.6%

* mark rate from total legal sized chinook encountered

5 ELECTRONIC DETECTION RESEARCH

There was no formal research conducted on electronic detection by any agency during 2002.

6 MASS MARKING MACHINE DEVELOPMENTS

Northwest Marine Technology continued work on development of MATS trailers. In 2002 the manufacturer delivered two automatic trailers to WDFW and one trailer to IDF&G. An additional three trailers will be delivered in 2003 to WDFW, ODF&W, and the Nez Perce Tribe.

7 DATA FORMAT MANAGEMENT ISSUES

7.1 Need for Imputed CWT Recoveries in Mark-Selective Fisheries

The CWT has been an effective fish marking tool since the 1970s to provide the fundamental data used for chinook and coho stock assessments and fishery management purposes along the entire Pacific West Coast. Analyses included the contribution and distribution of hatchery and some wild stocks in the various fisheries, escapement areas and the spawning grounds.

MSFs have been employed as a fishery management tool for coho since substantial numbers of marked fish became available in the late 1990s. In MSFs, regulations allow for differential retention of fish based on the absence or presence of the adipose fin. This differential harvest jeopardizes the long standing assumption that CWT marked hatchery stocks can be used to infer life history parameters of their natural origin counterpart stocks.

A system of double index tagging (DIT) was developed for a subset of the coho and chinook Indicator Stocks and added to the CWT marking system to address some of the challenges introduced with MSFs. A DIT is a group of two unique tag codes (or group of codes), one being applied to hatchery fish with an adipose clip while the other is applied a similar group of fish that aren't clipped. As such, the unmarked CWT-only fish look like natural origin fish and would be released if caught in a MSF. The return rate of both groups of fish to the hatchery provides an estimate of the impact on natural fish killed in MSFs.

In practice, there are still complications in constructing the exploitation rate histories of unmarked DIT fish intercepted and then released in MSFs. The root problem is that some of these fish die of their injuries following their release and there is no way to directly sample the post catch release mortality. This necessitates an indirect method with its attendant bias for estimating CWT mortalities or "imputed" mortalities of unmarked DIT fish in MSFs.

There are four different contexts in which imputed CWT recoveries are needed. In addition, separate estimates are needed for chinook and coho:

1) Imputed CWT mortalities would be provided for the unmarked pair of DIT release groups.
2) For other stocks, imputed CWT mortalities would be provided for the single index tagged fish to represent the unclipped fish.

3) Imputed mortalities also are needed to estimate the impact of the MSF on CWT marked groups that represent wild ESA fish.
4) Lastly, imputed CWT mortalities recoveries are needed for fisheries where there is no electronic tag detection (e.g. Alaska). In these cases, the unmarked pair of DIT fish are landed but not sampled.

This poses the question as to who should be required to provide these estimates - the agency conducting the fishery or the agency doing the mass marking of its stocks. If the latter, then there will be a new set of challenges in determining how to update the recovery data provided by the recovery agencies for their respective non-selective fisheries. The procedures for estimating, reporting and exchanging these new data elements have not been resolved.

7.2 Correct Mark Codes of Associated Untagged Fish in the Release Database

During the recent migration from Format 3.2 to 4.0, many agencies opted to have the Regional Mark Processing Center do the conversion rather than resubmit their respective release data files. By default, this resulted in millions of fish being assigned the mark code of '9000' or '9nnn" (Adipose clip unknown). In actuality, one can assume that virtually all non-CWT fish released prior to 1997 would not been adipose clipped, as the long standing Regional Marking Agreement mandated that the adipose clip could only be used with a CWT.

Several agencies have expressed concern that the releasing agencies either fix their data or allow the Mark Center to do a global edit and change the problem releases to a mark code of '0000' (No Adipose clip; No other external marks) or mark code '0009' (No Adipose clip; Unknown or unspecific other marks).

7.3 Validation Checks Needed for DITs in the Release File

DIT releases are identified in the release data file by the 'Related Group Type' field where the code 'D' indicates a double index tag group, and the code 'O' identifies other related groups. A second field, 'Related Group ID' specifies a unique code that is shared by the other group of the DIT or other related release groups. Unfortunately, the release data specifications are somewhat vague and there are cases in the release file where the Related Group ID is unique rather than shared with the other related groups. As such, the database can not be used to identify all DIT groups.

The Mark Center has been advised of this problem and has agreed to identify those release records that are in error and work with the release agencies to correct them. In addition, the Mark Center will add new validation checks to ensure that DIT groups or other related groups have the same 'Related Group ID'.

7.4 Standardized RMIS Queries for Selective Fisheries and Mass Marking

A number of somewhat standardized pieces of information have been requested to expedite the analyses of the Chinook and Coho Technical Committees in evaluating MSF. RMIS is working with members of the committees to define the requirements and feasibility of standard queries to provide this information.

7.5 Continued Need for a Mark-Selective Fisheries Regulations File

The analysis of mark-selective fisheries requires access to the regulations in place during a fishery. Necessary information includes retention regulations, opening and closing dates, location, species, catch limits, gear type, and other restrictions if any. The Data Standards Working Group (DSWG) did discuss Data Sharing Committee's request at some length in December, 2000. However, it was concluded that the exact requirements from an analytical perspective were too nebulous yet to proceed with the development of an all-encompassing and structured regulations file. As a stop gap measure, DSWG added a one character field in the recovery file and the catch/sample file as a flag to indicate mark-selective fisheries.

There is growing urgency to implement this regulations file as MSFs are taking on a new importance. For the immediate future, however, analysts will have to contact each agency directly for any needed MSF information.

7.6 Incomplete Conversion to Data Format 4.0

Not all agencies have successfully converted from PSC Format 3.2 (or even 3.0) to Format 4.0, which is designed to capture information on mass marking. As a result, the Mark Center must pass data files reported in Formats 3.0 to 3.2 through a conversion process. Given that the conversion process is not a linear process, this has the potential of introducing errors. In addition, this has resulted in frequent data processing delays and impacted timeliness of reporting. There have also been reporting errors regarding the identification of MSFs and the type of sampling.

It is imperative that all agencies complete the conversion to Format 4.0 in order to report information in the correct format. Every effort also needs to be used to minimize reporting errors.

8 RECOMMENDATIONS AND UNRESOLVED ISSUES

- The preparation of future SFEC reports should be greatly facilitated by the implementation of the protocols and procedures for mass marking and mark-selective fisheries which were adopted by the PSC in November 2002. However, this will only be possible if all agencies implement the procedures.
- Reporting of MSFs should be incorporated into PSC post-season reporting processes. Currently analysts must contact each agency independently to obtain information

pertaining to MSF regulations. This information should be incorporated into a MSF Regulations File and reported to RMIS, as requested by the Technical Committees.

- The geographical range required for ETD for chinook needs to be determined to ensure that the lack of CWT-only (tagged and unmarked) recoveries in areas without ETD (e.g. Alaska, B.C. sport, coastal Oregon chinook, and California) will not compromise the analysis and estimation of exploitation rates for wild stocks. There is also no long-term commitment from Canada to electronically sample chinook.
- There are continued concerns with the reliability of the ETD equipment, including varying sensitivity of wands and high costs for repairs and maintenance of equipment.
- There are a number of outstanding data management issues related to the implementation of mass marking and mark-selective fisheries. These include the need for reporting imputed CWT mortalities, validation of historic data, standardized data queries and a fisheries regulations file. Many of these tasks involve complicated issues and will require a concerted effort by agency staff and PSC Technical Committees to resolve.