

**HIGH SEAS SALMONID
CODED-WIRE TAG RECOVERY DATA, 2004**

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HIGH SEAS SALMONID CODED-WIRE TAG RECOVERY DATA, 2004

ABSTRACT

Information on high seas recoveries of coded-wire tagged (CWT) salmonids has been reported annually to the International North Pacific Fisheries Commission (1981-1992) and to the North Pacific Anadromous Fish Commission (1993-present). The Regional Mark Processing Center, Pacific States Marine Fisheries Commission, incorporates the CWT recovery data reported in this document into their coastwide, on-line CWT recovery data set (Regional Mark Information System (RMIS), <http://www.rmis.org/index.html>). In this document, release and recovery data for 29 CWT salmonids are reported for the first time. Reported recoveries are from U.S. groundfish (trawl) fisheries in the eastern Bering Sea and Gulf of Alaska portions of the U.S. Exclusive Economic Zone (26 recoveries, including 24 chinook and 2 chum salmon) and from Japanese salmon research vessel operations in the Bering Sea (1 chinook salmon), Gulf of Alaska (1 chinook salmon), and central North Pacific Ocean (1 steelhead trout). Two of the recoveries are slight westward extensions of the known ocean ranges of Cook Inlet and Southeast Alaska chinook salmon in the Bering Sea.

INTRODUCTION

The North Pacific Anadromous Fish Commission (NPAFC) coordinates the examination of high seas commercial and research catches for Pacific salmon and steelhead trout (*Oncorhynchus* spp.) that might contain a coded-wire tag (CWT). Recoveries of coded-wire tagged salmonids in the North Pacific Ocean and Bering Sea have been reported annually to the International North Pacific Fisheries Commission (Dahlberg 1981-1982; Wertheimer and Dahlberg 1983-1984; Dahlberg and Fowler 1985; Dahlberg et al. 1986-1992; Margolis 1985; Margolis et al. 1989; McKinnell et al. 1991) and to the North Pacific Anadromous Fish Commission (Dahlberg et al. 1993-97, Myers et al. 1998-2003). The Regional Mark Processing Center, Pacific States Marine Fisheries Commission, incorporates these data into their coastwide, on-line CWT recovery data set (Regional Mark Information System (RMIS), <http://www.rmis.org/index.html>). After 2002, recoveries of CWT salmon caught by the Pacific hake (*Merluccius productus*) fishery along the U.S. West Coast were no longer reported to the NPAFC. In this document, we list previously unreported data for CWT recoveries in the salmon bycatch of U.S. groundfish (trawl) fisheries for walleye pollock (*Theragra chalcogramma*) in the eastern Bering Sea and Gulf of Alaska portions of the U.S. Exclusive Economic Zone and from salmon research vessel operations in the Bering Sea and North Pacific Ocean. The results are compared to previous recoveries of high seas tags and thermal (otolith) marks reported to the International North Pacific Fisheries Commission (INPFC, 1956-2002) and to NPAFC (2003-present), and significant new information on the ocean ranges and migration patterns of salmon is discussed.

RESULTS AND DISCUSSION

Twenty-four CWT chinook salmon (*O. tshawytscha*) were recovered in the salmon bycatch of the U.S. groundfish (trawl) fisheries in the Bering Sea and Gulf of Alaska (Table 1), and two CWT chinook salmon were recovered during salmon research vessel operations (Table 2). The locations of new recoveries of CWT chinook salmon are shown by province, state, or geographic region in Figures 1-7. One groundfish trawl recovery was a slight westward extension of the known ocean range of Southeast Alaska chinook salmon in the Bering Sea (from 166°25'W to 167°55'W; Fig. 3). One research vessel recovery was a slight westward extension of the known ocean range of Cook Inlet chinook salmon (from 178°14'W to 179°00'W; Fig. 2). Two CWT British Columbia chum salmon (*O. keta*) were recovered in the Bering Sea trawl fishery (Table 3, Fig. 8). One Oregon steelhead trout (*O. mykiss*) was recovered in the central North Pacific Ocean (Table 2, Fig. 9).

ACKNOWLEDGMENTS

Fishermen, processors, observers, and scientists who participated in the 2004 high-seas CWT recovery program are gratefully acknowledged. The North Pacific Groundfish Observer Program, Alaska Fisheries Science Center (AFSC), National Marine Fisheries Service (NMFS), provided snout samples from salmonids lacking

the adipose fin and recovery data collected by observers from the U.S. groundfish fishery. Jerry Berger, AFSC, provided data on catch locations, when observer data accompanying the samples were incomplete or erroneous. Eric Reiter, Auke Bay Laboratory (ABL), AFSC, NMFS, dissected salmon snouts, read CWTs, and coded CWT recovery data. The Fisheries Agency of Japan provided salmonid head samples and accompanying biological and catch data from Japanese salmon research vessels. Robert Walker and Nancy Davis, School of Aquatic and Fishery Sciences, University of Washington, participated in Japanese salmon research vessel recoveries of CWT salmonids. The INPFC/NPAFC high seas tag, CWT tag, and otolith mark recovery databases used in this report are archived at the School of Aquatic and Fishery Sciences, University of Washington, Seattle. ABL provided funding for compilation, reporting, and archiving of INPFC/NPAFC high seas tag and CWT release and recovery data (NOAA Contract No. 50ABNF-1-0002).

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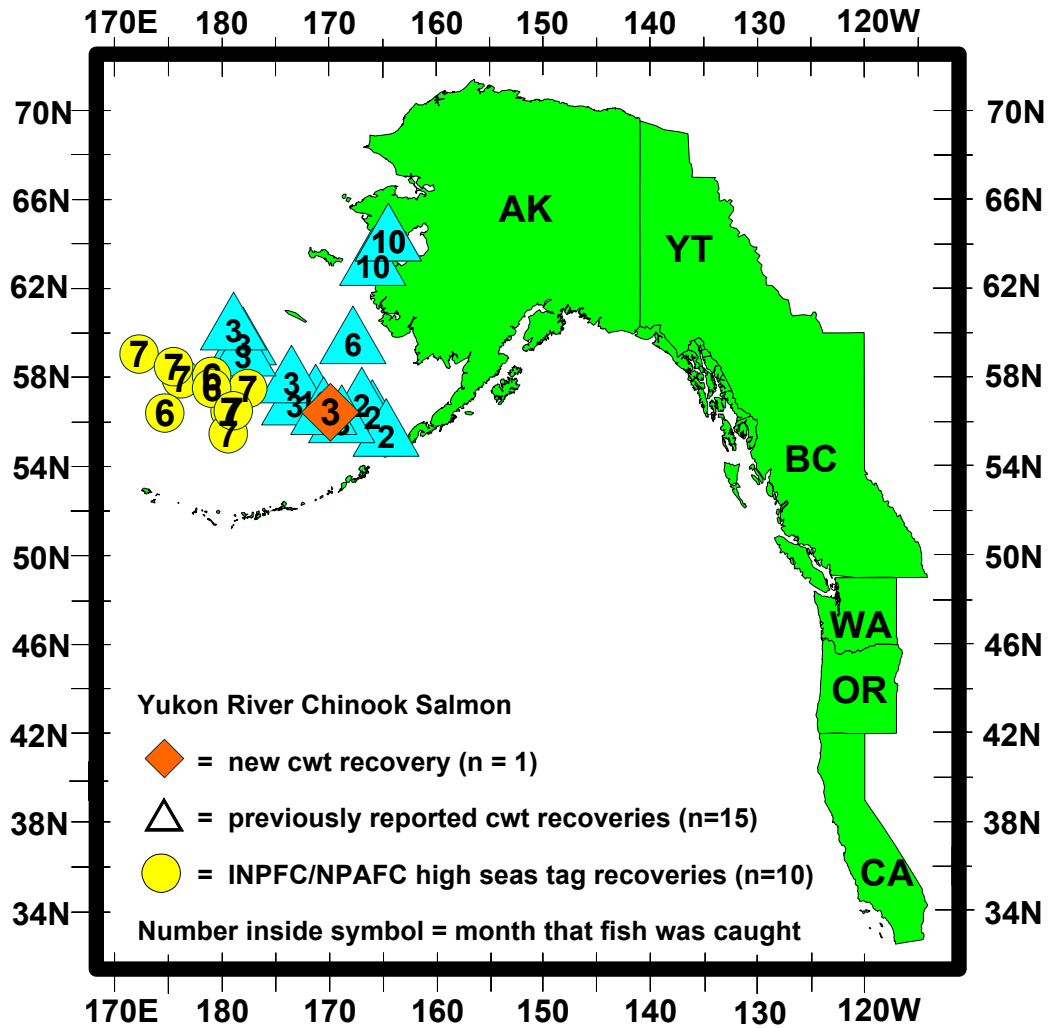


Fig. 1. The ocean distribution of Yukon River chinook salmon, as shown by high seas tag recoveries, 1956-2004. Processing plant recoveries of coded wire tagged (cwt) fish are not included. The geographic location of one new recovery of a cwt fish (Table 1, Fish no. 1) is indicated in the figure by a closed diamond. AK=Alaska, YT=Yukon Territory, BC=British Columbia, WA=Washington, OR=Oregon, CA=California.

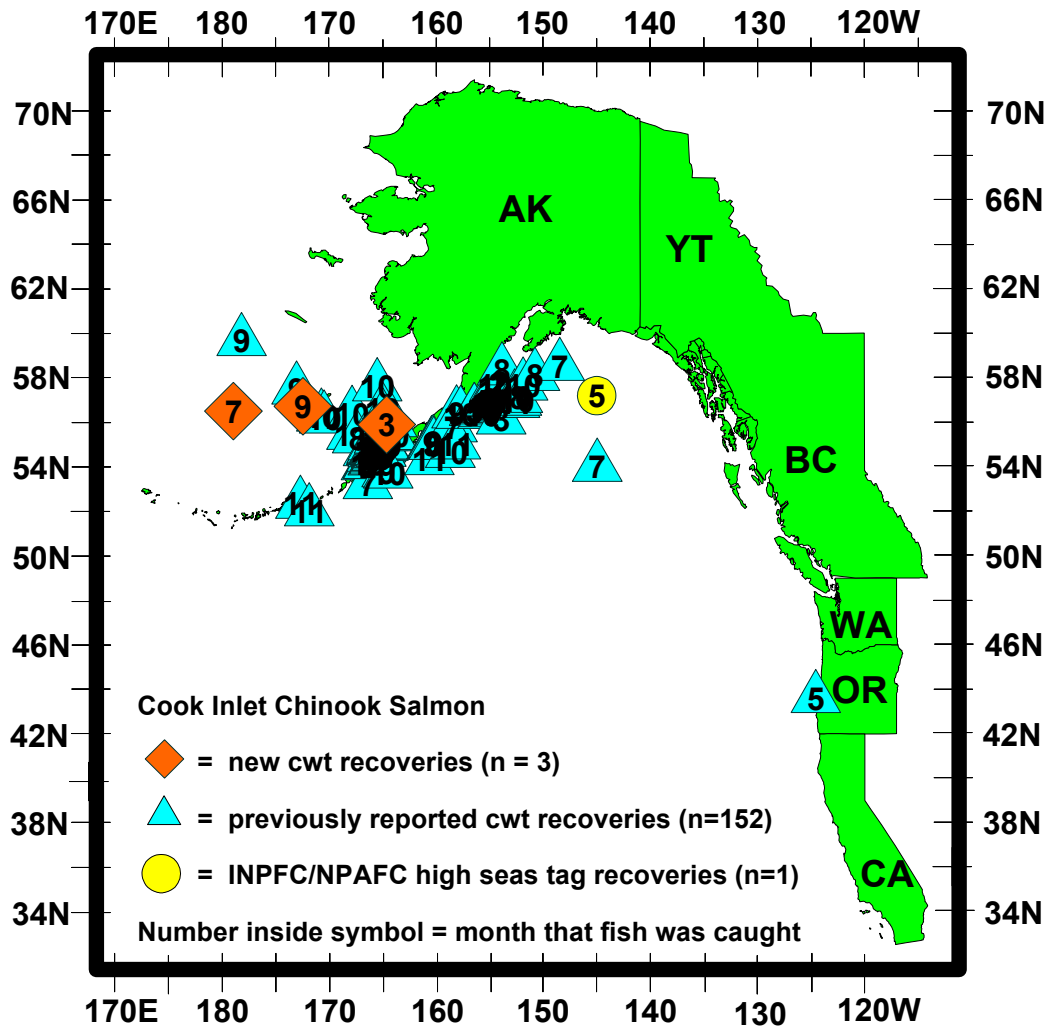


Fig. 2. The ocean distribution of Cook Inlet chinook salmon, as shown by high seas tag recoveries, 1956-2004. Processing plant recoveries of coded wire tagged (cwt) fish are not included. The geographic locations of three new recoveries of cwt fish (Table 1, Fish nos. 3 and 5; Table 2.1) are indicated in the figure by closed diamonds. AK=Alaska, YT=Yukon Territory, BC=British Columbia, WA=Washington, OR=Oregon, CA=California.

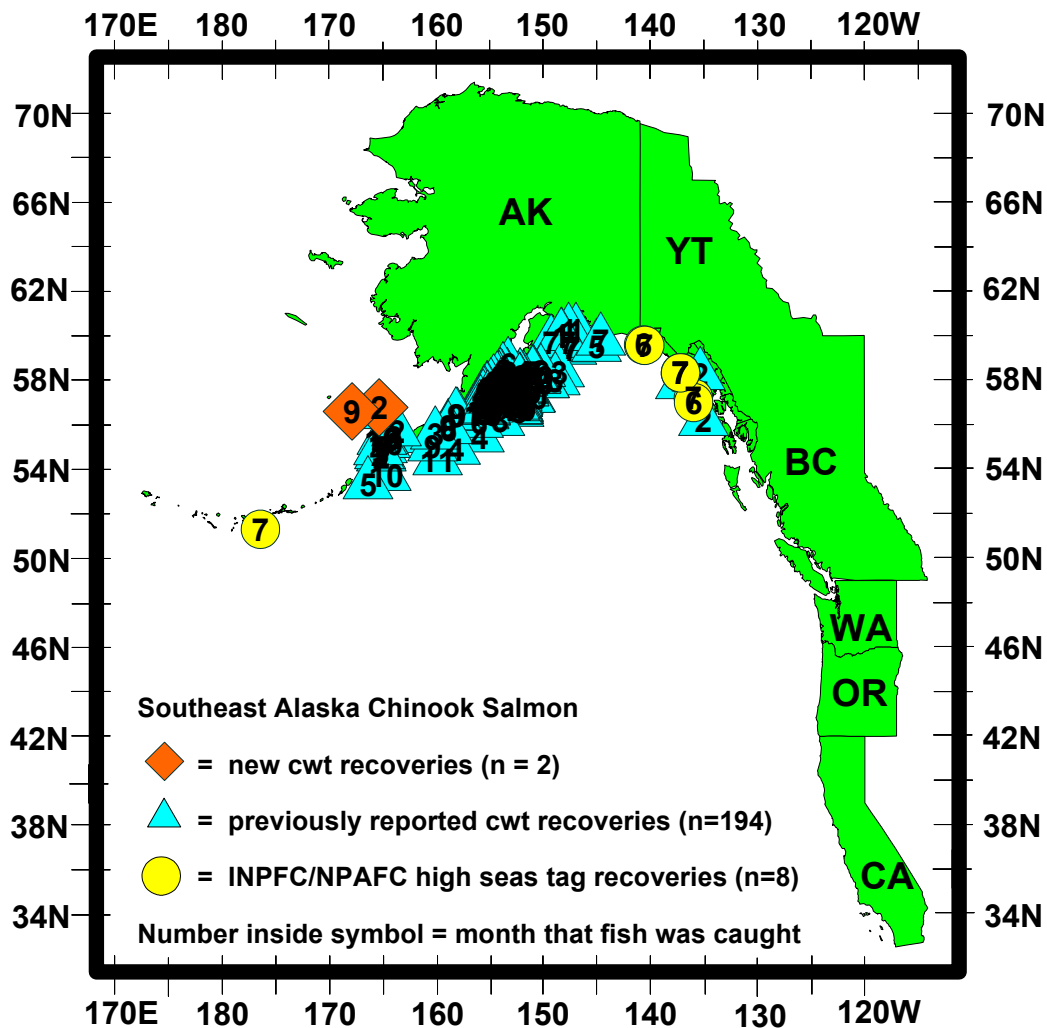


Fig. 3. The ocean distribution of Southeast Alaska chinook salmon, as shown by high seas tag recoveries, 1956-2004. Processing plant recoveries of coded wire tagged (cwt) fish are not included. The geographic locations of two new recoveries of cwt fish (Table 1, Fish nos. 7 and 8) are indicated in the figure by closed diamonds. AK=Alaska, YT=Yukon Territory, BC=British Columbia, WA=Washington, OR=Oregon, CA=California.

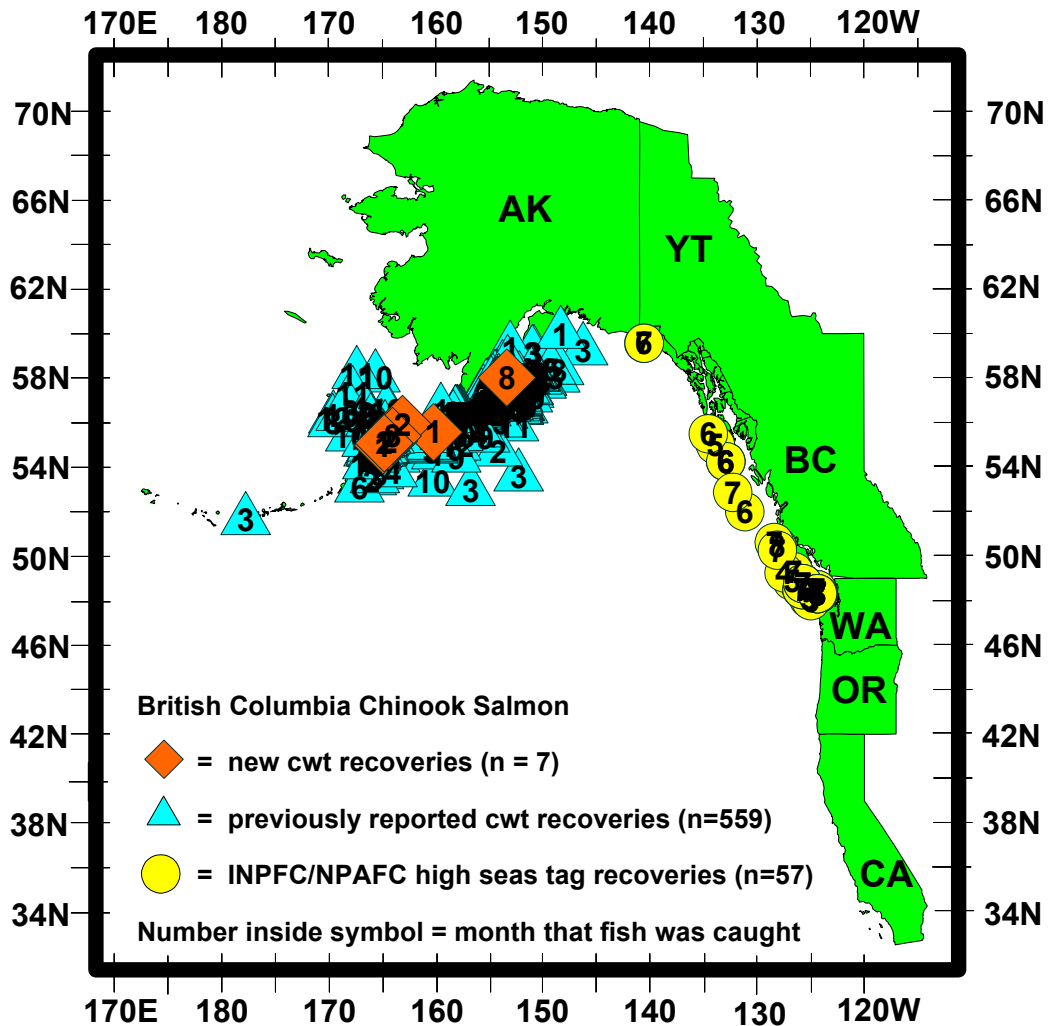


Fig. 4. The ocean distribution of British Columbia chinook salmon, as shown by high seas tag recoveries, 1956-2004. Processing plant recoveries of coded wire tagged (cwt) fish are not included. The geographic locations of seven new recoveries of cwt fish (Table 1, Fish nos. 10, 11, 12, 13, 16, 21, and 23) are indicated in the figure by closed diamonds. Coastal recoveries south of British Columbia are not shown. AK=Alaska, YT=Yukon Territory, BC=British Columbia, WA=Washington, OR=Oregon, CA=California.

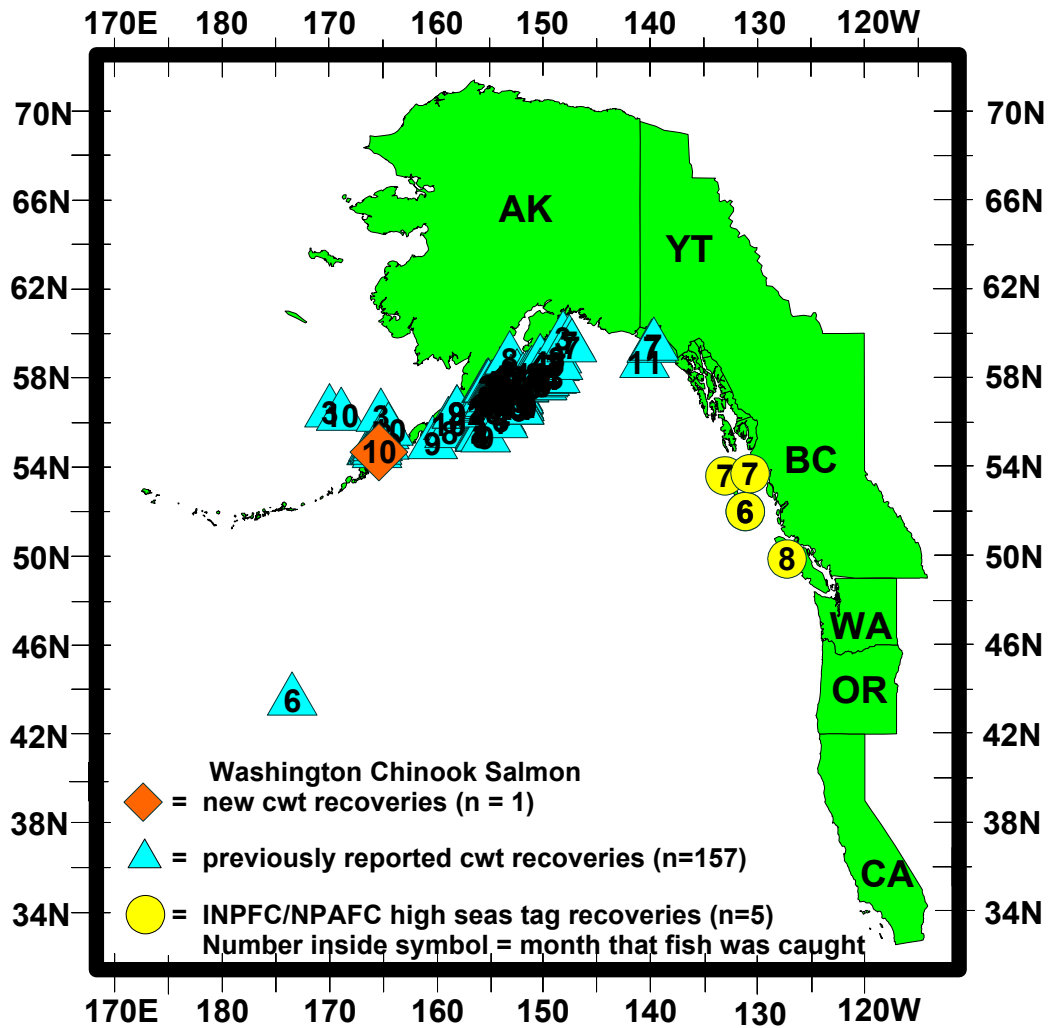


Fig. 5. The ocean distribution of Washington chinook salmon, as shown by high seas tag recoveries, 1956-2004. Processing plant recoveries of coded wire tagged (cwt) fish are not included. The geographic location of one new recovery of a cwt fish (Table 1, Fish no. 17) is indicated in the figure by a closed diamond. Coastal recoveries south of British Columbia are not shown. AK=Alaska, YT=Yukon Territory, BC=British Columbia, WA=Washington, OR=Oregon, CA=California.

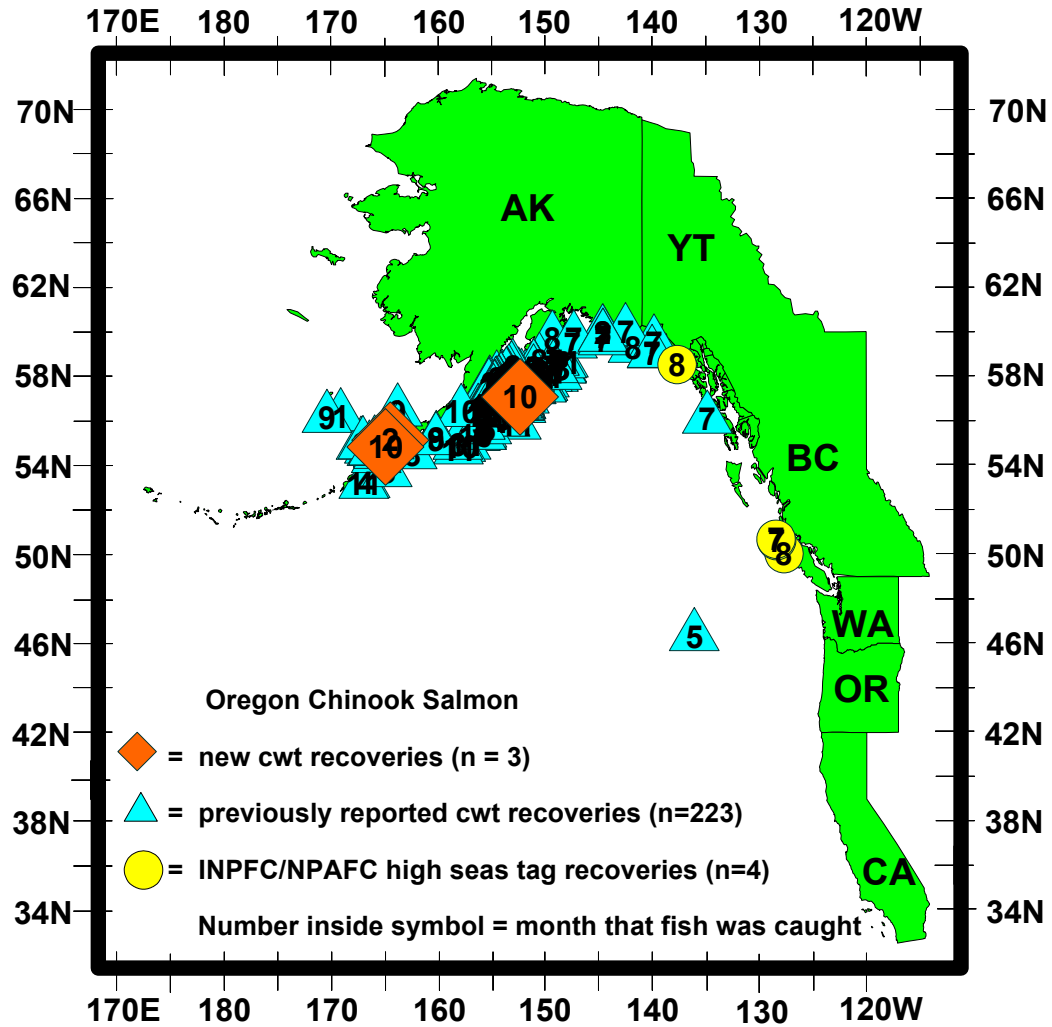


Fig. 6. The ocean distribution of Oregon chinook salmon, as shown by high seas tag recoveries, 1956-2004. Processing plant recoveries of coded wire tagged (cwt) fish are not included. The geographic locations of three new recoveries of cwt fish (Table 1, Fish nos. 19, 20, and 24) are indicated in the figure by closed diamonds. Coastal recoveries south of British Columbia are not shown. AK=Alaska, YT=Yukon Territory, BC=British Columbia, WA=Washington, OR=Oregon, CA=California.

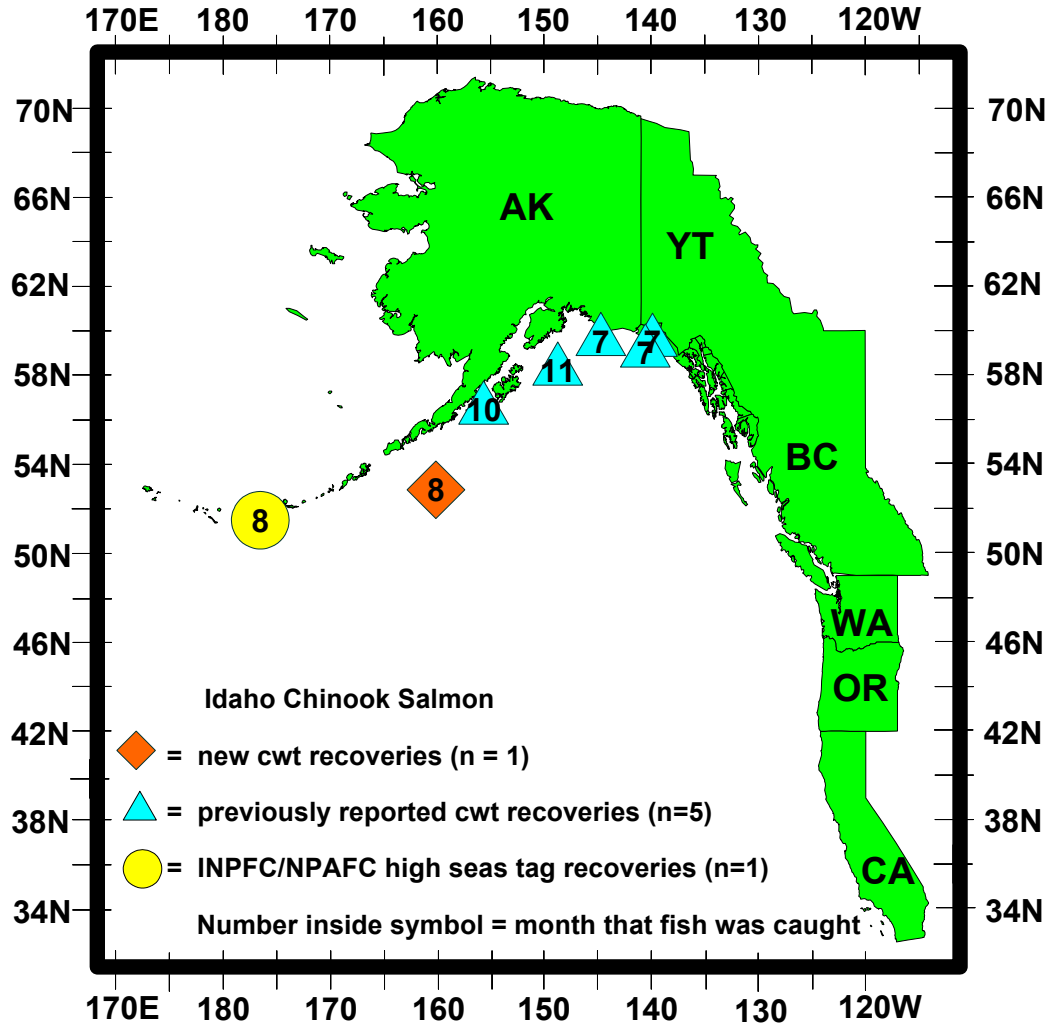


Fig. 7. The ocean distribution of Idaho chinook salmon, as shown by high seas tag recoveries, 1956-2004. The geographic location of one new recovery of a cwt fish (Table 2.2) is indicated in the figure by a closed diamond. Coastal recoveries south of British Columbia are not shown. AK=Alaska, YT=Yukon Territory, BC=British Columbia, WA=Washington, OR=Oregon, CA=California.

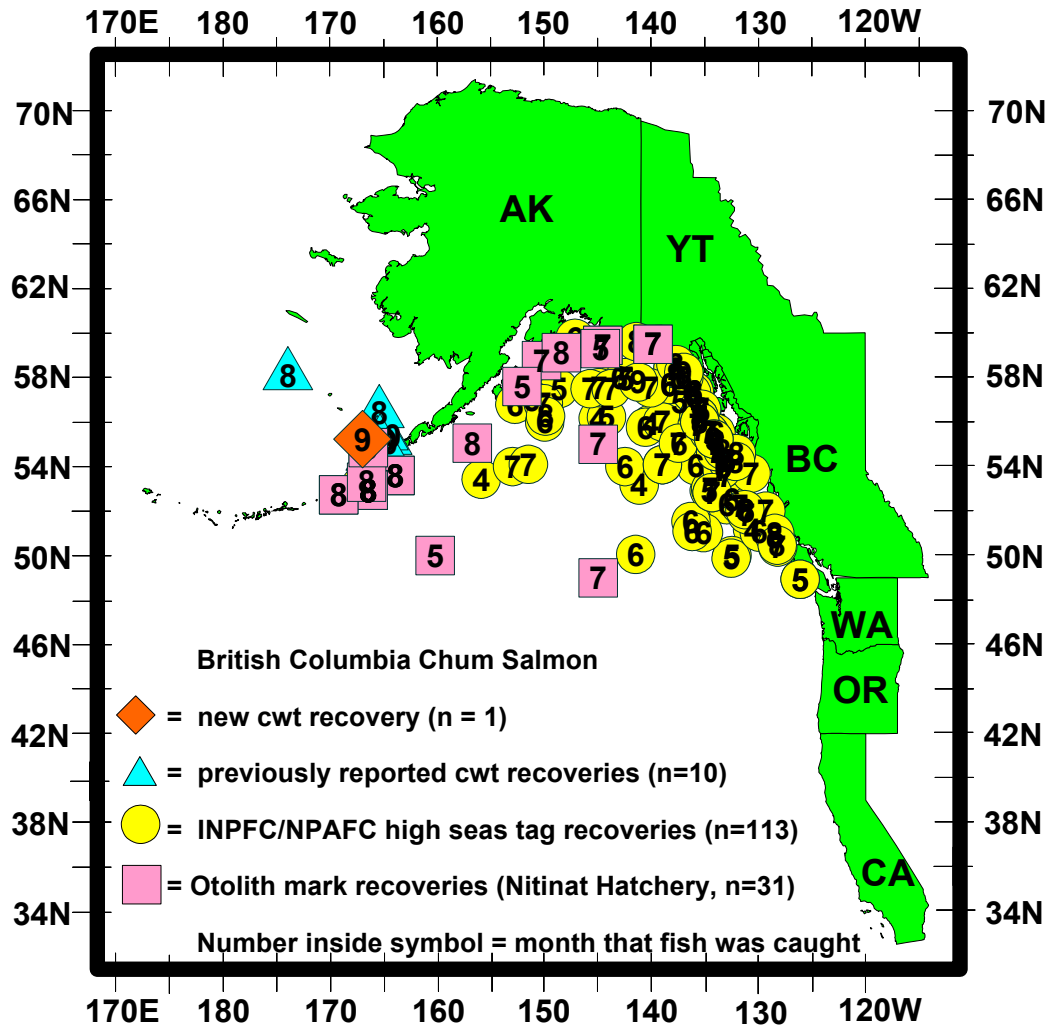


Fig. 8. The ocean distribution of British Columbia chum salmon, as shown by high seas tag and otolith mark recoveries, 1956-2004. The geographic location of one new recovery of a coded-wire tagged fish (Table 3) is indicated in the figure by a closed diamond. Recoveries of otolith-marked immature and maturing British Columbia hatchery chum salmon (Nitinat Hatchery, Vancouver Island) in 1997 and 1998 were reported by Farley and Munk (1998), Carlson et al. (2000), and Urawa et al. (2000). An additional 38 recoveries of otolith-marked British Columbia chum salmon in the 1994-1996 Bering Sea walleye pollock (*Theragra chalcogramma*) trawl fishery, reported by Ignell et al. (1997), are not shown. Processing plant recoveries of CWT fish are not shown. AK=Alaska, YT=Yukon Territory, BC=British Columbia, WA=Washington, OR=Oregon, CA=California.

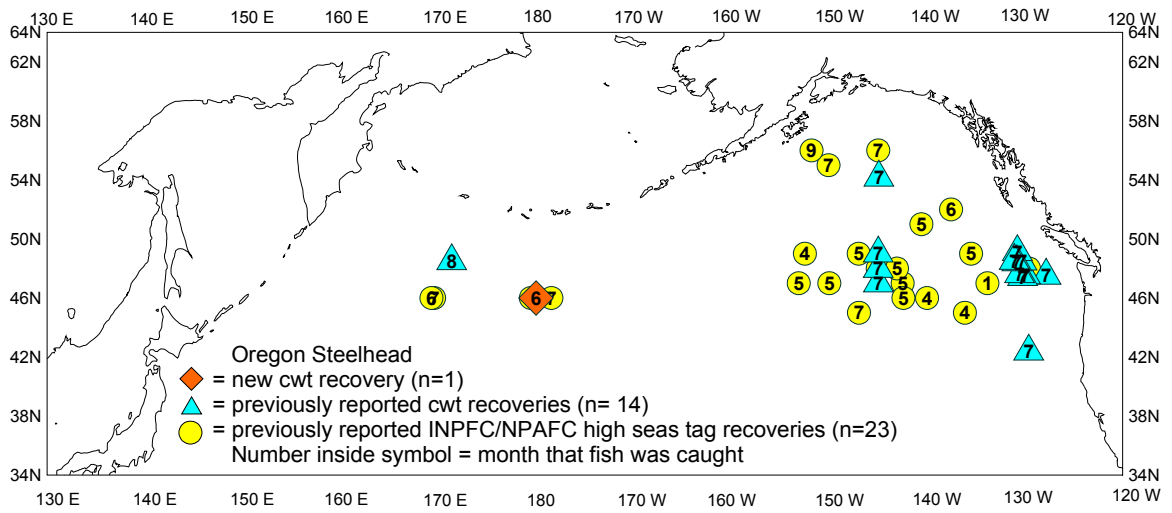


Fig. 9. The ocean distribution of Oregon steelhead trout, as shown by INPFC/NPAFC high seas tag and CWT recoveries, 1956-2004. The geographic location of one new recovery of a CWT steelhead (Table 2.3) is indicated by a closed diamond.

Table 1. Release and recovery information for coded-wire tagged chinook salmon (*Oncorhynchus tshawytscha*) caught in 2002-2004 U.S. commercial groundfish trawl fisheries for walleye pollock (*Theragra chalcogramma*) in the Bering Sea, Aleutian Islands, and Gulf of Alaska. All recoveries in the table are reported for the first time (1 September 2003-31 August 2004 reporting period). Run type: SP=spring, SU=summer, F=fall. Rearing type: H=hatchery, W=wild. State: AK=Alaska, BC=British Columbia, OR=Oregon, WA=Washington, YT=Yukon Territory. TSFT=Tip of snout to fork of tail length. Wt=whole body weight. Sex: M=male, F=female. NMFS statistical areas are shown in Appendix Fig. 1.

Fish no.	Tag code	Species	Stock short name	Run type	Rearing type	Brood year	Release site (Region ¹)	Release site (Basin ²)	Release location	State	Release agency ³	Release date (yymmdd)	Recovery date (yymmdd)	Latitude (deg)	Latitude (min)	Longitude (deg)	Longitude (min)	Hemisphere	TSFT (mm)	Wt (gm)	Sex
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1. Bering Sea Recoveries

1.	182353	CHINOOK	S-YUKON R	SP	H	99	YUKN	YUKN	R-WOLF CR/YUKN	YT	CDFO	000610	030303	56	26	169	55	W	650	3300	F
2.	184412	CHINOOK	S-YUKON R	SP	H	00	YUKN	YUKN	R-MCCLINTOCK R	YT	CDFO	010608	040319	Processing plant recovery from catch in NMFS Bering Sea Statistical Area 513					610	2580	F
3.	310241	CHINOOK	DECEPTION CR 247-41		H	00	CNAK	COOK	DECEPTION CR 247-41	AK	ADFG	010619	030316	55	54	164	41	W	530	1900	F
4.	310242	CHINOOK	DECEPTION CR 247-41		H	00	CNAK	COOK	DECEPTION CR 247-41	AK	ADFG	010619	030729	Processing plant recovery from catch in NMFS Bering Sea Statistical Area 517					660	3470	F

Table 1. (cont'd)

1. Bering Sea Recoveries

Fish no.	Tag code	Species	Stock short name	Run type	Rearing type	Brood year	Release site (Region ¹)	Release site (Basin ²)	Release location	State	Release agency ³	Release date (yymmdd)	Recovery date (yymmdd)	Latitude (deg)	Latitude (min)	Longitude (deg)	Longitude (min)	Hemisphere	TSFT (mm)	Wt (gm)	Sex
5.	310241	CHINOOK	DECEPTION CR 247-41		H	00	CNAK	COOK	DECEPTION CR 247-41	AK	ADFG	010619	030912	56	43	172	30	W	710	5090	M
6.	310243	CHINOOK	DECEPTION CR 247-41		H	00	CNAK	COOK	DECEPTION CR 247-41	AK	ADFG	010619	030930	Processing plant recovery from catch in NMFS Bering Sea Statistical Area 519							
7.	040142	CHINOOK	UNUK R 101-75		W	98	SEAK	SEAK	UNUK R 101-75	AK	ADFG	991018	040217	56	47	165	22	W	890	9540	F
8.	040157	CHINOOK	CRYSTAL CR		H	99	SEAK	SEAK	AUKE BAY 111-50	AK	DIPC	010613	030930	56	36	167	55	W	620	3090	
9.	184348	CHINOOK	S-BULKLEY R UP	SP	H	00	NASK	SKNA	R-BULKLEY R UP	BC	CDFO	020503	040125	Processing plant recovery from catch in NMFS Bering Sea Statistical Area 517					590	2600	
10.	184354	CHINOOK	S-ATNARKO R LOW	SU	H	99	COBC	CCST	R-ATNARKO R LOW	BC	CDFO	000606	040219	55	5	164	51	W	880	8840	F
11.	184654	CHINOOK	S-ATNARKO R LOW	SU	H	01	COBC	CCST	R-ATNARKO R LOW	BC	CDFO	020605	040308	55	24	164	5	W	560	2200	F
12.	184307	CHINOOK	S-KENNEDY R LOW	F	H	99	WCVI	SWVI	R-KENNEDY R LOW	BC	CDFO	000530	040207	55	10	164	25	W	730	5380	

Table 1. (cont'd)

1. Bering Sea Recoveries

Fish no.	Tag code	Species	Stock short name	Run type	Rearing type	Brood year	Release site (Region ¹)	Release site (Basin ²)	Release location	State	Release agency ³	Release date (yyymmdd)	Recovery date (yyymmdd)	Latitude (deg)	Latitude (min)	Longitude (deg)	Longitude (min)	Hemisphere	TSFT (mm)	Wt (gm)	Sex
13.	184703	CHINOOK	S-KENNEDY R LOW	F	H	00	WCVI	SWVI	R-KENNEDY R LOW	BC	CDFO	010525	030216	55	56	163	9	W	480	1800	
14.	184701	CHINOOK	S-KENNEDY R LOW	F	H	00	WCVI	SWVI	R-KENNEDY R LOW	BC	CDFO	010525	040225	Processing plant recovery from catch in NMFS Bering Sea Statistical Area 509					650	3155	F
15.	183224	CHINOOK	S-KENNEDY R LOW	F	H	01	WCVI	SWVI	R-KENNEDY R LOW	BC	CDFO	020601	031008	Processing plant recovery from catch in NMFS Bering Sea Statistical Area 509					500	1600	M
16.	184360	CHINOOK	S-SARITA R	F	H	00	WCVI	SWVI	R-POETT - NOOK	BC	CDFO	010606	040123	54	59	164	58	W	670	4040	
17.	210165	CHINOOK	QUINAULT LK (21)	F	H	99	NWC	QEQU	QUINAULT LK (21)	WA	QDNR	000831	021011	54	40	165	24	W	690	4400	
18.	630778	CHINOOK	PRIEST RAPIDS (36)	F	H	00	CECR	KLIC	KLICKITAT R 30.0002	WA	WDFW	010531	030912	Processing plant recovery from catch in NMFS Bering Sea Statistical Area 519					580	2780	F
19.	093028	CHINOOK	SANTIAM R S FK	SP	H	99	LOCR	WILL	SANTIAM R S FK	OR	ODFW	010312	040208	55	8	164	31	W	750	5670	F
20.	093315	CHINOOK	SALMON R	F	H	00	NOOR	SIYA	SALMON R	OR	ODFW	010825	031001	54	50	164	58	W	640	3720	M

Table 1. (cont'd)

2. Gulf of Alaska Recoveries

Fish no.	Tag code	Species	Stock short name	Run type	Rearing type	Brood year	Release site (Region ¹)	Release site (Basin ²)	Release location	State	Release agency ³	Release date (yyymmdd)	Recovery date (yyymmdd)	Latitude (deg)	Latitude (min)	Longitude (deg)	Long (min)	Hemisphere	TSFT (mm)	Wt (gm)	Sex
21.	182246	CHINOOK	S-CHUCK-WALLA R	SP	H	00	COBC	RIVR	R-CHUCK-WALLA R	BC	CDFO	010624	030826	58	1	153	24	W	670	4500	M
22.	184557	CHINOOK	S-NITINAT R	F	H	00	WCVI	SWVI	R-NITINAT LK	BC	CDFO	010606	030223	Processing plant recovery from catch in NMFS Bering Sea Statistical Area 630				470	1350	M	
23.	184309	CHINOOK	S-KENNEDY R LOW	F	H	01	WCVI	SWVI	R-KENNEDY R LOW	BC	CDFO	020601	040121	55	34	160	15	W	550	2025	M
24.	092109	CHINOOK	GARDINER CR (UMPQUA)	F	H	01	SOOR	UMPQ	UMPQUA R	OR	ODFW	20020619	031009	57	5	152	24	W	510	2200	

¹Region: CECR=Central Columbia R, CNAK=central Alaska, COBC=Coastal British Columbia, LOCR=Lower Columbia R, NASK=Nass R - Skeena R, NOOR=North Coastal Oregon, NWC=North Washington Coast, SEAK=Southeast Alaska, SOOR=South Coastal Oregon, WCVI=Western Vancouver Island, YUKN=Yukon Territory (Yukon R in Yukon Territory only).

²Basin (if different than region): CCST=Central Coastal BC, COOK=Cook Inlet, KIIC=Klickitat R, QEU=Queets R - Quinault R, RIVR=Rivers and Smith Inlets, SIYA=Siletz R - Yaquina R, SKNA=Skeena R, SWVI=SW Vancouver I, UMPQ=Umpqua, WILL=Willamette R.

³Agency: ADFG=Alaska Department of Fish & Game, CDFO=Canadian Department of Fisheries and Oceans, DIPC=Douglas Island Pink & Chum, Inc., ODFW=Oregon Department of Fish & Wildlife, QDNR=Quinault Department of Natural Resources, WDFW=Washington Department of Fish & Wildlife.

Table 2. Release and recovery information for coded-wire tagged salmonids (*Oncorhynchus* spp.) caught in Japanese salmon research gillnets, trawls, and longlines in the Bering Sea and North Pacific Ocean. All recoveries in the table are reported for the first time (1 September 2003 - 31 August 2004 reporting period). Species: CHIN=chinook salmon (*O. tshawytscha*), STEEL=steelhead trout (*O. mykiss*). Run type: W=winter. Rearing type: H= Hatchery. State: AK = Alaska, ID=Idaho, OR = Oregon. TSFT = Tip of snout to fork of tail length. Wt = whole body weight. Sex: M = male, F = female. Gear: G=research gillnet, L=research longline, T=research trawl.

Tag code	Species	Stock short name	Run type	Rearing_type	Brood year	Release site (Region ¹)	Release site (Basin ²)	Release location	Release State	Release agency ³	Release date (yymmdd)	Recovery date (yymmdd)	Latitude (deg)	Latitude (min)	Longitude (deg)	Longitude (min)	Hemisphere	TSFT (mm)	Wt (gm)	Sex	Gear	Vessel type
2.1 Bering Sea Recoveries																						
310251	CHIN	CROOK- ED CR 244-30		H	01	CNAK	COOK	CROOKED CR 244-30	AK	ADFG	020605	040709	56	30	179	0	W	592	2450	M	G	Japan
2.2 Gulf of Alaska Recoveries																						
108671	CHIN	S FK SALMON		H	00	SNAK	SALM	SFK SAL@ KNOX BRIDGE	ID	IDFG	020328	030803	52	51	160	10	W	529	2040	F	T	Japan
2.3 Central North Pacific Ocean Recoveries																						
093350	STEEL	HOOD R	W	H	01	CECR	HOO	HOOD R E FK	OR	ODFW	020515	040621	46	0	180	0		715	3580	F	L	Japan

¹Region: CNAK=central Alaska, LOCR=Lower Columbia R, NOOR=North Coastal Oregon, NWC=North Washington Coast, SEAK=Southeast Alaska, SNAK=Snake R, UPCR=Upper Columbia R, YUKN=Yukon Territory (Yukon R. in Yukon Territory only).

²Basin (if different than region): CLEA=Clearwater R, COOK=Cook Inlet, GRIA=Grand Ronde R-Imnaha R-Asotin Cr, MEOK=Methow R - Okanogan R, QUHO=Quillayute R-Hoh R, WTN=Wilson, Trask, Nestucca, YOCL=Youngs Bay-Clatskanie R.

³Agency: ADFG=Alaska Department of Fish & Game, CDFO=Canadian Department of Fisheries and Oceans, DIPC=Douglas Island Pink and Chum, Inc., FWS=U.S. Fish and Wildlife Service, IDFG=Idaho Department of Fish and Game, ODFW=Oregon Department of Fish & Wildlife, SJ=Sheldon Jackson College, SSRA=Southern Southeast Regional Aquaculture Association, WDFW=Washington Department of Fish & Wildlife.

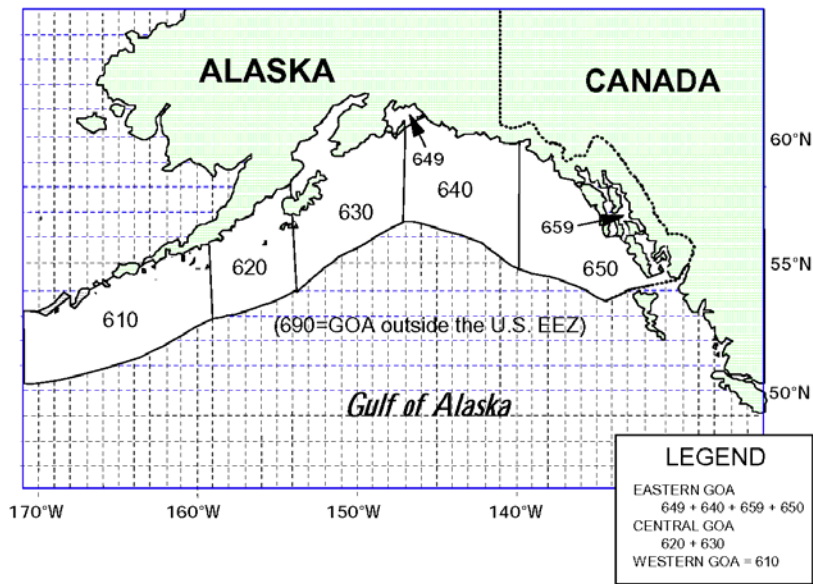
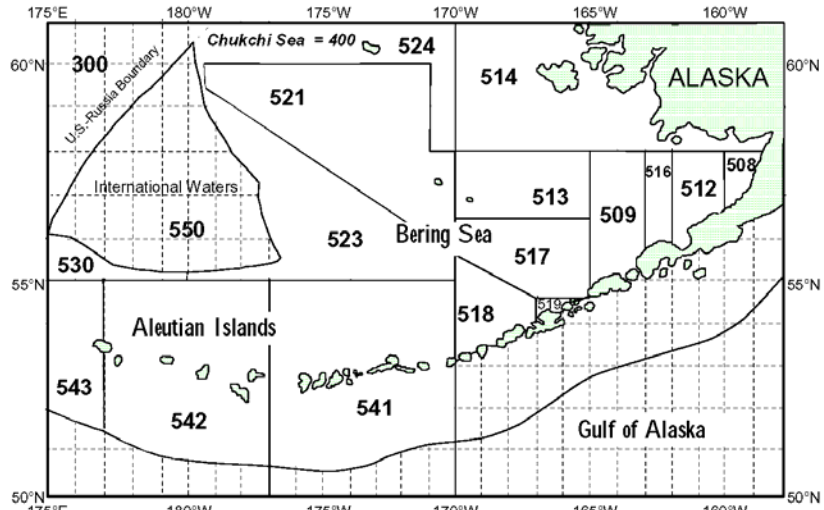
Table 3. Release and recovery information for coded-wire tagged chum salmon (*Oncorhynchus keta*) caught in 2003 U.S. commercial groundfish trawl fisheries for walleye pollock (*Theragra chalcogramma*) in the Bering Sea. All recoveries in the table are reported for the first time (1 September 2003-31 August 2004 reporting period). Run type: F=fall. Rearing type: H=hatchery. State: BC=British Columbia. TSFT=Tip of snout to fork of tail length. Wt=whole body weight. Sex: U=unknown. NMFS statistical areas are shown in Appendix Fig. 1.

Fish no.	Tag code	Species	Stock short name	Run type	Rearing type	Brood year	Release site (Region ¹)	Release site (Basin ²)	Release location	State	Release agency ³	Release date (yymmdd)	Recovery date (yymmdd)	Latitude (deg)	Latitude (min)	Longitude (deg)	Long (min)	Hemisphere	TSFT (mm)	Wt (gm)	Sex
1.	184658	CHUM	S-SLIAMMON R	F	H	00	GST	GSMN	R-SLIAMMON R	BC	CDFO	010523	030816	Processing plant recovery from catch in NMFS Bering Sea Statistical Area 517				W	550	1970	U
2.	184660	CHUM	S-SLIAMMON R	F	H	00	GST	GSMN	R-SLIAMMON R	BC	CDFO	010523	030921	55	14	167	1	W	560	2010	U

¹Region: GST=Georgia Strait.

²Basin (if different than region): Georgia Strait – Mainland North.

³Agency: CDFO=Canadian Department of Fisheries and Oceans.



Appendix Fig. 1. U.S. National Marine Fisheries Service (NMFS) statistical areas in the Bering Sea and Aleutian Islands (top panel) and Gulf of Alaska (bottom panel).