2023 Ocean Selective Fishery Sampling Report

SUBMITTED BY:

WASHINGTON DEPARTMENT OF FISH AND WILDLIFE
FISH MANAGEMENT PROGRAM
600 CAPITOL WAY NORTH
OLYMPIA, WASHINGTON 98501-1091

PERIOD COVERED:

May 1, 2023 through October 7, 2023

Date of Draft: 2/1/2025

Washington Department of FISH & WILDLIFE

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

1. INTRODUCTION

The Pacific Fishery Management Council (PFMC) adopted 2023 recreational and commercial troll fisheries for all salmon species between Cape Falcon, Oregon, and the U.S.-Canada border. Recreational and commercial mark-selective fisheries (MSFs) for coho were included in all four marine areas of coastal Washington (Marine Areas 1, 2, 3, and 4; **Figure 1**). Council-area fisheries were adopted based on assumptions regarding coho and Chinook abundance, distribution of stocks, Chinook age class distributions, coho mark rates, compliance with selective fishery regulations, and incidental mortality.

The PFMC adopted ocean coho MSFs in Marine Areas 1 through 4 for the twenty-fifth consecutive year, following state-tribal agreement during the North of Falcon process. No Chinook MSFs were recommended by the Council's Salmon Advisory Subpanel nor adopted by the PFMC in 2023.

The Washington Department of Fish and Wildlife's (WDFW) Ocean Sampling Program (OSP) continued its intensive monitoring program in all ocean ports during the salmon fishing season to collect data to estimate key parameters characterizing the fishery and its impacts on unmarked salmon. All salmon fishery openings were monitored in 2023. Sampling activities included on-water observation, a Voluntary Trip Report (VTR) system, and dockside creel sampling. Among other parameters, sampling activities emphasized data collection needs for the estimation of *i*) the mark rate of the targeted coho population, *ii*) the total number of coho harvested by mark-status, including an estimate of angler compliance rate with coho MSF regulations, *iii*) the total number of coho released (by mark-status), *iv*) the coded-wire tag (CWT) stock composition of landed coho, and *v*) the total mortality of marked and unmarked coho.

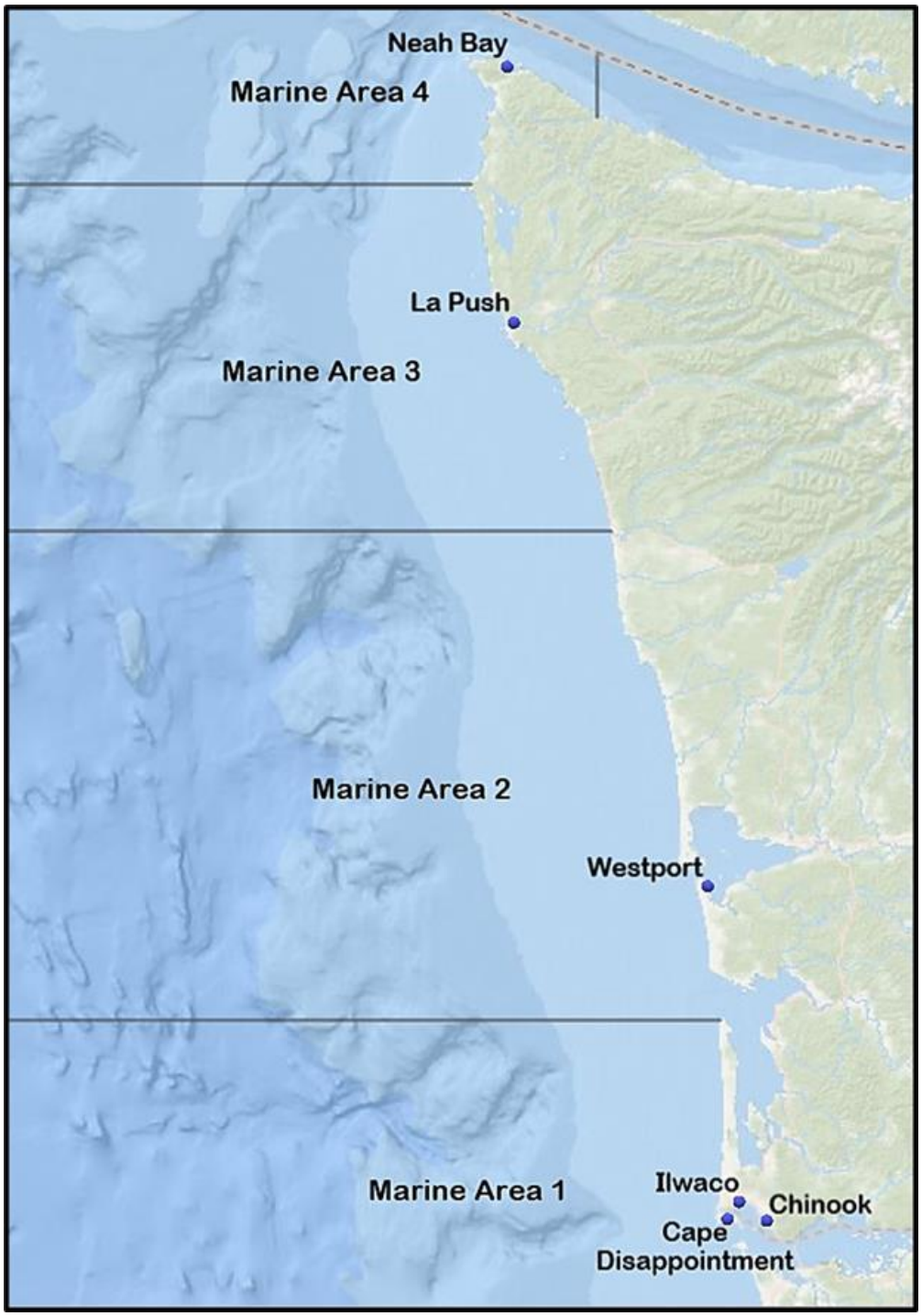

Figure 1. Map of coastal Washington showing the marine areas (Marine Areas 1 through 4) and major sampling sites**.**

2. SEASON DESCRIPTION

2.1 Ocean Recreational All-Species Fishery (Coho Mark-Selective)

Marine Area 1: The ocean recreational fishery was open in Marine Area 1 for all salmon species seven days per week from June 24 through September 30. A daily bag limit of two salmon, one of which could be a Chinook, was in effect. From June 24 through August 25, all retained coho were required to have a healed adipose fin clip. August 26 through September 30, the fishery was modified in-season to allow retention of unmarked coho with a daily bag limit of two. The Columbia Control Zone was closed. This opening, 99 (63 days coho MSF, 36 days coho non-selective) fishing days were available in the area.

Marine Area 2: The ocean recreational fishery was open in Marine Area 2 for all salmon species seven days per week from June 24 through September 30. A daily bag limit of two salmon, one of which could be a Chinook, was in effect. From June 24 through August 25, all retained coho were required to have a healed adipose fin clip. July 28 through August 12, the bag limit was modified in-season so that Chinook retention was not allowed on Fridays and Saturdays. August 26 through September 30, the fishery was modified in-season to allow retention of unmarked coho with a daily bag limit of two. This opening, 99 fishing days were available in the area (63 days coho MSF, 36 days coho non-selective).

Marine Area 3: The ocean recreational fishery was open in Marine Area 3 for all salmon species, except chum August 1 through September 30, seven days per week from June 17 through September 30. A daily bag limit of two salmon, one of which could be a Chinook, was in effect June 17 through July 7; the bag limit was modified in-season to a daily bag limit of two salmon, beginning July 8. From June 17 through August 25, all retained coho were required to have a healed adipose fin clip. August 26 through September 30, the fishery was modified in-season to allow retention of unmarked coho with a daily bag limit of two. From October 3 through October 7, salmon fishing was open, but restricted to the portion of Area 3 north of 47°50’00” north latitude and south of 48°00’00” north latitude, seven days per week. A daily bag limit of one Chinook was in effect. This opening, 111 fishing days were available in the area (70 days coho MSF, 36 days coho non-selective).

Marine Area 4: The ocean recreational fishery was open in Marine Area 4 for all salmon species, except chum August 1 through September 30, seven days per week from June 17 through September 30. A daily bag limit of two salmon, one of which could be a Chinook, was in effect June 17 through July 7; the bag limit was modified in-season to two salmon, beginning July 8. From June 17 through August 25, all retained coho were required to have a healed adipose fin clip. August 26 through September 30, the fishery was modified in-season to allow retention of unmarked coho with a daily bag limit of two. This opening, 106 fishing days were available in the area (70 days coho MSF, 36 days coho non-selective).

The recreational salmon fishery operated under preseason quotas of 39,000 landed Chinook and 159,600 landed marked coho.

2.2 Non-Tribal Commercial Troll Fishery

The non-Tribal commercial troll fishery was open May 1 through June 29 for all salmon except coho from Cape Falcon, Oregon, to the U.S.-Canada border. Marine Areas 1 and 2 were open during this time for 58 days. Marine Areas 3 and 4 were open during this time for 52 days, it was closed May 11 through May 17. The fishery reopened for all salmon species, except no chum retention north of Cape Alava, WA, beginning August 1, on July 1 in all areas between Cape Falcon, Oregon, and the U.S.-Canada border. From July 1 through August 25, all retained coho were required to have a healed adipose fin clip. Marine Areas 1 through 4 were closed August 3 through August 16. The fishery was modified in-season to allow retention of unmarked coho August 26 through September 30. The fishery closed as scheduled on September 30, allowing a total of 78 available fishing days (42 days coho MSF, 36 days coho non-selective). Specific open dates and regulations are available in the **PFMC Review of 2023 Ocean Salmon Fisheries** (https://www.pcouncil.org/documents/2024/02/review-of-2023-ocean-salmon-fisheries.pdf/).

3. METHODS

WDFW's OSP implemented a comprehensive monitoring program in all major ocean ports during the coho MSF seasons in Washington Marine Areas 1-4. OSP collected data to estimate key fishery parameters characterizing the ocean MSFs and associated impacts on unmarked salmon. Sampling activities included direct on-the-water observations of salmon encounters during charter observer trips, VTRs of completed trips provided by charter boat captains and private boat anglers, dockside angler interviews (with catch sampling), and total boat counts via exit or entrance counts at each major coastal port.

3.1 On-Board Observation

OSP samplers conducted direct on-water observation of salmon encounters aboard charter vessels during the ocean recreational all-species coho MSF. For each hook up, data collected included result of the hook up (fish kept, released, or dropped off), species, mark status (marked or unmarked), and size class (legal or sublegal). These data were used to estimate the encounter rates of Chinook and coho by size class and mark group (legal-size and marked [LM], legal-size and unmarked [LU], sublegal-size and marked [SM], and sublegal-size and unmarked [SU]), as well as drop-offs.

Direct on-water observation of salmon encounters was primarily used in Marine Areas 1 and 2 where charter vessel salmon fishing trips are numerous, and vessels have the capacity to accommodate OSP observer staff. The VTR program (see Section 3.2 below) was also used to collect encounter data in these two areas.

In Marine Areas 3 and 4, where few charter vessels take salmon fishing trips, and those who do have limited capacity, the VTR system was the primary method used to collect on-water encounter data; charter on-board observation was minimal in these areas.

3.2 Voluntary Trip Reports

Selective fishery encounter statistics were acquired through VTRs that WDFW samplers distributed to, and collected from, charter boat captains and private boat anglers in all four marine areas. The VTR form is designed to capture information identical to that collected by onboard observers. Anglers complete the information on the form as they fish, minimizing recall error.

Samplers distributed VTRs to private vessels on every sampled day in all sampled ports. Charter vessels agreeing to participate were given a binder with several forms to complete throughout the season. For private vessels, samplers approached anglers preparing to depart for fishing or after returning from fishing, explained the purpose of the VTR, how to complete it, and encouraged anglers to record all encounters while fishing and to return the form to a dockside sampler at the end of the fishing day. Anglers could also mail these forms to the WDFW Region 6 Office postage paid. Additionally, office staff contacted anglers who regularly complete VTRs by phone or mail in advance of the season and provided blank VTRs and binders.

3.3 Dockside Sampling

Dockside samplers were stationed in the four major landing ports for ocean salmon fisheries: Neah Bay, La Push, Westport, and Ilwaco (including the port of Chinook and the Cape Disappointment boat launch). The recreational salmon fisheries in each accessible port were sampled a minimum of four to five days per week, with weekend (Saturday, Sunday, and holidays) and weekday days (non-holiday Monday through Friday) stratified separately. Typically, all weekend days and three randomly selected weekdays per week were sampled. Total fisheries catch and effort estimates were generated by the OSP using data obtained during dockside sampling: effort counts, interview data, and examination of catch. Each is described below.

Effort Counts

On each sample day, a total recreational boat count was obtained by counting boats exiting or entering the port. A minimum of 20% of the boats returning to the port within each boat type (charter and private) were sampled. An exit count (a count of boats leaving the port) typically began at 4:00 AM and continued through the end of the sampling day (exact time was port-specific). An entrance count (a count of boats entering the port) usually began near 8:00 AM and continued through dusk. Whether OSP samplers conducted exit or entrance counts varied based on specific considerations for each port. Regardless of the method used, this effort count provided the total counts of charter and private boats participating on each sample day. This informs the total population size of each boat type.

Angler Interviews and Catch Sampling

WDFW samplers stationed in coastal ports collected catch and effort information during dockside angler interviews from boats returning from fishing. Information collected during each sample included number of anglers, target species, area fished, landed catch by species, mark status of landed salmon, identification and recovery of CWTs, and angler reports of released salmon by species, size (legal or sublegal) and mark status, and of released groundfish by

species. Additionally, dockside samplers collected DNA samples, length measurements, and scale samples from landed Chinook opportunistically.

3.4 Estimating Catch and Effort

3.4.i Estimated Stratum Totals (Primary Stage)

Combined (total) catch estimates are typically stratified by weekend/holiday and weekday. In some strata, every day is sampled. In those strata the combined estimates are simply sums of the daily catches. In other strata, where some days are not sampled, the average catch per day over all sampled days is multiplied by the number of days in the stratum to estimate the total catch.

Let:

a = the marine catch area,

i = trip type,

t = Weekend/holiday or Weekday stratum,

N_t = the number of days in stratum t,

T_t = collection of all days in stratum t,

n_t = the number of days sampled in stratum t,

S_t = collection of sampled days in stratum t (when S=T, n=N),

Y_{taik} = estimated catch (or effort) on day k for stratum t in area a from trip type i,

C_{tai} = catch for stratum t in area a from trip type i,

Then

$$\hat{C}_{tai} = N_t \frac{\sum_{k \in S_t} \hat{Y}_{taik}}{n_t}$$

with estimated variance (see Thompson 1992, p. 129):

$$\hat{V}\left(\hat{C}_{tai}\right) = \frac{N_t (N_t - n_t)}{n_t} \frac{\sum_{k \in S_t} \left(\hat{Y}_{taik} - \bar{\hat{Y}}_{tai}\right)^2}{n_t - 1} + \frac{N_t}{n_t} \sum_{k \in S_t} \hat{V}\left(\hat{Y}_{taik}\right)$$

where

$$\bar{\hat{Y}}_{tai} = \frac{\sum_{k \in S_t} \hat{Y}_{taik}}{n_t}.$$

For strata with all days sampled, $n_t = N_t$, and the catch and variance estimators reduce to:

$$\hat{C}_{tai} = \sum_{k \in T_t} \hat{Y}_{taik}$$

and

$$\hat{V}\left(\hat{C}_{tai}\right) = \sum_{k \in T_t} \hat{V}\left(\hat{Y}_{taik}\right).$$

3.4.ii Daily Catch and Effort Estimation (Secondary Stage)

Both catch and effort are post-stratified by trip type and area fished. Effort in terms of boat trips is simply the sampled number of boats for each trip type and area expanded by the appropriate boat type (charter or private) exit/entrance count. Effort in terms of angler trips is calculated as the mean number of anglers per boat (indexed by trip type and area) expanded by the counted total population of boats.

The total catch for a given species on a sampled day is the product of the population of boats and the estimated catch per boat, again post-stratified by trip type and area fished. Key assumptions in the current estimation procedures are that:

1) All boats exiting/entering a port are included in the exit/entrance count
2) Exit/entrance counts are made without error
3) The approximate systematic sample of boats can be treated as a simple random sample
4) Anglers answer questions accurately and do not conceal fish

In the following discussion, subscripts referring to port and boat type are suppressed. Let:

M_t = total exit or entrance count for a given port on day *t* (assumed known without error),

m_t = total boats sampled on day *t*,

m_{tai} = number of boats sampled of trip type *i* fishing in area *a* on day *t*,

a_{taij} = number of anglers on the *j*th boat from trip type *i* fishing in area *a* on day *t*,

y_{taij} = number of species-specific fish caught on the *j*th boat from trip type *i* in area *a* on day *t*, and

Y_{tai} = total catch of specific species caught from trip type *i* in area *a* on day *t*.

The estimate of the number of boat trips of trip-type *i* and area *a* follows the procedure outlined in Lai et al. (1991), where the proportion of boats in each category is estimated by:

$$\hat{p}_{tai} = \frac{m_{tai}}{m_t}$$

with estimated variance (see Cochran 1977, p. 52):

$$V(\hat{p}_{tai}) = \frac{\hat{p}_{tai} \cdot (1 - \hat{p}_{tai})}{(m_t - 1)} \cdot (\frac{M_t - m_t}{M_t})$$

The estimated total boat-trips are then obtained by:

$$\hat{M}_{tai} = M_t \cdot \hat{p}_{tai}$$

with estimated variance:

$$\hat{V}(\hat{M}_{tai}) = M^2{}_t \cdot \hat{V}(\hat{p}_{tai})$$

Effort expressed in terms of angler trips is the product of the average anglers per boat trip times the total number of boat trips. The mean number of anglers per boat trip (for trip type *i* and fishing area *a*) is estimated as:

$$\hat{\bar{a}}_{tai} = \frac{\sum_j a_{taij}}{m_t}$$

with variance:

$$\hat{V}(\hat{\bar{a}}_{tai}) = \frac{\sum_j (a_{taij} - \hat{\bar{a}}_{tai})^2}{m_t (m_t - 1)} \cdot (\frac{M_t - m_t}{M_t})$$

Thus, the estimated total number of angler trips is:

$$\hat{a}_{tai} = M_t \cdot \hat{\bar{a}}_{tai}$$

with variance:

$$\hat{V}(\hat{a}_{tai}) = M^2{}_t \cdot \hat{V}(\hat{\bar{a}}_{tai})$$

The catch (or number released) for a specific species on sampled day *t* in area *a* from trip type *i* is similarly estimated by:

$$\hat{Y}_{tai} = \frac{\sum_j y_{taij}}{m_t} M_t$$

with estimated variance:

$$\hat{V}\left(\hat{Y}_{tai}\right) = \frac{\sum_{j}\left(y_{taij} - \hat{\bar{y}}_{tai}\right)^2}{m_t\left(m_t - 1\right)} M_t\left(M_t - m_t\right)$$

This estimate and its variance differ somewhat from that described in Lai et al. (1991) since the total count, M_t (assumed to be a known quantity), is used to expand the estimated CPUE (calculated over all sampled boats) rather than the estimated boat-trips by trip-type and area fished.

4. RESULTS IN THE OCEAN RECREATIONAL ALL-SPECIES COHO MSF

4.1 Dockside Sampling Results

Private and charter anglers completed an estimated 65,493 angler trips coastwide (55,087 from Washington, 10,406 from Oregon) during the 2023 ocean recreational all-species coho MSF. These anglers harvested 27,192 Chinook (23,843 WA, 3,349 OR) and 31,152 coho (25,285 WA, 5,867 OR). **Table 1** shows effort and catch by month and area during the 2023 ocean recreational all-species coho MSF.

WDFW dockside samplers interviewed an estimated 40% of all anglers fishing from WA coastwide during the ocean recreational all-species coho MSF. 38% of all Chinook and 45% of all coho harvested in WA were sampled; 1,022 CWTs were collected from sampled Chinook, and 1,489 were collected from sampled coho in WA ports (**Table 2**).

4.2 On-water Observation and VTR Results

Tables 3 and 4 detail on-water data collected from VTRs submitted by charter and private fishing vessels. Charter boat VTRs provided on-water catch and encounter data from a total of 92 charter boat trips documenting 598 legal-sized Chinook, 114 sub-legal sized Chinook, 1,476 legal sized coho, and 57 sublegal sized coho during the ocean recreational all-species coho MSF. Dockside samplers also collected 108 completed and useable VTRs from private vessels containing 241 legal sized Chinook encounters, 50 sublegal sized Chinook encounters, 339 legal sized coho encounters, and 28 sublegal sized coho encounters. Mark rates calculated from VTR data, where available, are shown in **Table 5** and compared to pre-season FRAM coho mark rate projections.

4.3 Overall Fishery Impacts

Estimated Total Coho Encounters and Mortalities

Please note FRAM pre-season projections are based on ocean salmon fishery seasons as adopted by PFMC and, in some cases, may not be directly comparable with the ocean salmon fishery seasons that were conducted.

FRAM pre-season projections of coho encounters north of Cape Falcon, OR (Washington and Oregon) in the 2023 ocean recreational all-species coho MSF are compared with estimated

encounters based on Washington and Oregon sample data in **Table 6**. **Table 7** compares total coho mortality projected pre-season by FRAM north of Cape Falcon, OR (Washington and Oregon) with estimated coho mortality based on Washington and Oregon sample data.

The overall impacts of the 2023 ocean recreational all-species coho MSF in Marine Areas 1-4 are characterized in terms of grand-total estimates of coho encounters and mortalities by using estimates specific to mark group (i.e., marked and unmarked). The method described in section 3.4 was used to generate total estimates of retained catch by mark group. To estimate coho salmon encounters and releases by mark group, we applied Conrad's (2012) alternative method for estimating coho encounters and release mortalities in ocean MSFs, which independently calculates charter and private vessel totals based on observer and VTR data. This method differs from that used prior to 2012.

Estimated marked and unmarked coho retention is calculated from dockside sampling data as described in Section 3.4; note that since catch estimates are stratified by week, monthly total proportions of marked and unmarked estimated retained catch may vary slightly from monthly total proportions of marked and unmarked sampled coho. Encounters are calculated by boat type and marine area based on landed catch of legal sized marked coho, the proportion of observed encounters that were legal sized marked coho, and the proportion of observed encounters that were legal sized marked coho that were retained. Mortality was estimated for each mark group based on calculated encounters and the proportion of the legal sized coho of that mark status that were released multiplied by the PFMC ocean selective fishery mortality *(sfm)* rate of 14% (Conrad, 2012).

Observed estimates of total coho encounters and unmarked coho encounters were significantly lower than projected preseason in all marine areas. Total mortality estimates were significantly below preseason projections in all marine areas. Estimated unmarked mortality was significantly lower than projected preseason in all marine areas. Estimated marked and unmarked landed catch was significantly lower than projected preseason in all marine areas. Observed coho mark rates were lower than projected preseason in all marine areas.

Figure 2 compares the FRAM projected coho encounters and mortality by area with those estimated using Washington and Oregon sample data in the ocean recreational all-species coho MSF.

Compliance

Table 8 reports rates of compliance with coho MSF regulations observed by dockside samplers for the ocean recreational fishery by area and month. Coastwide, compliance with coho MSF regulations averaged 99%, similar to previous seasons.

Table 1. Estimates of total fishing effort and number of Chinook and coho retained during the 2023 ocean recreational all-species coho MSF between Cape Falcon, Oregon and the U.S.-Canada border.[1/]

	TOTAL ANGLER TRIPS					CHINOOK RETAINED					COHO RETAINED				
	June	July	Aug	Sept	TOTAL	June	July	Aug	Sept	TOTAL	June	July	Aug	Sept	TOTAL
Area 4	2,783	7,027	2,423	-	12,233	832	3,841	765	-	5,438	172	1,348	1,327	-	2,846
Area 3	179	812	743	-	1,734	29	523	346	-	898	14	264	352	-	630
Area 2	898	14,882	6,721	-	22,501	567	9,697	3,022	-	13,286	208	8,086	3,790	-	12,085
Area 1	634	7,991	9,993	-	18,619	120	1,187	2,916	-	4,222	431	6,675	2,619	-	9,725
TOTAL WA	**4,494**	**30,712**	**19,881**	**-**	**55,087**	**1,548**	**15,247**	**7,048**	**-**	**23,843**	**825**	**16,372**	**8,088**	**-**	**25,285**
OREGON (Area 1)	595	4,392	5,419	-	10,406	118	596	2,635	-	3,349	362	4,220	1,285	-	5,867
TOTAL NOF	**5,089**	**35,104**	**25,299**	**-**	**65,493**	**1,666**	**15,843**	**9,683**	**-**	**27,192**	**1,187**	**20,592**	**9,373**	**-**	**31,152**
WA Variance[2/]:					891,628					458,829					468,790
WA Standard Error:					944					677					685
WA CV (%):					2%					3%					3%
WA 95% CI:					53,236-56,938					22,515-25,171					23,943-26,627

1/ Closed months and months non-mark-selective for coho are denoted by (-).

2/ Variance estimates are unavailable for Oregon.

Table 2. WA dockside sampling statistics during the 2023 ocean recreational all-species coho MSF between Cape Falcon, Oregon and the U.S.-Canada border.

	Anglers Sampled	Sample Rate	Landed Chinook Sampled	Sample Rate	Landed Coho Sampled	Sample Rate	Chinook CWTs collected	Coho CWTs collected
Area 4	4,311	35%	2,039	37%	1,111	39%	250	129
Area 3	1,174	68%	633	70%	438	70%	81	46
Area 2	8,667	39%	4,577	34%	4,598	38%	491	543
Area 1	7,717	41%	1,861	44%	5,283	54%	200	771
TOTAL WA	**21,869**	**40%**	**9,110**	**38%**	**11,430**	**45%**	**1,022**	**1,489**

Return to Text

Table 3. VTR Chinook encounters by boat type, size class and mark status in the 2023 ocean recreational all-species coho MSF between Cape Falcon, Oregon and the U.S.-Canada border.[1/]

		Charter Boats (On-board observation/VTRs)							Private boats (VTRs)						
		Total	LEGAL-SIZED			SUBLEGAL-SIZED			Total VTRs	LEGAL-SIZED			SUBLEGAL-SIZED		
		Observer	Marked	Unmarked	Unknown	Marked	Unmarked	Unknown	Collected	Marked	Unmarked	Unknown	Marked	Unmarked	Unknown
Area 4	June	0	0	0	0	0	0	0	2	0	3	0	0	0	5
	July	1	1	3	0	0	2	0	6	7	8	0	2	0	0
	Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Sept	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TOTAL	**1**	**1**	**3**	**0**	**0**	**2**	**0**	**8**	**7**	**11**	**0**	**2**	**0**	**5**
Area 3	June	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	July	2	7	2	0	1	2	0	9	4	3	0	0	2	0
	Aug	0	0	0	0	0	0	0	6	3	1	0	2	6	0
	Sept	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TOTAL	**2**	**7**	**2**	**0**	**1**	**2**	**0**	**15**	**7**	**4**	**0**	**2**	**8**	**0**
Area 2	June	9	70	37	0	15	15	0	6	15	7	0	12	6	0
	July	45	190	153	1	42	23	1	32	64	40	0	3	4	0
	Aug	26	54	55	0	5	3	1	8	15	16	0	2	0	0
	Sept	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TOTAL	**80**	**314**	**245**	**1**	**62**	**41**	**2**	**46**	**94**	**63**	**0**	**17**	**10**	**0**
Area 1	June	1	2	3	0	1	0	0	7	4	3	0	0	0	0
	July	5	3	2	0	1	1	0	20	9	15	0	0	0	0
	Aug	3	10	5	0	1	0	0	12	10	14	0	2	4	0
	Sept	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TOTAL	**9**	**15**	**10**	**0**	**3**	**1**	**0**	**39**	**23**	**32**	**0**	**2**	**4**	**0**

1/ Closed months and months non-mark-selective for coho are denoted by (-).

Return to Text

Table 4. VTR coho encounters by boat type, size class and mark status in the 2023 ocean recreational all-species coho MSF between Cape Falcon, Oregon and the U.S.-Canada border.[1/]

		Charter Boats (On-board observation/VTRs)							Private boats (VTRs)						
		Total	LEGAL-SIZED			SUBLEGAL-SIZED			Total VTRs	LEGAL-SIZED			SUBLEGAL-SIZED		
		Observer	Marked	Unmarked	Unknown	Marked	Unmarked	Unknown	Collected	Marked	Unmarked	Unknown	Marked	Unmarked	Unknown
Area 4	June	0	0	0	0	0	0	0	2	0	0	0	4	0	0
	July	1	3	5	0	0	0	0	6	1	1	0	1	0	0
	Aug	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Sept	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TOTAL	**1**	**3**	**5**	**0**	**0**	**0**	**0**	**8**	**1**	**1**	**0**	**5**	**0**	**0**
Area 3	June	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	July	2	6	17	1	0	0	1	9	12	27	0	0	4	0
	Aug	0	0	0	0	0	0	0	6	8	4	0	0	0	0
	Sept	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TOTAL	**2**	**6**	**17**	**1**	**0**	**0**	**1**	**15**	**20**	**31**	**0**	**0**	**4**	**0**
Area 2	June	9	43	38	0	0	2	0	6	1	8	0	0	0	0
	July	45	376	418	0	25	12	0	32	55	69	0	1	5	0
	Aug	26	198	262	0	9	7	0	8	16	22	0	0	9	0
	Sept	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TOTAL	**80**	**617**	**718**	**0**	**34**	**21**	**0**	**46**	**72**	**99**	**0**	**1**	**14**	**0**
Area 1	June	1	2	0	0	0	0	0	7	11	9	0	0	0	0
	July	5	63	24	1	1	0	0	20	43	42	0	1	2	0
	Aug	3	14	5	0	0	0	0	12	7	3	0	0	0	1
	Sept	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	TOTAL	**9**	**79**	**29**	**1**	**1**	**0**	**0**	**39**	**61**	**54**	**0**	**1**	**2**	**1**

1/ Closed months and months non-mark-selective for coho are denoted by (-).

Return to Text

Table 5. Estimated Chinook and coho mark rates during the 2023 ocean recreational all-species coho MSF between Cape Falcon, Oregon and the U.S.-Canada border by size class using VTR encounters.[1/]

		LEGAL-SIZED CHINOOK			SUBLEGAL-SIZED CHINOOK			LEGAL-SIZED COHO			FRAM Projected Coho
		Charter	Private	Combined	Charter	Private	Combined	Charter	Private	Combined	**Mark Rate**
Area 4	June	NA	0%	0%	NA	NA	NA	NA	NA	NA	
	July	25%	47%	42%	0%	100%	50%	38%	50%	40%	
	August	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	September	-	-	-	-	-	-	-	-	-	
	TOTAL	**25%**	**39%**	**36%**	**0%**	**100%**	**50%**	**38%**	**50%**	**40%**	**54%**
Area 3	June	NA	NA	NA	NA	NA	NA	NA	NA	NA	
	July	78%	57%	69%	33%	0%	20%	26%	31%	29%	
	August	NA	75%	75%	NA	25%	25%	NA	67%	67%	
	September	-	-	-	-	-	-	-	-	-	
	TOTAL	**78%**	**64%**	**70%**	**33%**	**20%**	**23%**	**26%**	**39%**	**35%**	**57%**
Area 2	June	65%	68%	66%	50%	67%	56%	53%	11%	49%	
	July	55%	62%	57%	65%	43%	63%	47%	44%	47%	
	August	50%	48%	49%	63%	100%	70%	43%	42%	43%	
	September	-	-	-	-	-	-	-	-	-	
	TOTAL	**56%**	**60%**	**57%**	**60%**	**63%**	**61%**	**46%**	**42%**	**46%**	**64%**
Area 1	June	40%	57%	50%	100%	NA	100%	100%	55%	59%	
	July	60%	38%	41%	50%	NA	50%	72%	51%	62%	
	August	67%	42%	51%	100%	33%	43%	74%	70%	72%	
	September	-	-	-	-	-	-	-	-	-	
	TOTAL	**60%**	**42%**	**48%**	**75%**	**33%**	**50%**	**73%**	**53%**	**63%**	**69%**

1/ Closed months and months non-mark-selective for coho are denoted by (-).

Return to Text

Table 6. Comparison of modeled (FRAM model run Coho2318v2) and estimated total coho encounters in the 2023 ocean recreational all-species coho MSF.

Data Source	Area	Marked	Unmarked	Total Encounters	Landed Catch
FRAM	Area 4	17,293	14,966	32,258	16,600
	Area 3	4,329	3,220	7,548	4,151
	Area 2	61,830	34,162	95,993	59,050
	Area 1	83,681	37,575	121,256	79,799
	TOTAL	**167,132**	**89,923**	**257,055**	**159,600**
Estimated Actual Encounters	Area 4	3,100	3,610	6,710	2,846
	Area 3	664	1,135	1,798	630
	Area 2	14,178	18,535	32,713	12,085
	Area 1	15,771	12,249	28,020	15,592
	TOTAL	**33,713**	**35,528**	**69,242**	**31,152**
	Variance[1/]:	3,023,396	4,004,952	13,810,013	468,790
	Standard Error:	1,739	2,001	3,716	685
	CV (%):	5%	6%	5%	2%
	95% CI:	30,305-37,121	31,606-39,451	61,958-76,525	29,810-32,494

1/ Variance estimates are unavailable for Oregon statistics.

Return to Text

Table 7. Comparison of modeled (FRAM model run Coho2318v2) and estimated total coho mortalities in the 2023 ocean recreational all-species coho MSF.

		Release Mortality		**Drop Off Mortality** [1/]		**Landed Catch**		Total
Data Source	Area	Marked	Unmarked	Marked	Unmarked	Marked	Unmarked	Mortality
FRAM	Area 4	146	2,100	867	765	16,294	306	20,478
	Area 3	36	458	217	167	4,084	67	5,030
	Area 2	521	4,921	3,103	1,793	58,333	717	69,389
	Area 1	706	5,503	4,202	2,005	78,997	802	92,215
	TOTAL	**1,409**	**12,983**	**8,389**	**4,731**	**157,707**	**1,893**	**187,112**
Estimated Actual Mortality	Area 4	42	498	155	181	2,798	48	3,722
	Area 3	5	159	33	57	630	0	883
	Area 2	304	2,595	709	927	12,008	76	16,619
	Area 1	29	1,715	789	612	15,567	25	18,736
	TOTAL	**380**	**4,967**	**1,686**	**1,776**	**31,003**	**149**	**39,960**
Variance[2/]**:**		7,259	117,579	7,558	10,012	462,737	434	-
Standard Error:		85	343	87	100	680	21	-
CV (%):		22%	7%	5%	6%	2%	14%	-
95% CI:		213-546	4,295-5,639	1,515-1,856	1,580-1,973	29,669-32,336	108-190	-

1/ Observed drop off mortality calculated as 5% of observed encounters.

2/ Variance estimates are unavailable for Oregon statistics.

Return to Text

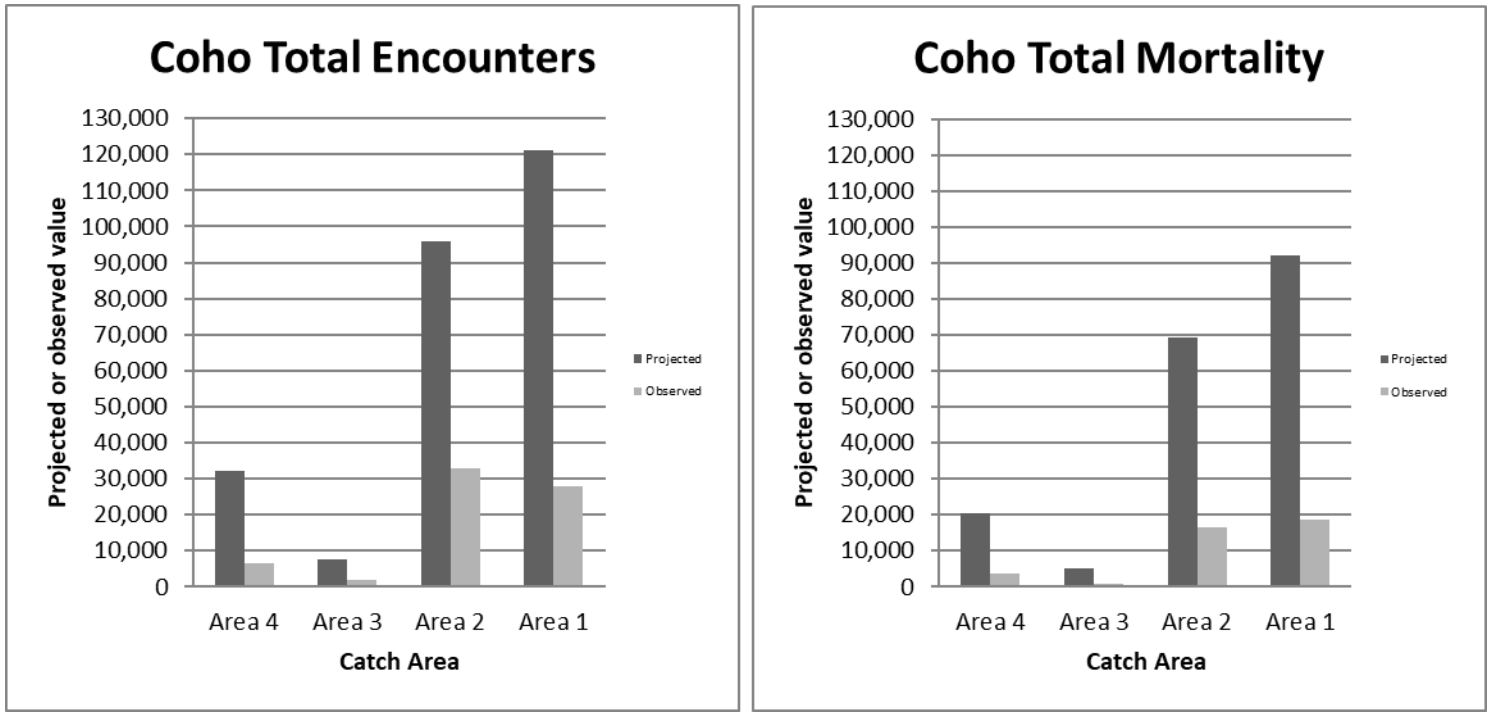

Figure 2. Comparison of modeled (FRAM model run Coho2318v2) and estimated total coho encounters and mortality in the 2023 ocean recreational all-species coho MSF.

Return to Text

Table 8. Compliance with coho MSF regulations observed during dockside sampling interviews in the 2023 ocean recreational all-species coho MSF between Cape Falcon, Oregon and the U.S.-Canada border.[1/]

		Total Coho Sampled	Marked Coho Sampled	Unmarked Coho Sampled	% Sampled Coho Marked
Area 4	June	93	90	3	96.8%
	July	469	466	3	99.4%
	August	549	537	12	97.8%
	September	-	-	-	NA
	Total	**1,111**	**1,093**	**18**	**98.4%**
Area 3	June	10	10	0	100.0%
	July	214	214	0	100.0%
	August	214	214	0	100.0%
	September	-	-	-	NA
	Total	**438**	**438**	**0**	**100.0%**
Area 2	June	169	166	3	98.2%
	July	3,216	3,203	13	99.6%
	August	1,213	1,204	9	99.3%
	September	-	-	-	NA
	Total	**4,598**	**4,573**	**25**	**99.5%**
Area 1	June	551	550	1	99.8%
	July	3,650	3,645	5	99.9%
	August	1,082	1,079	3	99.7%
	September	-	-	-	NA
	Total	**5,283**	**5,274**	**9**	**99.8%**

1/ Closed months and months non-mark-selective for coho are denoted by (-).

Return to Text

5. RESULTS IN THE NON-TRIBAL COMMERCIAL TROLL ALL-SPECIES COHO MSF

The non-Tribal commercial troll fishery harvested a total of 11,751 Chinook (10,929 WA, 822 OR) and 2,862 coho (2,270 WA, 592 OR) during the 2023 coastwide all-species coho MSF operating July 1 through August 25. Estimates of coho catch in the commercial troll all-species coho MSF were below preseason projections in all marine areas. **Table 9** shows commercial troll catch in the all-species coho MSF by month and area.

WDFW dockside samplers examined a total of 37% of all Chinook and 35% of all coho harvested and landed in WA during the non-Tribal commercial troll all-species coho MSF. CWT collections totaled 421 from Chinook and 103 from coho in WA ports (**Table 10**).

Table 9. Total Chinook and coho retained during the 2023 non-Tribal commercial troll all-species coho MSF between Cape Falcon, Oregon and the U.S.-Canada border.

	Chinook				**Coho**			
	July	August	September	TOTAL	July	August	September	TOTAL
Area 4	221	19	-	240	0	32	-	32
Area 3	1,557	75	-	1,632	207	108	-	315
Area 2	8,582	75	-	8,657	1,752	52	-	1,804
Area 1	378	22	-	400	97	22	-	119
TOTAL WA	**10,738**	**191**	-	**10,929**	**2,056**	**214**	-	**2,270**
OREGON (Area 1)	797	25	-	822	577	15	-	592
TOTAL NOF	**11,535**	**216**	-	**11,751**	**2,633**	**229**	-	**2,862**

1/ Months non-mark-selective for coho are denoted by (-).

Table 10. Chinook and coho sampled in WA during the 2023 non-Tribal commercial troll all-species coho MSF between Cape Falcon, Oregon and the U.S.-Canada border.

	Chinook			**Coho**		
	Total Sampled	Sample Rate	CWTs Collected	Total Sampled	Sample Rate	CWTs Collected
Area 4	65	27%	4	0	0%	0
Area 3	714	44%	65	120	38%	24
Area 2	3,180	37%	339	628	35%	76
Area 1	127	32%	13	36	30%	3
TOTAL WA	**4,086**	**37%**	**421**	**784**	**35%**	**103**

REFERENCES

Cochran, W. G. 1977. Sampling techniques. 3rd ed. John Wiley. 428 pp.

Conrad, R. 2012. Comparison of Two Methods for Estimating Coho Salmon Encounters and Release Mortalities in the Ocean Mark-Selective Fishery. PFMC Salmon Methodology Review, October 2012. http://www.pcouncil.org/resources/archives/briefing-books/november-2012-briefing-book/#salmonNov2012 Agenda Item C.3.a, Attachment 4

Conrad, R., and P. McHugh. 2008. Assessment of Two Methods for Estimating Total Chinook Salmon Encounters in Puget Sound/Strait of Juan de Fuca Mark-Selective Chinook Fisheries. Northwest Fishery Resource Bulletin Manuscript Series No. 2. http://www.nwifc.org/publications/northwest-fishery-resource-bulletin/; https://wdfw.wa.gov/publications/00492

Lai, H-L., R.Moore, and J. Tagart. 1991. Methodologies for estimating catch and effort statistics of ocean sport fishery off the Washington Coast with users guide for the program 'OSFP.FOR'. Prog. Report No. 289. Wash. Dept. of Fisheries, Olympia, WA. 35 pp.

Pacific Fishery Management Council. 2024. Review of 2023 Ocean Salmon Fisheries: Stock Assessment and Fishery Evaluation Document for the Pacific Coast Fishery Management Plan. February 2024. Pacific Fishery Management Council. Portland, Oregon. https://www.pcouncil.org/documents/2024/02/review-of-2023-ocean-salmon-fisheries.pdf/

SFEC-AWG. 2002. Pacific Salmon Commission, Joint Selective Fisheries Evaluation Committee Report, Investigation of methods to estimate mortalities of unmarked salmon in mark-selective fisheries through the use of double index tag groups. TCSFEC (02)-1, February 2002.

Thompson, S.K. 1992. Sampling. John Wiley. 343 pp.

Washington Department of Fish and Wildlife (WDFW) and Northwest Indian Fisheries Commission (NWIFC). 2010. 2010-11 Co-managers' List of Agreed Fisheries. Olympia, Washington.

Washington Department of Fish and Wildlife (WDFW). 2011. Methods Report: Monitoring Mark-Selective Recreational Chinook Fisheries In the Marine Catch Areas of Puget Sound (Areas 5 through 13). Draft Report: January 21, 2011. Washington Department of Fish and Wildlife. Olympia, Washington. 81 pp. https://wdfw.wa.gov/publications/01357

Back to Top