



**Monitoring Results from the 2002 Ocean Recreational Selective Fisheries
from Leadbetter Point to the U.S. Canada Border**

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Washington Department of Fish and Wildlife

March, 2002

Introduction

The Pacific Fishery Management Council (PFMC) adopted selective recreational fisheries for coho in all four ocean areas from Cape Falcon, Oregon to the U.S./Canada border as well as the Buoy 10 fishery in the Columbia River estuary. This paper is a report on the all-species recreational fisheries in the three areas north of Leadbetter Point (Catch Record Card Areas 2, 3 and 4).

When the Council set the 2002 selective fisheries, assumptions were made about coho and chinook abundance, distribution of stocks, coho mark rates, compliance with the new regulations, and incidental mortality. For the fourth consecutive year, a monitoring plan was implemented to test some of these assumptions through dockside catch and effort sampling along with direct on-water observations of the fisheries in progress.

Selective Fishery Descriptions

AREA 2: The ocean recreational fishery from Leadbetter Point, Washington to the Queets river (Area 2) was open Sunday through Thursday, June 30 through August 19 for a total of 37 fishing days. A two salmon daily bag limit was in effect; all retained coho were required to have a healed adipose fin clip.

AREA 3: The ocean recreational fishery from the Queets River to Cape Alava (Area 3) was open seven days per week July 7 through September 8. From September 21 through October 6, salmon fishing was restricted to that portion of Area 3 defined by a line from Teawhit Head northwest to "Q" Buoy, to Cake Rock, then true east to the shoreline, seven days per week. A total of 80 fishing days were available in Area 3. A two salmon daily bag limit was in effect; all retained coho were required to have a healed adipose fin clip.

AREA 4: The ocean recreational fishery from Cape Alava to the U.S./Canada border (Area 4) was open seven days per week July 7 through September 8, for a total of 64 fishing days. A two salmon daily bag limit was in effect; all retained coho were required to have a healed adipose fin clip.

Methods

AREA 2: WDFW stationed five dockside samplers and one on-water observer in Westport to monitor the Area 2 selective fishery. The on-water observer concentrated his efforts on the charter fleet operating from Westport. Charter operators volunteered space on their vessels to accommodate the WDFW observer, who collected information about that specific boat's encounters for the day. Data recorded included species hooked, presence or absence of the adipose fin, size (legal or sublegal), and result of the hookup (fish retained, released, or dropped off) for each hookup that occurred on that vessel.

Dockside port samplers collected catch information through interviews and catch inspections as fishing boats returned to port. Data collected per boat included catch by species, presence or absence of adipose fins on all retained salmon, number of anglers, total number of salmon

released by species, and number of adipose-clipped coho released. Landed salmon were sampled for species, fin mark, and coded-wire tag collection. Due to the mass marking of hatchery chinook and coho, electronic detection equipment was used to indicate the presence or absence of coded-wire tags in those salmon species.

Total effort data was collected through counts of vessels leaving the port on their way to the fishing grounds each day. Dockside sampling data was then expanded according to the observed effort profile to estimate total effort and retained and released catch.

AREA 3: WDFW stationed one employee in La Push to monitor the selective recreational ocean fishery in Area 3. Because there is very little charter boat activity in La Push, and because the private sport activity is relatively low and scattered, on-water observation from La Push was not feasible. Therefore, voluntary logbooks with instructions were distributed to anglers willing to keep track of their fish encounters. On a daily basis, these anglers recorded species hooked, presence or absence of the adipose fin, size (legal or sublegal), and result of the hookup (fish retained, released, or dropped off) for each hookup that occurred on that vessel.

Dockside, the port sampler collected catch information through interviews and catch inspections as described above. Total effort data was collected through a count of vessels returning to the port. Dockside sampling data was then expanded according to the observed effort profile to estimate total effort and retained and released catch.

AREA 4: WDFW stationed four dockside employees and two on-water observers in Neah Bay to monitor the Area 4 selective fishery. The on-water observers worked mainly from a WDFW vessel, fishing for salmon and recording species hooked, presence or absence of the adipose fin, size (legal or sublegal), and result of the hookup (fish retained, released, or dropped off). All fish hooked were released.

On-water observers also rode along on charter boats whenever possible. Charter operators in Neah Bay volunteered space on their vessels to accommodate the WDFW observers. The observers on charter boats collected information identical to that collected in Westport.

Dockside, the port samplers collected catch information through interviews and catch inspections as described above. Total effort data was collected through counts of vessels leaving the port on their way to the fishing grounds each day. Dockside sampling data was then expanded according to the observed effort profile to estimate total effort and retained and released catch.

ALL AREAS: Logbooks were made available to WDFW personnel and to the public to collect data from their private fishing trips as described in Area 3. Data recorded included Catch Record Card Area fished, target species, and for each hookup, the species hooked, presence or absence of the adipose fin, size (legal or sublegal), and result of the hookup (fish retained, released, or dropped off). Logbooks were collected from trips in all areas; data from Areas 2 and 4 were not included with on-water observer data and have not yet been analyzed.

Catch and Effort

In Area 2, 29,452 anglers harvested a total of 19,068 coho (49 percent of the 39,280 coho quota)

and 27,069 chinook. In Area 3, 3,120 anglers harvested a total of 1,652 coho (58 percent of the 2,870 coho quota) and 1,846 chinook. In Area 4, 10,575 anglers harvested a total of 8,396 coho (71 percent of the 11,780 coho quota) and 3,768 chinook. Table 1 shows estimated total effort and landed coho and chinook catch by month for the catch areas north of Leadbetter Point.

Selective Fishery Observation

AREA 2. WDFW staff observed anglers on board charter boats for each week the fishery was open in Area 2. Data collected include observations of 574 legal-sized coho encountered aboard chartered fishing vessels. Of these encounters, 317 coho were retained, which is 2% of the 19,068 coho retained in the ocean fishery. The mark rate (adipose fin clipped) of the legal-sized coho encountered through the season was 57%. The mark rate by month was 57% in July and 56% in August (Table 2). Five percent of the 1,114 salmon observed hooked in Area 2 dropped off prior to being landed.

AREA 3. Angler logbooks were collected from Area 3 during July and August. A total of 140 legal-sized coho were reported brought to the boat. Of these encounters, 45 coho were retained, which is 3% of the 1,652 coho retained in the ocean fishery. The mark rate (adipose fin clipped) of the legal-sized coho encountered through the season was 46%. The mark rate by month was 40% in July and 46% in August (Table 2). Four percent of the 294 reported salmon hooked in Area 3 dropped off prior to being landed.

AREA 4. WDFW staff observed catch in Area 4 for each week the fishery was open. A total of 306 legal-sized coho were observed as they were brought to the boat. The mark rate (adipose fin clipped) of the legal-sized coho encountered through the season was 40%. The mark rate by month was 37% in July, 39% in August, and 54% in September (Table 2). Eighteen percent of the 456 salmon observed hooked in Area 4 dropped off prior to being landed.

Comparison of Pre-season vs. Post-season Estimates of Coho Mark Rates

Pre-season projections of 2002 coho mark rates were estimated using the coho Fishery Regulation Assessment Model (FRAM). The coho FRAM uses inputs of pre-season run size projections and historic coded wire tag recovery data to predict the resulting impacts from a proposed fishery. FRAM model run 0228 was the final pre-season assessment of the PFMC's adopted fishery package for the 2002 ocean fisheries. Table 3 compares the coho mark rates projected by the FRAM model with those observed through on-water monitoring in Areas 2, 3, and 4 in 2002.

Observation data showed actual coho mark rates slightly lower than pre-season projections in Areas 2 and 4, and identical to pre-season projections in Area 3. The total observed coho mark rate for the season in the ocean Area 2 selective fishery was 57% compared to 62% projected pre-season. In ocean Area 3, the coho mark rate calculated from angler logbooks was 46%, equaling the pre-season projection. The observed coho mark rate in the ocean Area 4 selective fishery 40%, compared to 48% projected pre-season.

Comparison of Dockside and Observer Data in Selective Fisheries

Observation data on 2002 selective coho fisheries were collected in part to investigate potential bias in estimates of coho mark rates based on angler recollection of released coho. Table 4 compares coho release rates in Areas 2 and 3 collected through on-water observation and angler logbooks with data collected through dockside interviews. In Area 4, comparison of the two rates is invalid since most of the on-water data was collected through a catch-and-release program conducted by WDFW staff.

Relative to estimates of released salmon from fishery observation data, information collected at the dock in 2002 showed a small bias towards higher numbers of salmon released. The dockside sampling of the ocean Area 2 selective fishery showed a coho release rate of 57%, compared to a rate of 45% observed on the water; in Area 3, the release rate reported dockside was 72%, compared with a release rate of 68% reported in angler logbooks.

Compliance

Information on compliance with selective regulations was collected through both dockside sampling by the WDFW sampling program and enforcement activities conducted by WDFW Enforcement staff.

Compliance with the selective fishery regulation in the ocean fishery was high for both private and charter vessels. In Area 2, 49% of the total estimated coho landed were sampled dockside by the ocean sampling program. In Area 3, 70% of the total estimated coho landed were sampled, and in Area 4, 50% were sampled dockside. Dockside sampling showed compliance rates for the season of 99.0%, 99.4%, and 98.6% for Area 2, Area 3, and Area 4 respectively (Table 5). These rates are slightly above the compliance rates observed in 2001.

Boat patrols, dockside enforcement, and investigative work conducted by WDFW Enforcement found selective fishery compliance rates similar to those observed by the WDFW sampling program. In Area 2, the compliance rate was estimated at 98.4%; a 99.8% compliance rate was estimated in Area 3, and a compliance rate of 98.6% was estimated for Area 4.

Drop Off Rates

On-water observers and anglers completing voluntary logs were asked to record information on fish that were hooked but lost before being brought to the boat, commonly referred to as drop offs. For this study, the definition of drop off was that the fish was actually hooked but became free before it could be landed. This definition calls for some judgment on the part of the observers or anglers recording the data, resulting in potential bias.

Current Council methodology for estimating mortality due to drop off uses a rate of 5% of the total number of fish handled (retention plus release). Mortality rates for the season estimated from on-water observation data ranged from less than 1% to just over 1% in all areas. Estimates of drop off mortality rates from on-water observation data collected during the ocean selective fisheries are compared with FRAM projections in Table 6.

Estimated Mortality

Table 7 shows the FRAM pre-season projections of total coho mortality. Estimates of actual coho mortality in the ocean selective fisheries are shown in Table 8. This analysis uses estimates of coho mark rates from on-water sampling and voluntary angler logbooks to estimate total coho release. Estimates of incidental mortality are calculated using rates adopted by the Council for recreational fisheries (5% drop off mortality and 14% hooking mortality).

Incidental coho mortality in Area 2 is estimated at 3,707 which, when combined with a total coho retention of 19,068, puts the estimate of total coho mortality in the Area 2 selective fishery at 22,775. This compares to a pre-season projected total mortality of 46,089 coho.

In Area 3, incidental mortality is estimated at 474 which, when combined with a total coho retention of 1,652, puts the estimate of total coho mortality in the ocean selective fishery at 2,126. This compares to a pre-season projected total mortality of 3,662 coho.

Incidental coho mortality in Area 4 is estimated at 2,667 which, when combined with a total coho retention of 8,396, puts the estimate of total coho mortality in the ocean selective fishery at 11,063. This compares to a pre-season projected total mortality of 14,865 coho.

Conclusion

The observed coho mark rates in Areas 2 and 4 were slightly lower in all months than pre-season projections. The observed coho mark rate in Area 3 was also slightly lower than predicted in each month, but was identical overall to the pre-season prediction because a larger portion of the catch was landed in August than predicted.

The release data collected through dockside interviews were higher than what was observed during on-water observations where comparison was possible. Previous years' data as well as many other studies conducted by WDFW have shown that anglers tend to over-estimate rather than under-estimate the number of released fish.

The selective fishing compliance rate averaged 99% on the coast. Enforcement activities suggested similar compliance rates to what was observed by samplers on the dock. The pre-season model projected a rate of 5% retention of all unmarked handled coho; in-season data showed a retention rate of 1% of handled unmarked coho in all three areas.

Both total estimated mortality and incidental mortality in all three areas was lower than projected by the FRAM model pre-season. Mortality was reduced because coho quotas were not met in 2002.

Acknowledgments

The Ocean Sampling Program staff would like to thank all of the samplers and observers whose data collection made these analyses possible, and Sergeant Mike Cenci and the officers of the

Ocean Enforcement Division who supplied their compliance information. A special thanks goes to Mark Cedergreen and Butch Smith as well as the Westport Charter Boat Association and the Ilwaco Charter Boat Association and the individual charter boat operators who voluntarily gave us access to ride along with the fleet as they fished. Finally, thanks to the numerous recreational anglers who voluntarily completed logbooks providing information about their fishing encounters.

TABLE 1: Salmon catch and effort by area and month in the 2002 ocean recreational fisheries.

MONTH	Area 2			Area 3			Area 4/4B		
	Angler trips	Coho	Chinook	Angler trips	Coho	Chinook	Angler trips	Coho	Chinook
July	17,109	8,306	18,521	1,089	492	1,132	3,957	1,792	3,004
August	12,343	10,762	8,548	1,350	1,010	579	5,467	5,419	757
Sept	0	0	0	568	146	92	1,151	1,185	7
Oct	0	0	0	113	4	43	0	0	0
TOTAL	29,452	19,068	27,069	3,120	1,652	1,846	10,575	8,396	3,768

TABLE 2: 2002 mark rate of legal-sized coho encountered during on-board observation in the ocean recreational fisheries.

		Total	Marked	Unmarked	Unknown	Observed Coho
		Encountered	Encountered	Encountered	Encountered	Mark Rate
AREA 2	July	347	197	150	0	57%
	August	227	128	99	0	56%
	Sept	-	-	-	-	-
	Total	574	325	249	0	57%
AREA 3	July	15	6	9	0	40%
	August	125	58	67	0	46%
	Sept	0	0	0	0	N/A
	Total	140	64	76	0	46%
AREA 4/4B	July	142	53	89	0	37%
	August	129	50	79	0	39%
	Sept	35	19	16	0	54%
	Total	306	122	184	0	40%

TABLE 3: 2002 mark rate of legal-sized coho encountered during on-board observation in the ocean recreational fisheries compared with the FRAM preseason projected mark rates.

		Total Legal Sized Coho Encountered	Observed Coho Mark Rate	Projected Coho Mark Rate
AREA 2	July	347	57%	63%
	August/Sep	227	56%	58%
	Total	574	57%	62%
AREA 3	July	15	40%	45%
	August/Sep	125	46%	49%
	Total	140	46%	46%
AREA 4/4B	July	142	37%	51%
	August/Sep	164	42%	43%
	Total	306	40%	48%

TABLE 4: Comparison of coho release rates observed on-water and reported through dockside interviews in the 2002 ocean recreational fisheries.

		ON-WATER OBSERVATIONS			DOCKSIDE REPORTS		
		Coho Retained	Coho Released	Release Rate	Coho Retained	Coho Released	Release Rate
AREA 2	July	193	154	44%	5,677	7,705	58%
	August	124	107	46%	3,608	4,747	57%
	Sept	-	-	-	-	-	-
	Total	317	261	45%	9,285	12,452	57%
AREA 3	July	6	9	60%	465	1,227	73%
	August	39	86	69%	636	1,456	70%
	Sept	N/A	N/A	N/A	67	190	74%
	Total	45	95	68%	1,101	2,873	72%
AREA 4/4B	July	N/A	N/A	N/A	1,006	2,502	71%
	August	N/A	N/A	N/A	2,785	5,235	65%
	Sept	N/A	N/A	N/A	307	775	72%
	Total	N/A	N/A	N/A	4,098	8,512	68%

TABLE 5: Compliance with selective fishery regulations observed through dockside port sampling.

		Total Coho Sampled	Marked Coho Sampled	Unmarked Coho Sampled	% Sampled Coho Marked
AREA 2	July	5,677	5,612	65	98.9%
	August	3,608	3,582	26	99.3%
	Sept	-	-	-	-
	Total	9,285	9,194	91	99.0%
AREA 3	July	465	459	6	98.7%
	August	636	635	1	99.8%
	Sept	67	66	1	98.5%
	Total	1,101	1,094	7	99.4%
AREA 4/4B	July	1,006	978	28	97.2%
	August	2,785	2,755	30	98.9%
	Sept	307	307	0	100.0%
	Total	4,098	4,040	58	98.6%

TABLE 6: Estimated drop off mortality in the 2002 ocean recreational fisheries using on-water observation data.

		Total Salmon Handled	Observed Drop Offs	Estimated Observed Drop Off Mortality a/	FRAM total Drop Off Mortality b/	Observed Drop Off Mortality Rate c/
AREA 2	July	776	47	4	39	0.5%
	August	338	11	1	17	0.3%
	Sept	-	-	-	-	-
	Total	1,114	58	5	56	0.4%
AREA 3	July	30	0	0	2	0.0%
	August	264	13	1	13	0.4%
	Sept	N/A	N/A	N/A	N/A	N/A
	Total	294	13	1	15	0.4%
AREA 4/4B	July	233	42	3	12	1.4%
	August	176	32	3	9	1.5%
	Sept	47	7	1	2	1.2%
	Total	456	81	6	23	1.4%

a/ Assumes 8% hooking mortality rate on observed drop offs.

b/ Total drop off mortality calculated using FRAM methodology (5% of handled fish).

c/ Estimated drop off mortality/Total salmon handled; 5% used by FRAM pre-season.

TABLE 7: Preseason FRAM (model run 0228) projected coho mortality in the 2002 ocean recreational fisheries.

		Total Retention	Marked Retention	Unmarked Retention	Unmarked Released	Total Handled a/	Predicted Mark Rate	Drop Off Mortality b/	Release Mortality c/	Incidental Mortality d/	Total Mortality e/
AREA 2	July	30,000	29,636	364	17,842	49,734	63%	2,487	2,498	4,985	34,985
	August/Sept f/	9,280	9,137	143	7,005	16,868	58%	843	981	1,824	11,104
	Total	39,280	38,773	507	24,847	66,602	62%	3,330	3,479	6,809	46,089
AREA 3	July	1,750	1,706	44	2,164	4,023	45%	201	303	504	2,254
	August/Sept	1,120	1,095	25	1,202	2,392	49%	120	168	288	1,408
	Total	2,870	2,801	69	3,366	6,415	46%	321	471	792	3,662
AREA 4/4B	July	8,000	7,840	160	7,852	16,352	51%	818	1,099	1,917	9,917
	August/Sept	3,780	3,676	104	5,094	9,109	43%	455	713	1,169	4,949
	Total	11,780	11,516	264	12,946	25,461	48%	1,273	1,812	3,085	14,865

a/ Marked handled + Unmarked handled.

b/ 5% of total handled.

c/ 14% of unmarked released.

d/ Drop off + Release mortality.

e/ Total retention + Incidental mortality.

f/ August and September are modeled as one unit.

TABLE 8: Estimated actual coho mortality in the 2002 ocean recreational fisheries.

		Total Retention	Marked Retention	Unmarked Retention	Unmarked Released	Total Handled a/	Observed Mark Rate	Drop Off Mortality b/	Release Mortality c/	Incidental Mortality d/	Total Mortality e/
AREA 2	July	8,306	8,211	95	6,157	14,463	57%	723	862	1,585	9,891
	August/Sept	10,762	10,684	78	8,335	19,097	56%	955	1,167	2,122	12,884
	Total	19,068	18,895	173	14,492	33,560	57%	1,678	2,029	3,707	22,775
AREA 3	July	492	486	6	722	1,214	40%	61	101	162	654
	August/Sept	1,160	1,158	2	1,336	2,496	46%	125	187	312	1,472
	Total	1,652	1,644	8	2,058	3,710	46%	186	288	474	2,126
AREA 4/4B	July	1,792	1,742	50	2,876	4,668	37%	233	403	636	2,428
	August/Sept	6,604	6,533	71	8,950	15,554	42%	778	1,253	2,031	8,635
	Total	8,396	8,275	121	11,826	20,222	40%	1,011	1,656	2,667	11,063

a/ Marked handled + Unmarked handled.

b/ Observed mark rate in Area 3 assumed from dockside interview data.

c/ 5% of total handled.

d/ 14% of unmarked released.

e/ Drop off + Release mortality.

f/ Total retention + Incidental mortality.