

Shoreside Whiting Observation Program: 1997

prepared by

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INTRODUCTION

The Pacific Whiting Shoreside Observation Program was established in 1992 to provide information for evaluating bycatch in the directed Pacific whiting fishery and for evaluating conservation measures adopted to protect salmon and other prohibited species. The program has been continued annually in order to account for all catch in targeted whiting trips and to accommodate the landing of non-sorted catch from these trips. In 1995, the program changed its emphasis from a high target rate of observation (50% of landings) and a focus on prohibited species to a lower target rate of observation (10% of landings) and the collection of biological samples and information (otoliths, length, age, weight, sex, maturity) from Pacific whiting and selected bycatch species (yellowtail and widow rockfish, sablefish, chub (Pacific) mackerel, jack mackerel and prohibited species).

The program is a cooperative effort between the fishing industry and management agencies to observe and collect information on directed Pacific whiting landings at shoreside processing plants. Participants are mid-water trawlers delivering whiting to shoreside processing plants in California, Oregon and Washington, shoreside processing plants receiving unsorted whiting in the three states, the Pacific Fishery Management Council (PFMC), the National Marine Fisheries Service (NMFS), the Pacific States Marine Fisheries Commission (PSMFC), the Oregon Department of Fish and Wildlife (ODFW), the California Department of Fish and Game (CDFG), and the Washington Department of Fish and Wildlife (WDFW). Participating vessels apply for and carry exempted fishing permits issued by the National Marine Fisheries Service. Permit terms allow (and require) vessels to land unsorted whiting at designated shoreside processing plants. Permitted vessels are not penalized for landing prohibited species (e.g., Pacific salmon, Pacific halibut, Dungeness crab), nor are they held liable for overages of groundfish trip limits.

1997 WHITING FISHERY

The 1997 directed shoreside whiting fishery began on 15 March 1997 in California, and on 15 June 1997 in Oregon and Washington. The latter date is a one-month delay from the season opening date in 1996. The directed season for at-sea processors (catcher-processors and motherships collectively) began on 15 May 1997. A formal catch allocation formula was determined by the Pacific Fishery Management Council prior to the 1997 season; the total commercial harvest guideline (CHG) was 207,000 metric tons. The Council allocated 42% of the CHG to vessels landing at shoreside processing plants (86,900 mt), 34% of the CHG to catcher-processors (70,400 mt), and 24% of the CHG to catcher vessels delivering to motherships (49,700 mt). The mothership fishery closed on 1 June with a total catch of

50,395 mt of whiting (1.4% over the allocated amount) and the catcher-processor fishery closed on 11 June with a total harvest of 69,947 mt of whiting (0.6% under the allocated amount). The shoreside directed fishery closed on 22 August with landings of approximately 87,499 mt (0.7% over the allocated amount).

Tables 1a and 1b present landed catch and bycatch by fishing week for the duration of the 1997 whiting season. The vast majority of Pacific whiting (about 84.3%) was landed in Oregon; Washington landed approximately 8.5% and California landed about 7.3%. These two tables show the very slight differences resulting from some small directed whiting landings outside the EFP program, and incidental landings. The following abbreviations are used in these two tables: Y'tail - yellowtail rockfish; Widow - widow rockfish; Sable - sablefish; Mac - chub (Pacific) mackerel and jack mackerel (combined); Misc. Rock - miscellaneous rockfish; Misc. Fish - miscellaneous fishes (all others).

Forty mid-water trawlers participated in the program in 1997. Forty three vessels landed 84,680 mt whiting under this program in 1996; 35 vessels landed about 74,000 mt whiting in 1995, and 33 vessels delivered 72,000 mt whiting to shoreside processors in 1994.

Unsorted Pacific whiting landings in 1997 were observed at processing plants in the Crescent City (2), Eureka (2), Newport (3), Astoria (3), Ilwaco (1) and Westport (1) areas. Most mid-water trawlers targeting whiting and delivering fish to onshore processing plants, and most onshore processing plants receiving whiting participated in the observation program. Overall, 14% of Pacific whiting landings at shoreside processors were observed in 1997. This exceeded the 10% program goal, and was an increase from the 11.9% observation rate of 1996. However, there was a wide range in observation rates from plant to plant, with some processors observing appreciably more than 10% of the landings, and others being appreciably under.

Relative to 1996, the 1997 Pacific whiting fishery did not experience the same problems with small fish. Larger whiting were abundant and the proportion of smaller, younger individuals lower. This may partially account for the rapid harvest and short duration of this year's fishery: 68 days to take 87,499 mt vs. 87 days to take 84,680 mt in 1996. Fishers have indicated that the relative ease of finding whiting in 1997 allowed them to fish more carefully; this may have allowed them to fish with reduced bycatch for some groundfish species as discussed below.

BYCATCH OF GROUND FISH AND PROHIBITED SPECIES

Tables 2 through 6 summarize 1997 landed catch and bycatch; for Oregon this information is broken down by port. California and Washington information are combined; we are required to treat business information such as landings as confidential, and to release such information to the public in aggregates of three or more entities. Since only two processors received unsorted whiting in Washington in 1997, we cannot present this information by itself, or in a way which allows it to be readily calculated. These tables present landing information and bycatch rates from observations in the left column, and landings and rates for the EFP fishery based on fish ticket information in the next column to the right. In some cases, sharp differences can be noted between bycatch rates based on observations and rates calculated from information reported on fish tickets. This is a consequence of the programmatic change initiated in 1995 to 1) reduce observation rates from 50% to 10% and 2) to increase effort on enumeration of groundfish species bycatch and biological sampling. In 1997, large landings of incidentally caught chub (Pacific) mackerel and jack mackerel swamped some plants; landings of these species may be uncertain to some degree.

Rockfish bycatch

Bycatch of rockfish (yellowtail rockfish, widow rockfish and miscellaneous rockfish) was sharply lower in 1997 than 1996, both as an absolute quantity and as a rate based on volume of whiting landed. The largest quantities of bycaught rockfish, as with other bycaught groundfish, were landed in Oregon; this reflects the large proportion of whiting landed in Oregon. Bycatch rates of yellowtail and widow rockfish were highest in Washington and lowest in California in 1997; this is the same pattern as observed in 1995 and 1996. Weekly bycatch rates of rockfish showed considerable variability through the course of the 1997 whiting fishery (Tables 1a and 1b, Figures 2a, 2b and 2e).

Sablefish and Mackerel bycatch

Overall, sablefish landed as bycatch in the shoreside whiting fishery was relatively low and very comparable to 1996 rates. (Tables 1a and 1b, Figure 2c)

Mackerel bycatch information combines chub (Pacific) mackerel and jack mackerel, which are taxonomically distinct. Overall mackerel bycatch increased over six-fold from 1996 levels, which itself was 22% above 1995 levels. (Tables 1a and 1b, Figure 2d)

Salmon bycatch

A total of 1482 chinook salmon and 2 coho salmon were taken as bycatch in the 1997 shoreside whiting fishery and were turned over to state agencies by the processors: 1237 in Oregon, and 247 in California and Washington. This compares with 651 salmon provided to state agencies by processors in 1996, and 2972 in 1995. Overall, this represents an incidental catch rate of 0.017 salmon per metric ton of whiting for the entire EFP fishery. Observers at shoreside plants noted 224 salmon incidentally taken in observed landings of 13,470 mt whiting which also results in a rate of 0.017 salmon/mt whiting. These 224 fish are included in the total of 1484 turned over to state agencies. For comparison, the 1996 salmon bycatch rate in the shoreside whiting fishery was 0.008 salmon/mt whiting, and the 1995 rate was 0.032 salmon/mt whiting.

High salmon bycatch rates observed during the first three weeks of the 1995 season led to a one month delay (15 April to 15 May) in the opening of the directed whiting fishery in Oregon and Washington in 1996. While the delay seemed to accomplish its purpose in 1996, with sharply lower salmon bycatch rates noted, there was still a peak in bycatch rates early in the 1996 season. The 1997 season opening of 15 June north of 42° N appears to have led to a further reduction in early season salmon bycatch. (Table 7, Figure 3a). Interestingly, later season salmon bycatch rates in 1997 - while still well below the 0.05 salmon/mt whiting threshold - were higher than in previous years. We suspect this reflects changes in fishing patterns which in turn result from changes in whiting distribution due to oceanographic conditions.

Halibut Bycatch

Twenty eight Pacific halibut were landed in the three states by the 1997 whiting shoreside fishery; twenty seven of these in Oregon. These fish were also provided to hunger relief agencies.

PROGRAM COSTS

In 1997, the cost of the Oregon-Washington portion of the shoreside observation program was approximately \$60,000 (approximately \$30,000 for coordination and data processing costs, and an estimated \$30,000 for observers). This was essentially unchanged from 1996. As in 1995 and 1996, most program funding was provided by industry. Government costs were relatively minor in 1997, as in the previous two years, and are not included in the above summary. Oregon shoreside processing plants hired four observers to make observations at six processors. The Washington Department of Fish and Wildlife and the California Department of Fish and Game provided shoreside landing observations with existing staff.

BIOLOGICAL SAMPLING

In addition to documenting bycatch rates, shoreside observers collect a variety of biological information and samples which are used in stock assessment analyses. In particular, observers in Newport and Astoria measured some 2800 Pacific whiting for length frequency information, and collected over 1600 Pacific whiting otolith samples. This information and samples have been provided to Martin Dorn of the NMFS Alaska Fisheries Science Center for incorporation into subsequent whiting stock assessments.

Similarly, yellowtail rockfish otoliths and length-frequency information (some 700 samples) have been provided to the Washington Department of Fish and Wildlife for future stock assessments on this species.

Biological samples of chub (Pacific) mackerel are provided to the California Department of Fish and Game for their stock assessment work on this species.

Biological samples of widow rockfish, sablefish and jack mackerel are also taken; these have been retained at ODFW and are available for future assessment efforts.

DISTRIBUTION OF FISHING EFFORT

Figures 4a through 4e show the distribution of directed Pacific whiting tows during the years 1992 through 1996. While the general fishing areas are similar, considerable year to year variation in the location of whiting tows likely reflects the availability of appropriate grade fish and efforts to avoid incidental catch of other species.

AREAS FOR IMPROVEMENT IN 1998

The Council and members of the fishing community expect this project to supply accurate information on incidental catch of other species in the whiting fishery. Our results have been good, but each year we try to improve.

One area for focus in 1998 is to improve the reporting of salmon from unobserved landings. We will continue to work with processors to improve procedures to tag (vessel and landing date), store and report salmon landed so that these can be turned over to the states. Coded wire tags are recovered from marked salmon, and all incidentally caught salmon (and halibut) are turned over to hunger relief agencies. Increased attention to this element will increase the confidence of all users of this report in the accuracy of the information provided.

A second area of emphasis will involve working with processors to better report all incidentally taken groundfish species on fish tickets - even if these are purely weighbacks.

With lower rates of observation in this fishery, fish tickets are our primary basis to estimate fishing mortality. Since the volume of fish taken in all fisheries is used to estimate total fishing mortality for stock assessment purposes, it is important that we take all measures possible to ensure accurate reporting. Particular problem species in this respect in 1997 were chub (Pacific) mackerel and jack mackerel; large volumes of bycatch sometimes overwhelmed processors to the degree that estimates of landed volume were not made. As accurate weighing is required by Oregon regulation and the spirit of this permit program, we will work with processors to improve the reporting of bycatch volumes on fish tickets in 1998. ODFW will be undertaking a statistical analysis during the fall and winter of 1997-98 to compare landing estimates obtained by observer efforts versus those derived from fish tickets.

A third area of emphasis will be to continue to encourage the timely provision of logbook information. Information from fishing logs is particularly important to the use of biological samples in stock assessments; these assessments are stratified by fishing area and knowledge of where a particular sample was taken is an essential element to incorporating information from a biological sample into a stock assessment.

FISHING WEEK	START DATE	ENDING DATE	WHITING LANDINGS	WHITING MT	TRIPS OBS.	MT		Y'TAIL MT	WIDOW MT	SABLE MT	MAC MT	MISC ROCK MT	MISC FISH MT
						WHITING OBS.	SALMON OBS.						
1	4/6/97	4/12/97	5	195.97	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00
2	4/13/97	4/19/97	13	625.82	2	46.49	0	0.00	0.01	0.00	0.00	0.00	0.00
3	4/20/97	4/26/97	19	829.54	2	131.49	0	0.00	0.16	0.00	0.00	0.00	0.03
4	4/27/97	5/3/97	14	722.69	0	0.00	0	0.00	0.03	0.00	0.01	0.00	0.02
5	5/4/97	5/10/97	12	725.73	1	50.90	1	0.00	2.61	0.00	0.00	0.00	0.01
6	5/11/97	5/17/97	9	385.09	2	73.38	4	0.00	0.00	0.03	0.00	0.00	0.01
7	5/18/97	5/24/97	20	736.76	2	61.52	2	0.00	0.02	0.00	0.15	0.00	0.77
8	5/25/97	5/31/97	5	116.98	0	0.00	0	0.00	0.69	0.02	0.00	0.00	0.07
9	6/1/97	6/7/97	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00
10	6/8/97	6/14/97	2	0.35	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00
11	6/15/97	6/21/97	120	6,670.19	22	1,497.16	5	8.66	29.03	8.75	11.00	3.41	0.69
12	6/22/97	6/28/97	142	8,520.89	18	1,211.16	1	15.61	8.58	1.94	27.75	4.11	3.72
13	6/29/97	7/5/97	118	7,307.07	26	1,800.25	19	26.11	29.95	0.55	68.94	2.23	13.04
14	7/6/97	7/12/97	150	9,600.19	21	1,511.07	31	16.82	12.25	0.17	117.78	1.11	0.65
15	7/13/97	7/19/97	144	8,418.18	16	1,025.39	46	30.46	19.17	1.65	179.14	1.57	9.02
16	7/20/97	7/26/97	157	9,613.94	24	1,555.37	46	21.15	3.27	17.26	601.95	3.01	7.20
17	7/27/97	8/2/97	153	8,993.73	22	1,664.53	13	20.19	22.43	5.35	495.50	1.16	32.77
18	8/3/97	8/9/97	147	9,295.31	18	1,224.22	10	28.21	8.10	0.29	393.84	0.27	16.28
19	8/10/97	8/16/97	132	8,330.28	12	781.47	15	49.35	12.86	1.47	120.52	0.20	22.05
20	8/17/97	8/23/97	98	6,409.99	12	835.97	31	13.91	9.61	2.44	115.62	10.56	1.15
	YEAR	TOTAL	1460	87,498.70	200	13,470.35	224	230.45	158.77	39.92	2,132.20	27.62	107.48

Table 1a. Weekly EFP and NON-EFP whiting landings and bycatch for Washington, Oregon and California, 1997
(see text for explanation of abbreviations)

FISHING WEEK	START DATE	ENDING DATE	WHITING LANDINGS	WHITING MT	TRIPS OBS.	MT WHITING OBS.	SALMON OBS.	Y'TAIL MT	WIDOW MT	SABLE MT	MAC MT	MISC ROCK MT	MISC FISH MT
1	4/6/97	4/12/97	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00
2	4/13/97	4/19/97	4	204.22	2	46.49	0	0.00	0.01	0.00	0.00	0.00	0.00
3	4/20/97	4/26/97	10	549.60	2	131.49	0	0.00	0.16	0.00	0.00	0.00	0.03
4	4/27/97	5/3/97	8	489.06	0	0.00	0	0.00	0.03	0.00	0.01	0.00	0.02
5	5/4/97	5/10/97	7	441.79	1	50.90	1	0.00	2.61	0.00	0.00	0.00	0.01
6	5/11/97	5/17/97	9	385.09	2	73.38	4	0.00	0.00	0.03	0.00	0.00	0.01
7	5/18/97	5/24/97	15	735.31	2	61.52	2	0.00	0.02	0.00	0.15	0.00	0.77
8	5/25/97	5/31/97	2	112.58	0	0.00	0	0.00	0.00	0.02	0.00	0.00	0.07
9	6/1/97	6/7/97	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00
10	6/8/97	6/14/97	0	0.00	0	0.00	0	0.00	0.00	0.00	0.00	0.00	0.00
11	6/15/97	6/21/97	111	6,655.11	22	1,497.16	5	8.66	29.03	8.75	11.00	3.41	0.69
12	6/22/97	6/28/97	129	8,499.93	18	1,211.16	1	15.61	8.58	1.94	27.75	4.11	3.72
13	6/29/97	7/5/97	111	7,274.55	26	1,800.25	19	26.11	29.95	0.55	68.94	2.23	13.04
14	7/6/97	7/12/97	142	9,591.47	21	1,511.07	31	16.82	12.25	0.17	117.78	1.11	0.65
15	7/13/97	7/19/97	138	8,412.13	16	1,025.39	46	30.46	19.17	1.65	179.14	1.57	9.02
16	7/20/97	7/26/97	154	9,613.23	24	1,555.37	46	21.15	3.27	17.26	601.95	3.01	7.20
17	7/27/97	8/2/97	148	8,992.68	22	1,664.53	13	20.19	22.43	5.35	495.50	1.16	32.77
18	8/3/97	8/9/97	145	9,293.59	18	1,224.22	10	28.21	8.10	0.29	393.84	0.27	16.28
19	8/10/97	8/16/97	128	8,330.14	12	781.47	15	49.35	12.86	1.47	120.52	0.20	22.05
20	8/17/97	8/23/97	95	6,403.34	12	835.97	31	13.91	9.61	2.44	115.62	10.56	0.60
	YEAR	TOTAL	1356	85,983.83	200	13,470.35	224	230.45	158.08	39.92	2132.20	27.62	106.94

Table 1b. Weekly EFP whiting landings and bycatch for Washington, Oregon and California, 1997
(see text for explanation of abbreviations)

Table 2. 1997 Cumulative shoreside whiting fishery report for Washington, Oregon and California.

Cumulative Whiting Report

WASHINGTON, OREGON and CALIFORNIA Shoreside Fishery, Midwater Trawl Only

(Best Available Data as of 09/18/97)

***All Ports and Plants Cumulative Whiting Report, Through August 22, 1997**

	Observed Total	EFP Fishery Total	NON-EFP Fishery Total	Fishery Total	**
Whiting Harvest (mt)	13,470	85,984	1,515	87,499	
Number of Deliveries	200	1,356	104	1,460	
Salmon Catch (no)	224				
Misc Rockfish (lb)	2,623	60,891	0	60,891	
Yellowtail Rockfish (lb)	35,539	508,057	0	508,057	
Widow Rockfish (lb)	39,630	348,496	1,519	350,015	
Sablefish (lb)	16,686	88,009	0	88,009	
Mackerel (lb)	625,361	4,700,642	0	4,700,642	
Misc. Other Fish (lb)	16,243	236,960	0	236,960	
Salmon Rate (no/mt)	0.017				
Rockfish Rate (lb/mt)	0.195	0.708	0.000	0.708	**
Yellowtail Rate (lb/mt)	2.638	5.909	0.000	5.909	
Widow Rate (lb/mt)	2.942	4.053	1.003	4.053	
Sablefish Rate (lb/mt)	1.239	1.024	0.000	1.024	
Mackerel Rate (lb/mt)	46.425	54.669	0.000	54.669	
Other Fish Rate (lb/mt)	1.206	2.756	0.000	2.756	
% of Deliveries Observed	14				

* Includes all trips with whiting lbs>0

** All rates are calculated using only EFP values

Table 3. 1997 Cumulative shoreside whiting fishery report for Washington and California.

Cumulative Whiting Report

WASHINGTON and CALIFORNIA Shoreside Fishery, Midwater Trawl Only

(Best Available Data as of 09/18/97)

***All Ports and Plants Cumulative Whiting Report, Through August 22, 1997**

	Observed Total	EFP Fishery Total	NON-EFP Fishery Total	Fishery Total	**
Whiting Harvest (mt)	1,107	12,294	1,478	13,771	
Number of Deliveries	23	222	101	323	
Salmon Catch (no)	41				
Misc Rockfish (lb)	21	1,057	0	1,057	
Yellowtail Rockfish (lb)	1,008	96,932	0	96,932	
Widow Rockfish (lb)	72	59,661	0	59,661	
Sablefish (lb)	13	567	0	567	
Mackerel (lb)	85,364	347,353	0	347,353	
Misc. Other Fish (lb)	3,364	87,348	0	87,348	
Salmon Rate (no/mt)	0.037				
Rockfish Rate (lb/mt)	0.019	0.086	0.000	0.086	**
Yellowtail Rate (lb/mt)	0.911	7.885	0.000	7.885	
Widow Rate (lb/mt)	0.065	4.853	0.000	4.853	
Sablefish Rate (lb/mt)	0.012	0.046	0.000	0.046	
Mackerel Rate (lb/mt)	77.144	28.254	0.000	28.254	
Other Fish Rate (lb/mt)	3.040	7.105	0.000	7.105	
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% of Deliveries Observed	10				

* Includes all trips with whiting lbs>0

** All rates are calculated using only EFP values

Table 4. 1997 Cumulative shoreside whiting fishery report for Oregon.

Cumulative Whiting Report

OREGON Shoreside Fishery, Midwater Trawl Only

(Best Available Data as of 09/18/97)

***All Ports and Plants Cumulative Whiting Report, Through August 22, 1997**

	Observed Total	EFP Fishery Total	NON-EFP Fishery Total	Fishery Total	**
Whiting Harvest (mt)	12,364	73,690	37	73,727	
Number of Deliveries	177	1,134	3	1,137	
Salmon Catch (no)	183				
Misc Rockfish (lb)	2,603	59,834	0	59,834	
Yellowtail Rockfish (lb)	34,531	411,125	0	411,125	
Widow Rockfish (lb)	39,557	288,835	1,519	290,354	
Sablefish (lb)	16,672	87,442	0	87,442	
Mackerel (lb)	539,997	4,353,289	0	4,353,289	
Misc. Other Fish (lb)	12,879	148,402	1,210	149,612	
Salmon Rate (no/mt)	0.015				
Rockfish Rate (lb/mt)	0.211	0.812	0.000	0.812	**
Yellowtail Rate (lb/mt)	2.793	5.579	0.000	5.579	
Widow Rate (lb/mt)	3.199	3.920	40.702	3.920	
Sablefish Rate (lb/mt)	1.348	1.187	0.000	1.187	
Mackerel Rate (lb/mt)	43.676	59.076	0.000	59.076	
Other Fish Rate (lb/mt)	1.042	2.014	32.423	2.014	
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% of Deliveries Observed	16				

* Includes all trips with whiting lbs>0

** All rates are calculated using only EFP values

Table 5. 1997 Cumulative shoreside whiting fishery report for Astoria, Oregon.

Cumulative Whiting Report

ASTORIA, OREGON Shoreside Fishery, Midwater Trawl Only

(Best Available Data as of 09/18/97)

***All Ports and Plants Cumulative Whiting Report, Through August 22, 1997**

	Observed Total	EFP Fishery Total	NON-EFP Fishery Total	Fishery Total	**
Whiting Harvest (mt)	4,450	37,392	0	37,392	
Number of Deliveries	67	586	0	586	
Salmon Catch (no)	92				
Misc Rockfish (lb)	2,176	28,476	0	28,476	
Yellowtail Rockfish (lb)	28,092	382,160	0	382,160	
Widow Rockfish (lb)	4,572	222,234	0	222,234	
Sablefish (lb)	4,582	36,787	0	36,787	
Mackerel (lb)	101,093	1,318,927	0	1,318,927	
Misc. Other Fish (lb)	9,400	138,133	0	138,133	
Salmon Rate (no/mt)	0.021				
Rockfish Rate (lb/mt)	0.489	0.762	0.000	0.762	**
Yellowtail Rate (lb/mt)	6.313	10.220	0.000	10.220	
Widow Rate (lb/mt)	1.027	5.943	0.000	5.943	
Sablefish Rate (lb/mt)	1.030	0.984	0.000	0.984	
Mackerel Rate (lb/mt)	22.718	35.273	0.000	35.273	
Other Fish Rate (lb/mt)	2.112	3.694	0.000	3.694	
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% of Deliveries Observed	11				

* Includes all trips with whiting lbs>0

** All rates are calculated using only EFP values

Table 6. 1997 Cumulative shoreside whiting fishery report for Newport, Oregon.

Cumulative Whiting Report

NEWPORT, OREGON Shoreside Fishery, Midwater Trawl Only

(Best Available Data as of 09/18/97)

***All Ports and Plants Cumulative Whiting Report, Through August 22, 1997**

	Observed Total	EFP Fishery Total	NON-EFP Fishery Total	Fishery Total	**
Whiting Harvest (mt)	7,914	36,298	4	36,302	
Number of Deliveries	110	548	1	549	
Salmon Catch (no)	91				
Misc Rockfish (lb)	427	31,358	0	31,358	
Yellowtail Rockfish (lb)	6,440	28,965	0	28,965	
Widow Rockfish (lb)	34,986	66,601	1,519	68,120	
Sablefish (lb)	12,090	50,655	0	50,655	
Mackerel (lb)	438,904	3,034,362	0	3,034,362	
Misc. Other Fish (lb)	3,479	10,269	0	10,269	
Salmon Rate (no/mt)	0.011				
Rockfish Rate (lb/mt)	0.054	0.864	0.000	0.864	**
Yellowtail Rate (lb/mt)	0.814	0.798	0.000	0.798	
Widow Rate (lb/mt)	4.421	1.835	373.707	1.835	
Sablefish Rate (lb/mt)	1.528	1.396	0.000	1.396	
Mackerel Rate (lb/mt)	55.460	83.595	0.000	83.595	
Other Fish Rate (lb/mt)	0.440	0.283	0.000	0.283	
<hr/>					
% of Deliveries Observed	20				

* Includes all trips with whiting lbs>0

** All rates are calculated using only EFP values

Table 7. Weekly bycatch rate of salmon (# of salmon/mt. of whiting) in the shorebased whiting fishery, 1992-1997. Rates for 1992-1994 are based on observations. Rates for 1995-1997 are based on salmon turned over to state agencies by processors.

	1992*	1993	1994	1995**	1996**	1997**
April		0.088	0.042	0.069	0.000	
		0.076	0.074	0.398	0.003	0.000
		0.019	0.052	0.422	0.000	0.000
		0.135	0.031	0.018	0.000	0.000
May		0.038	0.015	0.041	0.000	0.000
	0.019	0.034	0.002	0.040	0.000	0.001
	0.097	0.054	0.004	0.019	0.029	0.010
	0.056	0.014	0.003	0.011	0.136	0.003
June	0.028	0.019	0.000	0.004	0.024	0.000
	0.015	0.021	0.017	0.008	0.007	0.000
	0.004	0.000	0.007	0.032	0.007	0.000
	0.001	0.001	0.007	0.013	0.000	0.011
July	0.000	0.001	0.001	0.035	0.001	0.005
	0.000	0.011	0.001	0.024	0.000	0.010
	0.002	0.010	0.003	0.011	0.004	0.016
	0.003	0.004	0.001		0.003	0.025
August	0.008	0.002	0.001		0.002	0.034
	0.002	0.003	0.003		0.001	0.012
	0.004	0.008	0.002		0.001	0.025
	0.005	0.003	0.001		0.000	0.014
September	0.014	0.003	0.000		0.000	0.022
	0.015		0.002		0.000	
	0.002		0.004		0.000	
	0.009		0.008		0.000	
October	0.017		0.001			
	0.005		0.003			
	0.016		0.010			
	0.012		0.000			
Rate for Year	0.001		0.002			
	0.003		0.039			
	0.014					
Rate for Year	0.010	0.010	0.008	0.032	0.008	0.017

*Oregon Only

**Salmon from all landings

EFP ONLY WHITING LANDINGS

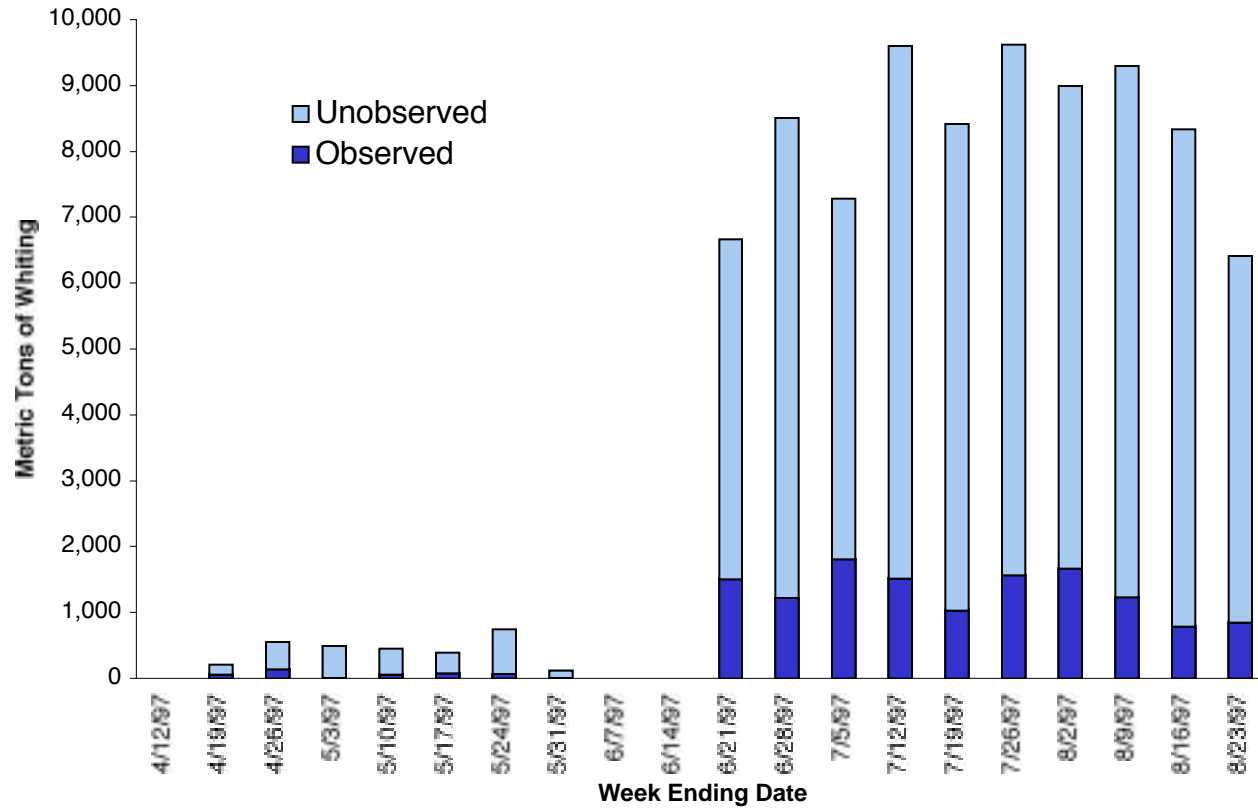


Fig. 1A. 1997 Weekly shoreside whiting landings; Washington, Oregon and California

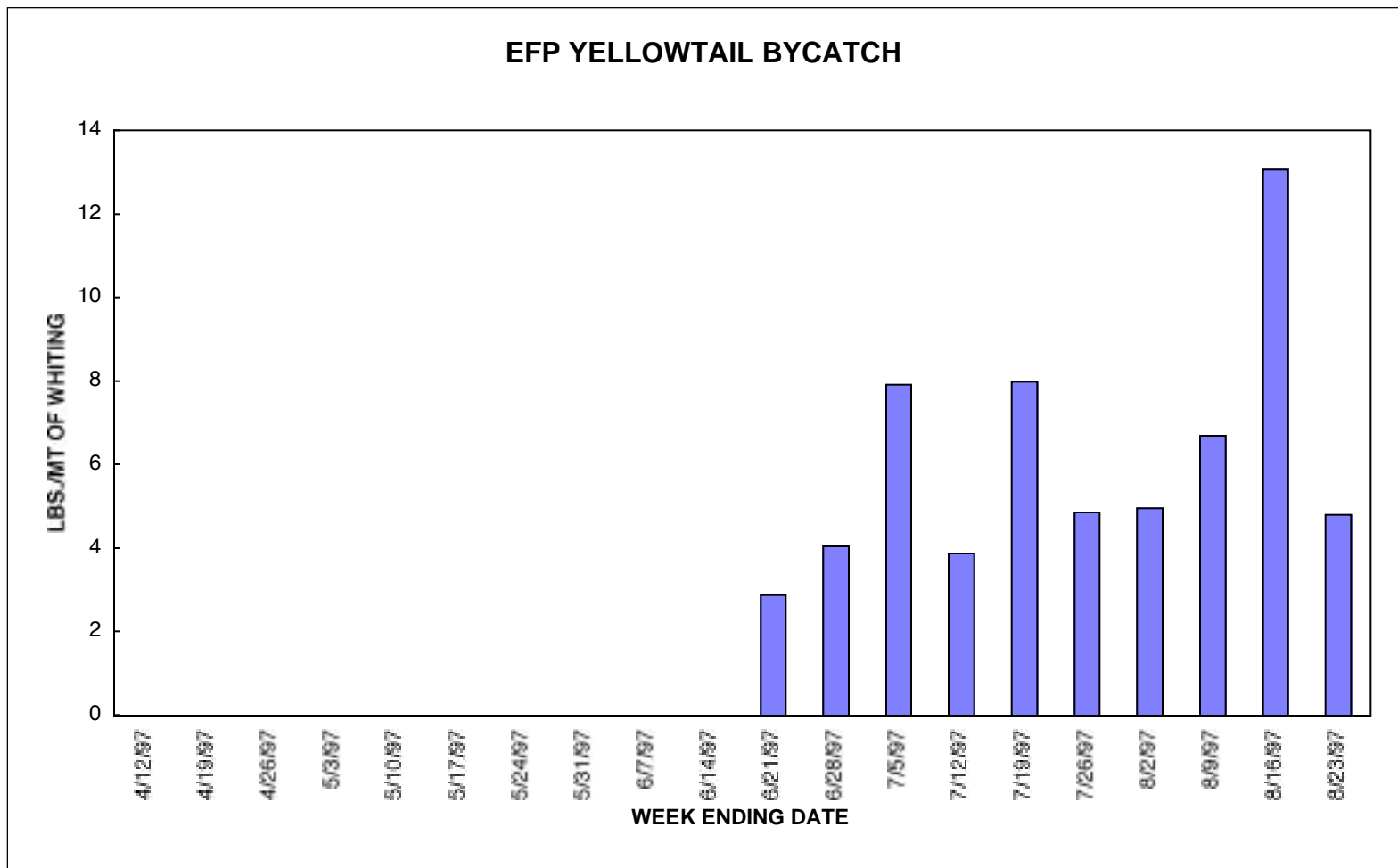


Fig. 2a. Weekly yellowtail rockfish bycatch in the shoreside whiting fishery for Washington, Oregon and California, 1997

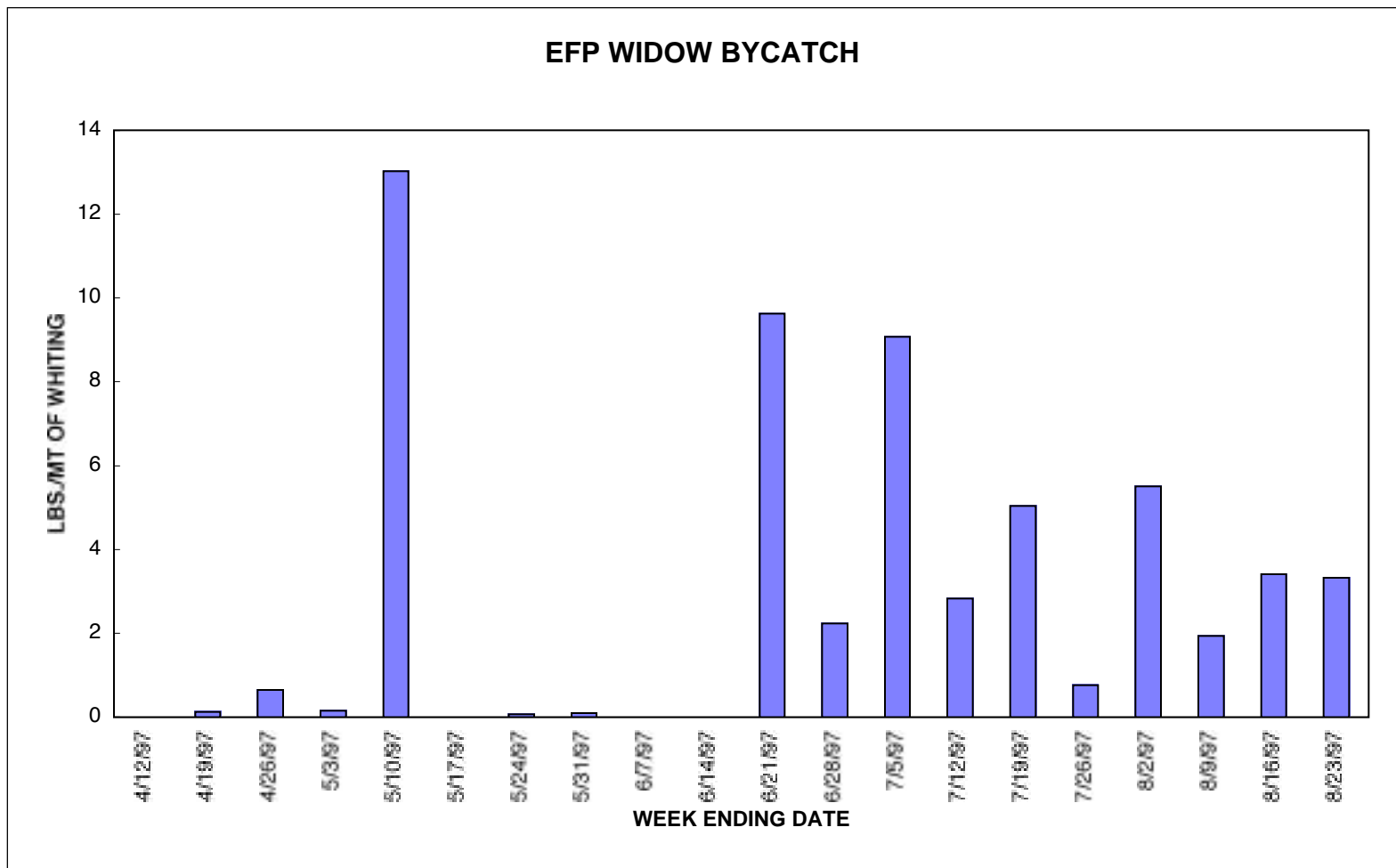


Fig. 2b. Weekly widow rockfish bycatch in the shoreside whiting fishery for Washington, Oregon and California, 1997

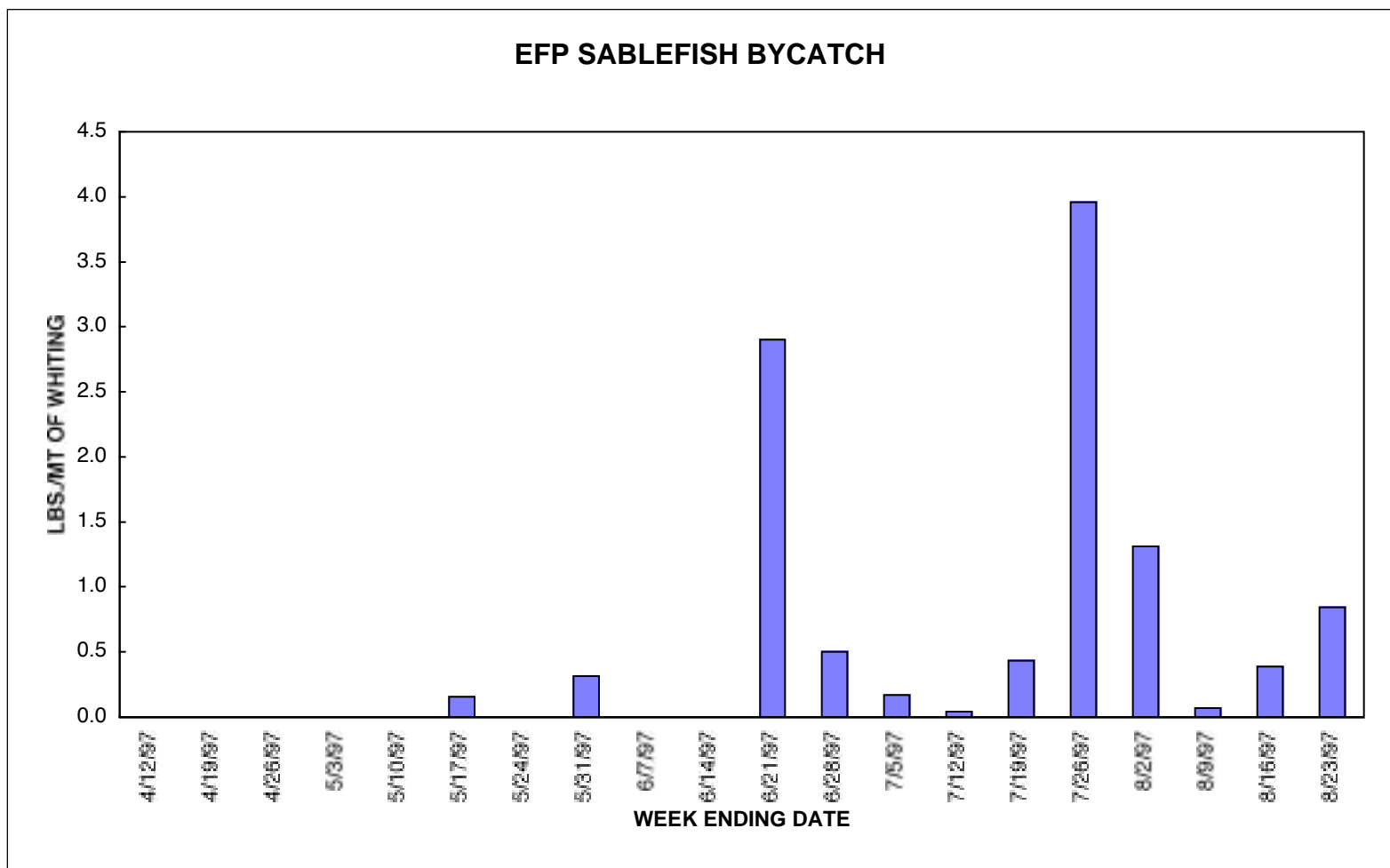


Fig. 2c. Weekly sablefish bycatch in the shoreside whiting fishery for Washington, Oregon and California, 1997

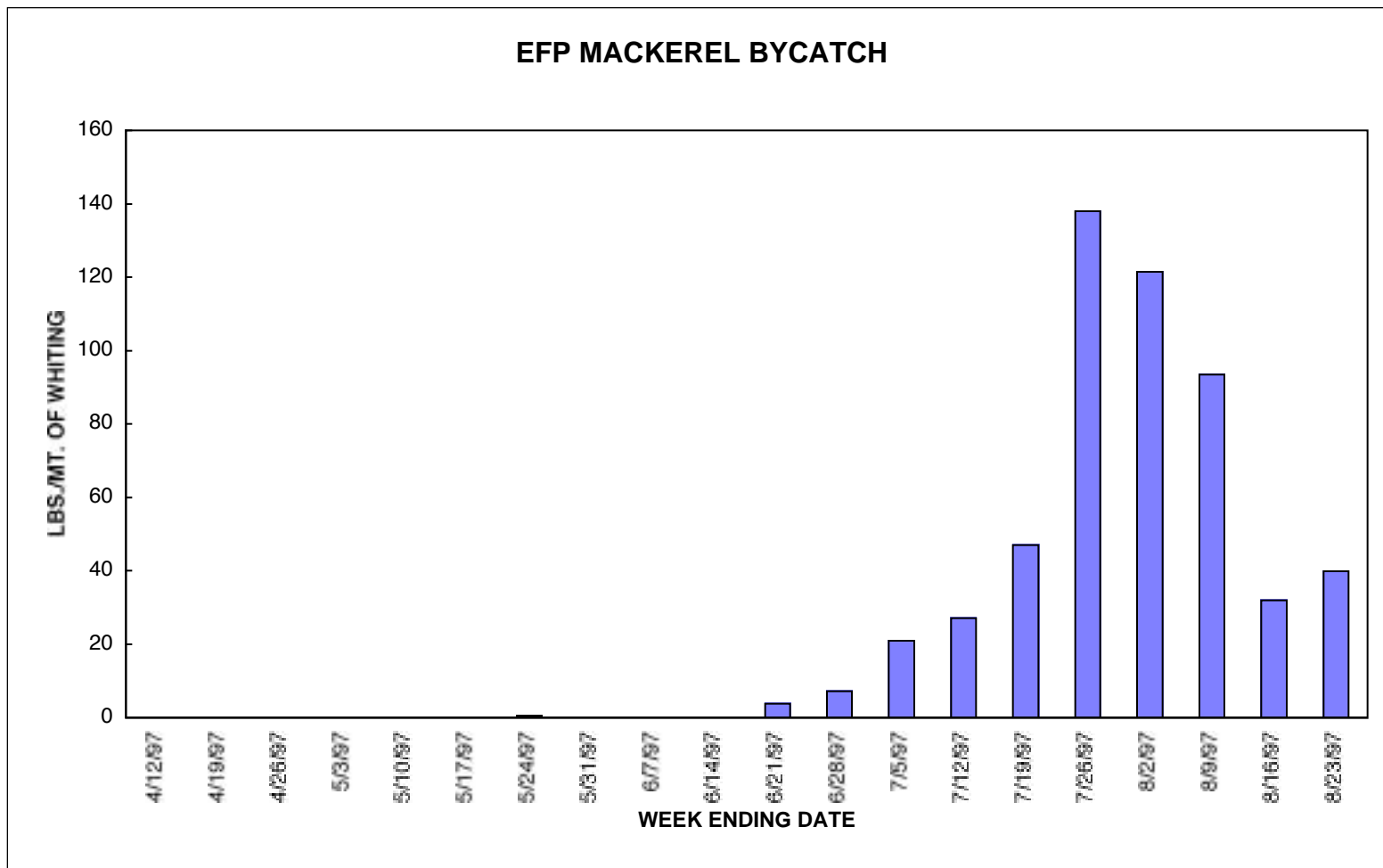


Fig. 2d. Weekly mackerel bycatch in the shoreside whiting fishery for Washington, Oregon and California, 1997

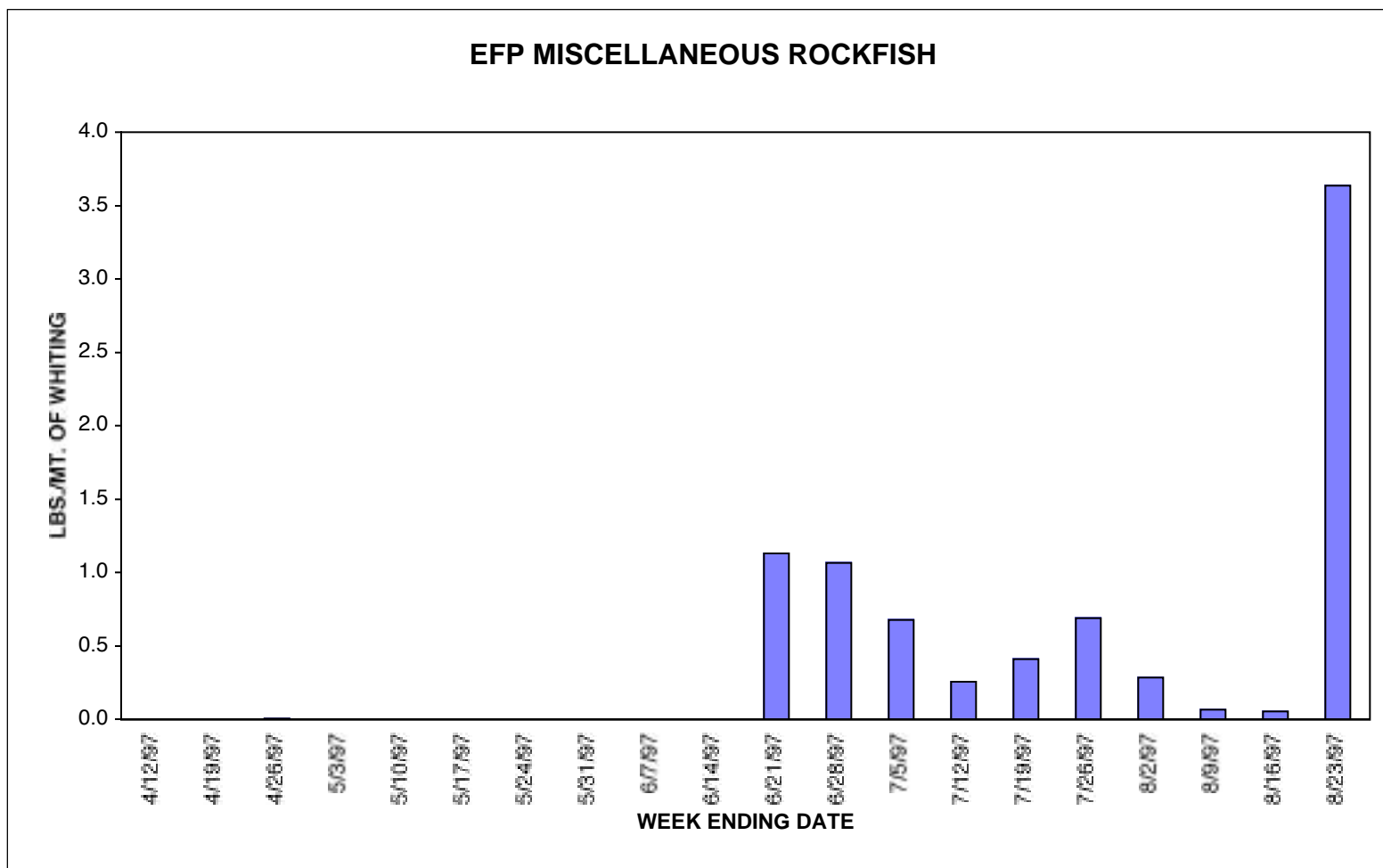


Fig. 2e. Weekly miscellaneous rockfish bycatch in the shoreside whiting fishery for Washington, Oregon and California, 1997

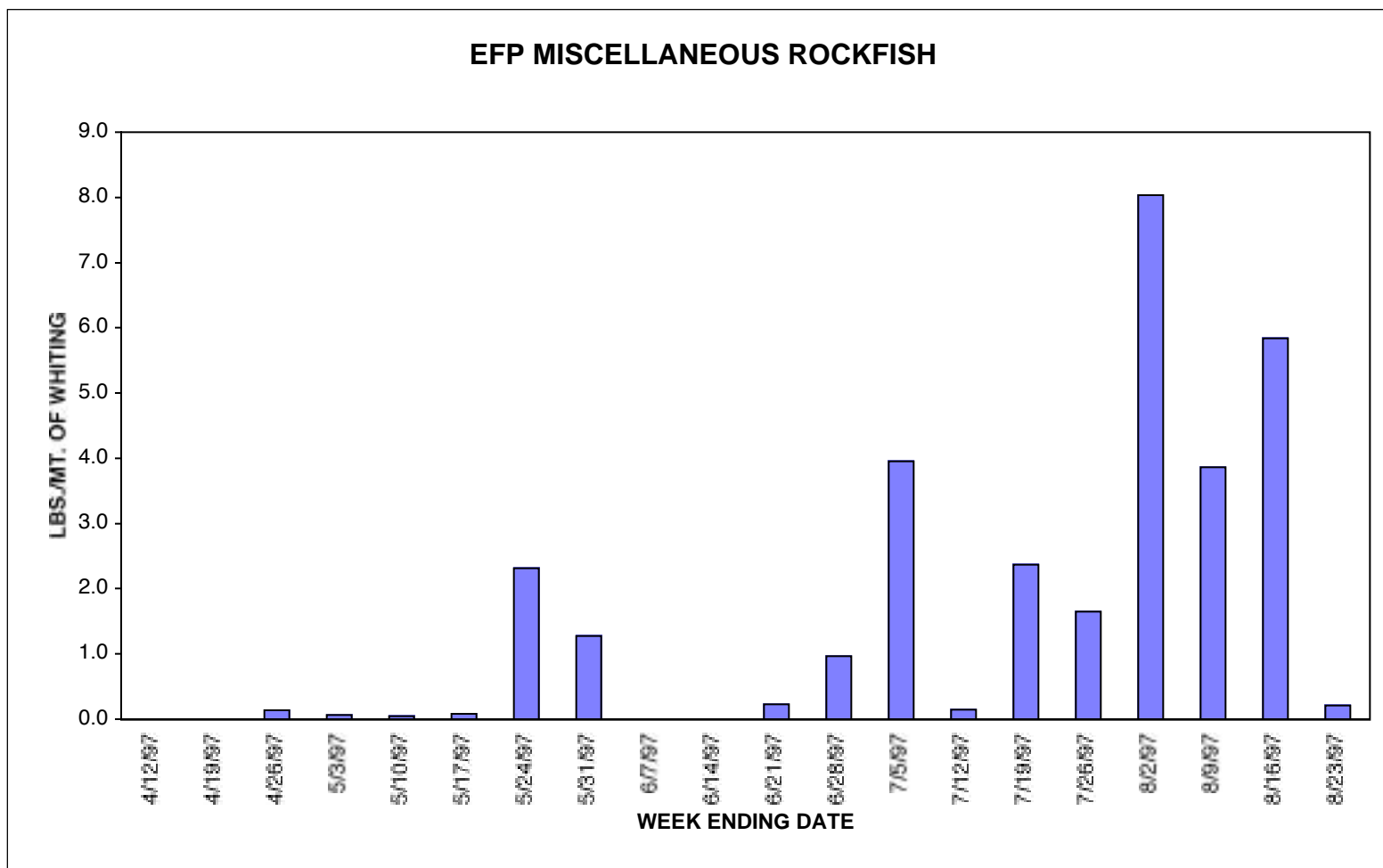


Fig. 2e. Weekly miscellaneous rockfish bycatch in the shoreside whiting fishery for Washington, Oregon and California, 1997

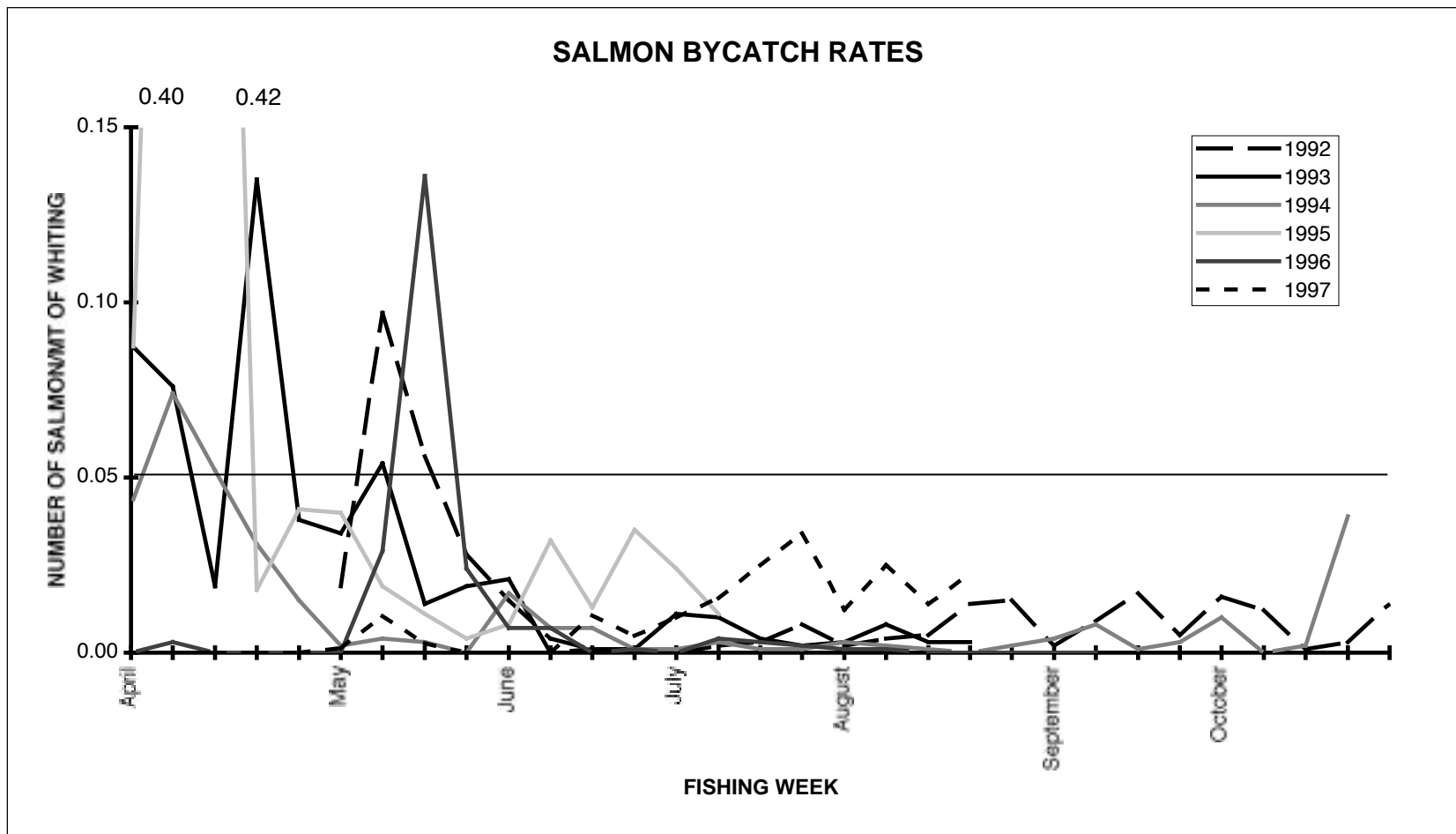


Fig. 3a. Salmon bycatch rates in the shorebased whiting fishery, 1992-1997. Rates for 1992-1994 are based on observations. Rates for 1995-1997 are based on salmon turned over to state agencies by processors. (Refer to Table 7).

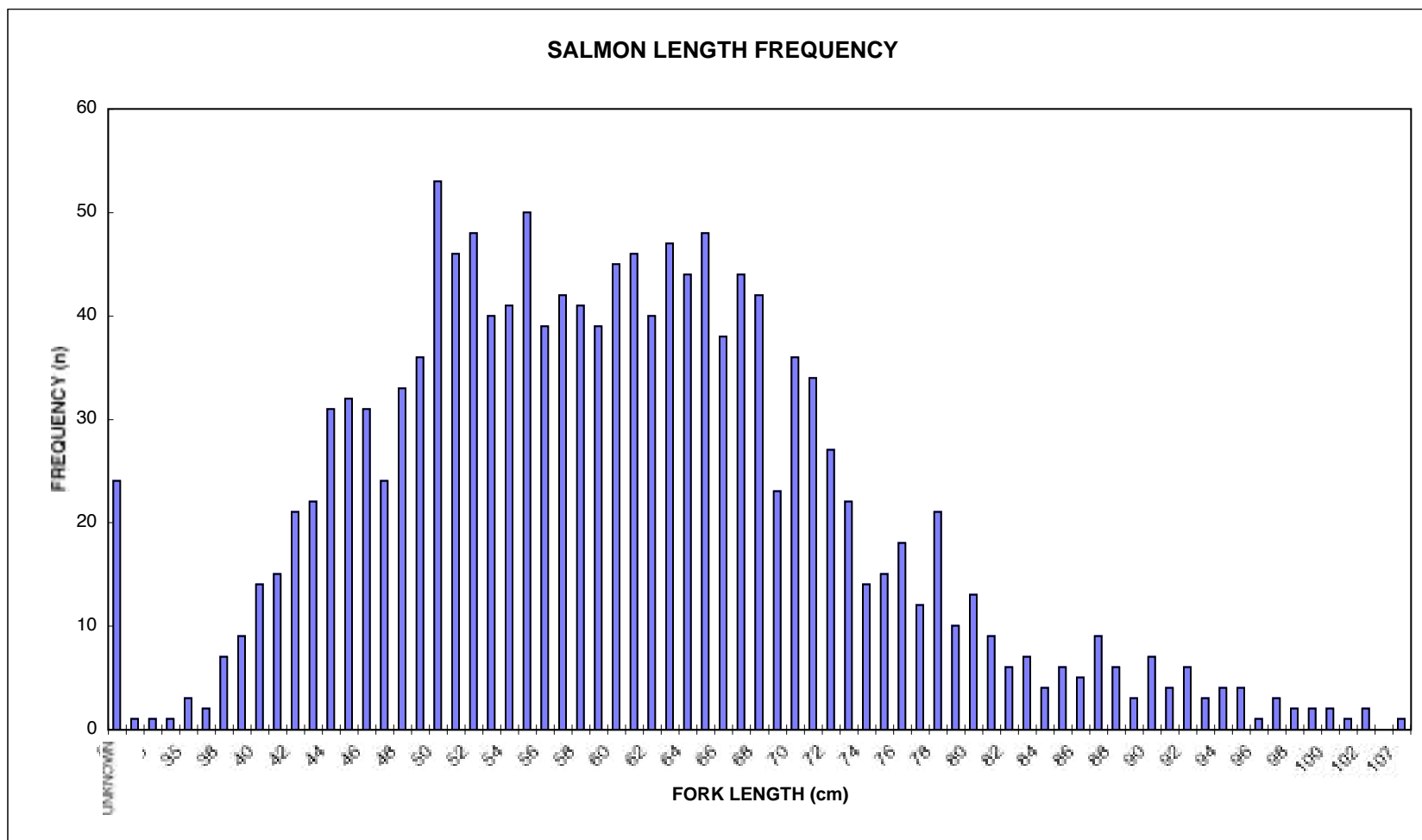


Fig. 3b. 1997 Length frequency of Chinook bycatch in the whiting fishery; Washington, Oregon and California

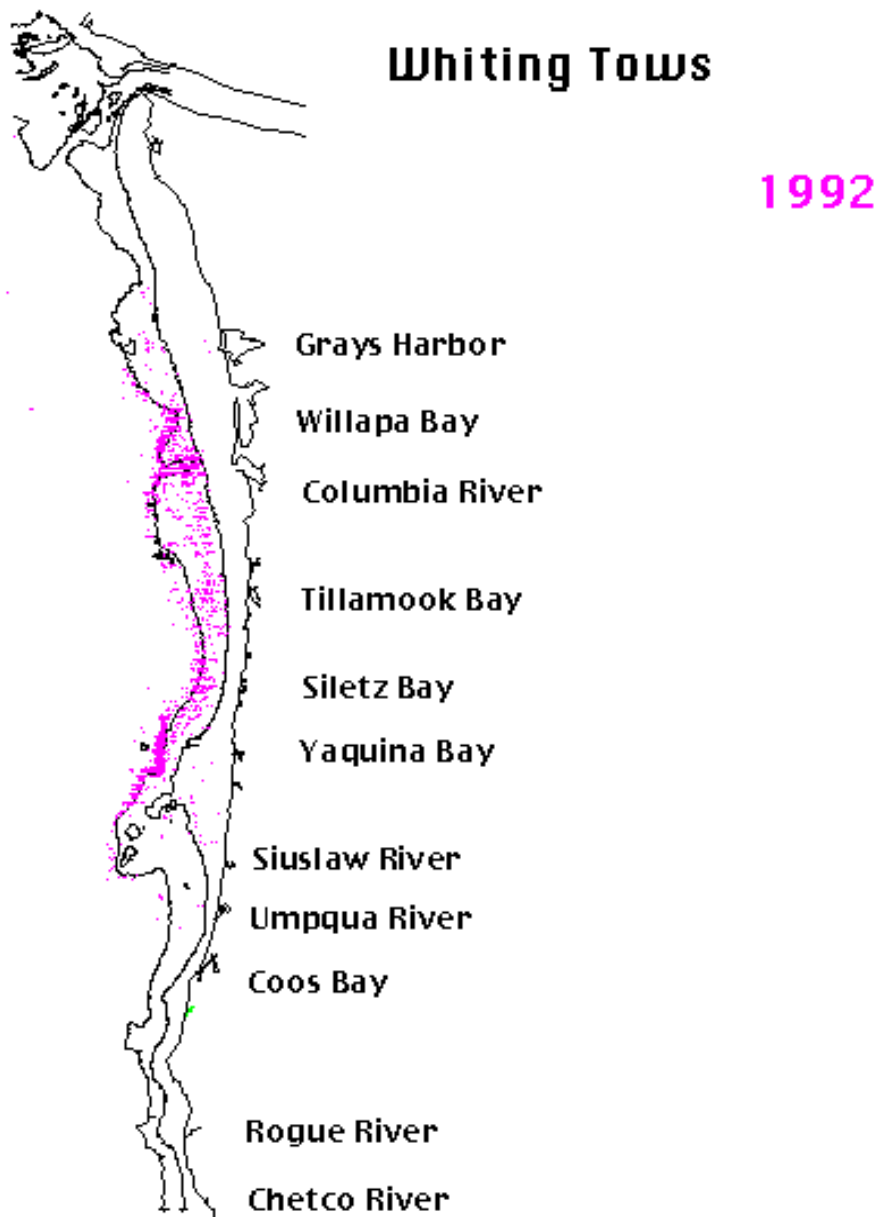


Fig. 4a. Location of whiting tows for the 1992 shoreside fishery

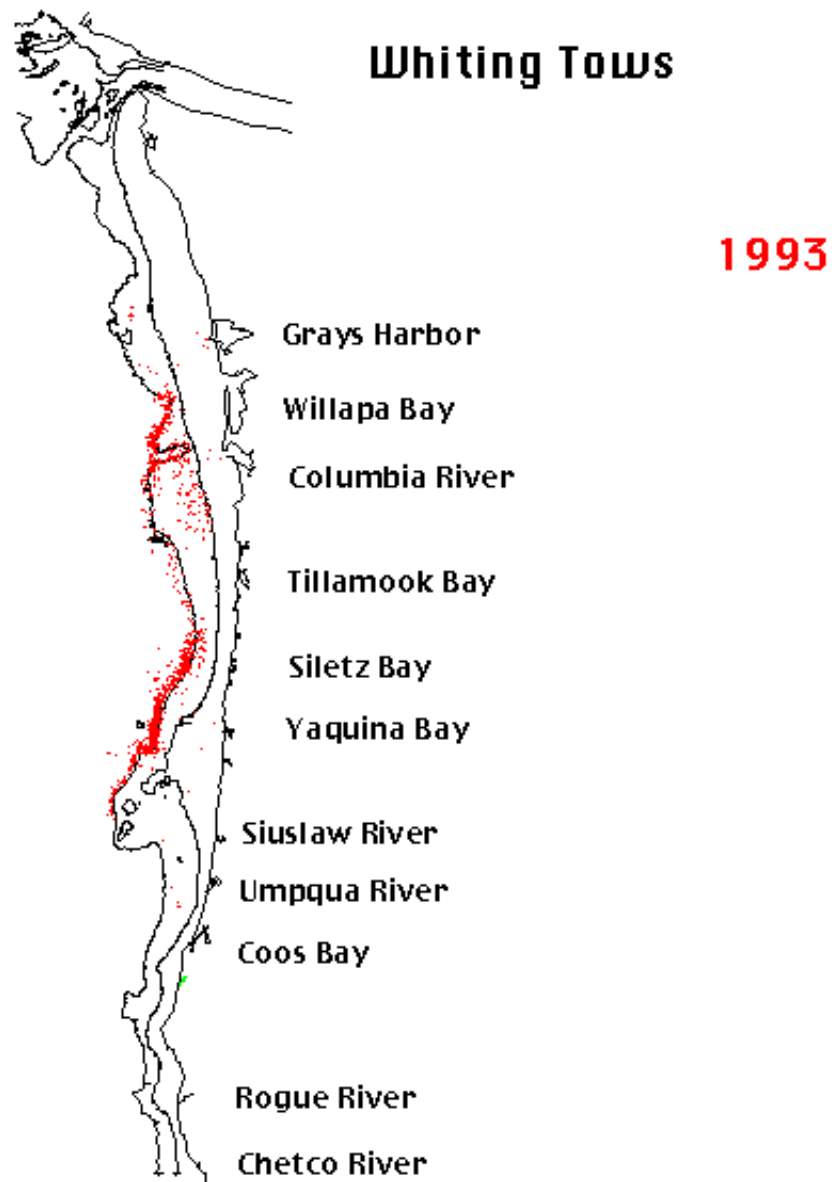


Fig. 4b. Location of whiting tows for the 1993 shoreside fishery

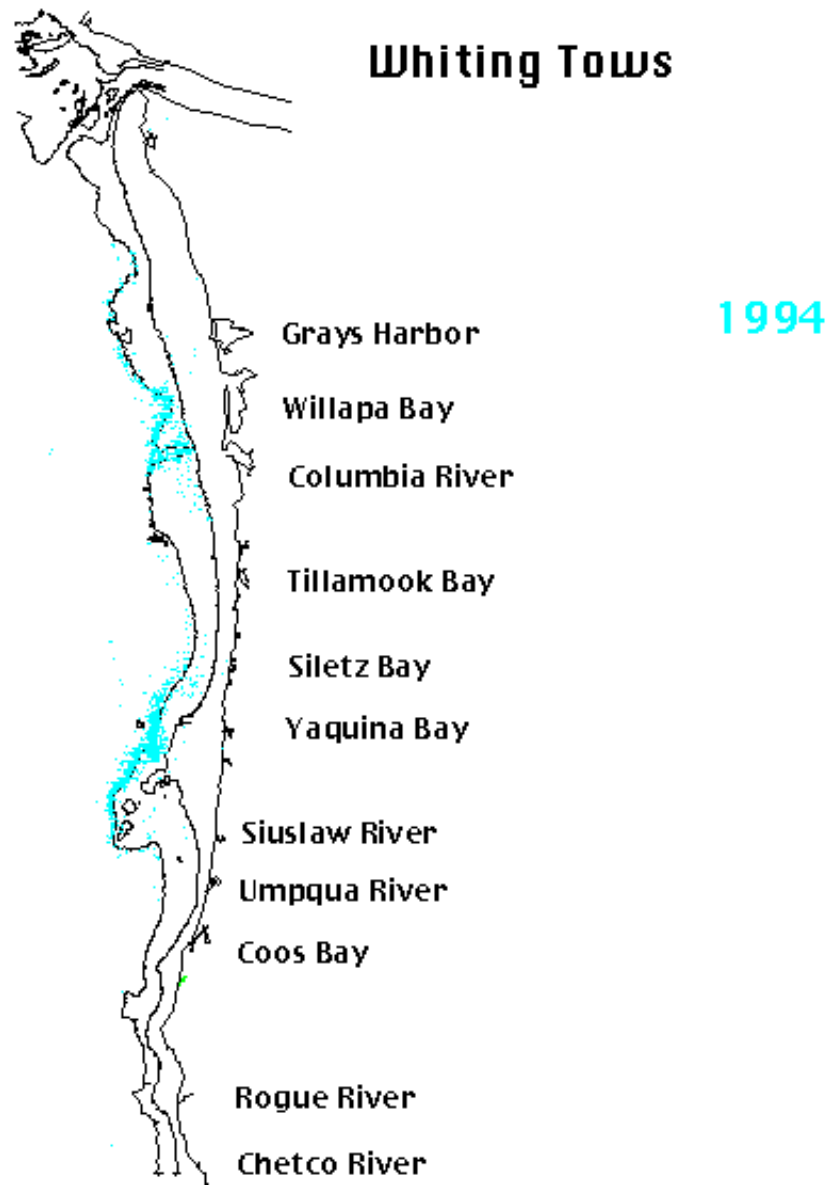


Fig. 4c. Location of whiting tows for the 1994 shoreside fishery

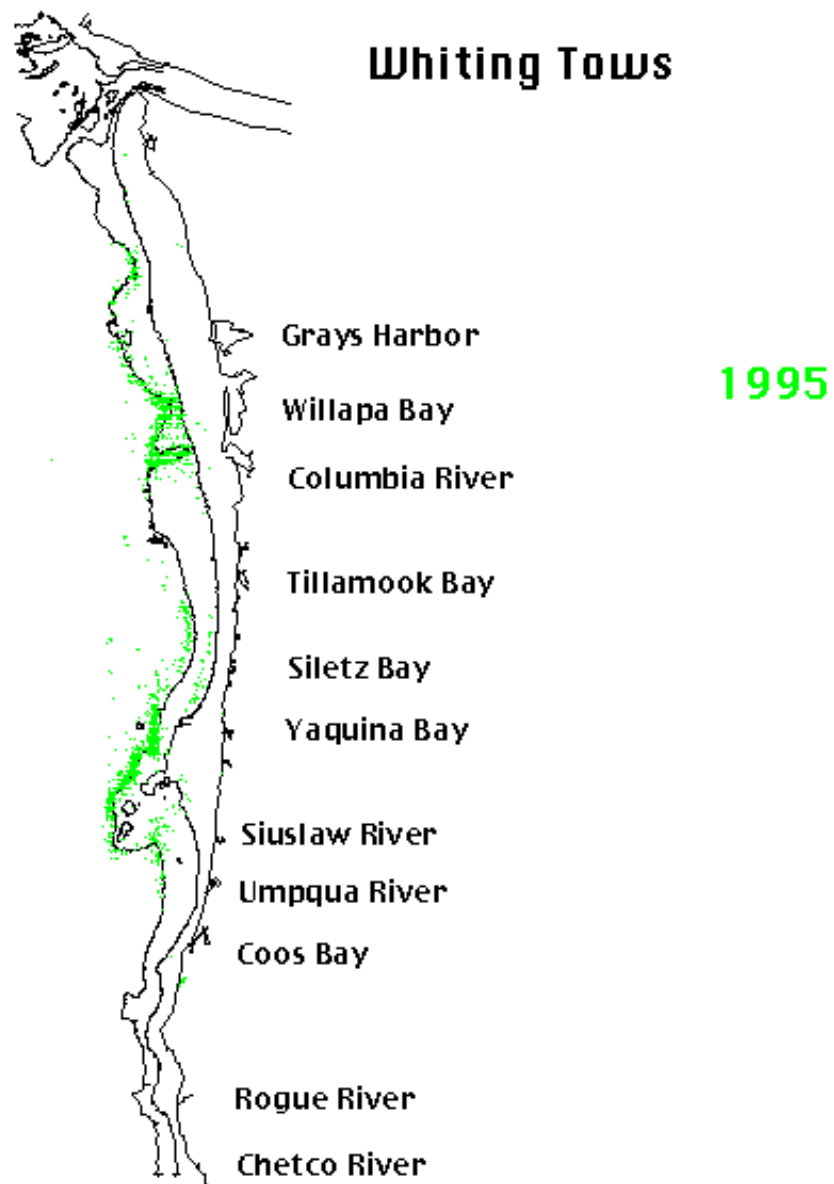


Fig. 4d. Location of whiting tows for the 1995 shoreside fishery

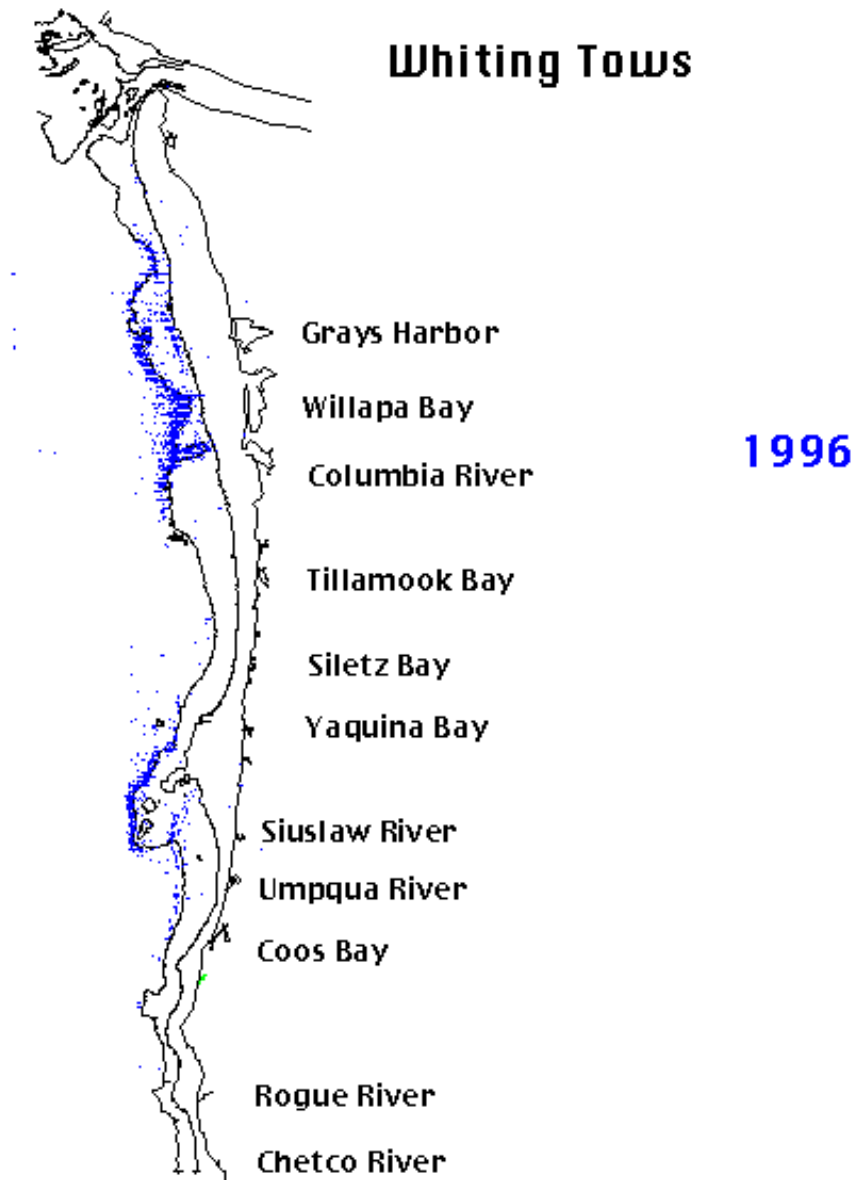


Fig. 4e. Location of whiting tows for the 1996 shoreside fishery

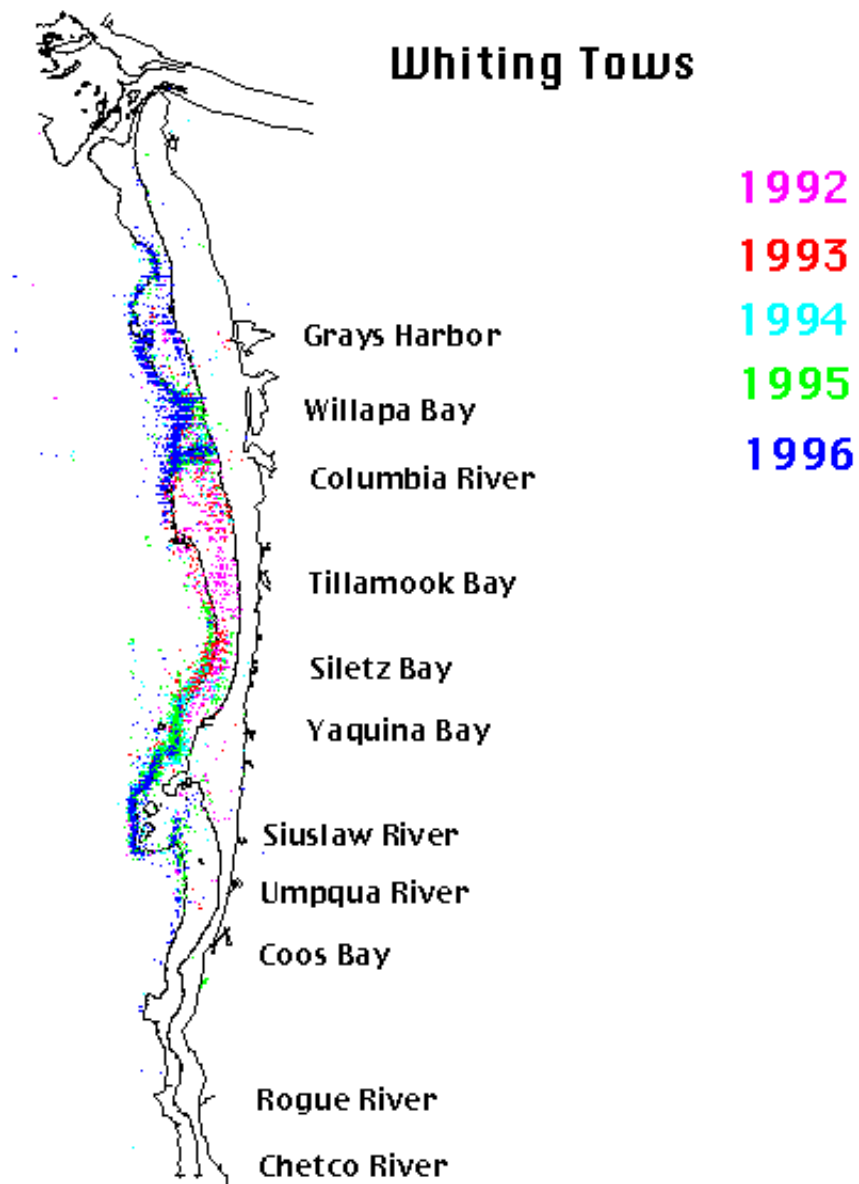


Fig. 4f. Location of whiting tows for the 1992-1996 shoreside fishery