

THE OREGON GROUND FISH FISHERY AND ITS INVESTIGATION IN 1979

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Prepared for the  
TWENTY-FIRST ANNUAL MEETING  
of the  
Technical Sub-Committee  
of the  
INTERNATIONAL GROUND FISH COMMITTEE  
June 18-20, 1980

Petersburg, Alaska

State of Oregon  
Oregon Department of Fish and Wildlife  
Marine Region

June 1980

AGENDA ITEM V - REVIEW OF AGENCY GROUND FISH PROGRAMS

A. Oregon

The Marine Region staff, headed by a Regional Supervisor is responsible for management and research on ocean foodfish not including anadromous fishes. It also participates in national and international issues involving these resources and fisheries, especially groundfish, shellfish (including shrimp), pelagic fish (albacore) and baitfish. A list of Marine Region staff involved with groundfish is shown in Appendix I. Many personnel changes occurred during 1979 due to retirement (Ed Niska), transfer, and additions. The staff at this writing is complete.

Major activities in 1979 continued past data collections of age, sex, and size composition on petrale, Dover, and English sole and selected rockfish species including *Sebastes alutus*. Collection of rockfish species composition was a major activity. Collection of biological data from the very large sablefish fishery began. A sablefish longline-pot fishery logbook was drafted and circulated in early 1980. Those used in 1979 were found to be unsatisfactory for these fisheries. The new logbook is much more usable in our opinion (Appendix II).

In all, 274 biological samples were taken in 1979, compared to 265 in 1978.

Species	International Statistical Area of Capture				Total
	2A	2B	2C	3A	
Dover sole	0	7	2	19	28
English sole	0	0	4	12	16
Petrale sole	0	7	2	15	24
Rockfish:					
<i>S. alutus</i>	0	0	1	11	12
<i>S. brevispinis</i>	0	0	1	0	1
<i>S. entomelas</i>	0	0	10	1	11
<i>S. flavidus</i>	0	0	0	9	9
<i>S. pinniger</i>	0	3	3	2	8
<i>S. reedi</i>	0	0	8	0	8
<i>Seb. alascanus</i>	0	0	13	0	13
Species composition	15	16	50	57	138
Sablefish	0	3	2	1	6
Totals	15	36	96	127	274

Sablefish samples were taken largely for the purpose of assessing age and size maturity by market category. Existing staff and workload did not permit us to expand our effort in 1979 onto this very fast developing fishery nearly as much as we would have liked.

An "exploding" shrimp fishery-and large increases in effort in 1977-79 also created additional need for sampling by our staff. This fishery also lands substantial amount of groundfish, a fact which made for increasing controversy in 1979 subsequent to the groundfish market tightening up in mid-year. Collection, coding, data entry, and error-checking of trawl catch, effort-area of catch data also was a major effort, as usual. Such data are eventually entered onto mag tapes at the Oregon State University's Computer Center; summary reports from the Cyber unit there are the result.

Participation in Pacific Fishery Management Council and North Pacific Fishery Management Council activities also occupied much staff time. Loeffel, Robinson, and Mr. L. Hreha all served on those Councils' Scientific and Statistical Committees, while Messrs. Demory, Golden, Lukas, and Butler respectively served on Management Plan development teams for groundfish, shrimp, and herring FMP drafting. The groundfish FMP was tentatively adopted by the PFMC at its May 1980 meeting. Implementation is scheduled for 1981. Mr. Demory served as Chairman of that PDT and Mr. Lukas as chairman of the PFMC's Shrimp PDT.

A temporary rule established in late-1978 establishing a 20,000-lb trip limit for Pacific ocean perch (*Sebastes alutus*) was made permanent in early 1979. Purpose of the measure was to prevent additional (to that in the prior several years) effort and catch on the depleted POP stock(s) in the INPFC Columbia and Vancouver areas. It should be mentioned that Oregon staff's purpose was not to prevent targeting; only to continue a low-level, below EY (equilibrium yield)[Oregon] domestic fishery established after heavy fishing in 1966-1970 depleted this stock(s). EY was estimated at about 800 mt annually in 1979.

The low-level targeting would also allow some stock assessment from fishery data until the PFMC decides what to do with POP management. With few exceptions, the fishery has abided by this goal and few violations of the 20,000 lb limit have occurred since 1979.

Glutted markets and diversion of trawl effort to the joint venture Pacific whiting (hake) fishery placed limits on the burgeoning trawl fisheries in mid-1979. Even so, new records were set for Oregon trawl landings and for some species. The sablefish fisheries also set records in 1979 in all gears due to very large demand by Japanese markets. Over 100 vessels participated in the longline and pot fisheries in 1979, compared to 25 in 1978. Diversion of salmon troll and shrimp vessels into this 'new' fishery also was spurred by comparatively poor shrimp fishing in 1979 and the stringent troll fishery regulations imposed by PFMC since 1978.

By November, even the large Japanese sablefish market was strained. Prices dropped, weather worsened, and on top of all, the very large 1979 Alaska salmon pack began to compete in Japan with the sablefish "pack". It is likely some improvement will occur, but not to the levels reached in 1979.

A Marine Recreational Fishery Survey coastwide was begun by the National Marine Fisheries Service in July 1979. Pacific Marine Fisheries Commission (PMFC)-hired personnel worked under direction of ODFW scientists to gather creel, demographic, and biological data on bottomfish in Oregon. Survey data were gathered and summarized in 2-month "waves". By years' end, three "waves" were completed in Oregon. Angler intercept (creel census) interviews totaled 4,412 angler-interviews during July 1-December 31, 1979. Workup of these data is still underway.

#### B. Publications

Reports completed or in progress were as follows:

1. Published during the period June 1, 1979 and May 31, 1980.

- Bruneau, Connie. 1980. The 1979 Oregon shrimp fishery. International Report 80-1. Oregon Department of Fish and Wildlife (processed).
- Barss, William H. 1979. Report of cruise 79-2. Marine resource survey off northern Oregon. Oregon Department of Fish and Wildlife (processed).
- \_\_\_\_\_. 1980. Identification of Oregon rockfish. Oregon Department of Fish and Wildlife, 29 p. booklet.
- Golden, James T. 1979. Report of cruise 79-1. Rockfish survey off northern Oregon. Oregon Department of Fish and Wildlife (processed).
- \_\_\_\_\_, William H. Barss and Robert L. Demory. 1979. Groundfish Assessment: Pacific ocean perch (*Sebastes alutus*) and tagging studies. Annual Report October 1, 1978 to September 30, 1979. Oregon Department of Fish and Wildlife (processed).
- Hayman, R.A., A.V. Tyler, and R.L. Demory. 1980. A comparison of cohort analysis and catch per unit effort for Dover sole and English sole. Trans. Amer. Fish. Soc. 109:35-53.
- Hayman, R.A., and A.V. Tyler. 1980. Environment and cohort strength of Dover sole and English sole. Trans. Amer. Fish. Soc. 109:54-70<sup>1/</sup>.
- Hosie, Michael J. 1979. Report of cruise 79-6, Shrimp. Oregon Department of Fish and Wildlife (processed).
- Niska, Edwin L. 1979. Report of cruise 79-4, Shrimp. Oregon Department of Fish and Wildlife (processed).

2. Manuscripts in Progress.

Demory, Robert L., James T. Golden, and J.G. Robinson. Report of Contract Studies in 1978 and 1979. Completion Report. Oregon Department of Fish and Wildlife (processed).

AGENDA ITEM VI - REVIEW OF NORTHEASTERN PACIFIC GROUND FISHERIES

A. Oregon Fisheries in 1979

1. Total Landings

Oregon-landed groundfish in 1979 totaled 30,396 mt (67.0 million lb) in the commercial and personal-use marine fisheries (Table 1). Recreational fishermen caught an estimated 597 mt (2%) of that, mostly other rockfish (nearly 80% of the recreational catch). Of the commercial catch, trawl landings accounted for 21,668 mt (73%). The burgeoning sablefish pot and longline fisheries took

<sup>1/</sup> Utilized data from ODFW files extensively.

Table 1. Oregon-Landed Catch (m.t.) of Groundfish in 1979 by Species and Gear.

	Trawl	Shrimp Trawl	Pot	Jig	Longline	Troll	Personal Use	Total
English sole	1,413	1	6	0	1	0	0	1,421
Rock sole	5	3	0	0	0	0	0	8
Petrале sole	1,042	4	1	Tr	0	Tr	0	1,047
Dover sole	5,067	35	2	0	Tr	0	0	5,104
Rex sole	734	10	0	0	0	0	0	744
Starry flounder	284	Tr	0	0	Tr	0	5	289
Other flatfish	888	13	8	Tr	1	Tr	Tr	910
Pacific cod	402	19	0	0	1	0	0	422
Lingcod	686	68	12	20	8	32	85	911
Sablefish	1,494	94	4,351	0	1,819	Tr	Tr	7,758
Pacific ocean perch	848	95	1	0	1	0	0	945
Other rockfish	8,450	1,010	62	132	118	177	476	10,425
Misc. species	187	Tr	5	Tr	9	Tr	31	232
Dogfish	39	1	1	0	1	0	Tr	42
Pacific whiting	129	9	0	0	0	Tr	Tr	138
Walleye pollock	0	0	0	0	0	0	0	0
Animal Food	0	0	0	0	0	0	0	0
Reduction	0	0	0	0	0	0	0	0
Totals	21,668	1,362	4,449	152	1,959	209	597	30,396

Tr = less than 0.5 mt

4,449 mt and 1,959 mt (total, 6,408 mt) of the commercial total (14.9% and 6.6% respectively), mostly sablefish (96%). A small but growing vertical hook and line (jig) fishery surfaced in 1979 with 152 mt, most of which was other rockfish (87%) and lingcod. These fishermen were mostly former or between-season salmon trollers working nearshore reefs in Areas 2A and 2C (Brookings and Garibaldi areas). Other gears took the remainder of groundfish mainly as by-catch to their target species: shrimp trawlers landed 1,362 mt (74% rockfish) and trollers landed 209 mt (85% rockfish).

The totals in each category were considerably larger than in 1978; trawl catch was a record for Oregon and up 50.2% from the 1978 level. The pot and longline catches, also records, were up 14-*fold* and 6.6-*fold* over 1978 levels. Estimated sport catch (May 1-September 30, ocean) was 79% higher in 1979 than 1978. Only troll catch declined in 1979 - by 43%, for unknown reasons, but probably due to PFMC-Plan enacted salmon time-area closures, and perhaps to movement of many trollers into the pot or longline fisheries.

The trawl fleet expanded with new, larger vessels including some built for the shrimp fishery since 1977. Several of these vessels in the 80+ ft size range utilized pelagic trawls, for the first time, in 1979 for rockfish. Of the total trawl groundfish catch of 21,668 mt, about 1,009 mt was caught by pelagic trawl, all of the latter in Area 2C, targeting on widow rockfish (*Sebastes entomelas*). Rockfish were a favored target of trawlers, and accounted for 43% of their catch, including 848 mt of Pacific ocean perch (*S. alutus*). As usual, yellowtail rockfish (*S. flavidus*) and canary rockfish (*S. pinniger*) were prominent in trawl-caught rockfish (Table 2). "Perch-complex" species accounted for about 22% of the total 9,297 mt of trawl-caught rockfish, including *S. reedi*, *S. alutus* and *S. crameri*.

The ocean recreational fishery caught an estimated 302,000 fish in 1979 (May-September inclusive). Most of the catch was rockfish, 61% of which was

Table 2. Species composition (mt) in 1979 for Oregon Landed Rockfish, including Pacific ocean perch, in the Trawl Fishery.

Species	1C-2A	2B	2C	3A	Total
<i>Sebastes alutus</i>	0.9	22.7	277.0	547.5	848.1
<i>S. crameri</i>	14.4	419.2	262.8	55.9	752.3
<i>S. diploproa</i>	1.7	22.7	50.3	2.8	77.5
<i>S. elongatus</i>	52.5	-	-	-	52.5
<i>S. entomelas</i>	239.6	35.4	1,316.1*	368.7	1,959.8*
<i>S. flavidus</i>	253.2	252.5	4.6	1,771.1	2,281.4
<i>S. melanops</i>	4.2	-	52.6	321.3	378.1
<i>S. paucispinis</i>	44.9	186.9	16.0	22.3	270.1
<i>S. pinniger</i>	205.8	1,454.5	84.5	190.0	1,934.8
<i>S. reedi</i>	-	5.1	431.8	11.2	448.1
<i>S. ruberrimus</i>	1.7	53.0	-	-	54.7
<i>Sebastolobes alascanus</i>	11.9	7.6	18.3	19.6	57.4
Other <i>Sebastes</i> spp.	14.4	83.4	50.5	33.6	181.9
Totals	845.2	2,543.0	2,564.5	3,344.0	9,296.7

\* Of the nearly 2,000 mt landed, 1,009 mt was caught by pelagic trawl; all pelagic trawl catch taken in Area 2C. All of pelagic trawl catch was *S. entomelas*, except traces of *S. jordani*.



black rockfish (*Sebastes melanops*) (Table 3). Lingcod were an important and

Table 3. Estimated 1979 Species Composition of the 1979 Oregon Recreational Bottomfish fishery (May-Sept), Ocean Fishery only.

Species	Percent of Catch (N)	Number	Mean wt. (lb)	Weight in lb (m.t.)
<i>Sebastes melanops</i>	61	184,385	3.5	645,348 (292.7)
<i>S. flavidus</i>	8	24,184	3.8	91,899 (41.7)
<i>S. pinniger</i>	7	21,159	5.7	120,606 (54.7)
<i>Ophiodon elongatus</i>	6	18,782	10.0	187,782 (85.2)
<i>S. mystinus</i>	4	12,090	3.0	36,270 (16.4)
<i>S. ruberrimus</i>	3	9,068	7.9	71,637 (32.5)
<i>Platichthys stellatus</i>	2	5,512	2.0	11,023 (5.0)
<i>Sebastes species</i>	7	20,834	4.0	83,334 (37.8)
Others	2	6,258	5.0	151,581 (68.8)
Total	100	302,272	4.5	1,316,146 (597.0)

valued target species, but catch was only 6% of total sport bag by number. By area, the sport catch was largely taken from areas 2A and 2C (Table 4). Surprisingly little (14.7 mt) was taken from Area 3A.

Table 4. 1979 Oregon Recreational Catch (in mt) During May 1-September 30, ocean Fishery only.

Species	Statistical Area				Total
	2A	2B	2C	3A	
Lingcod	17.3	2.0	64.7	1.2	85.2
Rockfish	207.3	41.6	223.5	3.4	475.8
Starry flounder	Tr	Tr	Tr	5.0	5.0
Misc.	4.6	2.2	19.1	5.1	31.0
Total	229.2	45.8	307.3	14.7	597.0

The trawl fishery took a record amount of groundfish, 219% greater than the ten-year mean (Table 5). Effort was also at a record level (56,444 hrs trawled, not including pelagic trawl effort), 92% greater than the ten year mean and 47% more than recorded in 1978. This was in spite of rather severe limits placed upon P.O.P., rockfish, and Dover sole landings by various dealers during the last 6-7 months of 1979. The trawl fishery took 9,431 mt of flatfish (44% of the total catch); Dover sole were 54% of that. As mentioned before, rockfish composed 43% of the trawl landing in 1979. Sablefish was the third-ranking category of fish in trawl landings with 1,493 mt (7%).

Tables showing catch by gear by area, trawl catch by area and month are included in Appendix 3.

## 2. Dover sole

Dover sole landings in 1979 totaled 5,104 mt, of which 5,067 were taken by trawl (Tables 1, 5). This was an Oregon record, and was 50% greater than in 1978 and 208% greater than the ten-year mean (2,441 mt) trawl catch. Majority of the catch was taken in Areas 2B (2,744 mt) and 3A (1,324 mt) followed by 667 mt in Area 2C (Appendix Table 3). Examination of temporal catch distribution (App. Table 4) showed the usual spring-summer peak catch during March through October; however, in Area 2B, the market limitations effected a definite downturn in catch after June and a decided slump in September. Area 3A landings also were generally highest in the spring-summer period but likewise reflected mid year slumps in buying by processors (App. Table 4). Stocks appeared to be in healthy shape with CPUE (in mt per hour trawled at the 30% trip threshold level) in 1979 as good or better than 1978 levels in all areas (Table 6) except 1C-2A. The 1979 CPUE was also substantially higher than the ten-year mean in all areas except 1C-2A.

## 3. Petrале sole

Trawl landings of petrale sole totaled 1,040 mt in 1979, slightly more than

Table 5. Oregon Trawl Landings (mt) of groundfish species, total effort (hr), and CPUE (mt/hr), 1969-79.

Species	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	Mean 1969-78
English sole	778	855	816	996	1,075	792	982	1,643	1,001	1,041	1,413	998
Rock sole	11	2	55	1	Tr	2	13	7	10	12	6	11
Petrале sole	832	971	1,036	991	994	1,221	1,202	793	822	1,000	1,040	986
Dover sole	2,519	2,512	2,512	2,695	2,003	2,542	2,168	2,262	1,818	3,374	5,066	2,441
Rex sole	551	487	381	596	570	590	464	477	425	642	734	518
Starry flounder	114	193	220	199	154	185	371	773	283	489	284	298
Other flatfish	230	293	236	272	298	264	459	566	435	564	888	362
Total flatfish	5,035	5,313	5,256	5,750	5,094	5,596	5,659	6,521	4,794	7,122	9,431	5,614
Pacific cod	21	35	219	485	205	311	265	277	364	398	401	258
Lingcod	492	429	581	612	907	879	694	439	381	445	686	586
Sablefish	61	50	109	183	380	248	305	442	326	958	1,493	306
Pacific ocean perch	309	571	491	131	109	147	186	567	424	486	848	342
Other rockfish	2,433	1,743	1,796	1,990	1,748	1,383	1,379	2,528	2,398	4,388	8,450	2,179
Misc. species	2	8	10	16	8	13	13	294	153	185	187	70
Dogfish	Tr	8	2	Tr	Tr	5	2	6	122	56	40	20
Minkfood	1,179	931	810	327	270	321	264	56	85	3	0	425
Pacific hake	0	0	3	4	25	14	2	218	450	383	129	110
Reduction	20	0	0	0	0	0	0	0	0	0	0	2
Total Landings	9,551	9,088	9,277	9,498	8,746	8,917	8,769	11,348	9,497	14,424	21,665	9,912
Total Trawl hrs.	25,692	27,587	28,644	29,206	28,243	27,258	28,468	33,259	26,683	38,447	56,444*	29,349
CPUE (mt/hr)	0.372	0.329	0.324	0.325	0.310	0.327	0.308	0.341	0.356	0.375	0.366*	0.338

Tr = less than 0.1 mt

\* Excludes pelagic trawl catch of *S. entomelas*

Table 6. Oregon trawl catch (mt) and CPUE (mt/hr) of Dover sole from major fishing areas.

Year	1C-2A		2B		2C		3A	
	Catch	mt/hr	Catch	mt/hr	Catch	mt/hr	Catch	mt/hr
1968	161	0.212	900	0.294	118	0.123	695	0.143
1969	403	0.198	1,346	0.283	52	0.091	697	0.151
1970	224	0.108	1,477	0.216	63	0.057	696	0.149
1971	205	0.120	1,167	0.244	73	0.167	566	0.156
1972	190	0.090	1,652	0.217	53	0.214	780	0.181
1973	278	0.124	1,200	0.178	31	0.093	474	0.187
1974	417	0.245	1,461	0.269	68	0.252	585	0.158
1975	212	0.145	1,187	0.170	114	0.071	648	0.143
1976	259	0.116	1,276	0.162	145	0.140	574	0.139
1977	152	0.134	760	0.126	141	0.048	764	0.104
1978	280	0.129	1,580	0.174	288	0.083	1,226	0.135
1979	331	0.120	2,745	0.241	668	0.152	1,324	0.148
1969-78 Mean		0.141		0.204		0.122		0.150

in 1978, and 5.5% more than the 1969-1978 mean (Tables 1, 5). Areas 2B and 3A contributed most of the trawl catch (444 and 368 mt, respectively), with Area 2C again the (like Dover sole) third ranking catch area (App. Table 3). Petrale sole was one of the few species which was not, or was little, affected by the mid-year market glut, partly because of its relatively low volume and partly because of its traditional high value, long shelf life, etc. Stock availability appeared to increase in all areas, with CPUE much higher in 1979 than the previous year (60-230% higher depending on Stat. Area - see Table 7). However, 1979 CPUE was substantially below the 10-year mean in Areas 2B, 2C, and 3A as it has been since about 1975.

#### 4. English sole

Trawl landings of English sole in 1979 were 1,413 mt, 35% above the 1978 landing, and 42% above the mean (Tables 1, 5). English sole landings were somewhat affected by the market crunch, declining precipitously from a May peak (App. Table 4) in Area 3A. Catch per unit effort increased over 1978 levels in Areas 1C-2A and 2B; declined in Areas 2C and 3A, by 37% in Area 3A. CPUE was down from the 10-year mean in all areas except 1C-2A (Table 8).

#### 5. Rock sole

Rock sole landings in 1979 were 6 mt, half the 1978 level and about half the 10-year mean of 11 mt. Shrimp trawlers landed an additional 3 mt in 1979.

#### 6. Lingcod

Trawl landings of lingcod were 686 mt in 1979, 54% higher than in the previous year, and 17% more than the mean. This was the highest landing of lingcod since 1975, but was still only 76% of the peak landing in 1973 of 907 mt. Area 3A accounted for over 50% of the trawl catch as in 1978. Catch of lingcod by other gear totaled 225 mt in 1979, mostly in personal-use, recreational fisheries (85 mt) and the shrimp fishery (68 mt). A growing jig fishery took

Table 7. Oregon trawl catch (mt) and CPUE (mt/hr) of petrale sole from major fishing areas.

Year	2B		2C		3A	
	Catch	mt/hr	Catch	mt/hr	Catch	mt/hr
1968	109	0.160	159	0.079	363	0.103
1969	145	0.168	106	0.152	422	0.117
1970	264	0.117	122	0.144	385	0.105
1971	190	0.148	76	0.119	541	0.107
1972	272	0.169	99	0.117	454	0.103
1973	220	0.133	227	0.204	414	0.150
1974	300	0.230	232	0.147	613	0.171
1975	458	0.109	298	0.074	404	0.116
1976	342	0.122	94	0.085	338	0.091
1977	274	0.042	147	0.040	387	0.052
1978	358	0.041	157	0.033	459	0.041
1979	443	0.089	121	0.076	368	0.066
1969-78 Mean		0.128		0.112		0.105

Table 8. Oregon trawl catch (mt) and CPUE (mt/hr) of English sole from major fishing areas.

Year	1C-2A		2B		2C		3A	
	Catch	mt/hr	Catch	mt/hr	Catch	mt/hr	Catch	mt/hr
1968	72	0.174	127	0.109	133	0.094	450	0.127
1969	111	0.071	71	0.152	112	0.090	430	0.114
1970	63	0.058	201	0.119	116	0.102	338	0.112
1971	105	0.058	239	0.125	147	0.102	287	0.097
1972	82	0.048	346	0.105	189	0.140	327	0.159
1973	156	0.060	321	0.088	253	0.112	304	0.118
1974	124	0.058	285	0.147	140	0.087	226	0.144
1975	76	0.059	293	0.108	305	0.083	303	0.110
1976	113	0.065	498	0.128	299	0.134	721	0.176
1977	28	0.021	342	0.109	318	0.102	310	0.122
1978	104	0.031	152	0.068	178	0.074	606	0.169
1979	256	0.066	224	0.081	177	0.067	756	0.106
1969-78 Mean		0.053		0.115		0.103		0.132

20 mt in 1979 (Table 1).

7. Pacific cod

Trawl landings of cod in 1979 totaled 401 mt, almost the same as in 1978, but 55% more than the decadal mean of 258 mt. It was the second highest landing of Pacific cod in the 1968-1979 period, exceeded only in 1972 (Table 5). Most cod (90%) landed by trawlers in Oregon were taken in Area 3A, as usual. Shrimp trawlers took 19 mt in 1979, about evenly divided between Areas 3A and 3B, with only 1.1 mt taken in 2C-south (App. Table 3).

8. Pacific ocean perch

Trawl landing of *S. alutus* in 1979 was estimated (by species composition sampling analyses) to be 848 mt, 75% higher than in 1978, and 248% more than the 10-year mean. This was the largest landing of *S. alutus* in Oregon since 1966, and reflected (a) the recovery of stocks (including recruitment of the 1970 year class) from their 1973 nadir and (b) the very strong market for P.O.P. and other rockfish that prevailed in late 1978 and the first half of 1979. Almost all of this total was taken within the INPFC Columbia Area (App. Table 3), most of it within Areas 3A (64%) and 2C (33%). Temporal distribution of catch was different between the latter two areas. Area 3A catch was decidedly higher in June, July, August, in spite of market limits imposed in June by buyers; Area 2C catch perhaps reflected the market situation better, with landings tailing off after May there (App. Table 4). Of perch-like species, frequently caught on the same local grounds and trips as *S. alutus*, *S. reedi* contributed a substantive 448 mt in 1979, mostly from Area 2C (Table 2). This and a few other species are commonly purchased, processed, and sold as "Pacific ocean perch" by the industry. The 20,000 lb (~9 mt) trip limit imposed on draggers during 1979 (for *S. alutus*) was not entirely successful in limiting Columbia Area P.O.P. catch to the 800 mt sustainable yield level objective of 1978-79; considering especially that Washington landings also were taken in Area 3A.



However, a revised 1979 estimate of equilibrium yield in Columbia Area, based in part on the 1979 P.O.P. survey by ODFW, WDF, and NMFS, was 892-1,338 mt (mid point, 1,115 mt). A corrected Columbia Area catch in 1979 then would be 1,210 mt (including a Washington catch of 310 mt and foreign fishery catches of 53 mt), slightly in excess of the new mid point EY estimate but within the range (using pers. comm. rept. 18-79<sup>1/</sup>).

#### 9. Other rockfish

Trawl catch of rockfish other than Pacific ocean perch was a record 8,450 mt in 1979, 1.9 times that of 1978 (itself the highest landing since 1946) and 3.9 times that of the ten-year mean of 2,179 mt. Total catch of other rockfish in Oregon was 10,425 mt, 86% greater than in 1978. Most of the other-gear catch was taken by shrimp trawlers (1,010 mt) and recreational fishermen (476 mt). Jig fishermen took 132 mt in 1979, compared to less than 10 mt in 1978 (Table 1). Species composition of the catch was reported earlier in this document. The pelagic trawl effort on widow rockfish (*S. entomelas*) was the first effort by U.S. fishermen on a traditional domestic species/species group using such gear. Some of these fishermen had participated in the 1978 joint venture Pacific whiting fishery and gear used was the same. Their trips were usually short, rarely more than overnight, with little search time and comparatively few but extremely productive (and short) tows. Fishing was done at night, since pelagic gear was not productive during daytime for *S. entomelas*. The major 1979 fishing ground was a undersea "mountain-top"; 2x3 miles in area. Some Washington based vessels also fished the area similarly in 1979.

#### 10. Sablefish

Total 1979 sablefish landings were a record 7,758 mt, nearly 5 times the

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<sup>1/</sup> Joint Cumulative Catch Estimates Report for Pacific Ocean Perch, 1979. Report No. 18-79. January 22, 1980, Wash. Dept. Fish., Oreg. Dept. Fish & Wild.

1,614 mt of 1978. Where most previous years' landings were dominated by a modest trawl catch, landings in 1979 were mostly by pot fishermen (4,351 mt or 56%) followed by longliners (1,819 mt-23%). Shrimp trawlers landed 94 mt. Almost all remaining landings were by trawl - 1,493 mt (19%), 56% more than in 1978 and 487% more than the mean ten year level of 306 mt. A clinal areal trawl catch was seen with Areas 2B, 2C, and 3A contributing 681,462, and 304 mt, respectively (App. Table 3). Total catch, by area, is summarized by gear as follows:

Gear	Catch of sablefish by gear						Total
	Area						
	1C	2A	2B	2C	3A	3B	
Trawl	10	38	681	462	304	0	1,494
Shrimp Trawl	<1	<1	8	33	30	23	94
Pot (Trap)	0	635	1,248	1,755	714	0	4,351
Longline	0	212	676	374	558	0	1,819
Troll	<1	Tr	<1	Tr	0	0	<1
Jig	----- NIL -----						0
Total	~1	885	2,613	2,624	1,606	23	7,758

Areas 2B-3A catch totaled 6,843 mt, about equal amounts coming from Areas 2B and 2C and 1,606 mt from Area 3A. Area 2A catch was 885 mt (mostly caught off Brookings and Port Orford). Pot fishermen worked predominately in areas 2C and 2B while longliners seemed to predominate in Areas 2B and 3A (much of the latter by Astoria-based boats). Pot fishermen tended to fish much deeper (to at least 700 fm) than longliners, and were much less selective in size of fish caught or retained. Pot caught fish in landings were decidedly smaller than longline caught sablefish (Table 9). The very lucrative new Japanese market which absorbed this very large volume of fish in 1979 eventually

Table 9. Monthly Oregon 1979 Sablefish Fixed Gear Catch by Size Category and Port of Landing in Round-Weight Units.

(A) Pot	Size Category <sup>1/</sup>								Total
	Ex-small		Small		Medium		Large		
	mt	%	mt	%	mt	%	mt	%	
Astoria	86.9	12.5	335.1	48.2	142.5	20.5	130.7	18.8	695.2
Garibaldi	0.8	4.5	6.5	34.9	4.4	23.7	6.8	36.9	18.5
Newport	212.4	12.1	845.9	48.2	330.0	18.8	366.8	20.9	1,755.1
Winchester Bay	1.4	0.4	173.6	49.2	84.3	23.9	93.5	26.5	352.8
Coos Bay	2.7	0.3	355.8	39.8	278.0	31.1	257.4	28.8	893.9
Bandon	0	-	0.4	50.9	0.3	33.7	0.1	15.4	0.8
Port Orford	1.4	0.3	155.7	34.4	135.8	30.0	159.8	35.3	452.7
Gold Beach	0	-	40.9	32.9	36.5	29.3	47.0	37.8	124.4
Brookings	0	-	18.9	32.7	18.0	31.1	20.9	36.2	57.8
Total	305.6	7.0	1,932.8	44.4	1,029.8	23.7	1,083.0	24.9	4,351.2

(B) Longline	Ex-small		Small		Medium		Large		Total
	mt	%	mt	%	mt	%	mt	%	
	Astoria	5.0	0.9	57.8	10.4	92.2	16.6	400.6	
Garibaldi	0.1	4.7	0.8	34.3	0.7	26.6	0.8	34.3	2.4
Newport	0.4	0.1	67.4	18.0	98.8	26.4	207.6	55.5	374.2
Winchester Bay	2.5	0.7	62.1	17.3	78.2	21.8	216.0	60.2	358.8
Coos Bay	2.5	0.8	48.5	15.3	66.2	20.9	199.5	63.0	316.7
Bandon	0	-	0	-	0	-	0	-	0
Port Orford	0	-	24.9	11.8	39.8	18.9	146.0	69.3	210.7
Gold Beach	0	-	0	-	0	-	0	-	0
Brookings	0	-	0.2	23.6	0.4	37.7	0.4	38.7	1.0
Total	10.5	0.5	261.7	14.4	376.3	20.7	1,170.9	64.4	1,819.4

<sup>1/</sup> - Sizes: Ex-Small - <3 lb  
 Small - 3-5 lb  
 Medium - 5-7 lb  
 Large - >7 lb

became glutted, but winter weather had already set in by November when the first real signs of a market problem appeared. This market glut has continued to plague the fishery in mid year of 1980. Pot fishermen in large, modern boats fished up to 500 pots per vessel, or more in 1979. Many of these vessels experienced high pot losses due to adverse current conditions and from other vessels particularly trawlers, either accidentally or otherwise running through the gear. The pot loss caused some acrimony between users and also inspired ODFW staff to recommend a mandatory rot-out panel (of cotton twine) for pots so that lost pots would not continue to fish indefinitely. Over 100 vessels fished pot or longline gear in 1979, compared to only 25 in 1978.

11. Spiny Dogfish

Landings of dogfish shark totaled only 42 mt, 40 mt by trawl. This species was still an incidental item in the Oregon fishery.

12. Pacific whiting (hake)

Landings of Pacific whiting ashore in Oregon totaled only 138 mt in 1979, 129 mt by trawl. This was 66% less than the level reached in 1978, although still 17% above the ten-year mean trawl catch (Table 5). The shrimp trawl by-catch of 9 mt accounted for the remaining catch, although traces were seen in salmon troll and recreational catches (Table 1). Shoreside processing remained difficult at best due to the quality control problems (and also producer-processor logistics) associated with this species. It appears either a major technological breakthrough for at-sea refrigeration/preservation of whiting must occur, or at-sea processing as practiced in the foreign and/or joint venture fisheries will continue to be required in volume fishing for this species. Several Oregon vessels participated successfully in the U.S.-USSR joint venture in 1979.

B. Canada-U.S. Domestic Groundfish Regulations

1. Changes in 1979

Concern over escalating demand for, and catch of Pacific ocean perch (P.O.P.) in late 1978-1979 and results of further analyses of P.O.P. stock status suggesting stocks still needed protection from a much-increased fleet fishing power led to our making permanent a temporary rule establishing a 20,000-lb trip limit in Oregon for P.O.P. (*Sebastes alutus*). This action was taken early in 1979, effective immediately.

No changes in recreational fishery regulations were proposed or made in 1979.

A fast-growing pot fishery combined with large gear losses and concerns about "ghost-fishing" by such gear among managers and industry alike led to a "escape mechanism" regulation by the Fish and Wildlife Commission in May, to be effective January 1, 1980. Details of the Oregon Administrative Rule are as stated below:

Fishing Gear

635-04-035 It is unlawful to take ocean food fish for commercial purposes by any means except:

(3) Pots. Escape Device required: Beginning January 1, 1980, pots (traps) used to capture ocean food fish other than Dungeness crab shall contain one of the following escape devices to permit escapement of fish if the bottomfish pot is lost:

(a) A section of one of the vertical (upright) walls of the pot shall be attached to two intersecting sides (of not less than 8 inches each) of the pot frame with cotton twine, size No. 30 thread or less; or

(b) A section of any outside wall, except the bottom, shall have an L-shaped seam or panel of cotton twine knitted together with not more than size No. 30 thread. Each perpendicular leg of the "L" shall be not less than 8 inches in length;

(c) Pots which meet California destruct device regulations for fish traps shall be considered as meeting the above escape device requirements.

The pot and longline fisherman were also added to trawlers as being required to keep logbooks and make such data available to us on request.

2. Changes under consideration

No changes are contemplated which can be adequately summarized here, now. Results of the PFMC's Groundfish Plan regulations drafting team will, of course, have heavy effect on Oregon's regulation recommendations. Most likely subjects of change now due to FMP implementation will be mesh size of trawl gear, area-time closures for sablefish fisheries, other regulations on sablefish fixed gear, 5-fish bag limit on lingcod recreational fisheries (Oregon's now is 3; the difference could create difficulty in enforcement) and adjustments in definitions of trawl gear, all to effect compatibility and/or enforceability between ODFW and Federal FCZ regulations. By-catch limitations on shrimp trawl catches may also be required.

AGENDA ITEM VII - GROUND FISH RESEARCH

Tagging Studies

Lingcod - Of 3,818 fish tagged with Floy FD-67 anchor tags in July 1978, adjacent to Stonewall Bank (PMFC Area 2C) 387 (10.1%) were recovered as of December 31, 1979. Females comprised 88% of these, nearly identical to the proportion tagged. Movement was detected for only 36 fish, of which 17 traveled north, 10 traveled south, 6 moved into deeper water (west) and 2 were recaptured in 20 fm about 10 miles north and inshore of the tagging area. Greatest movement north was off Cascade Head or possibly Cape Lookout, while greatest southward movement was to the "Mudhole" inside Heceta Bank (off Heceta Head). Most tag recoveries were by trawlers. A few were returned by sport charter boats fishing on Stonewall Bank or from salmon trollers fishing near there. The preponderance of recoveries from or near the tagging area suggests very little movement.

In November 1977 through March 1978, 294 hook-line caught lingcod were tagged on an inshore reef near Yaquina Bay, of which 83% were males. Only 19 fish (6.5%) have been recovered from this tagging (through 12-31/1979); 89%

were males, and all were captured from the area of tagging. Results of tagging are summarized in Appendix Table 5.

English sole - Of 4,188 fish tagged in December 1977 and March 1978, 317 (7.6%) have been recaptured (as of 12-31/1979). An unknown number of additional tags have been recovered but not documented by this agency's personnel yet. There apparently was a difference in extent of northward distribution of tagged-recovered fish between the two taggings. Generally both taggings indicated a north and inshore feeding movement of fish as far north as Area 5A off northern Vancouver Island followed by a southward-offshore movement and concentration of fish into the tagging area (most were tagged in PMFC Area 2B on Heceta Bank). About 833 fish (20%) were tagged in shallower water between Alsea Bay and Cape Perpetua (Area 2C) inside of Heceta Bank. No fish were recaptured from north of the Heceta Bank area in the fourth quarter of 1978, but 17% were recaptured in the tagging area. Returns from 1979 showed much the same pattern as in 1978; however, fourth quarter returns were anomalous in that recoveries were from north of the tagging area only.

Fish tagged in March 1978 were recovered to a much lesser extent northward than the fish from the December tagging. The March tagging was generally done inshore of the December tagging. A similar pattern of distribution prevailed however.

With the two taggings combined, a shift northward during the second and third quarters with a return of tagged fish to the tagging area during the fourth quarter was indicated (Figure 1).

#### Pacific ocean perch 1979 Surveys

Oregon participated in a cooperative rockfish assessment survey in 1979 with Washington Department of Fisheries and National Marine Fisheries Service scientists. Our contribution (other than analyses) was off-Oregon field surveys

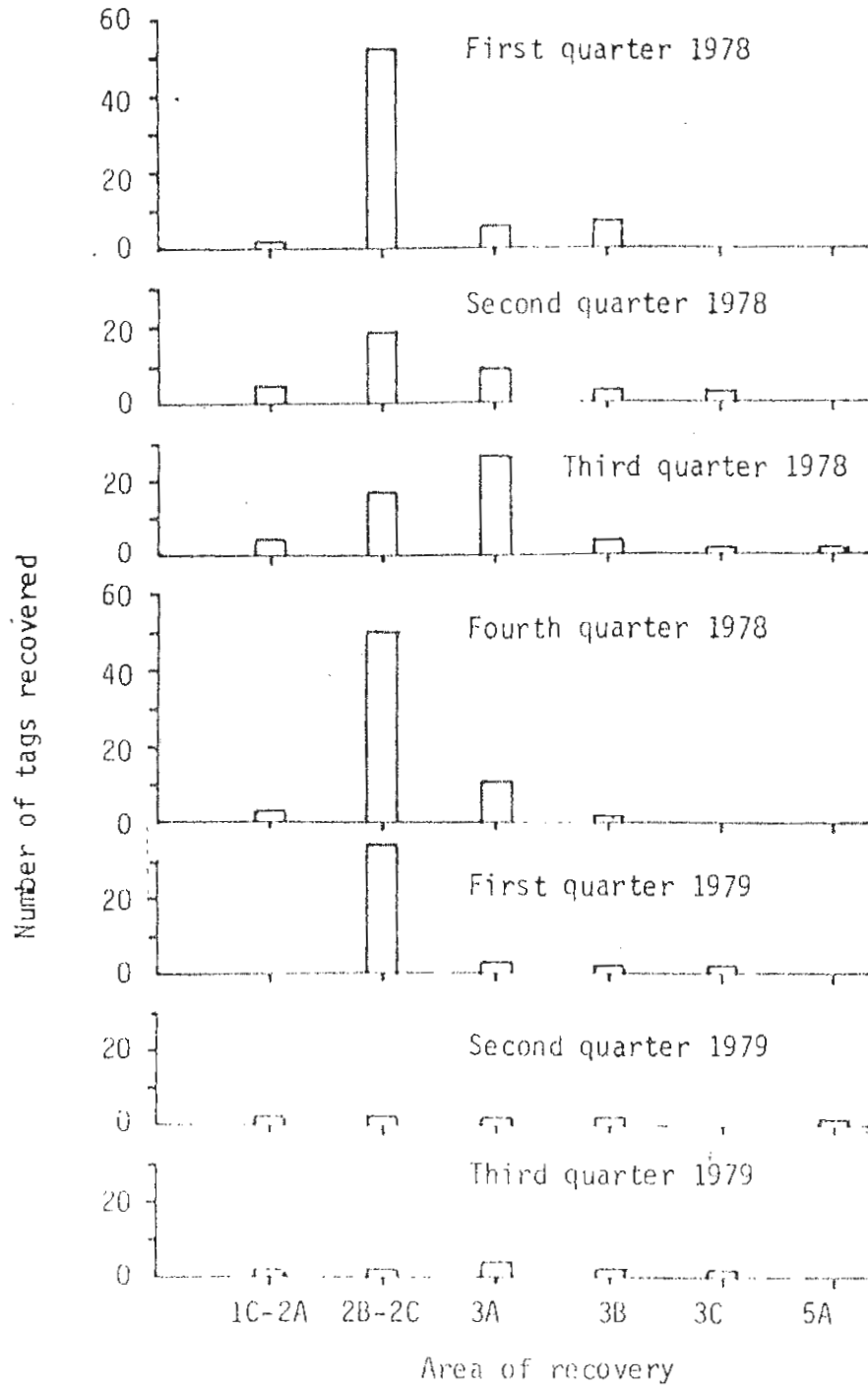


Figure 1. Number of tagged English sole recovered by international statistical area. Tag returns from December 1977 and March 1978 tagging experiments are combined.



using two chartered commercial trawlers, the FV's Washington and New Life of Astoria and Newport, respectively. We concentrated our field efforts on known P.O.P. grounds north of Newport to the Astoria Canyon off the Columbia River mouth. Analyses of biomass using the area-swept method (combined with data from off Washington) indicated an exploitable stock of 11,276 mt  $\pm 41\%$  (90% C.I.) in INPFC Columbia Area in May 1979. This compared to the 1977 estimate of 6,546 mt  $\pm 40\%$  (at the 90% C.E.). These confidence limits overlap, so statistically no significant difference in standing crop was shown between 1977 and 1979 in the Columbia Area. A slight increase in sampling intensity and stratified random sampling used in 1979 did not improve precision of our estimate at all. Gear, seasonal, and sampling design differences confounded comparisons between 1977 and 1979, however. The strong 1970 year class detected by fishermen in 1976 and the 1977 survey, was still evident in the 1979 survey and catches. It was most abundant in PMFC Area 3A.

Estimates of total instantaneous mortality (Z) was estimated by both the Robson-Chapman (1960) and Jackson (1939) methods for age groups 13-25. Estimates of Z were 0.34 and 0.31 for the Columbia and INPFC Vancouver Areas, respectively, using the Robson-Chapman method. Estimates using Jackson's method were respectively 0.24 and 0.20 for the two areas. An estimate of F in the Columbia Area regardless of method used was 0.08, nearly identical to that estimated for the Vancouver Area. Therefore, M was estimated ( $M=Z-F$ ) at 0.26 (Robson-Chapman) or 0.16 (Jackson) in the Columbia Area; at 0.20 or 0.08 in the Vancouver Area. The Jackson method provided the most agreeable result relative to previous work by Gunderson (1977). It appears M lies in the range 0.08 to 0.26 at any rate.

#### Shrimp Fishery By-catch Analysis

An effort was made in 1979 to both look at catch records and at shrimp

survey cruise data in order to assess groundfish by-catch. By-catch by the large (~203 vessels in 1979) shrimp fishery off Oregon has exceeded 1,000 mt for several years, mostly rockfish. Economics made this by-catch a socio-economic problem of some significance in 1979-80. Examination of compiled non-shrimp catch in a 1979 shrimp survey (Table 10) showed some interesting differences in by-catch over shrimp grounds covered (from Astoria Canyon to Cape Blanco). North Area (Astoria to off Tillamook Bay) survey catches were dominated by rockfish (41%) and whiting (30%). Smelt and flatfish were also substantial components. North-central area (Tillamook Bay to Stonewall Bank) catches, however, were dominated by sablefish (53%) and whiting (37%). Rockfish were a relatively minor component (<4%). The Coos Bay Area (essentially all of PMFC Area 2B except the sector south of Cape Arago which is called the Bandon Area in our analysis) again was dominated by rockfish (45%). Whiting and flatfish were also high in catches (19 and 26%, respectively). The twelve tows made in the Bandon Area (popularly called the "Blanco Bed" by shrimpers showed a mix of species groups with rockfish, flatfish, smelt, and whiting predominant.

In all areas except the Bandon Area, by-caught groundfish exceeded the amount of survey-caught shrimp (*Pandalus jordani*), by factors ranging from 5-1 to 21-1 inside the survey boundaries. Principal groundfish species caught throughout the survey was Pacific whiting (73%). Much of the by-catch is, of course, discarded by shrimp trawlers. Moreover, shrimpers tend to fish within a small part of the total shrimp stock grounds at any given time period, and by-catch tends to be quite different from potential ground-wide species composition. The differences in by-catch between our survey "Areas" often is repeated within these areas.

Widow, aurora, darkblotched, and yellowtail rockfish (*Sebastes entomelas*, *S. aurora*, *S. crameri*, and *S. flavidus*, respectively) dominated rockfish catches.

Table 10. Species composition (%) of major groups of fish caught incidentally to shrimp during the 1979 pink shrimp survey. The number of tows and distance towed is indicated.

Species	Inside				Outside			
	North	North Central	Coos Bay	Bandon	North	North Central	Coos Bay	Bandon
Lingcod	0.3	0.1	0.6	-	-	-	1.4	3.2
Pacific Cod	1.2	0.2	-	-	6.0	-	-	-
Pacific Whiting	29.6	36.5	18.9	9.8	73.3	8.4	28.0	1.5
Sablefish	1.3	53.0	3.0	1.1	-	2.0	7.3	0.2
Rockfish	40.7	3.3	45.0	15.6	10.7	70.3	3.2	11.7
Flatfish	11.0	3.7	25.6	25.5	6.9	10.6	53.0	49.5
Smelt	16.1	3.0	5.8	31.4	2.6	8.8	4.7	21.7
Other	0.3	<0.1	1.0	16.6	0.6	-	2.3	12.1
Total Weight of incidental catch (Pounds)	3,961	10,035	14,822	1,531	117	614	2,557	526
Total Weight Shrimp (Pounds)	827	481	3,083	2,938	-	448	1,004	1,555
No. Tows	29	22	33	12	1	4	8	5
Distance Towed (N.M.)	38.0	28.0	33.0	12.5	1.1	3.9	10.1	4.9

Pacific ocean perch, *S. alutus*, were a minor constituent. Of flatfish, arrow-tooth flounder, Dover sole, petrale sole, rex sole, and slender sole were frequently caught. Incidence of these varied from area to area as did species of rockfish.

More will be done in 1980 with file data on shrimp by-catch, including summaries of by-catch per landing frequency and ratio of by-catch to shrimp catch per delivery.

APPENDIX I - Marine Region Staff Associated with Groundfish Studies

Region Supervisor: Bob Loeffel	Newport
Assistant Supervisor, Management Studies: J.G. Robinson	Newport
Groundfish and Shrimp Management Project:	
G. Lukas, Leader Transferred 3/1/79 to Portland	Newport
J. Golden, Leader - (since 10/1/79)	Newport
M. Hosie, South Coast Area Biologist	Charleston
D. Douglas, North Coast Area Biologist (since 3/1/80)	Astoria
E.L. Niska, North Coast Area Biologist (to 12/31/79, retired)	Astoria
G. Hettman, Central Coast Technician, Groundfish	Newport
C. Bruneau, Central Coast Technician, Shrimp (since 7/1/79)	Newport
Groundfish and Shrimp Statistics:	
J. Golden, Leader (10/1/79-present)	Newport
T. Mallon, (½ t.) Technician/Keypunch Op.	Newport
G. Hettman (PT), Log and Data records, Groundfish	Newport
J. McCrae (PT) Support Researcher (since 5/17/80)	Newport
Stock Assessments:	
R. Demory, Leader (Groundfish)	Newport
S. Johnson (transfer in 12/10/79)	Newport
W. Barss	Newport
M. Saelens, South Coast operations (since 10/1/79)	Newport
M. Zirges, Leader (shrimp) (since 3/1/80)	Newport
C. Bruneau (PT) (shrimp)	Newport
1 PMFC sampler	Brookings
Bottomfish Personal Use Studies:	
J. Butler, Leader	Newport
Three year-round PMFC samplers; 4 seasonal samplers	Coastwide

APPENDIX II - Example of Sablefish Log Used in 1980 by ODFW

# Oregon Sablefish Log

Trip No.	Fish Receiving Ticket No.

Vessel Name \_\_\_\_\_

Port of Landing \_\_\_\_\_

ODF & W Vessel \_\_\_\_\_

Buyer \_\_\_\_\_

Registration No. \_\_\_\_\_

Gear: pot \_\_\_\_\_ longline \_\_\_\_\_

GEAR		
1	2	3

PORT	
4	5

VESSEL			
6	7	8	9

Type of pot: rectangular \_\_\_\_\_ conical \_\_\_\_\_

49301

Dimensions \_\_\_\_\_

String or Set Number	Number of Pots or Hooks	Depth Fathoms		Date	Time	LORAN READING				Estimated Weight of Sablefish	FISHING NOTES
						CH = CHANNEL					
						CH	Microseconds	CH	Microseconds		
			Set								
			Up								
			Set								
			Up								
			Set								
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Market Limits: \_\_\_\_\_ Comments: \_\_\_\_\_

Signed: \_\_\_\_\_

Hook/Pot Spacing \_\_\_\_\_ ft. apart on groundline.    Pots/String \_\_\_\_\_    **Total Pots Fished** \_\_\_\_\_  
(include pots not tended this trip)

APPENDIX III - Groundfish Landings in 1979 By Gear Type, Area and Species



OTTER TRAWL LANDINGS BY Intr. Stat. AREA IN 1979

(Landings in metric tons)

SPECIES	1C	2A	2B	2C	3A				Total
ENGLISH SOLE....	52.7	203.2	224.6	176.9	755.5				1,412.9
ROCK SOLE.....	0	0	1.8	0.8	2.7				5.3
PETRALE SOLE....	13.2	96.1	443.5	121.1	368.3				1,042.2
DOVER SOLE.....	78.0	253.0	2,744.3	667.0	1324.2				5,066.5
REX SOLE.....	8.3	37.1	129.7	38.7	520.5				734.3
STARRY FLOUNDER.	6.0	10.9	15.7	17.1	234.3				284.0
OTHER FLATFISH..	34.1	52.2	102.9	169.1	529.7				888.0
PAC. TRUE COD...	0	0	0.4	39.7	361.5				401.6
LINGCOD.....	11.9	48.1	179.6	89.2	356.9				685.7
SABLEFISH.....	9.7	37.6	680.6	462.2	303.9				1,494.0
PAC. OCEAN PERCH	0.5	0.4	22.7	277.0	547.5				848.1
OTHER ROCKFISH..	241.8	605.0	2525.2	2284.9	2793.5				8,450.4
MISC. SPECIES...	1.0	5.7	Tr	0.4	308.4				315.5
DOGFISH.....	0	0	0	1.8	37.6				39.4
ANIMAL FOOD.....	0	0	0	0	0				0
REDUCTION USE...	0	0	0	0	0				0
TOTAL LANDINGS..	457.2	1349.3	7071.0	4345.9	8444.5				21,667.9
TOTAL HOURS.....	1,645	4,846	17,511	8,934*	23,508				56,444*

\*Excludes pelagic trawl effort

Tr = <0.1 metric ton



INCIDENTAL SHRIMP TRAWL LANDINGS BY PMFC AREA IN 1979Landings in metric tons

SPECIES	1C	2A	2B	2C	3A	3B			
ENGLISH SOLE....	Tr.		0.6	Tr.	0.4	Tr.			1.2
PETRALE SOLE....	Tr.		1.0	0.5	2.1	0.5			4.1
DOVER SOLE,.....	0.2	0.6	12.2	6.5	11.2	4.5			35.0
REX SOLE.....	Tr.		6.5	0.4	2.2	0.9			10.0
STARRY FLOUNDER.									0.1
OTHER FLATFISH..	Tr.		0.1	4.2	5.2	3.6			13.1
PAC. TRUE COD...			Tr.	1.1	8.3	9.2			18.6
LINGCOD.....	2.1	2.4	9.9	8.3	28.9	16.8			68.4
SABLEFISH.....	0.5	0.1	7.8	32.6	30.1	22.9			93.9
PAC. OCEAN PERCH		1.6	8.5	78.4	5.8	0.3			94.6
OTHER ROCKFISH..	27.4	61.0	308.6	91.4	326.2	195.2			1,009.8
MISC. SPECIES...	Tr.	0.1	Tr.	0.1	0.1				0.2
PACIFIC WHITING			Tr.	Tr.	9.0				9.0
TOTAL LANDINGS	30.2	65.7	355.2	223.6	429.5	253.8			1,358.0
TOTAL LANDINGS..									

Note: Tr. = less than 0.1 metric ton

POT LANDINGS BY INTR. STAT. AREA IN 1979

(Landings in mt ~~pounds~~)

SPECIES	2A	2B	2C	3A					
ENGLISH SOLE....	0.6		5.6						6.2
ROCK SOLE.....									
PETRALE SOLE....	0.1		1.0						1.1
DOVER SOLE.....		1.4	1.0	Tr					2.4
REX SOLE.....									
STARRY FLOUNDER.									
OTHER FLATFISH..	2.6	4.2	0.7	Tr					7.5
PAC. TRUE COD...									
LINGCOD.....	3.9	4.6	2.7	0.4					11.6
SABLEFISH.....	634.9	1247.5	1755.1	713.7					4351.2
PAC. OCEAN PERCH		1.1	0.2	Tr					1.3
OTHER ROCKFISH..	6.4	12.2	6.6	36.7					61.9
MISC. SPECIES...	2.6	0.4	0.5	2.5					6.0
DOGFISH.....									
ANIMAL FOOD.....									
REDUCTION USE...									
TOTAL LANDINGS..	651.1	1271.4	1773.4	753.3					4449.2
TOTAL HOURS.....									

Tr = Trace

LONGLINE LANDINGS BY INTR. STAT. AREA IN 1979

(Landings in mt (metric tons))

SPECIES	2A	2B	2C	3A					Total
ENGLISH SOLE....			0.7						0.7
ROCK SOLE.....									
PETRALE SOLE....			0.3	Tr					0.3
DOVER SOLE.....		Tr		Tr					Tr
REX SOLE.....									
STARRY FLOUNDER.									
OTHER FLATFISH..		Tr	0.5	Tr					0.5
PAC. TRUE COD...				0.5					0.5
LINGCOD.....	1.5	1.1	0.8	5.0					8.4
SABLEFISH.....	211.7	675.5	374.2	558.0					1819.4
PAC. OCEAN PERCH			0.2	0.3					0.5
OTHER ROCKFISH..	13.1	19.2	29.9	56.1					118.3
MISC. SPECIES...			Tr	10.4					10.4
DOGFISH.....									
ANIMAL FOOD.....									
REDUCTION USE...									
TOTAL LANDINGS..	226.3	695.8	406.6	630.3					1959.0
TOTAL HOURS.....									

Tr = Trace

TROLL LANDINGS BY INTR. STAT. AREA IN 1979

(Landings in mt (公噸))

SPECIES	2A	2B	2C	3A					Total
ENGLISH SOLE....									
ROCK SOLE.....									
PETRALE SOLE....		Tr	0.1	Tr					0.1
DOVER SOLE.....									
REX SOLE.....									
STARRY FLOUNDER,									
OTHER FLATFISH..		Tr	Tr	Tr					Tr
PAC. TRUE COD...									
LINGCOD.....	8.7	7.1	15.5	0.5					31.8
SABLEFISH.....	0.3	Tr	0.1	Tr					0.4
PAC. OCEAN PERCH									
OTHER ROCKFISH..	48.4	55.1	62.5	10.7					176.7
MISC. SPECIES...	Tr	Tr	0.1						0.1
DOGFISH.....									
ANIMAL FOOD.....									
REDUCTION USE...									
TOTAL LANDINGS..	57.4	62.2	78.3	11.2					209.1
TOTAL HOURS.....									

Tr = Trace

JIG LANDINGS BY INTR. STAT. AREA IN 1979

(Landings in mt ~~metric~~)

SPECIES	2A	2B	2C	3A					Total
ENGLISH SOLE....									
ROCK SOLE.....									
PETRALE SOLE....			Tr						Tr
DOVER SOLE.....									
REX SOLE.....									
STARRY FLOUNDER.									
OTHER FLATFISH..	Tr		Tr						Tr
PAC. TRUE COD...									
LINGCOD.....	12.7	0.3	6.9	0.1					20.0
SABLEFISH.....									
PAC. OCEAN PERCH									
OTHER ROCKFISH..	94.1	0.3	37.4	Tr					131.7
MISC. SPECIES...			Tr						Tr
DOGFISH.....	0.1								0.1
ANIMAL FOOD.....									
REDUCTION USE...									
TOTAL LANDINGS..	106.9	0.5	44.3	0.1					151.8
TOTAL HOURS.....									

T = Trace

APPENDIX IV - Monthly Trawl Landings (1979) in Oregon by Area and Species



MONTHLY OTTER TRAWL LANDINGS FROM INTERNATIONAL STATISTICAL AREA 1C IN 1979  
(Landings in mt)

SPECIES	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTAL
ENGLISH SOLE	6.8	0.5	2.7	0	11.8	2.3	7.7	11.3	7.3	1.8	0.5	0	52.7
ROCK SOLE	0	0	0	0	0	0	0	0	0	0	0	0	0
PETRALE SOLE	0.9	0	0.5	0	1.4	4.5	2.3	1.8	1.8	Tr	0	0	13.2
DOVER SOLE	6.3	0	0.9	Tr	2.7	46.3	10.9	5.9	2.7	0.9	0	1.4	78.0
REX SOLE	0.5	0	0.5	0	0.9	1.8	1.4	1.8	1.4	Tr	0	0	8.3
STARRY FLOUNDER	0.9	0	Tr	0	Tr	Tr	0.5	4.1	0.5	Tr	Tr	0	6.0
OTHER FLATFISH	10.4	0.5	1.8	0	0.5	0.9	1.8	13.6	2.3	1.4	0.9	0	34.1
PAC. TRUE COD	0	0	0	0	0	0	0	0	0	0	0	0	0
LINGCOD	0.9	0	0.5	Tr	Tr	2.7	4.1	2.3	1.4	Tr	Tr	0	11.9
SABLEFISH	Tr	0	0.5	Tr	0	5.9	2.3	0.5	Tr	Tr	TR	0.5	9.7
PAC. OCEAN PERCH	0	0	0	0	0	0	0	0.5	0	0	0	0	0.5
OTHER ROCKFISH	84.4	Tr	22.7	5.4	4.5	5.9	33.6	33.6	38.1	8.6	2.7	2.3	241.8
MISC. SPECIES	0.5	0	Tr	0	Tr	Tr	0.5	Tr	Tr	Tr	Tr	0	1.0
DOGFISH	0	0	0	0	0	0	0	0	0	0	0	0	0
ANIMAL FOOD	0	0	0	0	0	0	0	0	0	0	0	0	0
REDUCTION USE	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	111.6	1.0	30.1	5.4	21.8	79.3	65.1	75.4	55.5	12.7	4.1	4.2	457.2
TOTAL HOURS	292	10	96	15	53	248	229	407	166	69	44	16	1,645

MONTHLY OTTER TRAWL LANDINGS FROM INTERNATIONAL STATISTICAL AREA 2A IN 1979  
(Landings in mt.)

SPECIES	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTAL
ENGLISH SOLE	6.3	9.1	36.7	1.4	18.6	2.7	15.4	18.6	15.9	23.6	30.4	24.5	203.2
ROCK SOLE	0	0	0	0	0	0	0	0	0	0	0	0	0
PETRALE SOLE	0.9	0.4	5.9	1.4	1.8	5.4	19.5	13.6	11.3	15.9	10.9	9.1	96.1
DOVER SOLE	0	0	0.9	18.6	21.3	34.9	24.5	21.8	65.8	38.5	18.1	8.6	253.0
REX SOLE	Tr	0.4	3.6	2.7	1.8	3.6	5.0	4.1	4.1	5.0	4.1	2.7	37.1
STARRY FLOUNDER	2.3	Tr	Tr	0	Tr	Tr	1.4	3.6	1.4	1.8	0.4	0.	10.9
OTHER FLATFISH	16.8	3.2	5.9	2.3	3.2	1.8	2.3	5.4	3.6	5.9	1.8	0	52.2
PAC. TRUE COD	0	0	0	0	0	0	0	0	0	0	0	0	0
LINGCOD	0.9	Tr	3.2	0.4	1.4	1.8	6.8	9.1	12.7	5.9	3.2	2.7	48.1
SABLEFISH	Tr	0	0.4	6.8	4.5	5.9	1.8	1.4	5.0	5.9	3.2	2.7	37.6
PAC. OCEAN PERCH	0	0	0	0	0	0	0	0.4	0	0	0	0	0.4
OTHER ROCKFISH	177.8	1.8	59.9	34.9	54.0	29.0	18.6	29.9	36.7	17.7	60.8	83.9	605.0
MISC. SPECIES	0.9	Tr	0.9	0	Tr	Tr	0.9	0.4	0.4	0.9	0.9	0.4	5.7
DOGFISH	0	0	0	0	0	0	0	0	0	0	0	0	0
ANIMAL FOOD	0	0	0	0	0	0	0	0	0	0	0	0	0
REDUCTION USE	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	205.9	14.9	117.4	68.5	106.6	85.1	96.2	108.3	156.9	121.1	133.8	134.6	1,349.3
TOTAL HOURS	318	88	427	173	173	272	504	502	675	831	552	331	4,846

MONTHLY OTTER TRAWL LANDINGS FROM INTERNATIONAL STATISTICAL AREA 2B IN 1979  
(Landings in metric tons )

SPECIES	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTAL
ENGLISH SOLE	70.3	10.0	8.2	7.3	24.0	16.8	13.6	25.4	10.4	7.3	14.1	17.2	224.6
ROCK SOLE	0	0	Tr	0	0	0	0	0	1.8	0	0	0	1.8
PETRALE SOLE	73.0	18.6	58.0	23.6	19.5	79.8	50.8	46.3	13.6	17.2	23.1	20.0	443.5
DOVER SOLE	94.3	78.0	348.3	342.9	308.4	337.9	254.4	246.3	152.8	200.5	250.3	130.2	2,744.3
REX SOLE	19.0	4.1	21.8	22.2	8.6	10.9	13.6	2.3	3.6	5.9	8.2	9.5	129.7
STARRY FLOUNDER	0.4	1.4	0.4	0.9	Tr	0.4	0.9	8.6	1.4	0.4	0.9	Tr	15.7
OTHER FLATFISH	15.4	2.7	5.0	4.1	4.1	10.0	7.7	30.4	13.6	2.7	4.5	2.7	102.9
PAC. TRUE COD	0	0	0	Tr	0	0.4	0	0	Tr	0	0	0	0.4
LINGCOD	6.8	1.8	24.0	22.7	14.5	13.6	41.3	26.3	11.3	8.2	7.7	1.4	179.6
SABLEFISH	18.1	16.8	57.1	58.0	49.0	81.2	120.6	113.8	39.5	28.1	50.3	48.1	680.6
PAC. OCEAN PERCH	1.3	1.2	2.2	3.2	1.5	2.0	1.9	2.5	2.0	2.0	1.8	1.1	22.7
OTHER ROCKFISH	144.7	137.1	244.5	356.4	167.2	224.8	213.1	277.8	221.1	214.8	199.6	124.1	2,525.2
MISC. SPECIES	Tr	Tr	Tr	Tr	Tr	Tr	Tr	Tr	0	Tr	Tr	0	Tr
DOGFISH	0	0	0	0	0	0	0	0	0	0	0	0	0
ANIMAL FOOD	0	0	0	0	0	0	0	0	0	0	0	0	0
REDUCTION USE	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	443.3	271.7	769.5	841.3	596.8	777.8	717.9	779.7	471.1	487.1	560.5	354.3	7,071.0
TOTAL HOURS	1,179	771	1,587	1,721	1,309	1,941	1,879	2,198	1,208	1,234	1,474	1,070	17,511

MONTHLY OTTER TRAWL LANDINGS FROM INTERNATIONAL STATISTICAL AREA 2C IN 1979  
(Landings in metric tons)

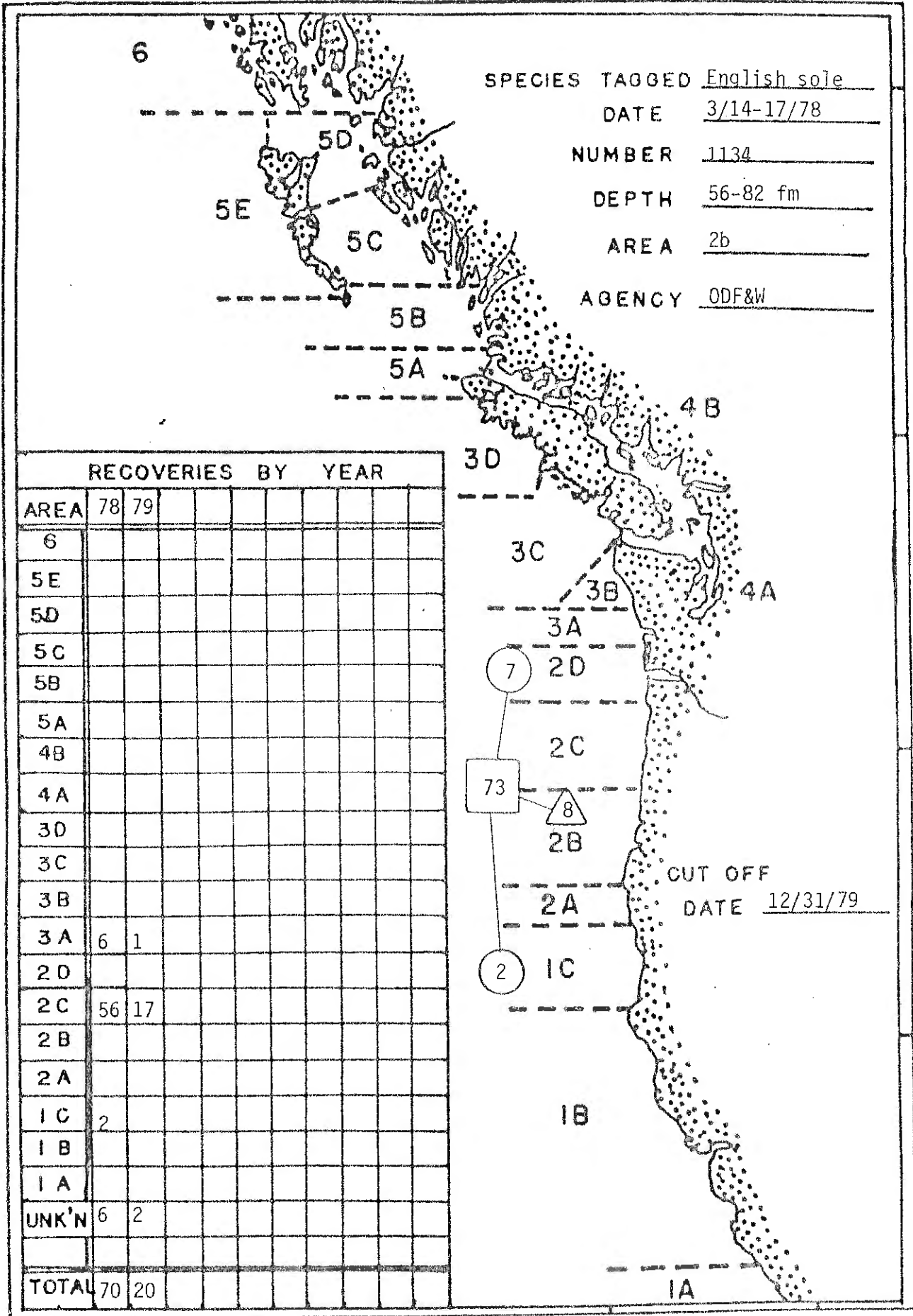
SPECIES	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTAL
ENGLISH SOLE	28.6	6.8	2.3	2.3	63.0	8.6	12.2	21.8	13.6	6.8	4.1	6.8	176.9
ROCK SOLE	0.4	0	Tr	0	Tr	0	0	0.4	Tr	0	0	0	0.8
PETRALE SOLE	1.4	0.9	2.7	4.5	24.5	15.4	24.0	26.3	10.0	7.7	1.4	2.3	121.1
DOVER SOLE	47.6	10.0	40.8	76.2	82.5	75.3	58.0	49.9	43.1	61.2	41.7	80.7	667.0
REX SOLE	0.9	2.3	2.7	6.3	6.3	3.6	3.6	6.3	2.7	1.8	0.4	1.8	38.7
STARRY FLOUNDER	0.9	1.8	4.5	2.3	Tr	0.4	Tr	0.9	2.7	0.4	0.9	2.3	17.1
OTHER FLATFISH	6.8	10.4	51.2	28.1	20.9	5.9	3.6	7.7	15.9	6.3	7.3	5.0	169.1
PAC. TRUE COD	0.4	3.6	0.4	0.4	1.8	16.3	4.1	10.9	0.9	0.9	Tr	Tr	39.7
LINGCOD	0.9	0.9	1.8	3.6	2.7	18.1	26.3	18.1	8.2	4.5	2.3	1.8	89.2
SABLEFISH	73.0	15.0	24.5	55.8	82.5	26.3	43.1	41.3	32.2	29.9	18.6	20.0	462.2
PAC. OCEAN PERCH	11.0	24.5	40.1	45.4	43.2	8.3	20.7	27.2	17.9	18.6	12.2	7.9	277.0
OTHER ROCKFISH	280.8	319.3	486.9	407.5	189.4	38.0	94.5	130.2	81.9	87.0	55.4	114.0	2284.9
MISC. SPECIES	Tr	Tr	Tr	0.4	0	0	Tr	Tr	Tr	0	Tr	Tr	0.4
DOGFISH	0	0	0	1.8	0	0	0	0	0	0	0	0	1.8
ANIMAL FOOD	0	0	0	0	0	0	0	0	0	0	0	0	0
REDUCTION USE	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	452.7	395.5	657.9	634.6	516.8	216.2	290.1	341.0	229.1	225.1	144.3	242.6	4345.9
TOTAL HOURS	586*	383*	437*	1,062*	1,237	888	1,018	1,124	726	597	353	523*	8,934*

\* Excludes pelagic trawl effort

MONTHLY OTTER TRAWL LANDINGS FROM INTERNATIONAL STATISTICAL AREA 3A IN 1979  
(Landings in metric tons)

SPECIES	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTAL
ENGLISH SOLE	43.5	29.0	46.7	18.1	272.1	38.5	54.9	93.0	48.1	71.7	34.0	5.9	755.5
ROCK SOLE	0	0	0	0	1.8	0	Tr	0.9	0	0	0	0	2.7
PETRALE SOLE	12.7	5.4	83.9	49.0	22.7	31.7	28.6	59.0	30.8	26.8	7.7	10.0	368.3
DOVER SOLE	1.8	12.2	28.1	90.2	165.5	264.9	174.1	260.8	147.4	133.8	37.2	8.2	1,324.2
REX SOLE	28.6	19.0	105.2	57.1	54.4	51.2	50.8	78.5	31.7	34.5	8.6	0.9	520.5
STARRY FLOUNDER	0.4	1.4	2.7	5.4	24.0	3.6	56.2	17.7	37.2	6.8	66.7	12.2	234.3
OTHER FLATFISH	15.0	13.6	34.9	31.3	47.2	93.0	46.7	90.2	63.5	39.0	52.6	2.7	529.7
PAC. TRUE COD	12.2	6.8	56.2	63.5	32.2	57.6	41.3	47.6	27.2	13.2	2.3	1.4	361.5
LINGCOD	9.5	2.7	34.9	27.2	18.6	27.2	36.7	103.4	34.5	27.7	10.9	23.6	356.9
SABLEFISH	5.0	16.3	14.5	25.9	50.3	66.7	38.1	44.0	14.5	16.3	10.9	1.4	303.9
PAC. OCEAN PERCH	1.5	5.4	10.7	30.5	26.2	148.6	100.5	89.0	34.8	39.7	47.8	12.8	547.5
OTHER ROCKFISH	91.4	163.3	295.5	194.0	411.5	206.5	217.0	208.9	287.2	253.7	298.2	166.3	2793.5
MISC. SPECIES	1.8	3.6	16.3	17.7	63.5	36.7	71.7	77.6	18.6	0.9	Tr	Tr	308.4
DOGFISH	0.9	5.4	6.3	5.0	2.3	0	0.4	0	4.1	8.2	5.0	0	37.6
ANIMAL FOOD	0	0	0	0	0	0	0	0	0	0	0	0	0
REDUCTION USE	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	224.3	284.1	735.9	614.9	1,192.3	1,026.2	917.0	1,170.0	779.6	672.3	581.9	245.4	8,444.5
TOTAL HOURS	784	638	2,667	2,359	2,848	2,961	2,371	3,447	1,869	1,851	1,301	412	23,508

APPENDIX V - Summary of Current ODFW Groundfish Tagging Studies

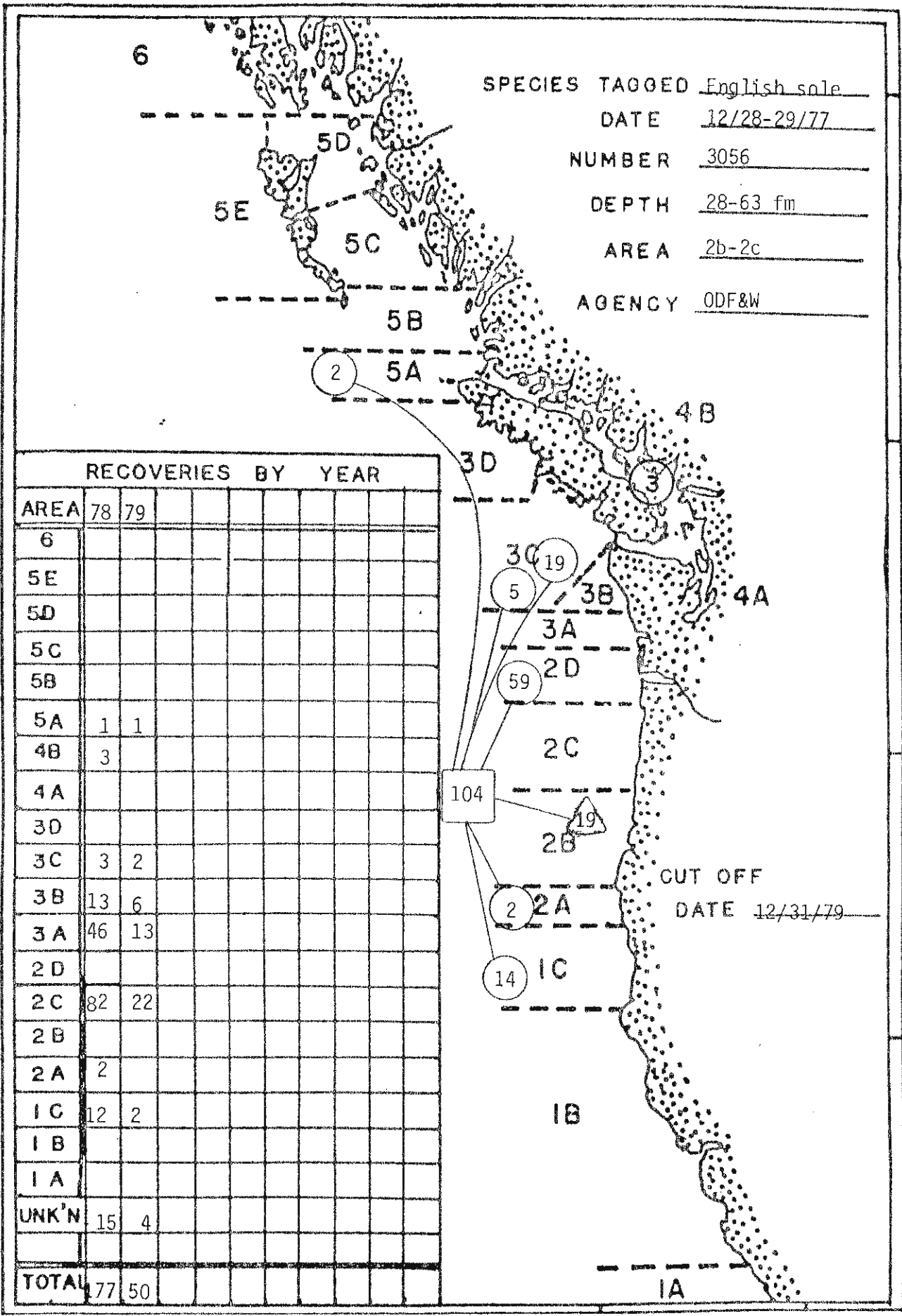


SPECIES TAGGED English sole  
 DATE 3/14-17/78  
 NUMBER 1134  
 DEPTH 56-82 fm  
 AREA 2b  
 AGENCY ODF&W

RECOVERIES BY YEAR

AREA	78	79							
6									
5E									
5D									
5C									
5B									
5A									
4B									
4A									
3D									
3C									
3B									
3A	6	1							
2D									
2C	56	17							
2B									
2A									
1C	2								
1B									
1A									
UNK'N	6	2							
TOTAL	70	20							

CUT OFF DATE 12/31/79



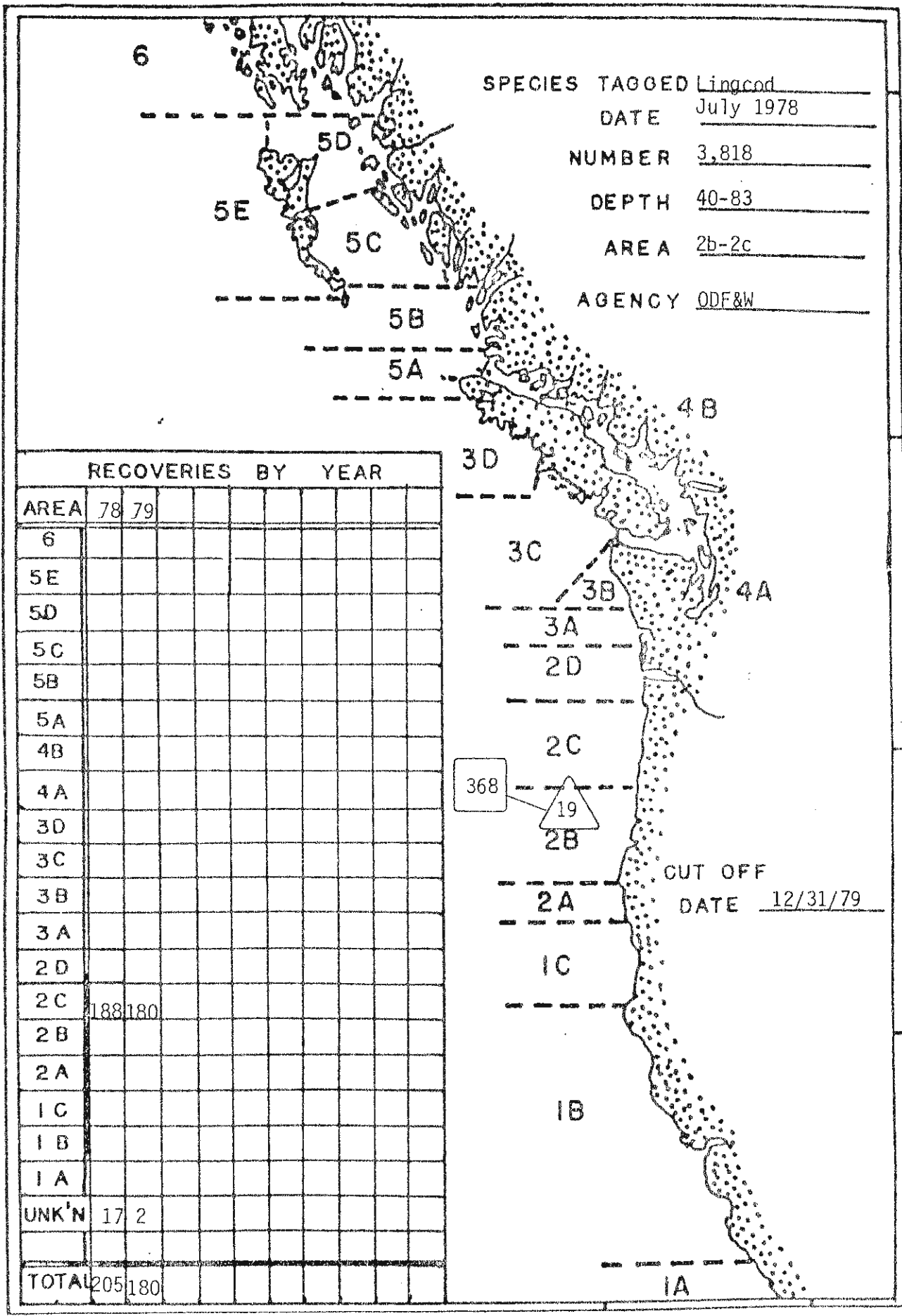
SPECIES TAGGED English sole  
 DATE 12/28-29/77  
 NUMBER 3056  
 DEPTH 28-63 fm  
 AREA 2b-2c  
 AGENCY ODF&W

RECOVERIES BY YEAR

AREA	78	79							
6									
5E									
5D									
5C									
5B									
5A	1	1							
4B	3								
4A									
3D									
3C	3	2							
3B	13	6							
3A	46	13							
2D									
2C	82	22							
2B									
2A	2								
1C	12	2							
1B									
1A									
UNK'N	15	4							
TOTAL	177	50							

CUT OFF DATE 12/31/79





SPECIES TAGGED Lingcod  
 DATE July 1978  
 NUMBER 3,818  
 DEPTH 40-83  
 AREA 2b-2c  
 AGENCY ODF&W

RECOVERIES BY YEAR

AREA	78	79							
6									
5E									
5D									
5C									
5B									
5A									
4B									
4A									
3D									
3C									
3B									
3A									
2D									
2C	188	180							
2B									
2A									
1C									
1B									
1A									
UNK'N	17	2							
TOTAL	205	180							

CUT OFF DATE 12/31/79

368  
 19  
 2B

IA