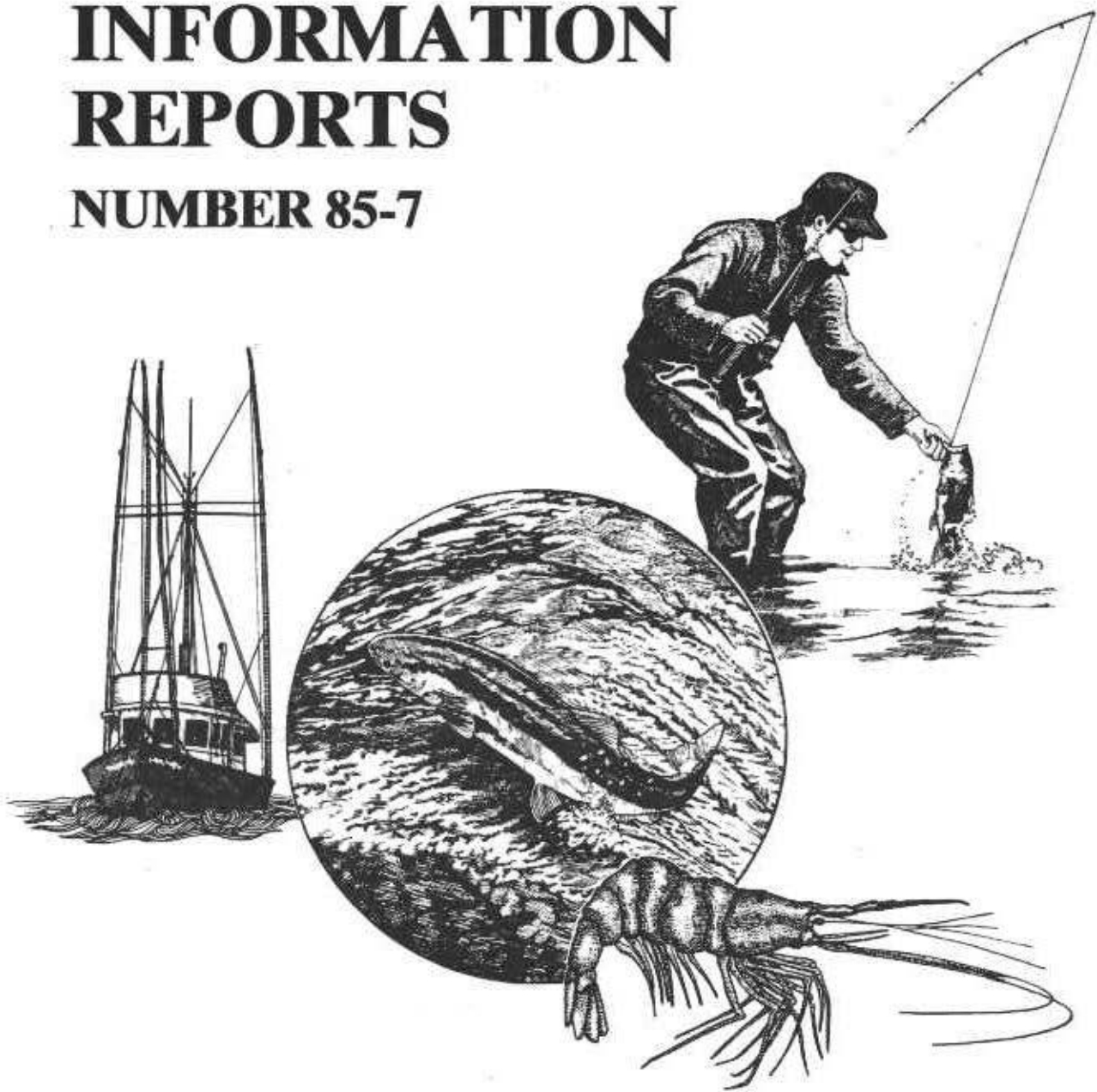


INFORMATION REPORTS

NUMBER 85-7



FISH DIVISION

Oregon Department of Fish and Wildlife

Observations on retention and discard of groundfish
from a limited sampling of Oregon trawl vessels in 1982

OBSERVATIONS ON RETENTION AND DISCARD OF GROUND FISH
FROM A LIMITED SAMPLING OF OREGON TRAWL VESSELS IN 1982

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August 1985

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OBSERVATIONS ON RETENTION AND DISCARD OF GROUND FISH
FROM A LIMITED SAMPLING OF OREGON TRAWL VESSELS IN 1982

ABSTRACT

A modest project was undertaken in 1982 to observe retention and discard of fish caught by trawl. The major objective was to document any discard of Pacific ocean perch (Sebastes alutus) that might occur during directed trawling for Dover sole (Microstomus pacificus). Eighty-three trawl hauls from 11 trips were sampled. Of the 53 Dover sole target tows only three contained more than 500 pounds of Pacific ocean perch. Overall, 76% of fish caught on directed Dover sole tows was retained. For the time period involved (February-July), discard of Pacific ocean perch in excess of the 5,000 pound trip allowance was not observed.

INTRODUCTION

In 1982 the Oregon Department of Fish and Wildlife undertook a modest project to observe the retention and discard of ground fish at sea by Oregon trawl vessels.

The primary objective of the study was to document the catch of Pacific ocean perch (Sebastes alutus) that might occur during directed fishing for Dover sole (Microstomus pacificus). Because efforts were and are being made to rebuild depleted Pacific ocean perch stocks, the magnitude of incidental catch on a tow by tow basis, as well as the discard of Pacific ocean perch that might occur beyond the then-allowed incidental trip limit^{1/} of 5,000 pounds was of prime concern.

The impetus for this project was initiated by regulatory action in 1981 when trip limits were reduced from 10,000 lbs per trip to 5,000 lbs per trip. A trip analysis^{2/} had indicated that a 5,000 lb trip limit would, on the average, reduce directed fishing effort on Pacific ocean perch. Fishermen claimed, however, that such a small incidental catch allowance would result in substantial discard.

In order to document the alleged discard, an observer was hired to sample and document catch retained and discarded. Because of limited funds this study was limited to the first six months of 1982 with the hope that this

^{1/} Trip limit as of May 1985 was 20% of total fish aboard or 5,000 pounds, whichever is less.

^{2/} Tagart, J., J. Golden, D. Kimura and R. Demory, 1980. Evaluation of alternative trip limits for Pacific ocean perch. A report to the Scientific and Statistical Committee of the Pacific Fishery Management Council, Portland, OR 97201

time period would adequately cover that period of time when stocks of Pacific ocean perch and Dover sole inhabited common terrain in which substantial fishing effort was directed.

METHODS

Catch Sampling

Catch from sampled tows was sampled entirely if the total weight was under about 500 lbs. Most often, though, it was necessary to subsample a tow because catch weight was too large, usually greater than 1,000 lbs. Estimates of the total catch weight before sorting were made by the vessel captain since experience has shown these estimates to be quite accurate. If subsampling was necessary, several bushel baskets were filled which provided a sample of about 500 lbs of fish. Sampled fish were sorted by species and weighed on a platform scale to the nearest pound. If a species had commercial value, the species was resorted by a crew member and any discard was re-weighed. The ratio between fish retained and fish discarded was then extrapolated to the total catch.

Gear Type

Gear type was not considered to be a variable of this study, although two types of trawls were used. One had a chain disc foot rope, and this trawl was usually used on smooth, soft bottom for flatfish. The second type of trawl had a roller type foot rope which was usually used on hard, irregular bottom, particularly for rockfishes. Many vessels carry both types of trawls aboard to maximize opportunity to fish different species or species associations and/or bottom types on the same trip.

Location of Study

This study covered a large geographical area, from about Cape Blanco, Oregon (Lat. 43°N) to Cape Flattery, Washington (Lat. 48°20'N). Depths fished ranged from 39 fms to 350 fms (71-640 m.).

Analysis

The analysis used in this report was straight-forward, i.e., to compare species retained and discarded. The simplest way to do this was to calculate the weighted percentage retained or discarded by trip and pool the results.

To facilitate analysis and to highlight differences in species composition and distribution, tows were separated into two categories: Dover sole targeted and non-targeted tows and depth strata of <90 fm, 90-159 fms, 160-229 fms, 230-299 fms, and >299 fms. A Dover sole target tow was defined as a tow where Dover sole comprised at least 30% of the retained catch or a tow when the intent was to target on the species assemblage consisting of Dover sole, sablefish (Anoplopoma fimbria) and deep water rockfish. In the latter case either the depth and area of catch was consistent with known Dover sole fishing patterns or the intent to fish for Dover sole was declared by the fishermen before the trawl was set.

One trip was excluded from the analysis because it consisted of a single tow made with a pelagic trawl. The very large rockfish catch consisted of 99% widow rockfish (Sebastes entomelas) and 1% yellowtail rockfish (Sebastes flavidus). All of the catch was retained.

RESULTS

Trawl catches were observed aboard vessels that fished from off Cape Blanco, Oregon to off Cape Flattery, off Washington (Figure 1). Depth of catch ranged from 39 to 350 fms. Eighty-three tows were sampled from 11 trips. Dover sole was the target species for 53 of these tows (Table 1).

Total catch of all species from all trips was 359,933 lb of which 65% was retained (Table 2). On the Dover sole target tows total catch was 236,353 lb of which 76% was retained (Table 3). Dover sole was the principal species caught, amounting to 30% of the total catch from all tows and 45% of the total catch from the Dover sole target tows. Retention of Dover sole was high. On target tows retention was 94% while from all tows retention was 93%. Dover sole were caught in all depth strata but most were caught in depths between 160-299 fms (Table 4).

Other species of importance were various rockfish and sablefish. As a group rockfish (family scorpaenidae) amounted to 16% of the total catch from all tows and 15% of the catch from Dover sole target tows. Proportion of rockfish retained from all tows was 80%, but only 69% was retained from Dover sole target tows. The difference in percent retained was twofold. First, species composition of rockfish was different because most Dover sole target tows occurred off the continental shelf and thus were deeper than the main bathymetric limits of some rockfish species such as widow rockfish and yellow-tail rockfish which most commonly inhabit waters on the continental shelf. Alternatively, thornyheads (Sebastolobus sp.) were caught only on the Dover sole target tows. Secondly, there were several slope species of rockfish such as darkblotched rockfish (S. crameri), greenstriped rockfish (S. elongatus) and stripetail rockfish (S. saxicola) that do not attain the size of common shelf species of rockfish and were in part discarded.

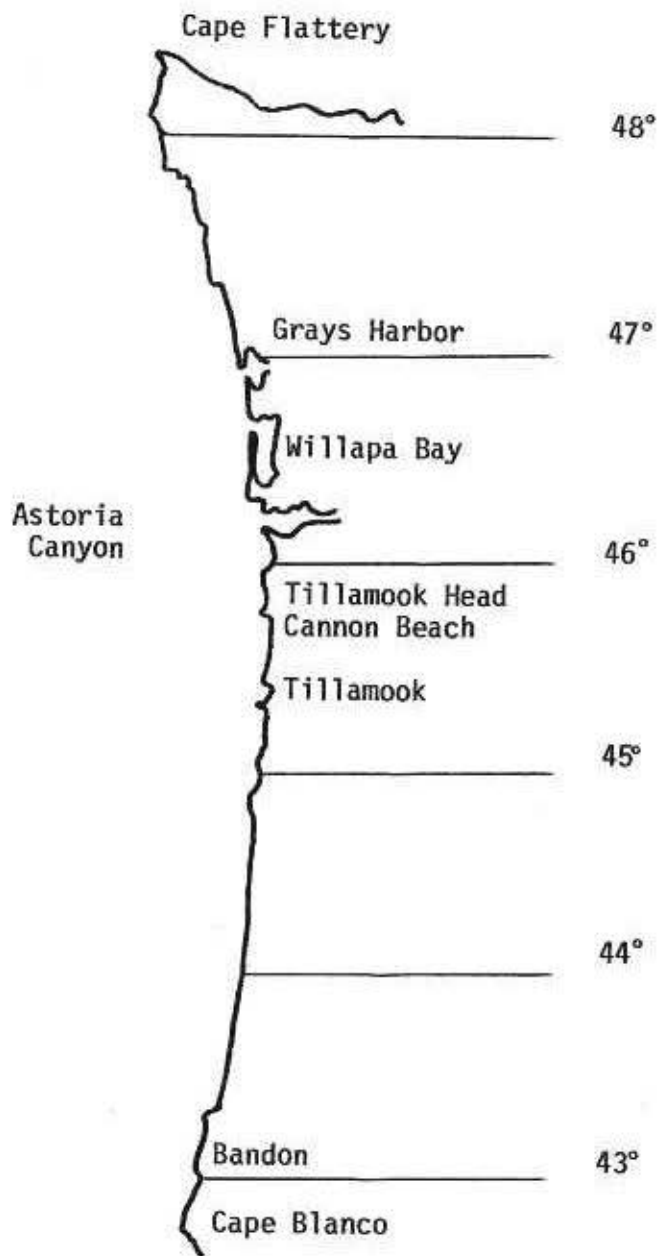


Figure 1. Geographical landmarks referred to in Table 1.

Table 1. Trip, trip date, relative location, depth and number of tows made during retention/discard study, 1982.

Trip No.	Date	Relative Location	Depth range fms	Total tows made/sampled	Dover sole target tows made/sampled
1	Feb 4	Grays Harbor, WA	43-46	1/1	0/0
2	Mar 4-7	Bandon, OR	66-330	14/10	12/9
3	Mar 15-18	Cannon Beach, OR	50-70	13/12	0/0
4	Mar 23	Tillamook, OR	200-250	1/1	1/1
5	Apr 5-7	Willapa Bay, WA	185-350	7/6	7/6
6	Apr 24-25	Astoria Canyon	210-280	4/4	4/4
7	May 4-6	Astoria Canyon	75-157	9/9	2/2
8	May 19-24	Tillamook, OR - Cape Flattery, WA	168-300	22/17	22/17
9	Jun 7-9	Tillamook Head, OR	40-93	5/5	4/4
10	Jun 27	Tillamook, OR	116-215	2/1	2/1
11	Jul 7-11	Tillamook Head, OR	39-69	20/17	11/9
Total				98/83	65/53

Table 2. Catch by species from all tows sampled during the retention/discard study, 1982. (Scientific names listed in Appendix 1.)

Species	Catch (lbs)		Total (lbs)	Percent Retained
	Retained	Discarded		
FLATFISH				
Arrowtooth flounder	5,301	16,582	21,883	24.2
Butter sole	1	9	10	10.0
Dover sole	100,527	7,131	107,658	93.4
English sole	3,676	3,282	6,958	52.8
Flathead sole	303	1,337	1,640	18.5
Pacific halibut	0	593	593	0
Pacific sanddab	0	8,417	8,417	0
Petrale sole	17,291	3,304	20,595	84.0
Rex sole	9,028	7,125	16,153	55.9
Slender sole	0	1,482	1,482	0
ROCKFISH				
Aurora rockfish	259	0	259	100.0
Black rockfish	5	0	5	100.0
Blackgill rockfish	268	0	268	100.0
Bocaccio	388	0	388	100.0
Canary rockfish	4,906	0	4,906	100.0
Darkblotched rockfish	1,347	2,421	3,768	35.7
Greenspotted rockfish	2	0	2	100.0
Greenstriped rockfish	85	4,396	4,481	1.9
Pacific ocean perch	10,025	30	10,055	99.7
Redbanded rockfish	321	44	365	87.9
Redstripe rockfish	99	405	504	19.6
Rosethorn rockfish	3	109	112	2.7
Rougheyeye rockfish	1,984	33	2,017	98.4
Sharpchin rockfish	177	195	372	47.6
Shortraker rockfish	3,764	0	3,764	100.0
Thornyheads	8,928	3,487	12,415	71.9
Silvergray rockfish	407	0	407	100.0
Splitnose rockfish	57	72	129	44.2
Stripetail rockfish	205	478	683	30.0
Widow rockfish	7,017	0	7,017	100.0
Yellowmouth rockfish	35	0	35	100.0
Yellowtail rockfish	7,394	0	7,394	100.0
ROUNDFISH				
Chinook salmon	0	2,062	2,062	0
Lingcod	8,368	320	8,688	96.3
Pacific cod	94	0	94	100.0
Pacific hake	0	14,719	14,719	0
Ratfish	0	14,830	14,830	0
Sablefish	43,312	10,150	53,462	81.0
Skates	0	19,005	19,005	0
Spiny dogfish	0	1,348	1,348	0
Misc. roundfish	0	990	990	0
TOTAL	235,577	124,356	359,933	65.5

Table 3. Catch by species from Dover sole target tows sampled during the retention/discard study, 1982.

Species	Catch (lbs)		Total	Percent Retained
	Retained	Discarded		
FLATFISH				
Arrowtooth flounder	4,921	15,346	20,267	24.3
Butter sole	0	0	0	0
Dover sole	100,154	6,585	106,739	93.8
English sole	599	160	759	78.9
Flathead sole	284	1,306	1,590	17.9
Pacific halibut	0	187	187	0
Pacific sanddab	0	500	500	0
Petrale sole	1,316	448	1,764	74.6
Rex sole	6,253	3,883	10,136	61.7
Slender sole	0	1,271	1,271	0
ROCKFISH				
Aurora rockfish	259	0	259	100.0
Black rockfish	0	0	0	0
Blackgill rockfish	256	0	256	100.0
Bocaccio	96	0	96	100.0
Canary rockfish	1,039	0	1,039	100.0
Darkblotched rockfish	1,275	2,360	3,635	35.1
Greenspotted rockfish	0	0	0	0
Greenstriped rockfish	50	4,260	4,310	1.2
Pacific ocean perch	5,827	14	5,841	99.8
Redbanded rockfish	321	44	365	87.9
Redstripe rockfish	0	1	1	0
Rosethorn rockfish	3	91	94	3.2
Rougheye rockfish	1,984	33	2,017	98.4
Sharpchin rockfish	161	190	351	45.9
Shortraker rockfish	3,764	0	3,764	100.0
Thornyheads	8,928	3,487	12,415	71.9
Silvergray rockfish	185	0	185	100.0
Splitnose rockfish	57	42	99	57.6
Stripetail rockfish	189	467	656	28.8
Widow rockfish	0	0	0	0
Yellowmouth rockfish	35	0	35	100.0
Yellowtail rockfish	144	0	144	100.0
ROUNDFISH				
Chinook salmon	0	12	12	0
Lingcod	1,918	75	1,993	96.2
Pacific cod	11	0	11	100.0
Pacific hake	0	3,190	3,190	0
Ratfish	0	4,483	4,483	0
Sablefish	38,510	2,433	40,943	94.1
Skates	0	5,882	5,882	0
Spiny dogfish	0	232	232	0
Miscellaneous roundfish	0	832	832	0
TOTAL	178,539	57,814	236,353	75.5

Table 4. Total catch (lbs), catch retained and percent retained by depth strata of selected species from Dover sole target tows.

Species	Total Catch by Depth					Percent Retained by Depth				
	<90	190-159	60-229	230-299	>299	<90	90-159	160-229	230-299	>299
Arrowtooth Flounder	4,335	3,584	5,427	6,326	595	0	53.8	55.2	0	0
Dover sole	18,258	7,372	11,860	58,964	10,285	71.7	80.7	100.0	100.0	100.0
Petrale sole	1,539	139	73	13	0	73.0	100.0	56.2	100.0	-
Rex sole	3,222	5,475	1,147	266	26	36.0	68.0	95.8	93.6	80.8
Darkblotched rockfish	1,840	1,673	117	5	0	2.2	66.5	100.0	100.0	-
Greenstriped rockfish	942	3,367	0	1	0	0	1.5	-	0	-
Pacific ocean perch	0	3,177	2,529	41	94	-	99.6	100.0	100.0	100.0
Rougheye rockfish	12	140	1,854	11	0	0	85.0	100.0	100.0	-
Shortraker rockfish	0	0	1,293	2,471	0	-	-	100.0	100.0	-
Thornyheads	333	2,433	1,775	6,934	940	0	9.0	77.7	96.2	70.0
Lingcod	1,607	386	0	0	0	95.3	100.0	-	-	-
Pacific hake	1,727	892	382	0	0	0	0	0	0	-
Sablefish	2,205	2,938	3,646	27,407	4,747	34.0	81.9	94.1	99.2	99.7

The total catch of Pacific ocean perch was 10,055 lb of which 5,841 lb was caught in directed Dover sole tows. Retention of Pacific ocean perch was essentially 100%; only 44 lbs were discarded. The largest single haul of Pacific ocean perch was 2,156 lb which comprised 36% of the retained weight of the tow and 21% of the Pacific ocean perch caught in observed trips. Of the 83 tows, Pacific ocean perch occurred in 23. Of the 53 Dover sole target tows, Pacific ocean perch occurred in 18, of which 10 contained less than 100 lbs of this species and only four tows contained more than 500 lbs (Table 5). The relatively low incidence of Pacific ocean perch in directed Dover sole tows was mostly due to depths fished. Most Pacific ocean perch were caught between 90 fms and 229 fms while most Dover sole were caught between 160 fms and 229 fms.

Sablefish was also an important species commonly caught along with Dover sole. Total catch of sablefish from all tows was 53,462 lbs of which 81% was retained. Of the 83 tows, sablefish occurred in 73 of which 23 contained less than 100 lbs of this species and six tows contained more than 2,000 lbs (Table 6). Sablefish occurred in all 53 Dover sole target tows and four of these tows contained more than 2,000 lbs of sablefish. However, more than one-half of the tows were less than 500 lbs. The maximum weight of sablefish caught on a single tow was 6,600 lbs all of which was discarded (undersized). Similarly to Dover sole most sablefish were caught between 160-299 fms (Table 4).

DISCUSSION

Pacific ocean perch were caught on about one-half of the directed Dover sole tows but catches were usually small. Results indicated that incidental catch of Pacific ocean perch was not a significant factor on most tows, at

DATE: January 21, 1986

TO:

FROM: Bill Barss

SUBJECT: ERRATA for Information Report No. 85-7

The weight category 00 - 499 in Table 5 on page 11 should read 100 - 499.
The heading All Tows in Table 6 on page 11 should be changed to Other Tows.
Both of these corrections can be made by replacing page 11 with the following:

Table 5. Numbers of tows by weight category that produced Pacific ocean perch during the retention/discard study, 1982.

Weight lbs	Dover Target Tows		All Tows	
	Number	Percent	Number	Percent
<100	10	55.6	12	52.1
100 - 499	4	22.2	4	17.4
500 - 999	3	16.7	4	17.4
>999	1	5.6	3	13.0
TOTAL	18	100.1	23	99.9

Table 6. Numbers of tows by weight category that produced sablefish during the retention/discard study, 1982.

Weight lbs	Dover Target Tows		Other Tows	
	Number	Percent	Number	Percent
<100	9	17.0	14	70.0
100 - 499	21	39.6	3	15.0
500 - 999	10	18.9	1	5.0
1000 - 1499	5	9.4	0	0
1500 - 1999	4	7.5	0	0
>1999	4	7.5	2	10.0
TOTAL	53	99.9	20	100.0

Table. 5 Numbers of tows by weight category that produced Pacific ocean perch during the retention/discard study, 1982.

Weight lbs	Dover Target Tows Number	Percent	All tows Number	Percent
<100	10	55.6	12	52.1
100 - 499	4	22.2	4	17.4
500 - 999	3	16.7	4	17.4
>999	1	5.6	3	13.0
TOTAL	18	100.1	23	99.9

Table 6. Numbers of tows by weight category that produced sablefish during the retention/discard study, 1982.

Weight lbs	Dover Target Tows Number	Percent	All Tows Number	Percent
<100	9	17.0	14	70.0
00-499	21	39.6	3	15.0
500-999	10	18.9	1	5.0
1000-1499	5	9.4	0	0
1500-1999	4	7.5	0	0
>1999	4	7.5	2	10.0
Total	53	99.9	20	100.0

least during the time period involved. Had the project been carried out throughout the year results may or may not have been substantially different.

In general, discard of important commercially used species of groundfish was relatively low, but for some species discard was total. Examples were Pacific whiting (Merluccius productus), dogfish (Squalus acanthias), skates (Raja spp.) and ratfish (Hydrolagus colliei). These species as well as others were not salable. This may change because some of the species now currently discarded will not be, if and when markets develop.

Two species were discarded because retention was legally prohibited. These were Pacific halibut (Hippoglossus stenolepis) and chinook salmon (Oncorhynchus tshawytscha) which may be legally retained only when caught by hook and line gear. The catch of halibut amounted to only 593 lbs or an incidence of 0.002 lb per lb of total catch. There were 2,062 lbs of chinook salmon caught. The incidence was 0.006 lb per lb of total catch.

Observer programs provide access to certain types of data that cannot be obtained by sampling landings. Discard data such as that obtained from this study is one type. Perhaps a more important type of data is the proportion of incompletely recruited fish of species of commercial importance such as Dover sole, English sole (Parophrys vetulus) and petrale sole (Eopsetta jordani). These data are vital for use in accurate stock assessments. Another important type of data is discard caused by regulation. Although some species are prohibited when caught by net gear such as halibut, crabs and salmonids, other species such as rockfish may be discarded because of trip limits. Such documentation is necessary to evaluate a regulation's impact on both the resource and the fishing industry.

ACKNOWLEDGMENT

We are grateful to the commercial fishing industry which donated assistance and vessels to the project. Special thanks go to the following skippers and their crews: Rod Heuschkel, M/V Master Stacy; Sandy Killian, M/V American Scoter; Leo Kuntz, M/V Ike; Roger Marshall, M/V Wild Mary; Phil Shoop, M/V Sea King; Tony Vandecoevering, M/V Ms Dana; John Viuhkala, M/V Blue Max; and Bob Williams, M/V McKinley. We also give special acknowledgment to Mr. Steve Jones who provided at-sea sampling and composition summaries.

Appendix 1. Common and scientific names of species captured during the retention/discard study, 1982.

FLATFISH

Arrowtooth flounder	<u>Artheresthes stomias</u>
Butter sole	<u>Isopsetta isolepis</u>
Dover sole	<u>Microstomus pacificus</u>
English sole	<u>Parophrys vetulus</u>
Flathead sole	<u>Hippoglossoides elassodon</u>
Pacific halibut	<u>Hippoglossus stenolepis</u>
Pacific sanddab	<u>Citharichthys sordidus</u>
Petrale sole	<u>Eopsetta jordani</u>
Rex sole	<u>Glyptocephalus zachirus</u>
Slender sole	<u>Lyopsetta exilis</u>

ROCKFISH

Aurora rockfish	<u>Sebastes aurora</u>
Black rockfish	<u>S. melanops</u>
Blackgill rockfish	<u>S. melanostomus</u>
Bocaccio rockfish	<u>S. paucispinis</u>
Canary rockfish	<u>S. pinniger</u>
Darkblotched rockfish	<u>S. crameri</u>
Greenspotted rockfish	<u>S. chlorostictus</u>
Greenstriped rockfish	<u>S. elongatus</u>
Pacific ocean perch	<u>S. alutus</u>
Redbanded rockfish	<u>S. babcocki</u>
Redstripe rockfish	<u>S. proriger</u>
Rosethorn rockfish	<u>S. helvomaculatus</u>
Rougheye rockfish	<u>S. aleutianus</u>
Sharpchin rockfish	<u>S. zacentrus</u>
Shortraker rockfish	<u>S. borealis</u>
Silvergray rockfish	<u>S. brevispinis</u>
Splitnose rockfish	<u>S. diploproa</u>
Stripetail rockfish	<u>S. saxicola</u>
Widow rockfish	<u>S. entomelas</u>
Yellowmouth rockfish	<u>S. reedi</u>
Yellowtail rockfish	<u>S. flavidus</u>
Thornyheads	<u>Sebastolobus sp.</u>

ROUNDFISH

Chinook salmon	<u>Oncorhynchus tshawytscha</u>
Lingcod	<u>Ophiodon elongatus</u>
Pacific cod	<u>Gadus macrocephalus</u>
Pacific hake	<u>Merluccius productus</u>
Ratfish	<u>Hydrolagus colliei</u>
Sablefish	<u>Anoplopoma fimbria</u>
Skates	<u>Raja spp.</u>
Spiney dogfish	<u>Squalus acanthias</u>

MISCELLANEOUS

American shad
Blacktail snailfish
Brown cat shark
Codling
Eelpout
Giant wrymouth
Pacific butterfish
Pacific herring
Pacific rattail
Pacific sleeper shark
Pacific tom cod
Staghorn sculpin
Sturgeon poacher
Walleye pollock

Alosa sapidissima
Careproctus melanurus
Apristurus brunneus
Moridae
Zoarcidae
Delopis gigantea
Peprilus simillimus
Clupea harengus
Coryphaenoides acrolepis
Somniosus pacificus
Microgadus proximus
Leptocottus armatus
Agonus sp.
Theragra chalcogramma