

IMPORTANCE AND SPECIES COMPOSITION OF CONTINENTAL SHELF ROCKFISH  
LANDED BY UNITED STATES TRAWLERS .

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Most landings of Scorpaenids other than Pacific ocean perch aren't separated by species when sold in the United States, but are reported in a common "rockfish" category. Most of these rockfish (about 91%) are caught on the continental shelf, rather than the deep water inhabited by Pacific ocean perch or Dover sole.

Data on the species composition of shelf rockfish landings are quite limited, and it is our intention that this document provide some background information on these landings. Because of geographic difference in the species composition of rockfish landings, the discussion was organized by state.

WASHINGTON

Shelf rockfish species have made up 24-30% of the total trawl landings during 1969-73 (Table 1) and are an important component of the Washington trawl landings. Data on species composition of "rockfish" landings has been collected since 1966, with the objective of reporting all major foodfish landings by species, rather than inappropriate groupings of species. Time has not allowed the completion of a final report on this work, but the following summary can be made.

Table 1. Total Washington Trawl Landings and Landings of Shelf Rockfish, 1969-73 (Metric Tons).

Year	Total Trawl Landings	Total Rockfish Landings	Landings of Shelf Rockfish	Percent of Total Trawl Landings
1969	26,354	7,774	7,774	30
1970	22,364	5,513	5,513	25
1971	19,600	4,773	4,773	24
1972	19,079	4,843	4,843	25
1973	18,397	5,553	5,251	29
Mean	21,159	5,691	5,631	27

## Methods

Considerable effort was put into arriving at rockfish reporting areas. The objective was to combine Washington Statistical Areas (WDF Areas, Fig. 1) in which the rockfish community and fishing pattern were similar.

The first step toward this goal consisted of examining trends in the species composition of the rockfish landings by 10 fm intervals within each area. All 1966-71 data derived from catch composition estimates were combined to generate the data in Fig. 2. Data from areas 4-5; 7, 8, 10 and 11; and 14-15 were considered together, since composition estimates in each area were too limited to consider them individually.

Since all months were combined in preparing Fig. 2, between-area similarity in species composition indicates that a) there were no between-area differences and b) there were either no between-month differences or the seasonal fishing patterns in the areas were somewhat similar.

WDF areas were then combined on the basis of:

- 1) Similarities in species composition at a given depth (Fig. 2)
- 2) Similarities in fishery history
  - a) Degree to which the rockfish catch was incidental
  - b) Other species fished in the area
  - c) Total landings

The basic areas chosen were 2-3; 4-6; 7, 8, 10, 11; and 12-15. Further analysis of catch composition in areas 7, 8, 10, 11 wasn't carried out because rockfish catches from this area were quite low. The species composition data for areas 2-3; 4-6 and 12-15 were broken down by depth and month, however, so that seasonal trends in rockfish composition could be examined (Fig. 3).

After evaluating the data in Fig. 3, and information on 1966-71 catch by depth by month, seven rockfish reporting strata were chosen. These strata, and the catch composition data used to estimate the species composition within these strata were as follows:

Reporting Strata

Composition Data

Charlotte Area(WDF Areas 2-3)  
 Jan.-April -- all depths  
 May-July -- all depths  
 Aug.-Dec. -- 0-80 fms  
 Aug.-Dec. -- 81-160 fms

Charlotte Area(WDF Areas 2-3)  
 Jan.-April -- 70-110 fms  
 May-July -- 50-90 fms  
 Aug.-Dec. -- 50-80 fms  
 Aug.-Dec. -- 81-110 fms

N. Vancouver Area(WDF Areas 4-6)  
 Jan.-Dec. -- all depths

N. Vancouver Area(WDF Areas 4-6)  
 Jan.-Dec. -- 60-110 fms

S. Vancouver-Columbia Areas(WDF Areas 7-17)  
 Jan.-Dec. -- 0-70 fms  
 Jan.-Dec. -- 71-200 fms

S. Vancouver Area(WDF Areas 12-15)  
 Jan.-Dec. -- 50-70 fms  
 Jan.-Dec. -- 71-110 fms

Total landings of S. flavidus, S. brevispinis, S. pinniger, S. paucispinis, S. babcocki and miscellaneous Sebastes were calculated for each of these strata, for each year from 1967-71. Combining these annual catches within a given area yielded the data in Table 2.

Table 2. Estimated Washington landings<sup>1/</sup>(metric tons)of shelf rockfish by species and year.

	<u>S.</u> <u>flavidus</u>	<u>S.</u> <u>brevispinis</u>	<u>S.</u> <u>pinniger</u>	<u>S.</u> <u>paucispinis</u>	<u>S.</u> <u>babcocki</u>	<u>S.</u> <u>entomelas</u>	<u>Other</u> <u>species</u>	<u>Total</u>
1967	991.7	568.6	1105.5	279.6	--	8.1	124.8	3078.3
1968	1508.4	915.1	1828.0	113.3	231.6	25.1	10.4	4631.9
1969	3968.4	1304.6	1726.3	606.1	71.5	26.9	47.0	7750.8
1970	3214.3	637.4	1378.3	169.7	27.9	--	24.6	5452.2
1971	2132.5	933.4	1350.9	257.2	5.6	26.4	32.2	4738.2

<sup>1/</sup>Excluding landings from inside Puget Sound

Results

The fishery for rockfish was still developing in 1967, but comparison of the 1968-71 data in Table 2 with the landings of non-rockfish species is quite interesting. Four-year mean (1968-71) landings were 2,706 mt for S. flavidus, 947.6 mt for S. brevispinis and 1,570.9 mt for S. pinniger.

The 1962-71 mean landings were 2,766.9 mt for truecod and 1,762.2 mt for lingcod. Truecod and lingcod were the second and fourth most important species

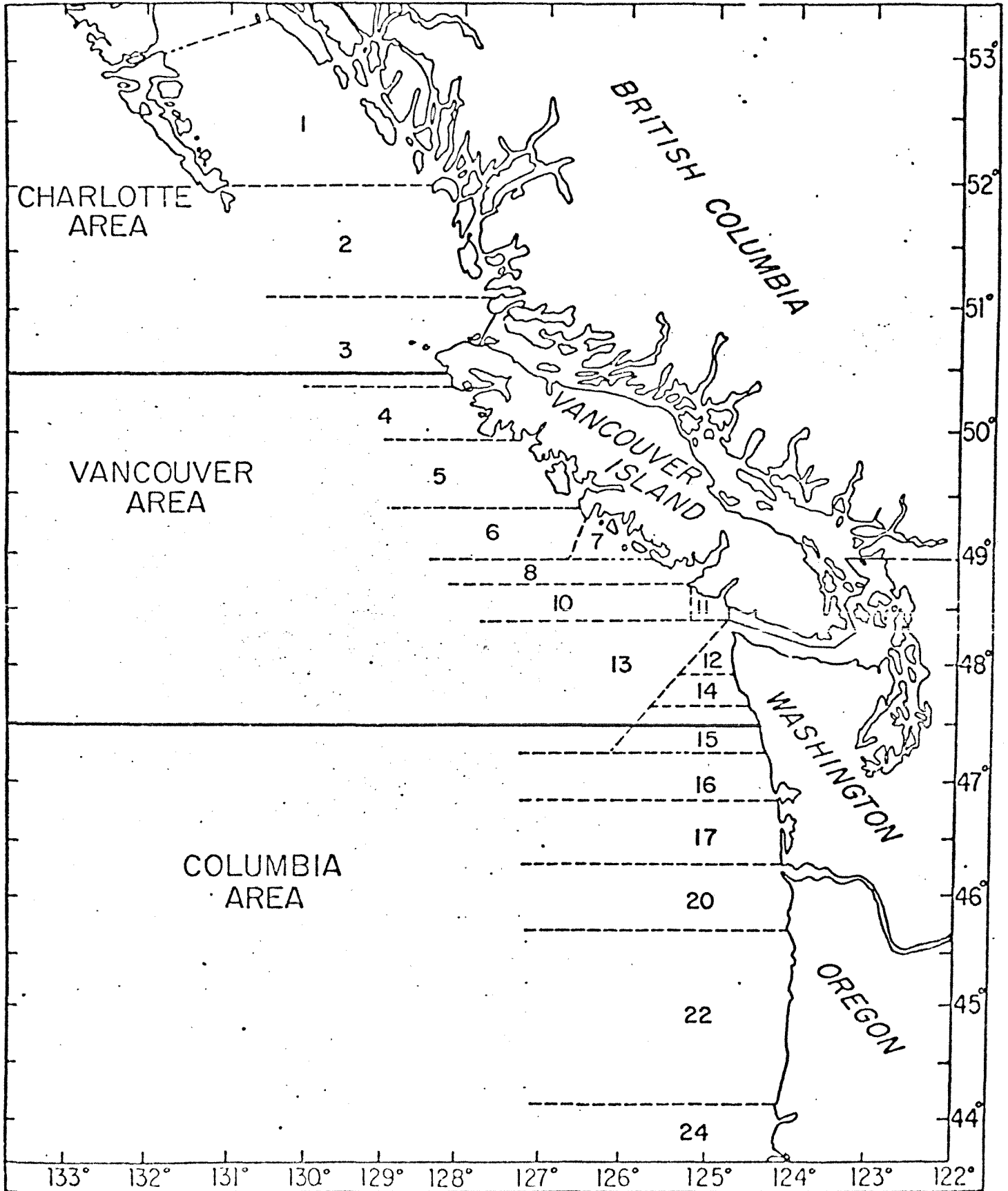


Figure 1. Relationship between Washington Statistical Areas and INPFC Areas.

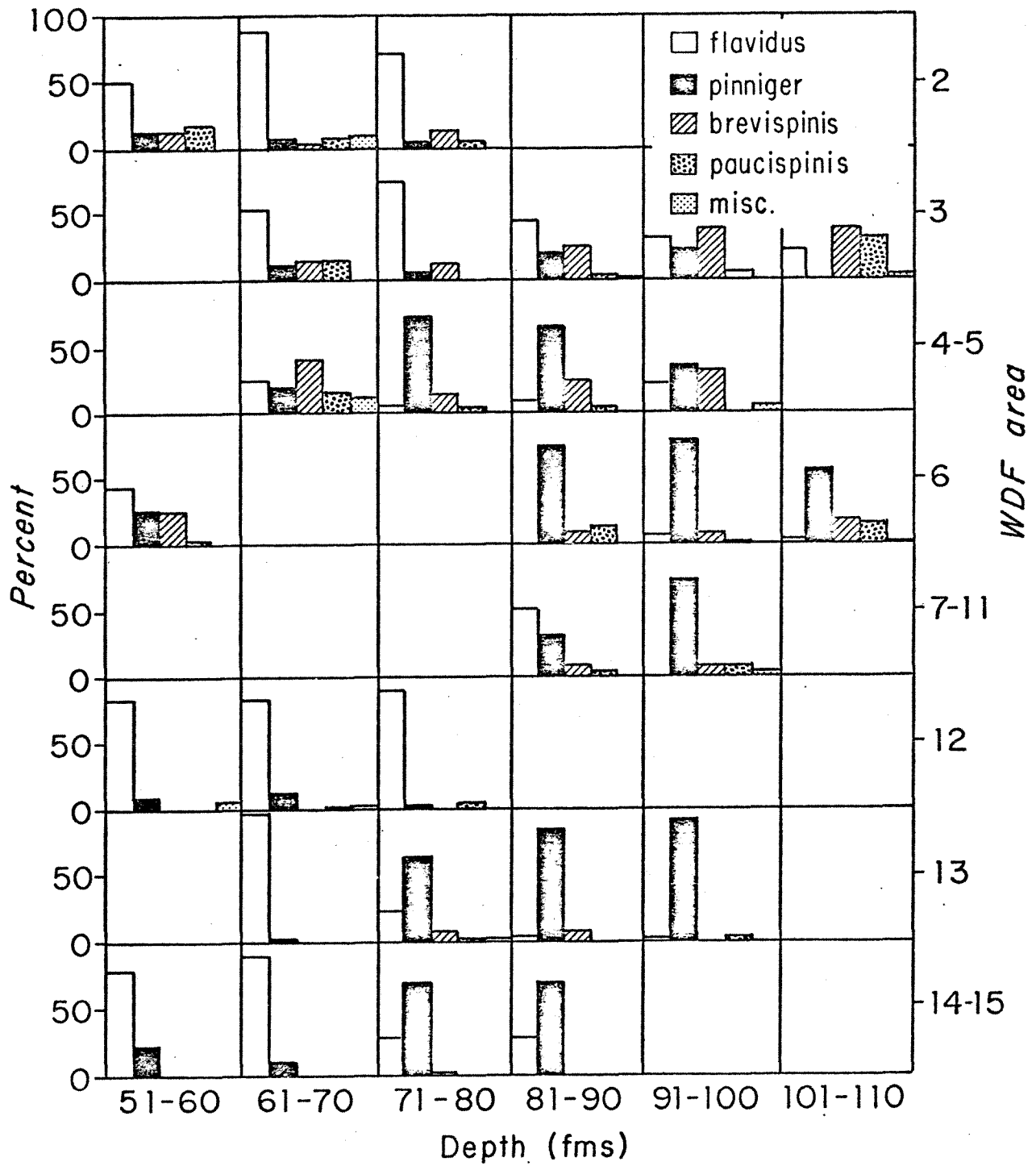


Figure 2. Species composition of the 1966-71 rockfish landings, by depth and WDF area.

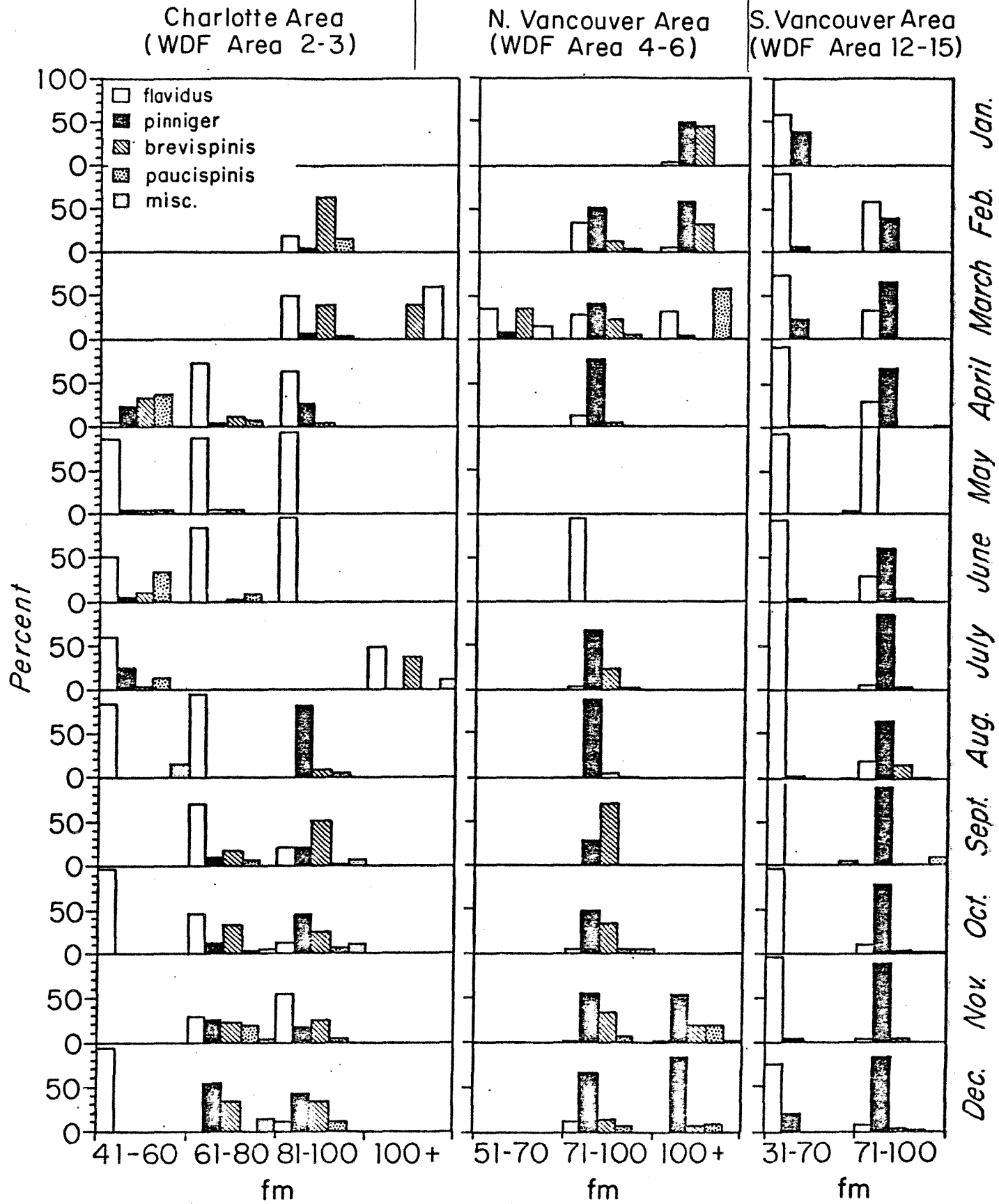


Figure 3 Species composition of the 1966-71 rockfish landings, by WDF area, depth, month.

in terms of weight landed, and have received a significant amount of attention in the form of market sampling, analysis of catch trends, etc. On the basis of weight landed, it would appear that S. flavidus is as important as truecod, that S. pinniger is as important as lingcod and that the effort put into monitoring these stocks should be substantially increased (Table 3).

Table 3. Relative importance of the major species landed by the Washington trawl fishery, by weight and value.

<u>Ranked by weight</u>		<u>Ranked by value</u>	
Mean annual landings (m.t.)		Mean annual value of landings (1000's of dollars) <sup>3/</sup>	
<u>1/</u> Pacific ocean perch	5851.4	Pacific ocean perch	1096
<u>1/</u> Pacific cod	2766.9	Pacific cod	549
<u>2/</u> <u>S. flavidus</u>	2705.9	<u>S. flavidus</u>	432
<u>1/</u> Lingcod	1762.2	English sole	360
<u>2/</u> <u>S. pinniger</u>	1570.9	Lingcod	350
<u>1/</u> English sole	1360.8	Petrable sole	344
<u>2/</u> <u>S. brevispinis</u>	947.6	<u>S. pinniger</u>	294
<u>1/</u> Petrable sole	919.0	Dover sole	180
<u>1/</u> Dover sole	816.9	<u>S. brevispinis</u>	151

1/ 1962-71 mean

2/ 1968-71 mean

3/ Using 1972 values for price per pound

OREGON

Trawl landings of shelf rockfish have decreased since 1969, as have total Oregon trawl landings. Shelf rockfish species contributed from 16 to 23% of the total trawl landings during 1969-1973 and averaged 18 percent (Table 4).



Table 4. Total Oregon Trawl Landings and Landings of Shelf Rockfish, 1969-1973 (Metric Tons).

Year	Total Trawl Landings	Total Rockfish Landings	Landings of Shelf Rockfish	Percent of Total Trawl Landings
1969	9551	2314	2152	23
1970	9092	1594	1482	16
1971	9282	1544	1436	16
1972	9491	1840	1711	18
1973	8747	1614	1501	17
Mean	9233	1781	1656	18

In 1973, 19 species of rockfish were sampled from trawl landings of rockfish catches from the continental shelf off Oregon (Table 5). Market sampling data for landings from the Columbia Area indicate that the five leading species (in order of importance) in the shelf rockfish catch are Sebastes flavidus, S. pinniger, S. melanops, S. crameri, and S. diploproa. These five species comprised 94% by weight of shelf species caught in the Columbia Area, although other species were recorded in shelf rockfish catches from this area (Table 5).

Table 5. Shelf rockfish Species Sampled from Oregon Trawler Landings, 1973

Sebastes	aleutianus	Sebastes	melanops
S.	aurora	S.	mystinus
S.	babcocki	S.	paucispinis
S.	brevispinis	S.	pinniger
S.	crameri	S.	proriger
S.	diploproa	S.	ruberrimus
S.	elongatus	S.	rubrivinctus
S.	entomelas	S.	saxicola
S.	flavidus	S.	zacentrus
S.	helvomaculatus		

## CALIFORNIA

Trawl landings of shelf rockfish species have increased along with total trawl landings during the past 5 years in California. An increase in shelf rockfish landings from 2,119 mt to 6,627 mt has occurred from 1969 to 1973 and these species have comprised from 13 to 24% of the total trawl landings during the 5-year period (Table 6).

Table 6. Total California Trawl Landings and Landings of Shelf Rockfish, 1969-1973 (Metric Tons).

Year	Total Trawl Landings	Total Rockfish Landings	Landings of Shelf Rockfish	Percent of Total Trawl Landings
1969	16,571	3,434	2,119	13
1970	17,859	4,109	3,517	20
1971	17,484	4,018	3,393	19
1972	24,540	5,969	4,796	20
1973	27,698	7,958	6,627	24
Mean	20,830	5,098	4,090	20

In 1973, 23 species of rockfish were sampled from trawler landings of catches from the continental shelf off California (Table 7).

Areal differences in species composition of shelf rockfish exist along the California coast. While a large number of species have been noted in landings, only a few species dominate the catches from INPFC Areas off California.

Eureka Area. In 1973, 621 mt of shelf rockfish were taken from the Eureka Area. The four leading species (in order of importance) are Sebastes pinniger, S. paucispinis, S. melanops, and S. goodei. These species comprise 89% by weight of shelf species caught in the Eureka Area. Ten other species occurred in shelf rockfish catches from this area (Table 7).

Monterey Area. Shelf rockfish landings from the Monterey Area totaled 4,657 mt in 1973. Sebastes paucispinis and S. goodei are the predominant species and

comprise 94% of all shelf species by weight. Ten other species were recorded from shelf rockfish catches from this area (Table 7).

Conception Area. In 1973, shelf rockfish landings totaled 1,349 mt from the Conception Area. Sebastes paucispinis and S. goodei are the leading species in the Conception Area and form 86% by weight of the shelf species. Fourteen other species were noted in Conception Area catches of shelf rockfish (Table 7).

Table 7. Estimated Landings of Shelf Rockfish by California Trawlers in 1973 by INPFC Area (Metric Tons)

	Eureka	Monterey	Conception	Total
<i>Sebastes paucispinis</i>	169	2,989	888	4,046
<i>S. goodei</i>	83	1,391	273	1,747
<i>S. pinniger</i>	192	181	10	383
<i>S. melanops</i>	108			108
<i>S. entomelas</i>	15	30	34	79
<i>S. levis</i>		29	45	74
<i>S. miniatus</i>	* <sup>1/</sup>		53	53
<i>S. flavidus</i>	16			16
<i>S. saxicola</i>		14		14
<i>S. babcocki</i>	12			12
<i>S. chlorostictus</i>	*	*	*	
<i>S. crameri</i>	*			
<i>S. diploproa</i>		*	*	
<i>S. elongatus</i>	*	*	*	
<i>S. eos</i>			*	
<i>S. jordani</i>	*	*	*	
<i>S. ovalis</i>		*	*	
<i>S. rosenblatti</i>		*	*	
<i>S. ruberrimus</i>	*			
<i>S. rubrivinctus</i>			*	
<i>S. rufus</i>			*	
<i>S. serranoides</i>	*			
<i>S. serriceps</i>			*	
Total	621	4,657	1,349	6,627

<sup>1/</sup> Less than 10 metric tons.