

Fish Commission of Oregon
Trawl Investigations
Report of Cruise 70-2, Shrimp

Vessel: M/V Sunrise, chartered trawler.

Dates: February 10-12, 1970.

- Objectives:
1. To collect samples of pink shrimp (Pandalus jordani) by age and sex for distribution studies.
 2. To locate zero-age shrimp (1969 year class) in the study area.
 3. To tow for shrimp in the area 4 to 10 feet off bottom.
 4. To collect associated oceanographic data.
 5. To tag incidentally caught lingcod (Ophiodon elongatus) and yellowtail rockfish (Sebastes flavidus).
 6. To collect live shrimp for aquarium study.

Methods: The study area for cruise 70-2 included 18 stations in the area off Tillamook Head (Figure 1). All stations except 1-3 are 4 nautical miles apart.

We used a 41-foot headrope Gulf semi-balloon trawl. The body and intermediate of the trawl were made of 1-1/8-inch stretch mesh netting and the cod-end consisted of 1-1/2 inch mesh.

To evaluate the distribution of shrimp from 4 to 10 feet off the bottom during daytime tows, we attached a vertical distribution sampler (VDS) to our net (Figure 2). The sampler is similar in design to a VDS device used by the Bureau of Commercial Fisheries in Seattle. The sampler has a frame of 2-1/2-inch aluminum tubing and is 2 feet wide by 10 feet high. There are five openings in the upper 6

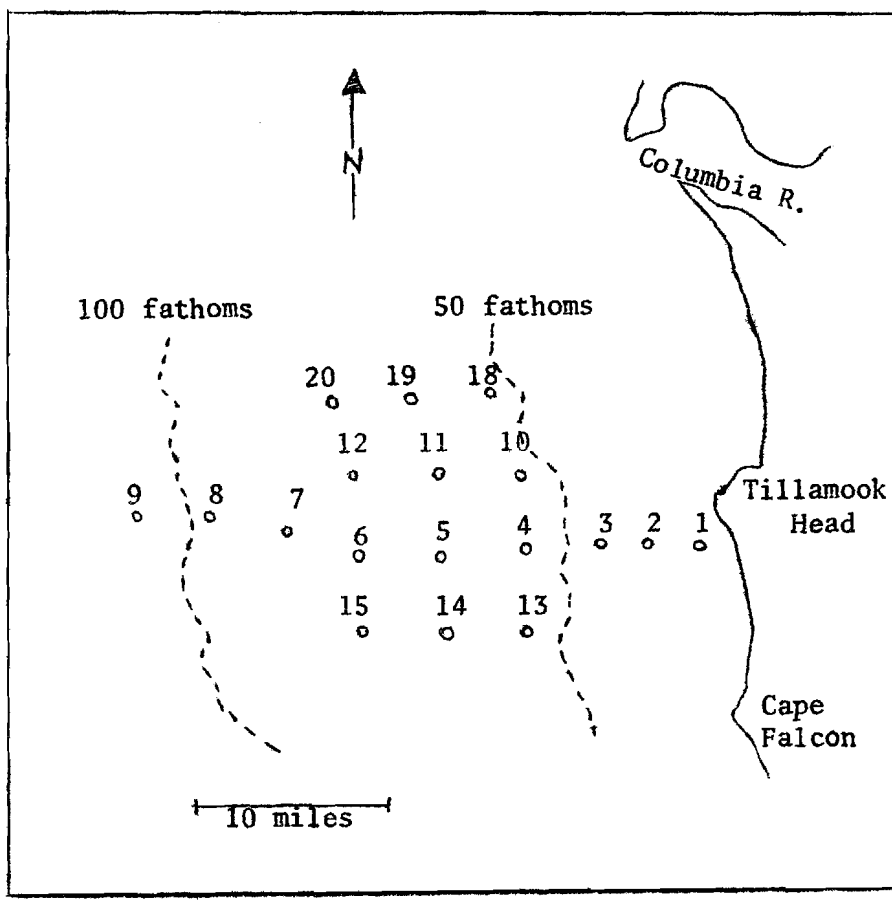


Figure 1. Location of trawl stations, Cruise 70-2

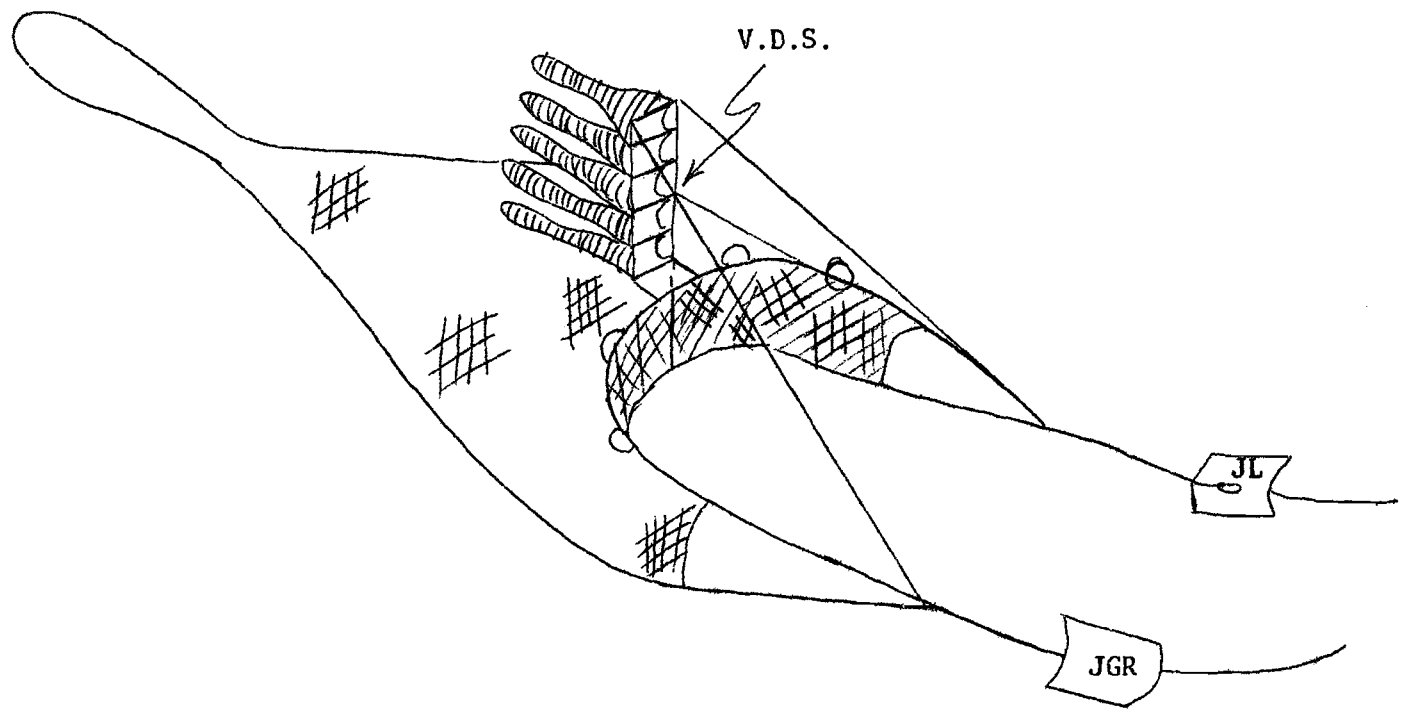


Figure 2. Placement of vertical distribution sampler in semiballoon trawl

feet, each measuring 1 foot vertically by 2 feet horizontally. Crosspieces of 2-1/2-inch aluminum tubing separate the openings. Knotless nylon, 1/2-inch mesh bags, 7 feet in length, were attached to each opening.

One 1/2-mile tow was made at each station. Approximately 400 shrimp were sampled from the catch of each tow.

Results:

Table 1 summarizes the results of catches of shrimp in the semiballoon trawl at 15 stations. We did not tow at station 18 because of bad weather. No tows were made at stations 1 and 2 due to the poor catch at station 3. The average catch of 10 stations, having catches of 1 or more pounds, was 19 pounds/tow. The sex composition breakdown in Table 1 includes the 1969 year class under the heading of immature males.

A pattern of distribution based on sex and age composition in per cent was evident from the data. The percentage of zero-age shrimp (1969 year class) in the samples was largest at the northern stations (19 and 20). The percentages progressively decreased from the northern end to the southern end of the study area. Inshore-offshore distribution of this year class was not apparent from the data. Stations 7 and 8 did have high percentages of zeros but because of the poor catches, the actual number per 1/2 mile was low.

Age I shrimp (1968 year class) were concentrated in the middle and southern portion of the study area. The percentages of age I females increased progressively from the northern

Table 1 Summary of sex and age composition in percent of shrimp catches, cruise 70-2.

Station no.	Depth (fms)	Catch (lbs)	No. per pound	Sample size (no)	Sex composition				Age composition				
					Immature males ^{1/}	Males	Transitionals	Females	0	I	II	III+	
18	--No tow--												
19	68-69	0.9	359	330 ^{2/}	81.8	14.9	2.7	0.6	81.8	18.2	0.0	0.0	
20	75-76	19.0	348	404	79.5	17.6	2.7	0.2	79.5	20.3	0.2	0.0	
10	64	12.0	177	399	31.3	64.9	3/	3.8	31.3	65.7	0.0	3.0	
11	74-75	7.0	192	400	36.2	52.8	4.8	6.2	36.2	60.8	0.8	2.2	
12	81	23.0	173	411	18.5	74.7	0.2	6.6	18.5	79.6	0.5	1.4	
3	50-51	0.4	67	28 ^{2/}	0.0	3.6	14.3	82.1	0.0	3.6	14.3	82.1	
4	66-67	33.0	134	349	19.5	57.0	7.2	16.3	19.5	64.7	3.2	12.6	
5	79	37.0	122	403	22.3	46.4	2.7	28.6	22.3	57.1	2.7	17.9	
6	83-84	0.3	169	49 ^{2/}	18.4	61.2	6.1	14.3	18.4	73.5	2.0	6.1	
7	83-84	1.2	237	284 ^{2/}	46.5	45.1	5.3	3.1	46.5	52.5	0.3	0.7	
8	96	0.6	566	328 ^{2/}	95.1	4.3	0.3	0.3	95.1	4.9	0.0	0.0	
9	149-151	0.5	72	34 ^{2/}	29.4	2.9	0.0	67.7	29.4	2.9	0.0	67.7	
13	72	29.0	104	402	16.4	33.6	0.2	49.8	16.4	45.0	5.2	33.4	
14	80	21.0	111	401	8.2	52.9	0.2	38.7	8.2	67.3	4.5	20.0	
15	83-84	9.0	109	404	7.4	53.2	3.5	35.9	7.4	61.4	7.4	23.8	

^{1/} 1969 year class.

^{2/} Total catch.

^{3/} Transitionals not separated, included in male percentage.

to the southern stations. Inshore-offshore distribution was not apparent.

The percentages of age II and III+ shrimp were largest in the southern half of the study area, stations 4-6 and 13-15. Stations 3 and 9 both had high percentages of age III+ shrimp, but total catches at these stations were very small. Virtually all age II and III+ shrimp in the samples were females.

The results of the catches in the VDS are summarized in Table 2. Only one pink shrimp, a male, was caught in the VDS. The catches of the other species may not be representative of their distribution near the bottom. Some may have been caught while the net was being retrieved.

XBT casts at 8 stations recorded bottom temperatures ranging from 46.3 F (station 8) to 49.6 F (station 3). The bottom temperatures decreased from the inshore to offshore stations.

Four yellowtail rockfish and one lingcod were tagged.

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Rudy Lovvold, Vessel Captain
Tom Lovvold, Crewman

Gerald Lukas
Fish Commission of Oregon
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Table 2 Vertical distribution sampler catches, cruise 70-2.

Station no.	Bag number and distance from bottom				
	1 8.8-9.8 ft.	2 7.6-8.6 ft.	3 6.4-7.4 ft.	4 5.2-6.2 ft.	5 4-5 ft.
18	--No tow--				
19	0	0	1 anchovy	1 anchovy	1 anchovy
20	0	0	2 anchovy	0	0
10	0	0	0	0	0
11	0	0	0	0	0
12	0	1 anchovy	0	0	0
3	13 anchovy	4 anchovy	9 anchovy	22 anchovy 1 shiner seaperch	17 anchovy
4	0	5 anchovy 1 shiner seaperch	5 anchovy	0	13 anchovy
5	0	0	0	0	1 pink shrimp, male
6	0	0	0	0	1 smelt
7	0	0	0	1 anchovy	0
8	0	<10 euphasids	<10 euphasids	<10 euphasids 3 smelt	<10 euphasids
9	5 euphasids 4 lanternfish	<10 euphasids 8 lanternfish	<10 euphasids 6 lanternfish	<10 euphasids 3 lanternfish	<10 euphasids
13	0 was inverted	0	1 anchovy	1 <u>Crago</u> sp. shrimp	1 anchovy
14	0	0	0	0	1 anchovy
15	1 anchovy	0	2 euphasids	1 euphasid	0