

Fish Commission of Oregon
Trawl Investigations
Report of Cruise 69-6, Shrimp

Vessel: M/V Sunrise, chartered trawler.

Dates: October 10-11, 17, 1969

- Objectives:
1. To determine benthic distribution of pink shrimp (Pandalus jordani) by sex and age in the area off Tillamook Head, Oregon.
 2. To determine the location of zero-age shrimp (1969 year class).
 3. To collect associated oceanographic data.
 4. To conduct cooperative research with personnel of the Oregon State University research vessel R/V Cayuse on the distribution and abundance of pink shrimp.
 5. To bring in live shrimp for aquarium study.
 6. To tag any lingcod (Ophiodon elongatus) and yellowtail rockfish (Sebastes flavidus) caught incidentally with the shrimp.

Methods: The study area for cruise 69-6 included 18 stations (Figure 1). All stations except 1-3 were 4 nautical miles apart.

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

One, 1/2-mile tow was made at each station. Approximately 400 shrimp were sampled from the catch of each tow. Each sample was placed in a plastic bag and iced. All

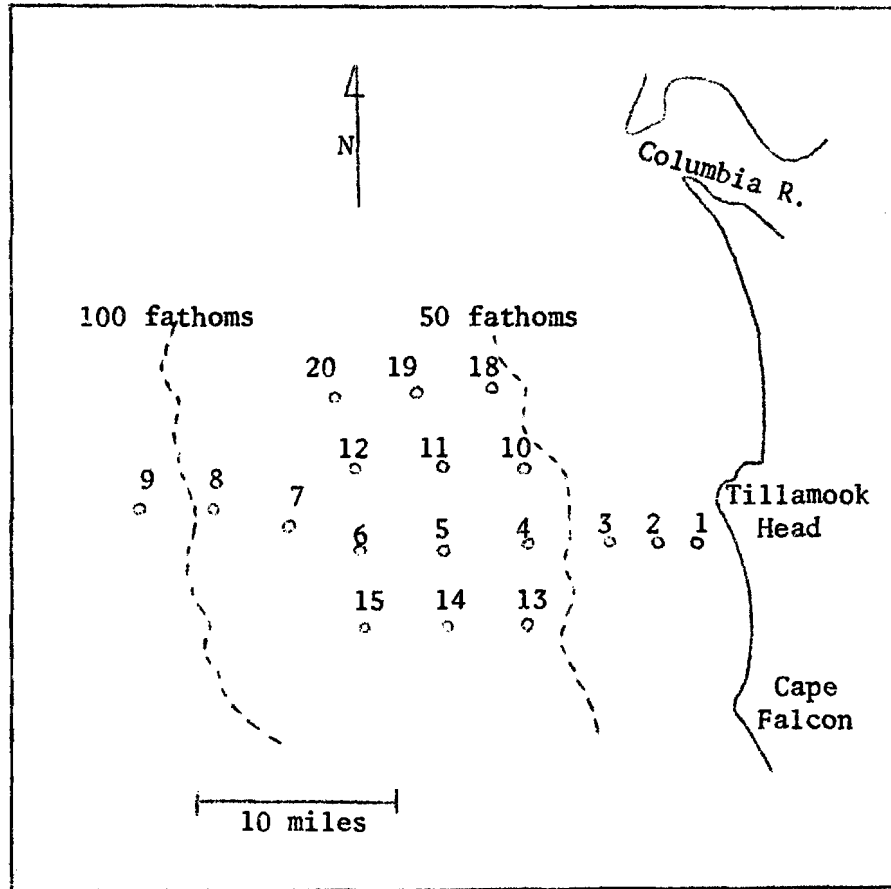


Figure 1. Location of trawl stations, Cruise 69-6

shrimp were sexed and measured at the laboratory. Large fish caught were identified to species, counted and weighed.

Cooperative tows were made with the R/V Cayuse. Plans called for the M/V Sunrise to tow a semi-balloon Gulf trawl beside a beam trawl towed by the R/V Cayuse. This was to compare shrimp catching efficiency of the two types of gear. In addition the R/V Cayuse would take pictures near the ocean floor of the M/V Sunrise's trawl fishing for shrimp.

Results:

Two separate trips were made during the cruise. The first trip was made on October 11-12, 1969, when shrimp samples were collected from 12 stations. Bad weather on the night of October 12 forced the M/V Sunrise to return to port. The second trip occurred on October 17, when shrimp were obtained from four more stations. No tows were attempted at stations 1 and 2 because of the poor shrimp catch (0.2 pound) at station 3.

On the first trip, 10 cooperative tows were made with the R/V Cayuse. At nine of these stations (3-6, 10-11 and 13-15), we towed our semi-balloon Gulf trawl beside a beam trawl the R/V Cayuse was towing. At one station (12) the R/V Cayuse, using a 70 millimeter underwater camera, took pictures near the sea floor of the M/V Sunrise's shrimp trawl in action.

Table 1 summarizes the shrimp catches of the M/V Sunrise and their sex and age composition in per cent. The average catch was 56.6 pounds per 1/2 mile towed,

Table 1. Summary of sex and age composition in per cent of shrimp catches, cruise 69-6

Station no.	Depth (fms)	Catch (lbs)	No. per pound ^{1/}	Sample size (no.)	Sex composition (%) ^{1/}			Age composition (%)			
					Male	Trans.	Female	0	I	II	III+
18	61-62	49.0	96	419	39.2	12.5	8.3	0.7	54.2	10.5	34.6
19	70	91.0	115	418	63.7	9.1	27.2	0.5	66.5	4.8	28.2
20	76	74.0	116	416	58.9	3.9	37.2	1.2	64.4	9.1	25.3
10	59	7.0	117	414	61.5	9.9	28.7	1.5	69.1	6.0	23.4
11	71-73	23.0	128	419	73.7	5.5	20.8	0.3	75.9	3.8	20.0
12	77-78	93.0	127	420	71.4	4.3	24.3	0.0	71.2	8.3	20.5
3	50-51	0.2	102	20 ^{2/}	0.0	45.0	55.0	0.0	75.0	15.0	10.0
4	64	17.0	103	446	48.4	11.9	39.7	0.0	57.6	7.2	35.2
5	76	51.0	112	443	64.0	4.2	31.8	2.7	63.0	4.7	29.6
6	80	18.0	119	445	68.7	4.1	27.2	1.8	66.8	4.7	26.7
7	75-77	0.4	118	177 ^{2/}	46.8	21.3	31.9	73.4	20.9	1.7	4.0
8	95-98	108.0	118	419	67.9	4.6	27.5	1.2	70.2	5.5	23.1
9	120-122	0.9	73	66 ^{2/}	25.0	0.0	75.0	3.0	24.3	10.6	62.1
13	69-70	10.0	105	422	53.4	6.2	40.4	5.0	53.8	5.2	36.0
14	77	31.0	127	456	75.0	3.6	21.6	19.1	62.5	3.1	15.3
15	80-81	164.0	132	417	75.7	3.2	21.1	1.2	74.1	6.2	18.5

^{1/} Does not include 0-age shrimp.

^{2/} Total number of shrimp caught.

excluding stations 3, 7 and 9 where catches were below 1 pound. The tow at station 7 was about 1 nautical mile offshore and 5-7 fathoms shallower than scheduled. This placed us over a rocky area where the percentage of shrimp caught was primarily zero-age. Incorrect positioning occurred because the electrical signal transmitted by the 2H5 Loran station was incorrect for unknown reasons. The incorrect 2H5 signal occurred at several other stations but was noted with proper corrections.

No distinct pattern was found in the shrimp distribution either by sex or age. However, there was a general trend of a higher percentage (6.2-45.0) of transitionals at six inshore stations (4, 10, 13 and 18) of the study area. At the other stations, with the exception of station 7 which had very few shrimp, the percentage of transitional shrimp ranged from 0.0 to 5.5. Also, a few individual stations did show definite segregation by sex and/or age. Station 3, the closest inshore, had the highest percentage of transitionals and the lowest percentage of males. The stations furthest offshore (9) also had a low percentage of males; however, it had no transitionals. Instead the percentage of age II and III+ females was the highest of all stations. Station 8, 4 miles inshore of station 9, had a high incidence of males and a fair percentage of transitionals.

Zero-age (1969 year class) shrimp were found in samples from 13 of the 16 stations towed. There was no definite pattern to the distribution of this year

class. The tow at station 7 had a high percentage (73.4) of zero-age shrimp. However, actual numbers/unit effort were not as high at station 7 as at several other stations where per cent occurrence of zero's was lower. The greatest abundance of the zero-age shrimp appeared to be in the south-central portion of the study area.

XBT casts at 16 stations showed only slight differences in temperature. There was, however, a general trend in bottom temperatures with the inshore stations being slightly warmer than the offshore stations. Station 3, (the closest inshore) had a bottom temperature of 46.3 F while at station 9, (the farthest offshore), the sea bed temperature was 44.9 F.

Approximately 100 shrimp caught in the trawl were kept alive on the boat in plastic garbage cans filled with salt water. These were brought back to the lab for aquarium study. An attempt to catch live shrimp using pots at night proved unsuccessful after a 4-hour soak.

Four lingcod and one yellowtail rockfish were marked with dart tags.

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