

LIBRARY

Moss Landing Marine Laboratories

P. O. Box 233

Moss Landing, Calif. 95039

STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF FISH AND GAME
MARINE RESOURCES REGION

Fifteenth Annual Shrimp Report

OCEAN SHRIMP REPORT: 1971 SEASON

by Nancy E. Nelson

Prepared at

Marine Resources Laboratory
411 Burgess Drive
Menlo Park, California 94025
May 1, 1972

Marine Resources Region
Administrative Report 72-4

OCEAN SHRIMP REPORT

1971 Season

by Nancy E. Nelson

FIFTEENTH ANNUAL SHRIMP REPORT

California's 1971 ocean shrimp landings totaled 3,074,540 pounds, a decrease of nearly a million pounds from 1970. The decrease resulted primarily from the failure of Area A vessels to reach the quota, and the lack of significant landings in the remaining permit areas.

AREA A

Northern California shrimp fishermen caught 2,678,250 pounds of shrimp in Area A in 1971, and Oregon vessels landed an additional 43,212 pounds from Area A in Brookings. The total of 2,721,462 pounds caught in Area A fell 678,538 pounds short of the 3.4 million pound quota, and was 1,056,288 pounds lower than the 1970 total. However, failure to reach the quota can be attributed largely to low availability of shrimp off California rather than to a smaller population than expected. An additional 310,526 pounds caught by California fishermen between the Oregon border and the Rogue River (Oregon Fish Commission Area 19) and landed in California are not included in the Area A total but are included in the statewide landing figure. Oregon and California vessels together caught approximately 900,000 pounds of shrimp in Area 19, bringing the total landings from the bed to 3.6 million pounds or only 400,000 pounds less than in the record year of 1970. California fishermen also landed 84,429 pounds caught in the area of Port Orford, Oregon.

The season opened on May 1, but a bitter price dispute held the boats in port until June 10 when the price was settled at 13¢ per pound, down 1¢

from 1970. Fishing continued through the October 31 closing date, despite the fact that an all-time high of 26 vessels were engaged in the fishery during all or part of the season (Table 1). Approximately 1.3 times the previous maximum amount of fishing effort (4,718 hours in 1970) was expended during the record 872 trips. However, the average catch rate for the season 450 pounds per hour, was the lowest since 1966, and the fourth lowest in the history of the 20-year-old fishery.

Table 1

Area A Monthly Shrimp Landings, Effort, Catch Per Hour, Vessel Units, and Number of Trips, 1971 (California Ports Only)

Month	Pounds Landed	Effort (Hours)	Pounds Per Hr.	Vessel	Trips
June	436,077	1,121.2	389	20	161
July	831,324	1,891.3	440	22	253
August	883,746	1,898.0	466	20	279
September	346,472	762.0	455	20	131
October	180,631	274.5	658	16	48
TOTALS	2,678,250	5,947.0	450*	26**	872

* Mean

** Total boats that made landings.

Although several vessels began the season in Eureka, virtually all landings were made at Crescent City after July. Fishing effort occurred from the

Oregon border south to Trinidad Head (loran 1H6 1620 to 2300) in 50 to 105 fathoms. However, best catches throughout the season were made on the northern half of the bed, from the Oregon border south to the Klamath River (loran 1620 to 1950) in 60 to 80 fathoms.

Age class composition of the catch was significantly affected by economic factors during June and July (Table 2). The acquisition of shrimp peeling machines by many processors led to a demand for larger shrimp because they yield a higher percentage recovery than smaller shrimp. As a result, fishermen were forced to fish selectively for 2-year-old shrimp, and a considerable number of tows were dumped because of small shrimp. Catch per hour and total pounds landed were probably adversely affected during these months. By the end of July, the smaller shrimp had become more acceptable to the buyers, partly because they had grown 1.3 to 1.5 mm (carapace length), but also because sufficiently large concentrations of 2-year-old shrimp were becoming increasingly difficult for fishermen to locate. Consequently, 1-year-old shrimp (1970 year class) made up the bulk of the catch for the remainder of the season.

Table 2
Area A Count Per Pound and Year Class
Composition of Shrimp, 1971 Season

Month	Count/Pound	Age Class Percent by Number				Age Class Percent by Weight			
		0	I	II	III	0	I	II	III
June	117	0.0	33.4	63.5	3.1	0.0	14.9	80.2	4.9
July	109	0.0	33.4	65.6	1.0	0.0	16.2	81.6	2.2
August	134	0.0	71.1	28.4	0.5	0.0	46.9	51.8	1.2
September	133	0.0	83.4	16.4	0.2	0.0	68.4	31.1	0.4
October	131	0.0	87.6	12.4	0.0	0.0	77.7	22.3	0.0
November*	122	1.9	84.4	13.4	0.1				

* Shrimp samples from N. B. SCOFIELD Crab Cruise 71-S-8. No individual weights were taken.

The heads-on count per pound followed a similar trend, jumping from 109 in July to 134 in August. Average for the season was 124.

Dominance of the catch by 1-year-old shrimp was expected to be the case during 1971, in accordance with the trend of even year class dominance established in 1965. Starting in that year, the 1964, 1966, and 1968 year classes each dominated the catch for two successive years, first as 1- and then as 2-year-olds.

The relatively high percentage (44.1) of "first year females" found during the November crab cruise (Table 3) is typical of years in which the population of 2-year-old spawning females is low. In contrast, in years when a large part of the shrimp population is made up of 2-year-olds (as in 1970), most 1-year-old shrimp function as males or pass into a transitional stage.

Table 3

Year Class and Sex Composition of Area A
Shrimp by Month, 1971 Season (Percentages)

Month	0	Males		Transitionals		Females		
		I	II	I	II	I	II	III
June	0.0	27.7	0.1	5.2	21.0	0.5	42.4	3.1
July	0.0	22.3	0.0	9.5	22.7	1.6	42.9	1.0
August	0.0	40.8	0.0	26.3	10.0	4.1	18.4	0.5
September	0.0	46.5	0.0	21.0	2.0	15.8	14.4	0.2
October	0.0	54.5	0.0	12.4	0.1	20.7	12.3	0.0
November*	1.9	19.6	0.0	20.8	0.0	44.1	13.4	0.1

* Shrimp samples from N. B. SCOFIELD Crab Cruise 71-S-8.

Individual length-weight measurements were made on a regular basis throughout the 1971 season. A comparison of similar data collected during the 1969 and 1970 seasons is presented in Table 4; 3-year-old shrimp are not included because of small sample size.

Table 4

Average Length of I- and II-Year-Old Shrimp,
1969 - 1971 Seasons

Season (Year Class)	I			II		
	1969 (1968)	1970 (1969)	1971 (1970)	1969 (1967)	1970 (1968)	1971 (1969)
May	14.47	14.64	--	20.0	18.39	--
June	14.75	15.21	13.59	20.6	18.75	20.14
July	15.19	15.76	14.82	20.7	19.10	20.83
August	15.46	16.34	15.49	20.8	19.52	21.18

It should be borne in mind that the 1967 and 1969 year classes were relatively weak in comparison with the 1968 and 1970 year classes. Individuals of the 1969 year class, both as 1-year-olds in 1970 and as 2-year-olds in 1971, were consistently larger than 1968 year class shrimp in 1969 and 1970. Likewise, 1967 year class shrimp, as 2-year-olds in 1969, were larger than 1968 shrimp in 1970. So far, the 1970 year class appears to be following a similar pattern; i.e., 1-year-old shrimp in 1971 were considerably smaller than 1-year-old shrimp (1969 year class) in 1970.

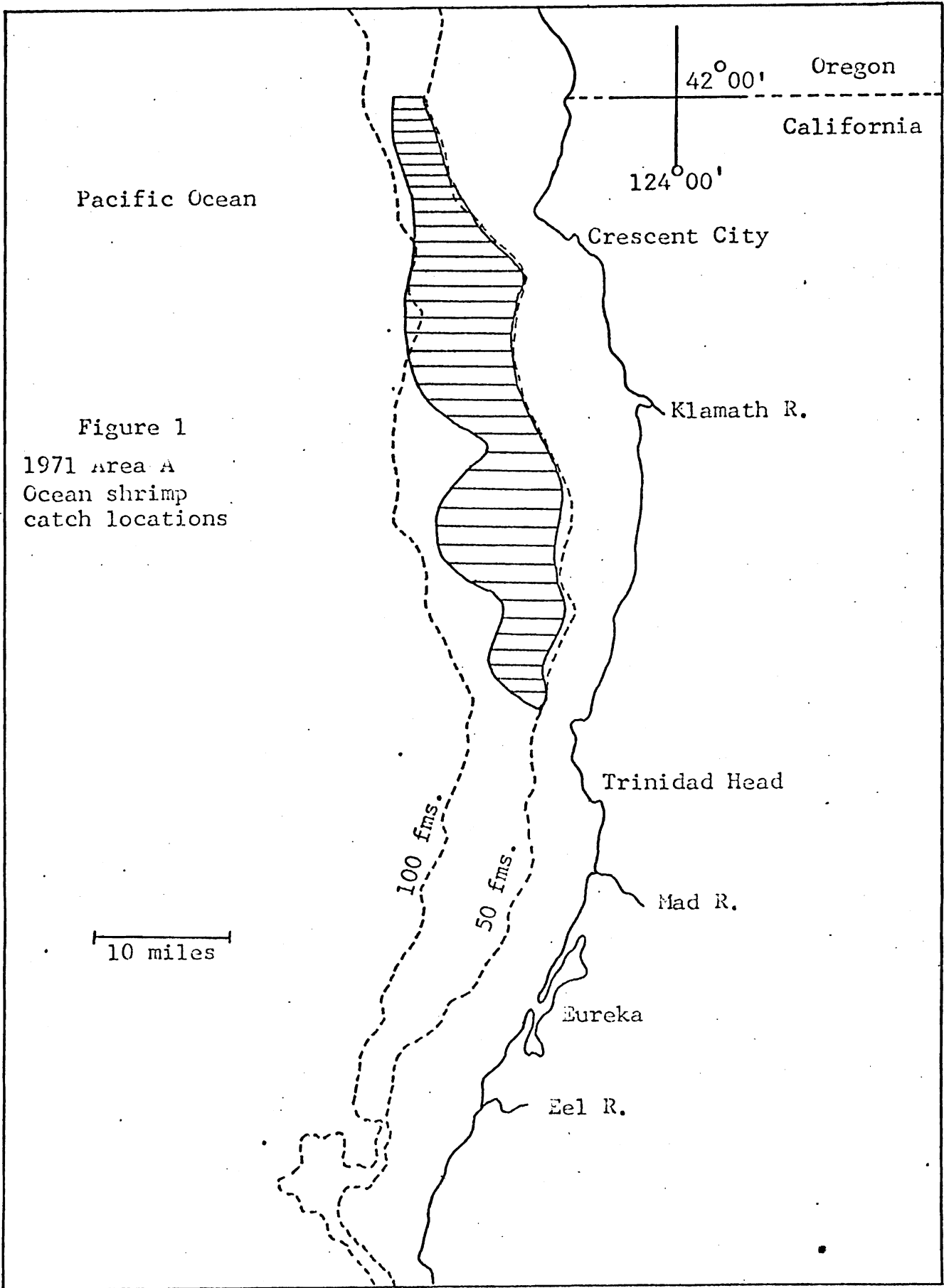
A total of 339 Pacific hake stomachs was examined from July through October to obtain an indication of the size of the incoming (1971) year class (Table 5). The average number of 1971 year class shrimp per stomach, 0.17, is comparable to the figures obtained for the 1967 and 1969 year classes (0.11 and 0.09 respectively). The average numbers of shrimp per hake stomach for the incoming year classes of 1966, 1968, and 1970 were 1.29, 1.32, and 0.82.

Table 5

Numbers of Shrimp Found in
Pacific Hake Stomachs-1971

Period	No. of Stomachs Examined	Number Empty*	No. of Shrimp	Number of Shrimp Per Stomach				Unmeasurable Shrimp
				0	I	II	III	
July-Oct.	339	45	977	0.17	1.43	0.60	0.01	1.11

* Empty stomachs not included in calculations.



Based on the hake stomach index of abundance and on the year class composition of the market samples, 1970 shrimp, as 2-year-olds, are expected to dominate the Area A fishery during the 1972 season.

AREA B-1

One vessel spent two days of exploratory fishing in June. A total of 13 tows failed to produce shrimp in commercial quantity. Only 525 pounds were landed. Best catches came from the area of Cape Vizcaino at a depth of 62 to 69 fathoms.

AREA B-2

One vessel expended two days, and another, one day of trawling in an effort to locate commercial quantities of shrimp. A total of six tows off the Russian River during June produced just 700 pounds. This was the only effort reported. Best catches came off the Russian River in 50 to 52 fathoms. Catch rates were from 300 to 400 pounds per hour in this area.

AREA C

Five days were spent exploratory fishing by one vessel in this area. A total of 18 tows from the period June 4 to 18 produced just 2,110 pounds. Catch rates as high as 1,000 pounds per hour were made, but this was not consistent and the fishermen were not satisfied and quit. The net, a shrimp sorter trawl was loaned to the fishermen by the National Marine Fisheries Service. According to the fishermen, the net was not sorting the fish from the shrimp as it was designed to do. Best catches of shrimp came off Avila in 93 to 104 fathoms.