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OCEAN SHRIMP REPORT

1972 Season

by

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and

Walter A. Dahlstrom

SIXTEENTH ANNUAL SHRIMP REPORT

MARINE RESOURCES REGION
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California's 1972 ocean shrimp landings totaled 2,488,683 pounds, a decrease of 585,857 pounds from the 1971 season when 3,074,540 pounds were landed. The decrease resulted primarily from the failure of the vessels to reach the quotas in Areas A, B-1 and B-2.

Area A

The 1972 shrimp catch from Area A fell considerably short of the quota for the second year in a row. Northern California shrimp fishermen caught 2,126,661 pounds and Oregon vessels landed an additional 137,600 pounds in Brookings, bringing the total catch from Area A to 2,264,261 pounds, nearly a million pounds short of the 3.2 million pound quota. Combined California and Oregon landings from Area 19 (Oregon border to the Rogue River) amounted to 1.45 million pounds. The total of 3.7 million pounds caught between Trinidad and the Rogue River, Oregon is only 300,000 pounds less than the record 1970 landings.

At the request of industry, the season opening was advanced by the

1/ Prepared at Marine Resources Laboratory, Marine Resources Region, 411 Burgess Drive, Menlo Park, California 94025.

Fish and Game Commission from May 1 to April 16. On April 19 the price was settled at 15 cents per pound, up 2 cents from 1971. Fishing continued through the October 31 closing date, but the number of vessels engaged in the fishery and their average catch per hour fluctuated greatly from week to week throughout the season. During the first 3 months of the season the small number (4 or 5) of California vessels fishing regularly in Area A had difficulty finding and staying on good concentrations of shrimp. Many California fishermen spent most of the season in Oregon where better concentrations of shrimp were available much of the summer. Due to the large volume of shrimp being landed at Oregon ports, many fishermen there were reportedly fishing on a recovery basis, so that the actual price across the docks was substantially lower than 15 cents. A tie-up of California vessels occurred on June 18 when California dealers, claiming they could not compete with the cheaper Oregon shrimp, tried to drop their price to the fishermen. Most Oregon vessels stopped fishing also to await the outcome of the California dispute. As a result, California dealers were forced to give in, and fishing was resumed on July 5 with the price remaining at 15 cents.

Catch per hour and the number of vessels continued to fluctuate a good deal, but both tended in general to increase as the season progressed (Table 1). Best fishing in July and the first part of August was from southwest of Crescent City to the Klamath River (loran LH6 1900-2000) in 55 to 80 fathoms (Figure 1). Fishing and weather were poor for the remainder of August, and all but 3 vessels had returned to Oregon

Table 1. Area A Monthly Shrimp Landings, Effort, Catch Per Hour, Vessel Units, and Number of Trips, 1972 (California Ports Only)

Month	Pounds landed	Effort (hours)	Pounds per hr.	Vessels	Trips
April	56,757	165.0	344	9	30
May	213,724	406.8	525	7	66
June	159,736	256.7	622	5	47
July	531,527	913.2	582	12	125
August	528,674	953.6	554	13	167
September	285,447	374.2	763	15	70
October	350,796	365.5	960	13	90
Totals	2,126,661	3,435.0	619*	18**	595

* Mean

** Total vessels that made landings.

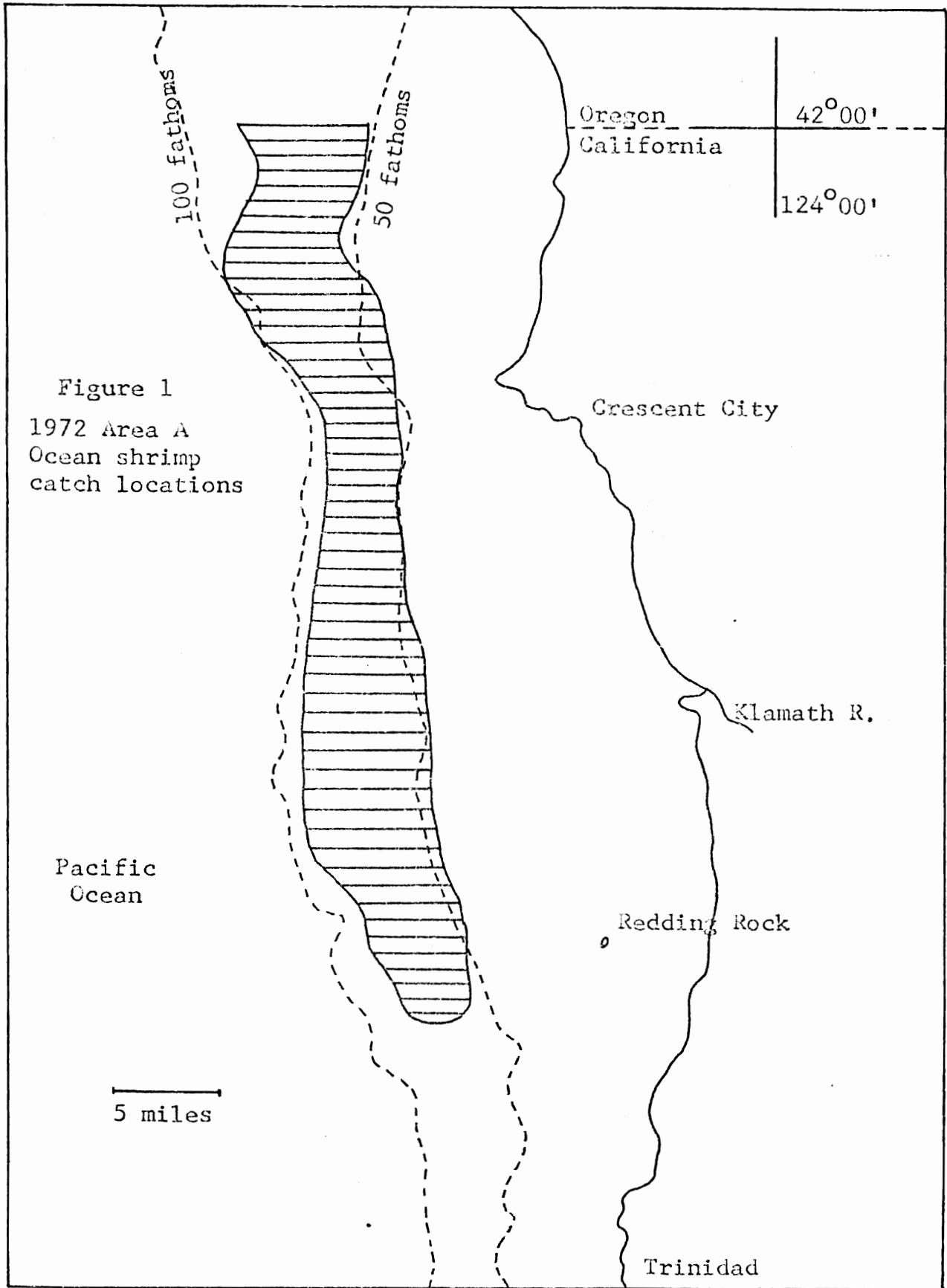


Figure 1
1972 Area A
Ocean shrimp
catch locations

by the end of the month. Fishing picked up again in mid-September when good concentrations were found in the area of Redding Rock in 45 to 60 fathoms. Excellent catches were made in the same area in mid-October; tows of 2000 pounds per hour or better were common. The average catch rate for the season of 619 pounds per hour was a considerable improvement over last year's 450 pounds.

As expected during an even year, 2-year-old transitionals and females (1970 year class) dominated the 1972 catch, both in numbers and weight (Tables 2 and 3). Average count per pound for the season, 121, was higher than normal for an even year class fishery, due to the fact that individuals of the 1970 year class were smaller (length and weight) than any shrimp in recent years (Table 4). Also, 1-year-old shrimp (1971 year class), which made up roughly 1/3 of the catch for the last 3 months of the season, were smaller than normal for an odd-year-class.

In spite of the fact that the quota was not reached in Area A, the 1970 year class was thought to be quite strong. Oregon fishermen enjoyed a record season of 20 million pounds, 80 percent of which were 2-year-old shrimp. Operation of a density dependent factor would appear to be one possible explanation for the relatively small size of both 1970 and 1971 shrimp.

A shrimp survey of Area A and southern Oregon was conducted from August 1-20. Estimated population and size of bed were 3.8 million pounds in 89 square miles and 2.6 million pounds in 50 square miles for Area A

Table 2. Area A Count Per Pound and Year Class Composition of Shrimp,
1972 Season

Month	Count/Pound	Age Class Percent by Number				Age Class Percent by Weight			
		0	I	II	III	0	I	II	III
April	137	0.0	7.1	82.7	10.2	0.0	2.6	79.0	18.3
May	139	0.0	9.4	82.5	8.1	0.0	3.6	81.4	15.0
June	125	0.0	7.7	86.0	6.3	0.0	3.2	84.7	12.1
July	115	0.0	16.1	80.6	3.3	0.0	9.8	84.6	5.6
August	119	0.0	29.8	68.6	1.6	0.0	18.6	78.2	3.2
August*		0.3	25.2	70.2	4.3				
September	109	0.8	34.4	64.4	0.5	0.0	23.9	75.1	0.9
October	101	0.1	42.2	57.4	0.3	0.0	29.1	70.3	0.6
October**		45.6	28.8	25.2	0.4				

* Shrimp samples from N. B. Scofield Shrimp Cruise 72-S-6.

** Shrimp samples from N. B. Scofield Crab Cruise 72-S-8

Table 3. Year Class and Sex Composition of Area A Shrimp by Month,
1972 Season (Percentages)

Month	Males			Transitionals		Females		
	0	I	II	I	II	I	II	III
April	0.0	7.1	4.0	0.0	41.4	0.0	37.3	10.2
May	0.0	9.4	4.7	0.0	46.7	0.0	31.1	8.1
June	0.0	7.1	3.7	0.4	42.7	0.2	39.6	6.3
July	0.0	14.4	4.0	1.6	43.9	0.0	32.7	3.3
August	0.0	24.6	2.6	5.0	34.7	0.1	31.3	1.6
September	0.8	26.9	1.8	7.4	23.0	0.2	39.5	0.5
October	0.1	25.9	0.0	16.3	6.5	0.0	50.8	0.3

Table 4. Average Carapace Length (mm) of 1-and-2-Year Old Shrimp
1969-1972 Seasons

Season (Year Class)	I				II			
	1969 (1968)	1970 (1969)	1971 (1970)	1972 (1971)	1969 (1967)	1970 (1968)	1971 (1969)	1972 (1970)
April				12.21				17.41
May	14.47	14.64		12.48	20.0	18.39		17.41
June	14.75	15.21	13.59	13.41	20.6	18.75	20.14	17.94
July	15.19	15.76	14.82	14.99	20.7	19.10	20.83	18.78
August	15.46	16.34	15.49	15.61	20.8	19.52	21.18	19.26
September			16.24	16.06			21.49	19.69
October			16.56	16.07			21.68	19.63

and Area 19 respectively, giving a combined total of 6.4 million pounds in 139 square miles. Prior to the survey approximately 1 million pounds had been landed from each of the 2 areas. The figures for Area 19 are not strictly comparable to those of previous surveys; 2 new strata were added this year at the northern end of the area, and these 2 strata contributed 1 million pounds to the population estimate. However, the size of the shrimp bed in Area A was the smallest for the last 5 summer and fall cruises, and the population estimate was the lowest since 1966.

Since the 1971 year class was relatively weak, strong recruitment of the 1972 year class is necessary to carry the fishery through the 1973 and 1974 seasons. Surveys conducted during late summer of 1966 and 1968 yielded better than 60 percent by number of incoming year class shrimp which subsequently supported the fishery for 2 years in a row. Samples from this year's survey contained only 0.3 percent by number of 1972 year class shrimp. However, 45.6 percent of the shrimp caught during the October crab cruises were juveniles, indicating the possibility of a late hatch rather than poor recruitment.

Pacific hake stomach contents examined between July and October contained unusually low number of all age classes of shrimp, with only 0.05 juvenile shrimp per stomach (Table 5). However, 65 percent of the total hake examined were caught during the August survey. Hake caught in October had 0.4 juveniles per stomach, which is a somewhat better showing but still only 1/2 to 1/3 as many as during the last 3 even years.

Table 5. Numbers of Shrimp Found in Pacific Hake Stomachs 1972

Period	No. of Stomachs Examined	Empty*	No. of Shrimp	Number of Shrimp per stomach				Unmeasurable
				0	I	II	III	
July-Oct.	407	59	195	0.5	0.13	0.22	0.01	0.16

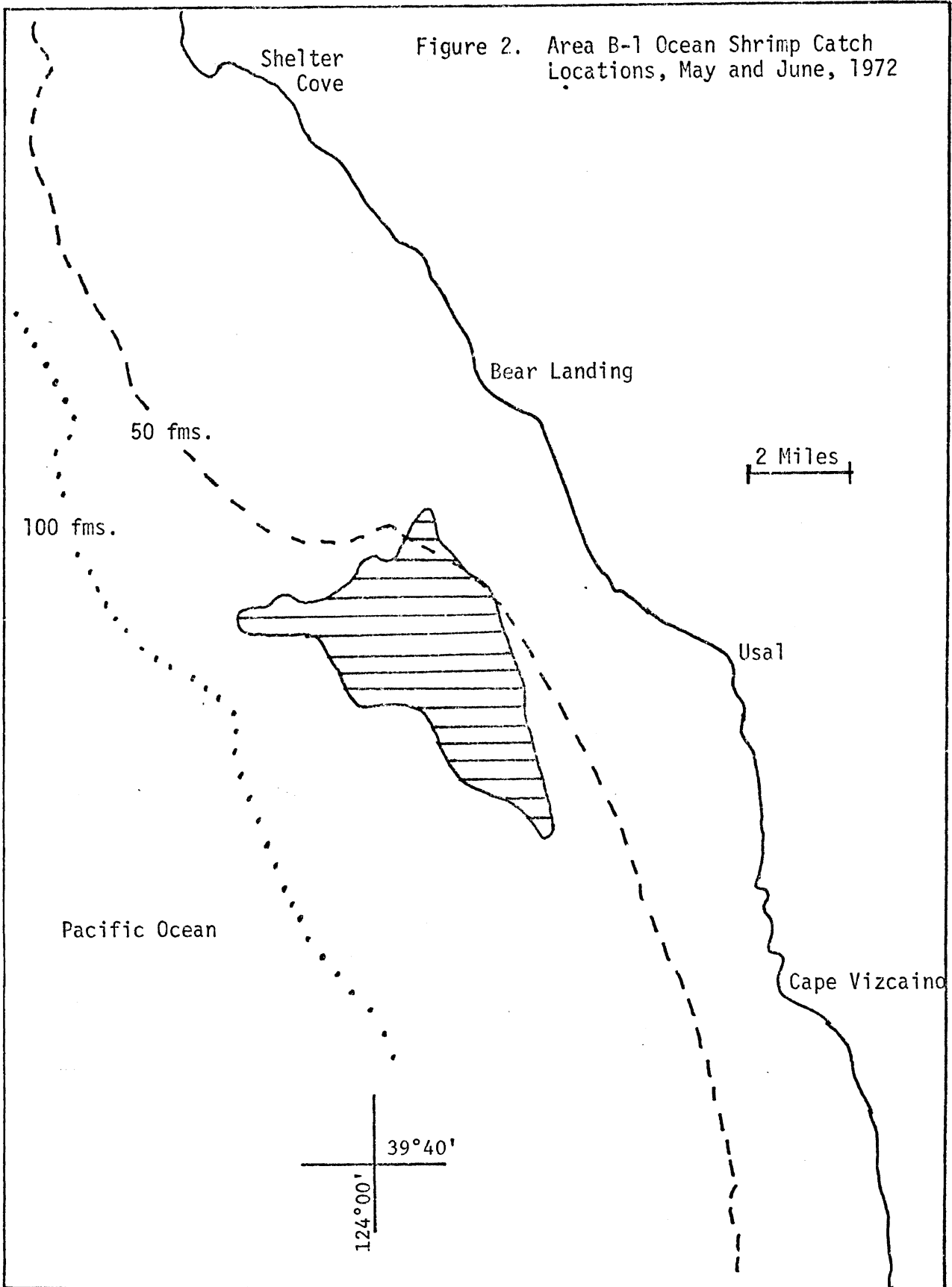
*Empty stomachs not included in calculations.

In view of the relatively high landings from southern Oregon and the small number of vessels fishing in Area A for much of the season it is possible that, as in 1971, failure to reach the quota this year was a reflection of low availability of shrimp off California, rather than of a reduced population. On the other hand, the results of the summer survey, the indications of poorer than normal recruitment, and the fact that good commercial fishing was concentrated in small areas for much of the season all seem to point to the possibility that the Area A population is down. In any case, the resource should be closely watched, especially during the early months of the 1973 season.

AREA B-1

Three vessels landed 102,362 pounds from May 21 to June 28. No fishing took place after June 28 because the fishermen were unable to locate the shrimp in commercial quantity and reach the quota of 250,000 pounds.

This season's landings were the highest since 1961 when 799,427 pounds were landed. The average catch per hour was 1,125 pounds for the season.



with a low of 539 pounds per hour during May and a high of 1,213 pounds during June (Table 6).

Table 6. Area B-1 Monthly Shrimp Landings and Effort 1972

Month	Landed	Effort (hours)	Pounds per Hour	Vessels	Trips
May	6,515	12.1	539	1	3
June	95,847	79.0	1,213	3	22
Totals	102,362	91.1	1,123*	3**	25

* Mean

** Total vessels that made landings

Fishing effort was concentrated mainly off Usal in 54 to 74 fathoms (Figure 2). Catch sampling during June revealed an average of 52.5 percent one-year-old shrimp in the catches (Table 7). Average heads-on counts per pound ranged from 102 to 150 with a season average of 135.

Table 7. Area B-1 Count per Pound and Year Class Composition of Shrimp 1972

Date	Heads-on Count per Pound	Age Class Percent by Number			Age Class Percent by Wgt.		
		I	II	III	I	II	III
June 8	142	55.7	42.7	1.6	35.8	61.3	2.9
June 27	128	49.3	48.0	2.7	32.1	63.6	4.2
Seasonal Avg.	135	52.5	45.4	2.1	34.0	62.4	3.6

One-year-old males and transitionals contributed most of the catch with two-year-old transitionals and females making up the bulk of the remainder (Table 8).

Table 8. Year Class and Sex Composition of Area B-1 Shrimp, 1972 Season (percentages).

Date	Males		Transitionals		Females		
	I	II	I	II	I	II	III
June 8	30.9	0.0	24.6	24.3	0.3	18.3	1.6
June 27	32.6	2.7	16.7	24.9	0.0	20.4	2.7

AREA B-2

Four vessels landed 213,452 pounds during April, May, June and August. Landings were sporadic and at times the fishermen ceased fishing because they were unable to find the shrimp in commercial quantity. No fishing took place after August 21 and consequently the fishermen were unable to reach the quota of 250,000 pounds.

Average catch per hour for the season was 1,182 pounds, nearly approaching the record average catch per hour for the area of 1,191 pounds set in 1970. Average catch per hour by month from a low of 340 pounds for June to a high of 1,515 pounds for August (Table 9).

Table 9. Area B-2 Monthly Shrimp Landings and Effort 1972.

Month	Pounds Landed	Effort (hours)	Pounds Per Hour	Vessels	Trips
April	30,279	22.4	1,353	3	7
May	90,797	95.2	953	4	21
June 7	850	2.5	340	1	1
August	91,526	60.4	1,515	2	13
Totals	213,452	180.5	1,182*	4**	42

* Mean

** Total vessels that made landings.

Fishing effort started off Fort Ross and Salt Point during April, May and June but shifted to the north off Salt Point and Horseshoe Point during August (Figure 3). Fishing depths ranged from 45 to 69 fathoms with best catches made in depths ranging from 48 to 57 fathoms.

Sampling during April revealed an average of 36.3 percent one-year-old shrimp and 61.8 percent two-year-old shrimp in the catches whereas August sampling showed 67.4 percent one-year-old and 32.3 percent two-year-old shrimp in the catches (Table 10). Average heads-on counts per pound were 133 in April and 118 in August with a season average of 125

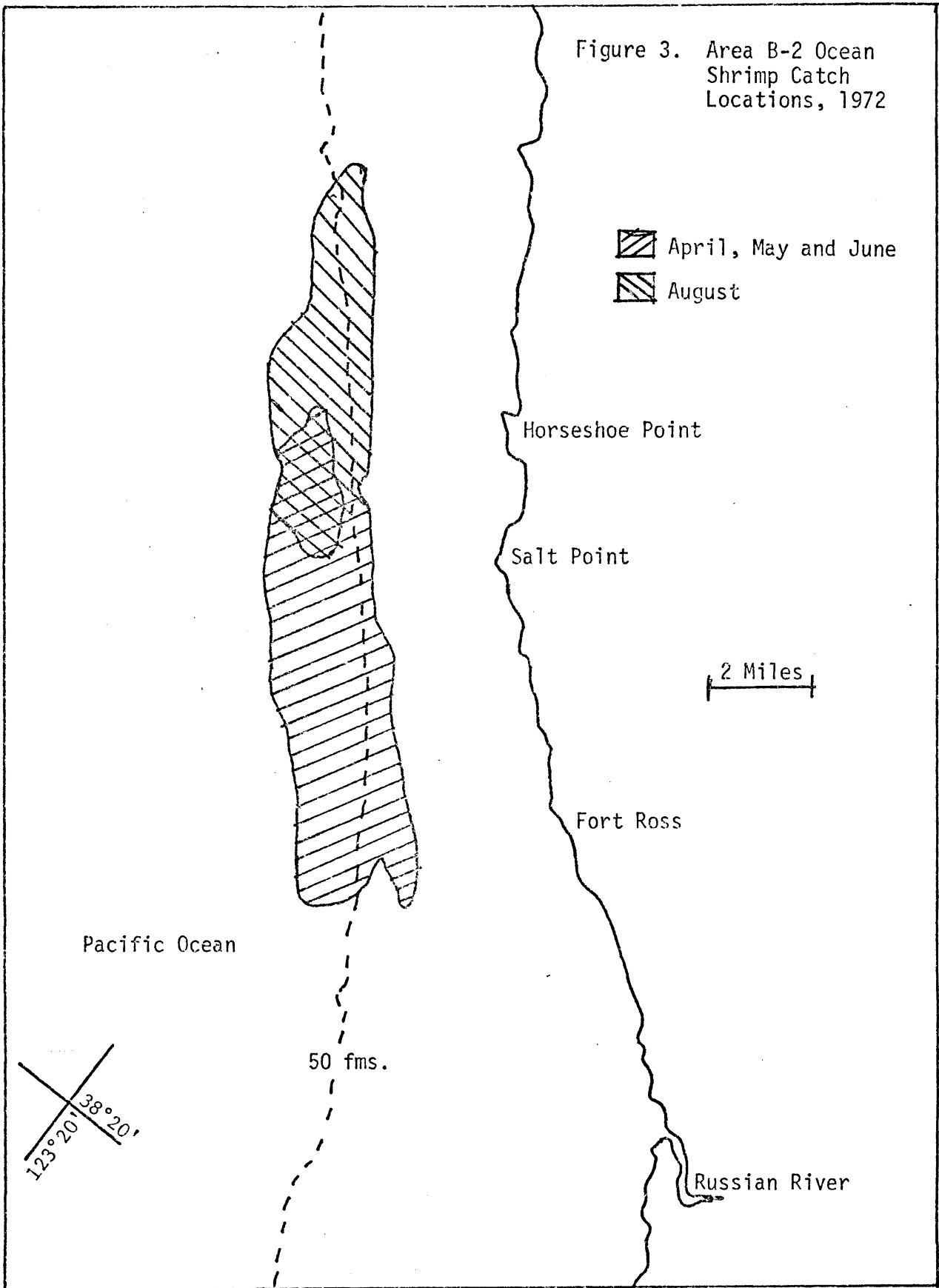


Table 10. Area B-2 Count per Pound and Year Class Composition of Shrimp
1972 Season

Month	Heads-on Count per Pound	Age Class Percent by No.			Age Class Percent by No.		
		I	II	III	I	II	III
April	133	36.3	61.8	1.9	24.4	71.8	3.8
August	118	67.4	32.3	0.3	55.1	44.3	0.6
Seasonal Average	125	51.9	47.0	1.1	39.8	58.0	2.2

One-year-old males and two-year-old females contributed to most of the catch with one-year and two-year-old transitional shrimp making up most of the remainder (Table 11).

Table 11. Year Class and Sex Composition of Area B-2 Shrimp by Month,
1972 Season (percentages)

Date	Males		Transitionals		Females		
	I	II	I	II	I	II	III
April	32.5	14.3	3.9	15.9	0.0	31.6	1.8
August	40.7	0.0	16.6	13.6	10.5	18.2	0.3

The outlook for the 1973 season in Areas B-1, B-2 and C is questionable. The populations appear to be relatively small and no large population build-up has been observed. Strong recruitment from the 1972 year class and subsequent year-classes is needed for increased productivity and sustained yield fishing.