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HUMBOLDT COUNTY PRAWN AND SHRIMP TRAPPING SURVEY

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INTRODUCTION

Spot prawns (Pandalus platyceros) and coonstripe shrimp (Pandalus danae) have been caught incidentally by trawlers and crab fishermen off Humboldt County for many years, but little information exists regarding their abundance, distribution, or potential in commercial fisheries.

Information on the two species in other areas has previously been reported (e.g., Yates 1968, Frey 1977, Barr 1973, Magoon 1978, Caldwell 1979, Butler 1980). Spot prawns are found from Alaska to San Diego and in the Sea of Japan, from intertidal areas to depths of 266 fm (487 m). Commercial pot fisheries exist in southeastern Alaska, British Columbia, Washington, and Monterey Bay. Adults in these areas are usually caught on rocky bottoms at depths of approximately 80-100 fm (146-183 m). Like other pandalid shrimp, spot prawns first mature as males, at which time they are about 7/lb (6.5 g). They later become females and can reach sizes of over 1.3/lb (35 g).

Coonstripe shrimp are found from Alaska to southern California, from intertidal areas to depths of 101 fm (185 m). Small commercial and sport fisheries exist in the Puget Sound area. These shrimp are generally caught on softer bottoms between 12-43 fm (22-79 m). Males average 23-10/lb (2-4.4 g) and females can average 5/lb (8.5 g) or more in British Columbia.

In March and April of 1971 the California Department of Fish and Game set traps for the two species in several locations along the Humboldt and Del Norte County coastlines (Nelson 1971). Spot prawns were fished around the Eel, Mattole, and Mendocino Canyons. At each canyon, six strings were set perpendicular to the 100 fm (183 m) contour line. Depths ranged from 70-112 fm (128-205 m). From the 18 stations fished in the three canyons only two spot prawns were caught. Six strings of traps were fished in shallower waters for coonstripe shrimp at each of the following locations: St. George Reef, Redding Rock, Patrick's Point, False Cape, and Tolo Bank. Either no shrimp or only 2-3 shrimp for all pots were caught at four of the five locations. At False Cape 35 shrimp, weighing a total of 1 lb were caught in 48 pots. The conclusion of the Department was that spot prawns and coonstripe shrimp do not exist in commercial quantities along the north coast.

In the spring of 1984 Capt. Darrel Olson caught up to 2 lbs/pot of coonstripe shrimp along the Del Norte county coastline in pots of his own design. This encouraging catch suggested that this species, at least, might be more abundant along the coast than previously reported. Shortly thereafter, Mr. Sus Kato of the National Marine Fisheries Service (NMFS) loaned 20 prawn traps to the U.C. Cooperative Extension/Sea Grant Marine Advisory Program for use in experimental fishing on the north coast. A cooperative project between the Marine Advisory Program, Capt. Olson, and NMFS was developed to conduct exploratory fishing for coonstripe shrimp and, as time and weather allowed, spot prawns along the Humboldt County coastline.

METHODS

Two types of pots were used. The pots provided by NMFS were rectangular, collapsible pots, measuring 20 in (51 cm) x 20 in (51 cm) x 36 in (91 cm). The two side tunnels had 3 in (7.5 cm) inner diameter circular openings and the mesh was 1½ in (3.8 cm) shrimp webbing. Capt. Olson's pots were half-cyllindrical with a 24 in (62 cm) x 32 in (80 cm) base and height of 18 in (46 cm). The two side tunnels also had 3 in (7.5 cm) openings surrounded by shrimp mesh. The remaining sides were covered with a small mesh screen (50% light exclusion).

Initially, 10 NMFS pots were attached in a longline and spaced every 10 fathoms (18 m) apart. This set of pots was fished in deep water for spot prawns. The remaining 10 NMFS pots were tethered to an equal number of Capt. Olson's pots (which were much heavier) and each pair was separately buoyed. The remainder of Capt. Olson's pots as well as 10 octopus pots were individually buoyed. Later, all pots were attached to longlines and fished in this manner.

Pots were baited with several types of bait, each generally alternated along a string or longline. The types of bait used were: hanging rockfish carcasses, chopped rockfish carcasses in bait jars, chopped sablefish in bait jars, chopped herring in bait jars, and chopped squid in bait jars. Soak times ranged from 3-7 days. These times are longer than those recommended in the literature, but approximate the maximum catches of Capt. Olson in Del Norte county, which occurred after 5-day soaks.

RESULTS

Thirty pot-pulls were made near the Eel River Canyon and 6 spot prawns were caught (Table 1). Locations of sets are shown in Figure 1. None of the prawns carried eggs, and the average size was 15/lb (3 g).

Of 151 pots-pulls made in shallower water, 314 coonstripe shrimp were caught (Table 1). This total catch was less than 4 lbs (1.8 kg). The best catch occurred in 18 fm (33 m) off the stacks on the North Spit of Humboldt Bay, where 2½ lbs (1.1 kg) were recovered in 18 pots and were of an average count of 41/lb (1.1 g). Because of the low catches no differences could be detected regarding the effectiveness of particular baits or different trap designs. Egg-bearing females weighed up to 29/lb (1.6 g), although shrimp without eggs (mostly males, but probably with some females included) were considerably smaller.

By-catches at the deepwater stations included hagfish (Eptatretus sp.), sablefish (Anoplopoma fimbria), spotted cusk-eel (Chilara taylori), snailfish (Liparis (pulchellus?)), greenstriped rockfish (Sebastes elongatus), darkblotched rockfish (Sebastes crameri), lingcod (Ophiodon elongatus), a sepia squid (Rossia pacifica), heart urchin, and a sand star.

By catches at shallow stations included snails (Nassarius sp.), snailfish (Liparis (pulchellus?)), juvenile dungeness crabs (Cancer magister), red rock crabs (Cancer productus), hermit crabs (Pagurus sp.), spiney dogfish (Squalus acanthias), staghorn sculpin (Leptocottus armatus), juvenile Pacific sanddab (Citharichthys sordidus), and tomcod (Microgadus proximus).

No octopus were caught.

Figure 1. Location of spot prawn and coonstripe shrimp trapping locations. Depths are in fathoms.

+S - Spot Prawn Trapping Sites

\+ - Coonstripe Shrimp Trapping Sites

+B - Best Catch of Coonstripe Shrimp

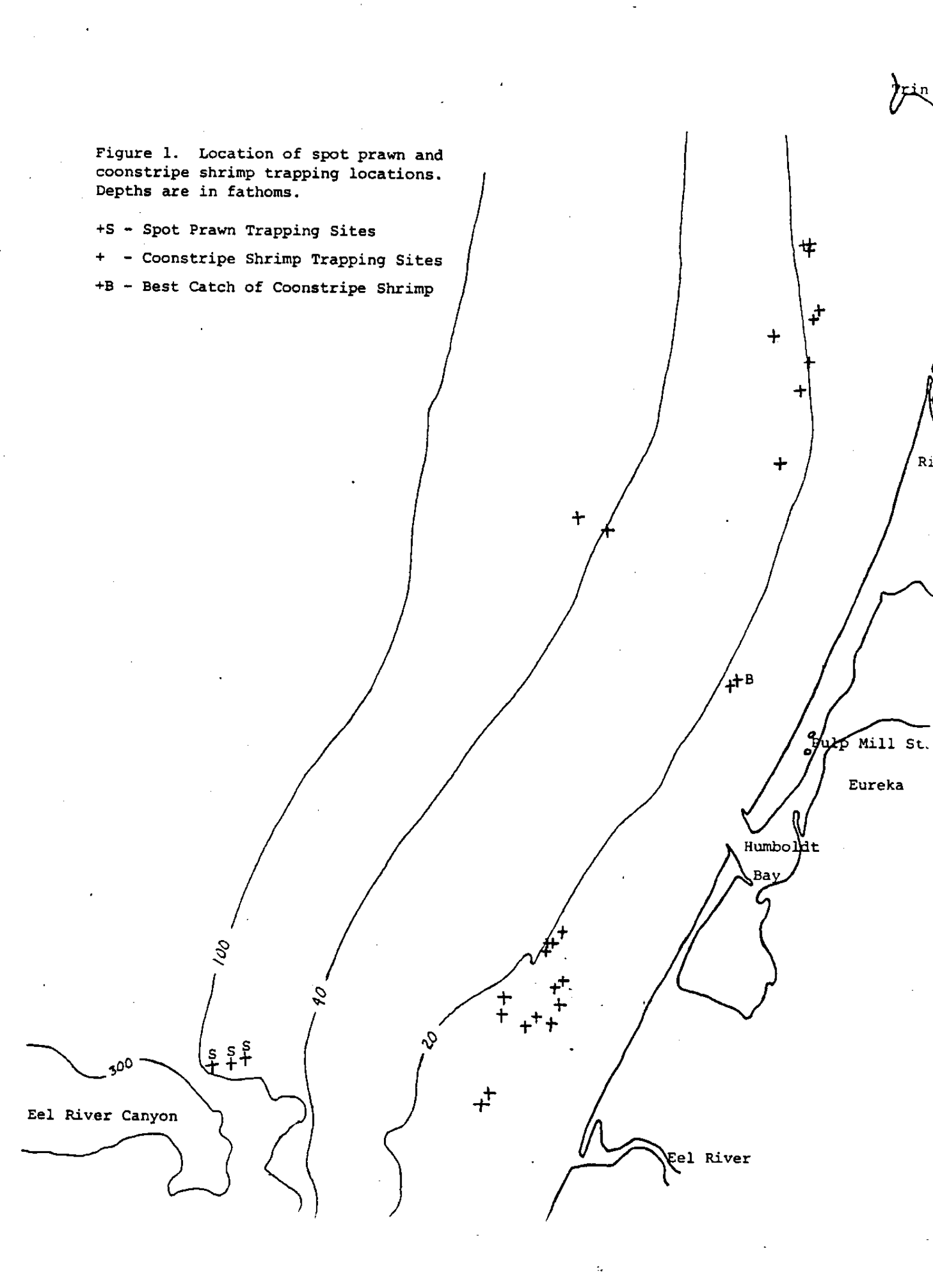

Table 1. Summary of prawn and shrimp trapping survey, February - April, 1985

LOCATION	DEPTH	DATE SET	DATE RETRIEVED	NUMBER OF POTS RETRIEVED	SPECIES	NUMBER	AVERAGE COUNT/POUND
Eel Canyon	80	5 Feb	10 Feb	10	Spot	2	15/lb
" "	84	10 Feb	13 Feb	10	Spot	3	15/lb
" "	90	13 Feb	19 Feb	10	Spot	1	-
Table Bluff to Eel River	15	5 Feb	10 Feb	16	Coonstripe	2	42/lb
"	15	5 Feb	13 Feb	4	Coonstripe	1	-
"	15	5 Feb	19 Feb	2	Coonstripe	3	Non-Egg-Bearing 152/lb Egg-Bearing 38/lb
"	12	10 Feb	13 Feb	10	Coonstripe	0	-
"	17	13 Feb	19 Feb	20	Coonstripe	127	Non-Egg-Bearing 152/lb Egg-Bearing 38/lb
Look for lost pots		11 Mar					
Trinidad to Mad R.	16-20	31 Mar	6 Apr	27	Coonstripe	16	Non Egg-Bearing 150/lb Egg-Bearing 29/lb
"	16-19	6 Apr	12 Apr	27	Coonstripe	43	Non-Egg-Bearing 55/lb Egg-Bearing 32/lb
Mad R. to Stacks	16	12 Apr	18 Apr	18	Coonstripe	19	35/lb
Offshore Mad R.	38	12 Apr	18 Apr	9	Coonstrisp	0	-
Mad R. to Stacks	16	18 Apr	28 Apr	18	Coonstripe	103	41/lb
Offshore Mad R.	42	18 Apr	28 Apr	9		Pots Missing	
Looked for lost pots		7 May					
"		30 May					

DISCUSSION

Commercial quantities were not found for either spot prawns or coonstripe shrimp. It is possible that localized concentrations exist and that more extensive searching would find those concentrations, but it is obvious that commercially harvestable quantities are not available over a large area. Continued directed searches for the coonstripe shrimp are not recommended because of the expense involved; however, by fishing a series of shrimp pots along with a string of crab pots, quantities of coonstripes might be located at little additional expense to the fisherman. Because of even greater costs, poorer returns, and conflicts with setting fixed gear in popular trawling areas, further directed searches for spot prawns appear even less advisable.

ACKNOWLEDGEMENTS

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