

SOUTHERN QUEENSLAND DEEPWATER TRAWL SURVEY

82/7

by

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A \$48,000 grant from the Fishing Industry Research Trust Account to J. & M. Hodge enabled the Southport based trawler "Iron Summer" to conduct a trawl survey of the southern Queensland continental slope between Noosa (26°20'S) and Point Danger (28°10'S) during the 1982/83 financial year.

The object of the survey was to locate trawlable grounds with commercial quantities of prawn or fish resources. There is a general feeling in the Queensland trawling industry that there are too many vessels working the known resources. It was hoped that if new resources were found then pressure on known stocks off southern Queensland would be relieved to some extent.

Surveys by the New South Wales State Fisheries research vessel "Kapala" have previously found stocks of deepwater prawns, mainly Royal Reds, off the New South Wales coast. Some of these stocks are now being regularly fished and provide an alternate fishery for trawler operators.

Survey trawls conducted by "Kapala" on the continental slope north-east of Point Danger in 1978 took small quantities of deepwater prawns which suggested the possibility of a deepwater prawn resource off southern Queensland.

From both a commercial and scientific viewpoint the survey was quite successful. Only limited trawlable grounds were located in the survey area, but the grounds off Point Lookout (see Figure 1) proved to have good quantities of deepwater prawns. New grounds were fished several times during the year to give some seasonal data on catches.

Technical support was provided by the Queensland Department of Primary Industries in planning and conducting the survey. A substantial collection of specimens, including approximately 160 species of fish, was made during the survey and this collection will be deposited with the Queensland Museum.

Vessel and Gear

The "Iron Summer" is owned by John Hodge and skippered by Terry Sowten. It is an 18.3m steel trawler powered by a V12/71 GM engine through an Omega 514 twin disc gearbox and fitted with a Kort nozzle. It is equipped with Jaden hydraulic winches (Model 10), a Furuno echo sounder and a Furuno 25Kw radar.

For the survey a Satellite navigator (Shipmate DS5000) was installed on the vessel, oil coolers were fitted to the winch hydraulics, and 2,000m of 10mm steel rope warp added to each winch drum.

Fishing gear consisted of 2.44m x 1.97 flat trawl boards spreading either a single 27m Siebenhausen prawn trawl with 5.4m sweeps or triple 27m Siebenhausen nets.

Results

Trawlable Areas

North of Cape Moreton good deepwater trawl ground was sparse. In small areas of good ground the slope steepened considerably at about 400m. There were also a number of submarine canyons crossing the area. Although Royal Red prawns were taken in this area in 380, 390 and 575m it does not appear to have as much potential as the area south of Cape Moreton.

Between Cape Moreton and Point Danger there was considerably more ground available and most trawls were conducted in this area. Areas of good ground were found northeast of Point Lookout, northeast of Jumpinpin and east of Southport (see Figure 1). However none of them would be described as extensive.

Catches

Good catches were taken in all of these areas on occasions, but more consistently off Point Lookout. Trawl catch data are given in Table 1.

A number of species of prawns were taken during the survey and four in particular were taken in commercial quantities. They were the Royal Red prawn (*Haliporoides sibogae*), the Red Prawn (*Aristeomorpha foliacea*), the Giant Scarlet prawn (*Plesiopenaeus edwardsianus*), and another smaller species of Royal Red (*Haliporoides* sp.). Significant nighttime prawn catches generally were composed of all four species. Royal Red and Red Prawns were caught during some daylight trawls, but Giant Scarlets were only taken in trawls that were completed after dark. However most trawls in deeper water were at night, so there is little information available to determine if Giant Scarlets can be caught during daylight. Catch composition varied with depth (see Table 2).

TABLE 2 JUNE CATCH COMPOSITION (% weight)

DEPTH	GIANT SCARLET	ROYAL RED	RED	ROYAL RED (NEW SPECIES)
380	0	53%	47%	0
520	0	42%	49%	9%
560	42%	37%	5%	16%

The best catch of prawns by triple gear was 450kg (150kg/hr) taken in September at night in 530 metres (Operation 25). The next best survey catch was 180kg (109kg/hr) taken in March during the day in 520 metres (Operation 55).

Giant Scarlet Prawns

No Giant Scarlet prawns were taken in less than 530 metres during the survey, although the best catch was taken at this depth. The second best catch of Giant Scarlets was taken at 620 metres - the deepest survey trawl.

Giant Scarlets are an attractive large bright red prawn (as the name implies) and the largest taken during the survey weighed 160g. The average size from a November commercial sample was 62g (range 22g - 146g) or 16 per kilo. In June the average size was 40g (range 7g - 112g) or 25 per kilo. Giant Scarlets taken during commercial operations in January were reported to be smaller and in deeper water (600+ metres).

Prices obtained for Giant Scarlets increased from \$2.70 per kilo early in the survey to \$4.00 per kilo. One exceptional price of \$9.50 per kilo was obtained at a Fish Board auction. The generally low prices for this species can be attributed to two factors i) lack of market familiarity and ii) low processing recoveries compared with other large prawn species. Giant Scarlets have a relatively large head causing a proportionately smaller tail recovery. Tail recovery was 47% compared with approximately 60% in tiger and banana prawns. The pleopods or tail swimming appendages are also very long and hence weigh more than pleopods of other species, so that meat recovery from the tail is also low - about 35% of whole weight. Nevertheless Giant Scarlets are an attractive and delectable prawn with an excellent flavour and tender texture and should maintain a price of \$4.00 per kilo if landings were regular or substantial. They do not suffer from the black spot problem encountered with Royal Reds, so they are less difficult to handle.

Royal Red Prawns

The Royal Red (*H. sibogae*) is an established commercial prawn species that has been fished for several years off the New South Wales coast, with major grounds off Port Stephens and Ballina. A number of articles on the species have appeared in past issues of "Australian Fisheries" and there is further information on distribution and abundance in the New South Wales State Fisheries FRy "Kapala" Cruise Report Series.

The Royal Red prawns off southern Queensland were recognised as two separate species late in the survey - the Royal Red found off New South Wales and a new Royal Red species.

Generally, Royal Reds were more widely distributed than Giant Scarlets both by latitude and depth. They were taken as far north as 26°29'S and as far south as 28°01'S and from 380m out to 620m. In June samples of Royal Reds (*H. sibogae*) in 380m averaged 15g (range 6g - 31g) or a count of 66 per kilo. In deeper water samples from 520m and 560m they averaged 13g and 10.5g respectively. Larger Royal Reds appear to inhabit shallower depths at that time of the year.

The unidentified species of Royal Red (*Haliporoides* sp.) was smaller than *Haliporoides sibogae* and averaged 8.3g (range 5g - 14g) or a count of 120 per kilo, and were more abundant in deeper water.

Prices obtained for Royal Reds caught during the survey ranged from \$2.00 per kilo to \$2.60 per kilo. The Royal Red has a relatively thin shell which tends to go black rapidly after exposure to air and consequently it is unsuitable for marketing as a whole prawn. It is usually headed and shelled and marketed as peeled prawns. The meat, however, has a good flavour and soft texture and is particularly good for frying.

The low price for Royal Reds can be offset by the excellent catch

rates. The best survey catch rates in Table 1 for Royal Reds (actually a mixture of the two Royal Red species and Red Prawns) were 109 and 83kg/hr ENE of Jumpinpin and Point Lookout respectively (Operations 55 & 25). These catch rates were exceeded by vessels fishing commercially on the grounds off Point Lookout (27°13'S to 27°24'S) during October and November. "Iron Summer" (fishing commercially) caught well in excess of 1 tonne (all species) in a single trawl during this period, and a Tweed Heads trawler was reported to have taken several tonnes in one trawl.

Red Prawns

Red Prawns (*A. foliacea*) were rarely separated from Royal Reds in catches. June catch composition is shown in Table 2.

Generally Red Prawns were widely distributed and were taken in most catches where any other deepwater prawn species were taken.

Red Prawns in 520m in June averaged 18g (range 12g - 35g) or 54 per kilo. Slightly larger prawns were taken in 380m where they averaged 21g (range 12g - 34g) or approximately 47 per kilo.

Although whole Red Prawns are slightly larger than whole Royal Reds in the same catches, the Red Prawn has a relatively larger head than the Royal Red and so meat sizes are similar. This prawn appears most suitable for processing into a peeled prawn for similar reasons to those outlined for Royal Reds. The species also has a strong and distinctive odour. However fried prawns have a good flavour and tender texture, and therefore Red Prawns should be quite marketable as peeled prawns.

Other Catches

A number of other penaeid and carid prawn species were taken in the

trawls but only in small quantities. A few crabs large enough to have commercial potential were also taken, but again only in small numbers. The only other crustacean taken in commercial quantities were bugs or shovelnose lobster (*Ibacus sp.*) similar to those taken as a by-catch on the southern Queensland offshore king prawn grounds.

Several fish species that have commercial potential such as gemfish (*Rexea solandri*), red ocean perch (*Helicolenus papillosus*) and flathead (*Suggrundus diversideus*) were taken in the trawls but catches were small. If fish trawl nets had been used, catches of mobile fish such as gemfish may have improved considerably. However, since trawl fish prices are generally less than those received for deepwater prawns, catches would need to improve enormously for the prospects for a fish trawl fishery to look attractive.

Operational Problems

Difficulties were encountered during the survey in getting position fixes. Land was generally out of radar range and vessel location fixes were dependent on the satellite navigator. Unfortunately on some occasions up to seven hours elapsed between satisfactory satellite passes.

Although the satnav was linked to the magnetic compass and speed was constantly updated, inaccuracies of this method over a period of a few hours, combined with southerly currents resulted in errors in position. The data for the area east of Caloundra and Mooloolaba was probably the worst affected. The Omega navigation system, which was not available during the survey, may be able to provide more accurate positional fixes for vessels fitted with this equipment.

The southwards setting East Australian Current was strong at times, and created some problems. In addition to positional problems already

mentioned, the current was also blamed for twisting the fishing gear on a few occasions. With plaited nets, boards and sleds it was necessary to return to port to untangle the gear. Difficulties were also experienced working on smaller grounds in strong currents where the margin for error was less.

Tuna long lines set by foreign fishing vessels were encountered on the grounds off Point Lookout and off Point Danger on a few occasions in the latter half of 1982. They hampered both survey and commercial operations, until Commonwealth DPI was advised of the problem and the lines were subsequently removed

Conclusion

The survey found stocks of deepwater prawns which proved to be available throughout the year. For those vessels suitably equipped to work in deeper waters these stocks could prove to be a useful alternate fishery, particularly during Spring.

SHOT NUMBER	DATE	START TIME (EST)	LOCATION		DEPTH (metres)	FISHING TIME (minutes)	NET	PRAWN CATCH (kg)			OTHER CATCH	COMMENTS
			START	FINISH				GIANT SCARLET	ROYAL RED	RED		
1	27.07.82	2024	28°12' 153°54'	28°09' 153°54'	235	150	Single	0	0	0	8 Gemfish	Good bottom
2	27.07.82	2300	28°07' 153°54'	28°05' 153°54'	274	120	Single	0	0	0	4 Gemfish	Net damage, hard bottom
3	28.07.82	1620	28°04' 153°58'	28°00' 153°57'	400	124	Single	0	0	0		Good bottom, very little in net
4	28.07.82	2013	27°58' 153°52'	27°55' 153°52'	183	62	Single	0	0	0	King prawn (2.5kg) 5 Gemfish	Good bottom
5	28.07.82	2145	27°55' 153°47'	27°52' 153°46'	164	100	Single	0	0	0	King prawn (1kg) 1 Gemfish	
6	29.07.82	0800	27°35' 154°00'	- - - -	535	120	Single	0	0	0	Carid prawn (0.5kg)	Good bottom
7	30.07.82	-	27°46' 153°58'	- -	540	-	Single	-	-	-		Trawl aborted, adverse currents
8	30.07.82	0030	27°42' 153°52'	27°47' 153°51'	220	75	Single	0	0	0	King prawn (2.5kg) 3 Gemfish	Good bottom
9	01.08.82	2237	28°01' 154°00'	28°00' 154°00'	550	70	Single	0	0	0		Good bottom
10	02.08.82	0250	28°03' 153°57'	27°59' 153°57'	400	92	Single	0	0	0		Hook-up, net damage, hard bottom
11	02.08.82	0704	26°42' 153°42'	26°37' 153°42'	380	120	Single	0	0	0	Bugs (25kg) 22 Gemfish	Good bottom
12	03.08.82	1050	26°35' 153°45'	26°31' 153°46'	280	87	Single	0	0	0	Bugs (8kg) 5 Gemfish	Good bottom
13	03.08.82	1830	26°40' 153°37'	26°41' 153°36'	150	180	Single	0	0	0	King prawn (2kg)	Net damage by bomb, lost most of catch. Good bottom
14	11.08.82	1906	27°26' 153°46'	27°21' 153°45'	183	120	Single	0	0	0	Bugs (3kg) 1 Gemfish	Good bottom
15	11.08.82	1036	27°21' 153°47'	27°16' 153°47'	210	120	Single	0	0	0	Bugs (1kg)	Good bottom
16	12.08.82	0102	27°15' 153°47'	27°14' 153°47'	240	40	Single	0	0	0	Bugs (0.5kg)	Hook-up, net damage, hard bottom
17	13.08.82	0332	27°10' 153°45'	27°20' 153°48'	210	170	Single	0	0	0	Bugs (3kg) King prawn (1kg) 5 Gemfish	Good flat bottom
18	13.08.82	2046	27°20' 153°56'	27°17' 153°53'	40	145	Single	32		20		Good flat bottom

19	08.09.82	1741	27°58' 153°57'	27°57' 153°57'	540	31	Single	0	0	0	Trawl aborted, rough bottom
20	08.09.82	2030	28°03' 153°58'	28°02' 153°58'	480	40	Single	0	0	7	Hook-up, trawl aborted, hard bottom
21	24.09.82	1932	27°24' 153°54'	27°19' 153°54'	520	180	Single	0	0	1	Net not on bottom
22	24.09.82	2335	27°19' 153°54'	27°14' 153°53'	535	147	Single	36	135		Good bottom
23	25.09.82	0259	- -	27°12' 153°52'	530	38	Single	24	6		Trawl aborted, rough bottom
24	25.09.82	2059	27°25' 153°51'	27°25' 153°51'	260	5	Triple	0	0	0	Trawl aborted, net damage, rough bottom and reef
25	26.09.82	1718	27°20' 153°54'	27°17' 153°54'	530	180	Triple	200	250		Sandy bottom
26	26.09.82	2245	27°16' 153°54'	27°24' 153°54'	540	120	Triple	4	14		Rough weather, gear bouncing
27	22.11.82	2312	27°40' 153°57'	27°36' 153°57'	530	120	Single	0	10		Good bottom
28	23.11.82	0309	27°39' 153°57'	27°36' 153°57'	550	103	Single	0	5		Good flat bottom
29	23.11.82	2141	27°56' 154°00'	27°55' 154°00'	555	81	Single	0	0	0	Strong current, twisted wires, trawl aborted
30	30.11.82	1909	27°55' 154°01'	27°54' 154°00'	559	80	Single	0	9	5	Net not fishing correctly, good bottom
31	30.11.82	2158	27°56' 153°59'	27°54' 154°00'	590	92	Single	1	5	30	Good bottom
32	01.12.82	0216	27°55' 153°59'	27°52' 153°58'	490	124	Single	0	0	0	Good bottom
33	04.12.82	1916	28°01' 154°01'	28°00' 154°00'	580	120	Single	0	7	7	Good flat bottom
34	04.12.82	2227	27°59' 154°00'	27°55' 154°01'	565	130	Single	0	7	4	Good bottom
35	05.12.82	0311	27°52' 153°55'	27°51' 153°54'	245	49	Single	0	0	0	Bottom hard but flat
36	05.12.82	2056	27°22' 153°55'	27°19' 153°55'	570	180	Single	25	20	15	Good bottom

37	06.12.82	0055	27°19' 153°54'	27°13' 153°52'	590	195	Single	45	20	25		Good flat bottom
38	06.12.82	2357	27°13' 153°44'	27°08' 153°43'	210	120	Single	0	0	0	King prawn (2kg)	Good bottom
39	13.12.82	2133	26°34' 153°48'	26°30' 153°50'	575	120	Single	0	40	0		Net malfunction, lost 30% of catch
40	14.12.82	0121	26°33' 153°45'	26°29' 153°50'	390	120	Single	0	20	0	Bugs (70kg) 9 Small crayfish	Bottom hard but flat
41	14.12.82	2045	27°13' 153°44'	27°11' 153°44'	230	96	Single	0	0	0	King prawn (2kg) Bugs (1kg)	Good bottom
42	15.12.82	0252	27°32' 153°54'	27°30' 153°52'	260	71	Single	0	0	0		Net damage, hard bottom
43	15.12.82	1920	27°35' 153°50'	27°36' 153°50'	210	110	Single	0	0	0		Good bottom
44	15.12.82	2255	27°45' 153°51'	27°42' 153°51'	210	85	Single	0	0	0		Good bottom
45	16.12.82	0314	27°40' 153°58'	27°39' 153°58'	400	60	Single	0	0	0	2 Gemfish	Good bottom
46	23.03.83	1910	27°58' 153°58'	27°56' 154°00'	565	118	Single	1	1	0		Net damage, some hard bottom
47	23.03.83	1802	28°00' 153°49'	27°58' 153°49'	220	35	Single	0	0	0	King prawn (0.5kg)	Hard bottom
48	23.03.83	2018	27°50' 153°51'	27°46' 153°51'	210	118	Single	0	0	0	King prawn (0.5kg)	Good bottom
49	24.03.83	0040	27°39' 153°55'	27°34' 153°56'	540	134	Single	0		30		Good bottom
50	24.03.83	1831	27°15' 153°45'	27°13' 153°45'	210	110	Triple	0	0	0	Bugs (4kg) 1 Gemfish	Good bottom
51	24.03.83	2317	27°19' 153°54'	27°13' 153°52'	530	204	Triple	6		105		Good bottom
52	30.03.83	2229	27°57' 154°00'	27°54' 154°00'	560	102	Triple	35		35		Good bottom
53	31.03.83	0120	27°56' 154°00'	27°59' 154°00'	590	43	Triple	3		50		Good bottom
54	31.03.83	0610	27°41' 153°58'	27°35' 153°57'	540	134	Triple	0		45		Good bottom
55	31.03.83	0949	27°37' 153°57'	27°36' 153°57'	520	99	Triple	0		180	2 Gemfish	Good bottom
56	31.03.83	1454	27°20' 153°57'	27°15' 153°54'	540	126	Triple	0		40		Good bottom

57	31.03.83	1848	27°19' 153°54'	27°14' 153°55'	600	180	Triple	90	50	3 large crabs	Good bottom	
58	31.03.83	2344	27°18' 153°55'	27°14' 153°53'	620	137	Triple	100	20		Good bottom	
59	09.05.83	2014	27°19' 153°56'	27°13' 153°53'	590	143	Triple	40	80	1 large crab	Irregular bottom	
60	09.05.83	2355	27°15' 153°53'	27°20' 153°53'	610	105	Triple	40	40	2 large crabs	Good bottom	
61	10.05.83	0322	27°18' 153°55'	27°13' 153°53'	560	117	Triple	40	60		Good bottom	
62	10.06.83	1925	27°45' 153°52'	27°43' 153°52'	230	30	Triple	0	0	0	Good bottom	
63	10.06.83	2045	27°43' 153°53'	27°42' 153°53'	260	40	Triple	0	0	0	Good bottom	
64	11.06.83	0200	27°42' 153°58'	27°39' 153°57'	520	108	Triple	0	5	0	Carid prawn (5kg)	Good bottom
65	11.06.83	1830	27°19' 153°54'	27°16' 153°54'	560	-	Triple	24	48		Carid prawn (4kg)	Good bottom
66	11.06.83	2400	27°19' 153°44'	- -	180	390	Triple	0	0	0	King prawn (15kg) Bugs (30kg)	Good bottom
67	12.06.83	2225	26°40' 153°43'	- -	380	35	Triple	0	35		Trawl aborted, nets choked	