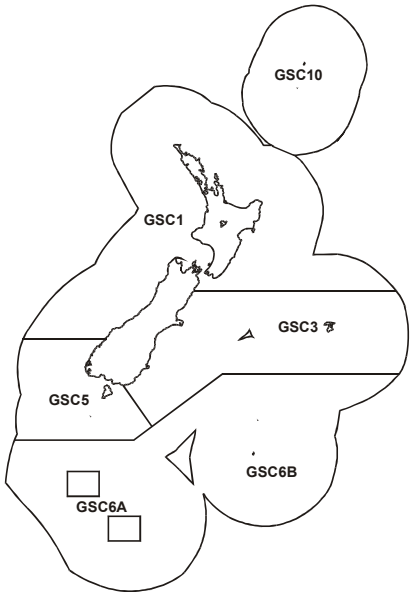
GIANT SPIDER CRAB (GSC)

(*Jacquinotia edwardsii*)



1. FISHERY SUMMARY

1.1 Commercial fisheries

The giant spider crab (*Jacquinotia edwardsii*) was introduced into the Quota Management System on 1 April 2004 with a combined TAC of 451 t and TACC of 419. There are no allowances for customary or recreational take, and there is an allowance for other sources of mortality of 32 t. The fishing year is from 1 April to 31 March and commercial catches are measured in greenweight. Up until 2001–02, reported commercial catches of this crab were generally low (Table 1). Since then total reported landings have risen from about 8 t to more than 70 t (Table 1). There was exploratory fishing for this crab in the late 1960s and early 1970s in the Auckland Islands and Pukaki Rise areas and then little interest until, according to Ministry of Fisheries data, the 1999–00 fishing year.

Table 1: TACCs and reported landings (t) of giant spider crab by Fishstock from 2001–02 to 2006–07 from CELR and CLR data. (N/A = no TACC set).

	GSC 1		GSC 3		GSC 4		GSC 5		GSC 6	
Fishstock	Landings	TACC	Landings	TACC	Landings	TACC	Landings	TACC	Landings	TACC
1990–91	0.018	–	0	–	0	–	0	–	0	–
1991–92	0	–	0	–	0	–	0	–	0	–
1992–93	0	–	0	–	0	–	0	–	0.23	–
1993–94	0.044	–	0	–	0	–	0	–	0.84	–
1994–95	0	–	0	–	0	–	0	–	0	–
1995–96	0	–	0	–	0	–	0	–	0	–
1996–97	0.034	–	0	–	0	–	0.006	–	0	–
1997–98	0	–	0	–	0	–	0.005	–	0	–
1998–99	0.57	–	0	–	0	–	0	–	0	–
1999–00	0	–	0.32	–	0	–	0	–	0.92	–
2000–01	0	–	0.24	–	0	–	0	–	0.106	–
2001–02	0	–	0.204	–	0	–	1.075	–	7.075	–
2002–03	0	–	0.308	–	0	–	0.76	–	3.295	–
2003–04	0	1	0.693	14	0.03	N/A	2.178	19	6.996	N/A
2004–05	0	1	0.322	14	0	N/A	5.329	19	0	N/A
2005–06	0	1	0.095	14	0	N/A	7.677	19	0	N/A
2006–07	0	1	0.223	14	0	N/A	5.448	19	0	N/A

Table 1 (*Continued*):

	GSC 6A		GSC 6B		GSC 8		GSC 10		TOTAL	
Fishstock	Landings	TACC	Landings	TACC	Landings	TACC	Landings	TACC	Landings	TACC
1990–91	0	–	0	–	0	–	0	–	0.018	–
1991–92	0	–	0	–	0	–	0	–	0	–
1992–93	0	–	0	–	0	–	0	–	0	–
1993–94	0	–	0	–	0	–	0	–	1.114	–
1994–95	0	–	0	–	0	–	0	–	0	–
1995–96	0	–	0	–	0.018	–	0	–	0.018	–
1996–97	0	–	0	–	0	–	0	–	0.04	–
1997–98	0	–	0	–	0	–	0	–	0.005	–
1998–99	0	–	0	–	0	–	0	–	0	–
1999–00	0	–	0	–	0	–	0	–	1.697	–
2000–01	0	–	0	–	0	–	0	–	0.313	–
2001–02	0	–	0	–	0	–	0	–	8.223	–
2002–03	0	–	0	–	0	–	0	–	4.363	–
2003–04	0	148	0	237	0	N/A	0	0	26.544	419
2004–05	23.825	148	2.345	237	0	N/A	0	0	34.828	419
2005–06	62.944	148	1.337	237	0	N/A	0	0	72.053	419
2006–07	23.235	148	0.686	237	0	N/A	0	0	29.592	419

1.2 Recreational fisheries

There are no known records of recreational use of this crab.

1.3 Customary non-commercial fisheries

There are no known records of customary use of this crab.

1.4 Illegal catch

There is no known illegal catch of this crab.

1.5 Other sources of mortality

There is no quantitative information on other sources of mortality, although this crab is often taken as a bycatch in orange roughy fishing.

2. BIOLOGY

Jacquinotia is found from the intertidal to over 500 m in the southeast and south of New Zealand from near Mernoo Gap to Campbell Island. It appears to attain highest densities southeast of the Snares, on the Pukaki Rise, and around the Auckland Island. Ryff & Voller (1976) recorded *Jacquinotia* in highest quantities on the Pukaki Rise and at the Auckland Islands, then decreasing quantities at the Campbell Islands, Bounty Islands, Stewart Island, Stewart Island Shelf, Puysegur Bank, and off Otago Heads, an observation consistent with earlier resource surveys (Ritchie 1970, 1973; Webb 1972). At the Auckland Islands they appear to be most abundant between 20 m and 40 m, but on the Pukaki Rise between 140 m and 160 m.

This spider crab, also sometimes known as the southern spider crab or the Auckland Islands crab, is a large, conspicuous brachyuran with a brick red carapace and bright red to yellowish-white chelae. The male grows much larger than the female, to at least 20 cm across the back and, together with its up to 40 cm long clawed legs, can give a total spread approaching 1 m. The males at least seem to be migratory. There have been reports of 'mounding' behaviour associated with moulting and mating (Bennett 1964, Ritchie 1970) in which large numbers of crabs form clumps, particularly in spring and autumn.

Large males have been observed feeding on ribbed mussels (*Aulacomya maoriana*) and they probably also feed on other shellfish, both bivalves (*Mytilus*, *Mactra*) and gastropods (*Haliotis*, *Maurea*, *Struthiolaria*). In contrast, females are detritus feeders on sandy substrates, and juveniles seem to feed on drift algae. These differences mean that although both males and females may enter pots, only males have been observed feeding on fish bait.

Sexes are separate and in both there appears to be a terminal moult. Males reach maturity at 110 mm carapace length (CL) and females at 100 mm CL. It appears that, at least near land masses, large males migrate between shallow and deep water seasonally. Pairs form in shallow water (less than 10 m) or just

out of the water in September-November, when females are in late berry. Egg extrusion probably takes place in September to February and larval release in September to November. A female of 101 mm CL carries about 37 500 eggs; a female of 126 mm CL about 71 200 eggs. Only one batch of eggs is produced each year and the interval between hatching of one lot of eggs and extrusion of the next batch is very short. In summer, females and pre-puberty males occur mainly in shallow water while large males are deeper.

Larval duration, survival, behaviour, and settlement are poorly known. There are two zoeal stages but the megalopa is unknown. Zoea probably occur in the plankton during September to November. Juveniles have been found in large numbers close inshore at the Auckland Islands, where shoreline rock meets the deeper mud and sand flats. Seaweed present here was apparently both food and shelter for the young crabs.

There is little or no information available on age, growth and natural mortality. Moulting appears to take place between November and March. Males reach 220 mm CL; females 144 mm. According to Ritchie (1970), *M* for mature females is 13–25%, and may be slightly higher for mature males.

3. STOCKS AND AREAS

For management purposes stock boundaries are based on QMAs, however, there is currently no biological or fishery information which could be used to identify stock boundaries.

4. ENVIRONMENTAL AND ECOSYSTEM CONSIDERATIONS

4.1 Sea-bed disturbance

Crab fishing is done with pots and is a relatively benign method of fishing compared with trawling. Direct effects on the sea-bed may arise from the pot landing on the bottom. These are unlikely to be harmful on either hard or soft substrates, and the proportion of the habitat affected is likely to be low.

4.2 Incidental catch (fish and invertebrates)

Incidental catch of fish and invertebrates has been recorded at the Auckland Islands (Ritchie 1970). Three other species of crab entered pots at the Auckland Islands mainly *Nectocarcinus bennetti*, but also *N. antarcticus*, and occasionally *Cancer novaezelandiae*. Two notothenid fish, *Notothenia microlepidota* and *N. filholi*, commonly entered pots set on reef. Unnamed species of octopus and whelk also occurred in pots at the Auckland Islands in noticeable numbers (Ryff & Voller 1976).

4.3 Incidental Catch (seabirds and mammals)

Not relevant to crab fisheries.

4.4 Community and trophic structure

The effect of bait on the trophic structure of the community is unknown, but because of the low intensity of potting, it is likely to be small. There is insufficient information to assess the effects of potting for *J. edwardsii* on community structure.

4.5 Spawning disruption

Aggregation associated with mating, particularly in spring and autumn, has been reported for this species. It is not known whether these aggregations are targeted, or the effect this would have on the spawning population. Because commercially-takeable crabs are generally those larger than 140 mm CL, the fishery is effectively for males. The effects of an essentially male fishery on the dynamics of reproduction are unknown.

4.6 Habitats of special significance

Habitats of special significance have not been defined for this fishery.

4.7 Biodiversity
The effect of fishing for this crab on the maintenance and healthy functioning of the natural marine habitat and ecosystems is unknown, but likely to be negligible.

4.8 Aquaculture and enhancement
Not relevant to crab fisheries.

5. STOCK ASSESSMENT

5.1 Estimates of fishery parameters and abundance
There are no estimates of fishery parameters or abundance for any giant spider crab fishstock.

5.2 Biomass estimates
There are no biomass estimates for any giant spider crab fishstock.

5.3 Estimation of Maximum Constant Yield (MCY)
There are no estimates of MCY for any giant spider crab fishstock.

5.4 Estimation of Current Annual Yield (CAY)
There are no estimates of CAY for any giant spider crab fishstock.

6. STATUS OF THE STOCKS

There are no estimates of reference or current biomass for any giant spider crab fishstock.

7. FOR FURTHER INFORMATION

Bennett EW. 1964. The marine fauna of New Zealand: Crustacea, Brachyura. New Zealand Oceanographic Memoir 22. 120 p.

Chilton C. 1911. Scientific results of the New Zealand government trawling expedition, 1907. Crustacea. Records of the Canterbury (New Zealand) Museum 1: 285–312.

McClay CL. 1988. Brachyura and crab-like Anomura of New Zealand. Leigh Laboratory Bulletin No. 22.

Melville-Smith R. 1982. A brief exploitation of the stone crab *Lithodes murrayi* (Henderson) off South West Africa, 1979/80. Fisheries Bulletin of South Africa 16: 45–55.

O'Driscoll RL., Booth JD., Bagley NW., Anderson OF., Griggs LH., Stevenson ML., Francis MP. 2001. Areas of importance for spawning, pupping or egg-laying, and juveniles of New Zealand deepwater fish, pelagic fish, and invertebrates. Final Research Report for Ministry of Fisheries Research Project ENV2000/04. Objectives 1, 2, & 3.

Paul LJ. 2000. New Zealand fishes. Identification, natural history & fisheries. Reed.

Ritchie LD. 1970. Southern spider crab (*Jacquinotia edwardsii* (Jacquinot, 1853)) survey – Auckland Islands and Campbell Island. Fisheries Technical Report No. 52.

Ritchie LD. 1973. Commercial fishing for southern spider crab (*Jacquinotia edwardsii*), at the Auckland Islands, October 1971. Fisheries Technical Report No. 101.

Roberts PE. 1972. The plankton of Perseverance Harbour, Campbell Island, New Zealand. Pacific Science 26: 296–309.

Ryff MR., Voller RW. 1976. Aspects of the southern spider crab (*Jacquinotia edwardsii*) fishery of southern New Zealand islands and Pukaki Rise. Fisheries Technical Report No. 143.

Thomson GM. 1913. The natural history of Otago Harbour and the adjacent sea, together with a record of the researches carried out at the Portobello Marine Fish Hatchery: Part 1. Transactions of the New Zealand Institute 45: 225–251.

Webb BF. 1972. Report on the investigations of the 'Lloret Lopez II' – 8 January to 2 April 1970. Section 3 Crab survey – 18 February to 27 February 1970. Fisheries Technical Report No. 97.

Webber WR., Wear RG. 1981. Life history studies on New Zealand Brachyura. 5. Larvae of the family Majidae. New Zealand Journal of Marine and Freshwater Research 15: 331–383.