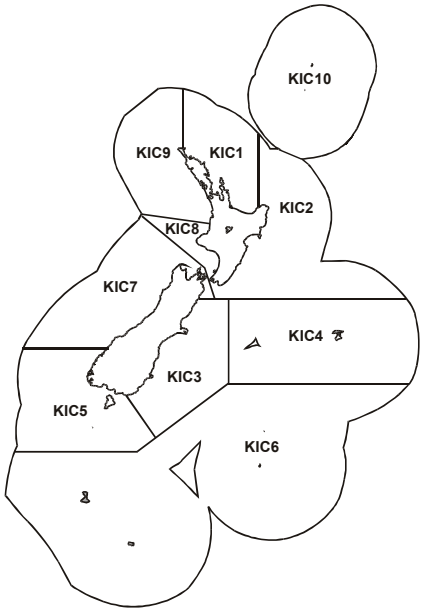
KING CRAB (KIC)

(*Lithodes murrayi, Neolithodes brodiei*)



1. FISHERY SUMMARY

1.1 Commercial fisheries

King crabs (*Lithodes murrayi and Neolithodes brodiei*) were introduced into the Quota Management System on 1 April 2004 with a combined TAC of 9 t and TACC 9 t (Table 1). There are no allowances for customary, recreational or other sources of mortality. The fishing year is from 1 April to 31 March and commercial catches are measured in greenweight. The two crabs are relatively distinct, and are found at different depths, but may be confused with other species of *Lithodes*.

Landings have been reported from all QMAs except KIC 7 and KIC 9, however, these landings are small and are unlikely to reflect the real catch as these crabs are generally discarded at sea and remain unreported. Most of the landed catch has been reported under the aggregated code KIC, although there are a few records by species (i.e., *L. murray*i [LMU] and *N. brodiei* [NEB]).

Most of the reported landings since 1992–93 are from KIC 6, and most of this was landed in the 1996–97 fishing year under a special permit. Between 2000 and 2002 landings were also made under a special permit (Table 1). Target fishing is by potting, although the crabs are taken as bycatch in the orange roughy fishery off the Wairarapa coast and in Queen Scallop dredging off the Otago coast. Figure 1 shows the per-stock catch composition of the entire KIC fishery, and the historical landings and TACC for KIC4.

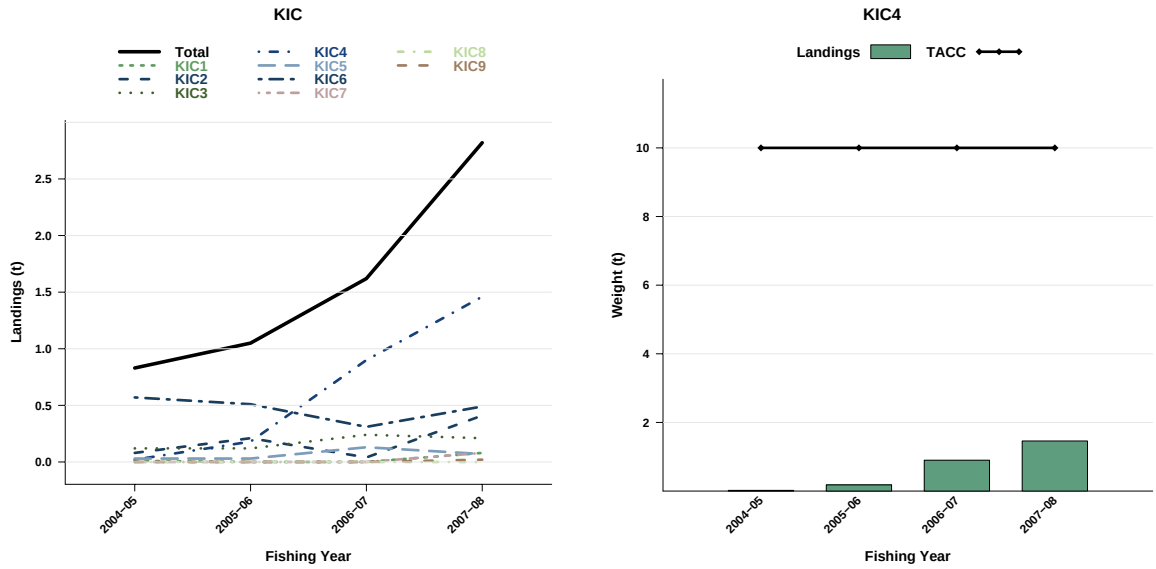


Figure 1: Left: Landings for individual KIC stocks and the sum total of all KIC landings (solid line) throughout time. Right: Historical landings and TACC for KIC4 (South East Chatham Rise). Note that these figures do not show data prior to entry into the QMS.

1.2 Recreational fisheries

There are no records of recreational use of these crabs, and because of their depth range recreational catch is unlikely.

1.3 Customary non-commercial fisheries

There are no known records of customary use of these crabs, and because of their depth range customary take is unlikely.

1.4 Illegal catch

There is no known illegal catch of these crabs.

1.5 Other sources of mortality

There is no quantitative information on other sources of mortality, although the crabs are sometimes taken as a bycatch in orange roughy fishing and Queen scallop fishing.

Table 1: TACCs and reported landings (t) of king crab by Fishstock from 1992–93 to 2007–08 from CELR and CLR data.

	KIC 1		KIC 2		KIC 3		KIC 4		KIC 5	
Fishstock	Landings	TACC	Landings	TACC	Landings	TACC	Landings	TACC	Landings	TACC
1993–94	0	–	0.119	–	0.064	–	0	–	0	–
1994–95	0	–	0	–	0	–	0	–	0	–
1995–96	0	–	0	–	0.055	–	0	–	0	–
1996–97	0	–	0.08	–	0	–	0	–	0	–
1997–98	0	–	0	–	0	–	0	–	0	–
1998–99	0	–	0	–	0	–	0	–	0	–
1999–00	0	–	0	–	0.021	–	0	–	0	–
2000–01	0	–	0	–	0	–	0	–	0	–
2001–02	0.135	–	0.26	–	0	–	0	–	0	–
2002–03	0.01	–	0.005	–	0	–	0	–	0.032	–
2003–04	0	1	0	1	0.009	1	0.012	1	0	1
2004–05	0	1	0.073	1	0.133	1	0.025	1	0.013	1
2005–06	0	1	0.211	1	0.118	1	0.181	1	0.028	1
2006–07	0	1	0.041	1	0.24	1	0.896	1	0.126	1
2007–08	0.078	1	0.408	1	0.206	1	1.455	1	0.068	1

Table 1 continued:

	KIC 6		KIC 7		KIC 8		KIC 9		KIC ET	
Fishstock	Landings	TACC	Landings	TACC	Landings	TACC	Landings	TACC	Landings	TACC
1993–94	0	–	0	–	0	–	0	–	0	–
1994–95	0	–	0	–	0	–	0	–	0	–
1995–96	0	–	0	–	0	–	0	–	0	–
1996–97	4	–	0	–	0	–	0	–	0	–
1997–98	0	–	0	–	0	–	0	–	0	–
1998–99	0.026	–	0	–	0	–	0	–	0	–
1999–00	0.035	–	0	–	0.072	–	0	–	0	–
2000–01	0.055	–	0	–	0	–	0	–	0	–
2001–02	0.029	–	0	–	0	–	0	–	0	–
2002–03	0.045	–	0	–	0	–	0	–	0	–
2003–04	0.456	1	0	1	0	1	0	1	0	–
2004–05	0.698	1	0	1	0	1	0	1	0	–
2005–06	0.505	1	0	1	0	1	0	1	0.02	–
2006–07	0.308	1	0	1	0	1	0	1	0.004	–
2007–08	0.492	1	0.080	1	0	1	0.019	1	0	–

	TOTAL*	
Fishstock	Landings	TACC
1993–94	0.119	–
1994–95	0	–
1995–96	0.102	–
1996–97	4.104	–
1997–98	0	–
1998–99	0.011	–
1999–00	0.119	–
2000–01	0.035	–
2001–02	0.45	–
2002–03	0.063	–
2003–04	0.482	9
2004–05	0.942	9
2005–06	1.063	9
2006–07	1.615	9
2007–08	2.806	9

*In 1995–96 and 1998–99, 47 kg and 1 kg of LMU were landed respectively, but no FMA was assigned to the landings. In 1996–97 24 kg of NEB was landed but no FMA was assigned to this landing. These reported landings by species are included in the total landings for KIC in those years.

2. BIOLOGY

King crabs belong to the infraorder Anomura, and differ from true crabs (Brachyura) in that the last pair of walking legs is reduced and folded inside the carapace.

*L. murray*i is a large, pear-shaped, dark purplish-red or brick red crab that has been found at depths between 120 m and 700 m. from the east coast of Northland to southern parts of the Campbell Plateau. It is a circumpolar, Southern Ocean species growing so large that the distance between the tips of the second legs can reach 1.25 m. The carapace width in males of this species may exceed 200 mm. Females are smaller.

N. brodiei is also pear-shaped, and typically a uniform brick to bright red colour. It is widely distributed from the Three Kings Islands to the Campbell Plateau, where it occurs on soft and rocky bottoms between about 800 and 1100 m. Carapace width in this species is up to about 180 mm.

King crabs are thought to aggregate for protection during breeding and moulting. Migrations between shallow and deep waters also probably occur in response to moulting and mating, at least in near-shore populations. They occur mainly on soft substrates but have also been found on rocky bottoms. They are probably omnivorous, although animal food (sessile, sedentary, and mobile invertebrates, and small fish), including dead material, is their predominant food. Their principal predators are fish and seals.

Sexes are separate in all species of King crabs and they appear to be seasonal spawners, probably spawning in summer or autumn.

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 king crabs on community structure.

4.5 Spawning disruption

Aggregation associated with mating, particularly in summer and autumn may occur for these species. It is not known whether these aggregations are or will be targeted, or the effect this would have on the spawning population.

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 king crab fishstock.

5.2 Biomass estimates

There are no biomass estimates for any king crab fishstock.

5.3 Estimation of Maximum Constant Yield (MCY)

There are no estimates of MCY for any king crab fishstock.

5.4 Estimation of Current Annual Yield (CAY)

There are no estimates of CAY for any king crab fishstock.

6. STATUS OF THE STOCKS

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

7. FOR FURTHER INFORMATION

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