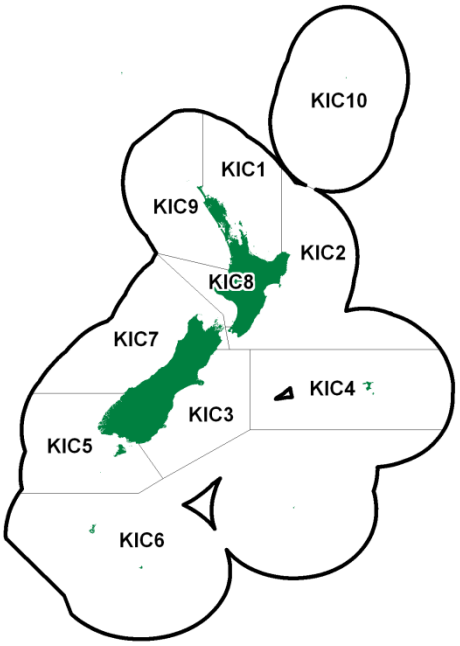
KING CRAB (KIC)

(*Lithodes aotearoa, Lithodes robertsoni, Neolithodes brodiei*)



Lithodes Aotearoa

Lithodes robertsoni

Neolithodes brodiei

1. FISHERY SUMMARY

Allowances, TACCs, and TACs are shown in Table 1.

Table 1: Recreational and Customary non-commercial allowances, other mortality, TACCs, and TACs (t) for king crab by Fishstock.

Fishstock	Recreational allowance	Customary non-commercial allowance	Other sources of mortality	TACC	TAC
KIC 1	0	0	0	10	10
KIC 2	0	0	0	10	10
KIC 3	0	0	0	10	10
KIC 4	0	0	0	10	10
KIC 5	0	0	0	10	10
KIC 6	0	0	0	10	10
KIC 7	0	0	0	10	10
KIC 8	0	0	0	10	10
KIC 9	0	0	0	10	10
KIC 10	0	0	0	0	0

1.1 Commercial fisheries

King crabs (*Lithodes aotearoa, Lithodes robertsoni,* and *Neolithodes brodiei*) were originally introduced into the Quota Management System on 1 April 2004 as *Lithodes murrayi* and *N. brodiei,* with a combined TAC of 90 t and TACC of 90 t (Table 2). *Lithodes murrayi* have undergone taxonomic revision and are now known as the New Zealand king crab *Lithodes aotearoa* (Ahyong 2010).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. King crab are a minor bycatch in conjunction with orange roughy fishing off the Wairarapa Coast, queen scallop fishing off the Otago coast, and both squid and hoki fishing off the east coast, South Island. The three crabs are relatively

distinct and are found at different depths but may be confused with other species of *Lithodes* (e.g., *L. murrayi*).

Landings have been reported from all QMAs; however, these landings are small.. Most of the landed catch has been reported under the aggregated code KIC, although there are a few records by species (i.e., *L. aotearoa* [LMU], *L. robertsoni* [LRO], and *N. brodiei* [NEB]) mainly by the fisheries observers.

Table 2: TACCs and reported landings (t) of king crab by Fishstock from 1993–94 to present. The fishing year is from 1 April to 31 March.

Fishstock	KIC 1		KIC 2		KIC 3		KIC 4		KIC 5	
	Landing	TACC	Landing	TACC	Landing	TACC	Landing	TACC	Landing	TACC
1993–94	0	–	0.12	–	0.06	–	0	–	0	–
1994–95	0	–	0	–	0	–	0	–	0	–
1995–96	0	–	0	–	0.06	–	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	–	0.02	–	0	–	0	–
2000–01	0	–	0	–	0	–	0	–	0	–
2001–02	0.14	–	0.26	–	0	–	0	–	0	–
2002–03	0.01	–	0.01	–	0	–	0	–	0.03	–
2003–04	0	–	0	–	0.01	–	0.01	–	0	–
2004–05	0.01	10	0.08	10	0.12	10	0.02	10	0.03	10
2005–06	0	10	0.21	10	0.12	10	0.18	10	0.03	10
2006–07	0	10	0.04	10	0.24	10	0.9	10	0.13	10
2007–08	0.08	10	0.41	10	0.21	10	1.46	10	0.07	10
2008–09	0.01	10	0.19	10	0.24	10	1.57	10	0.07	10
2009–10	0	10	0.2	10	0.35	10	1.49	10	0.03	10
2010–11	0.02	10	0.18	10	0.25	10	1.9	10	0.14	10
2011–12	0	10	2.48	10	0.07	10	0.02	10	0.04	10
2012–13	0	10	3.76	10	0.13	10	0.02	10	0.11	10
2013–14	0	10	10.31	10	0.11	10	0.12	10	0.33	10
2014–15	0.01	10	8.09	10	0.12	10	0.02	10	0.09	10
2015–16	0	10	2.08	10	0.08	10	0.04	10	0.04	10
2016–17	0.02	10	0.03	10	0.05	10	0.29	10	0.02	10
2017–18	0.01	10	0.02	10	0.08	10	0.05	10	0.05	10
2018–19	0	10	0.02	10	0.45	10	0.05	10	0.41	10
2019–20	0.10	10	0.81	10	0.11	10	0.08	10	0.11	10
2020–21	0.01	10	0.05	10	0.44	10	0.05	10	0.01	10
2021–22	0.08	10	0.02	10	0.04	10	0.18	10	0.04	10
2022–23	0	10	1.13	10	5.53	10	0.13	10	0.03	10
2023–24	0.01	10	0.62	10	8.25	10	0.15	10	0.03	10

Fishstock	KIC 6		KIC 7		KIC 8		KIC 9		Total	
	Landing	TACC	Landing	TACC	Landing	TACC	Landing	TACC	Landing	TACC
1993–94	0	–	0	–	0	–	0	–	0.12	–
1994–95	0	–	0	–	0	–	0	–	0	–
1995–96	0	–	0	–	0	–	0	–	0.10	–
1996–97	4.00	–	0	–	0	–	0	–	4.10	–
1997–98	0	–	0	–	0	–	0	–	0	–
1998–99	0.03	–	0	–	0	–	0	–	0.01	–
1999–00	0.04	–	0	–	0.07	–	0	–	0.12	–
2000–01	0.06	–	0	–	0	–	0	–	0.04	–
2001–02	0.03	–	0	–	0	–	0	–	0.45	–
2002–03	0.05	–	0	–	0	–	0	–	0.06	–
2003–04	0.46	–	0	–	0	–	0	–	0.48	–
2004–05	0.57	10	0	10	0	10	0	10	0.83	90
2005–06	0.51	10	0	10	0	10	0	10	1.05	90
2006–07	0.31	10	0	10	0	10	0.02	10	1.62	90
2007–08	0.49	10	0.08	10	0	10	0	10	2.82	90
2008–09	0.42	10	0.06	10	0	10	0.06	10	2.56	90
2009–10	0.34	10	0	10	0	10	0	10	2.47	90
2010–11	1.04	10	0	10	0.2	10	0.03	10	3.73	90
2011–12	0.34	10	0	10	0	10	0	10	2.98	90
2012–13	0.14	10	0	10	0	10	0.04	10	4.16	90
2013–14	0.70	10	0	10	0	10	0	10	11.61	90
2014–15	0.50	10	0.01	10	0	10	0	10	8.84	90
2015–16	0.27	10	0	10	0	10	0.01	10	2.51	90
2016–17	0.21	10	0	10	0	10	0	10	0.63	90
2017–18	0.85	10	0.01	10	0	10	0	10	1.07	90
2018–19	0.74	10	0	10	0	10	0.01	10	1.66	90
2019–20	0.54	10	0.01	10	0	10	0.01	10	1.76	90
2020–21	0.61	10	0.02	10	0	10	0	10	1.19	90
2021–22	0.68	10	0.05	10	0	10	0.04	10	1.13	90
2022–23	0.62	10	0.01	10	0	10	0.01	10	7.46	90
2023–24	1.20	10	0.23	10	0	10	0	10	10.47	90

Note. 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 were landed but no FMA was assigned to this landing. These reported landings are included in the total landings for KIC in those years.

Most of the reported landings have come from KIC 2 from 2011–12 to 2015–16, which was fished under a special permit during that time; catches of 2.15 tonnes in 2013–14 and 2.3 tonnes in 2014–15 were taken under special permit and are additional to the landing reported in Table 1. A special permit was also issued for KIC 6 in the 1996–97 fishing year. Target fishing is by potting, although small quantities of crabs are taken as bycatch in fisheries such as orange roughy and squid. Figure 1 shows the historical landings and TACC for KIC 2.

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.

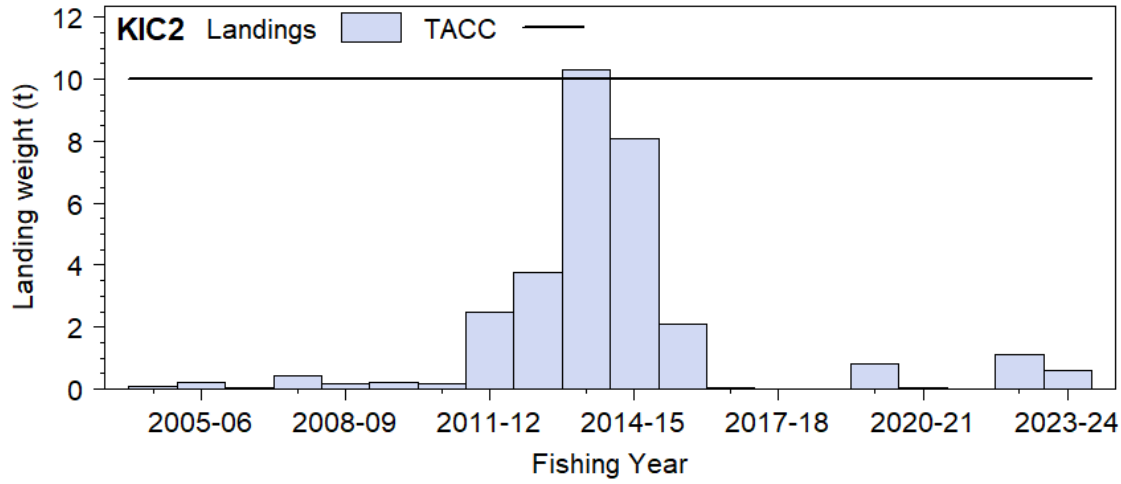


Figure 1: Reported commercial landings and TACC for KIC 2. Note that this figure does not show data prior to entry into the QMS and does not include the catch taken under special permits.

2. BIOLOGY

King crabs belong to the Anomura and differ from true crabs (Brachyura) in that the last pair of walking legs is very reduced and tucked into the gill chamber, and in females the abdomen is asymmetric.

Lithodes aotearoa 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 with a carapace width up to 138 mm.

Lithodes robertsoni has been found at depths between 935–1259 m from as far north as the Challenger Plateau to as far south as the Snares Islands. The largest yet-examined specimen is its male holotype whose carapace measures 128.1 mm in postrostral length and 117.0 mm in width.

Neolithodes brodiei is also a very large crab, having a similar leg span to *Lithodes aotearo* but a proportionately smaller carapace. It 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 hard and soft substrates between about 800 m and 1100 m. Carapace width in this species is up to about 180 mm.

King crabs appear to be seasonal spawners, probably spawning in summer or autumn. 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.

King crabs are associated with suspension-feeding fauna such as sponges, gorgonians, polychaetes, brachiopods, bryozoans, and ascidians. Garrick's masking crab, ling, black shark, red cod and hagfish, and other invertebrates, including unnamed holothurians and starfish, have all been reported from crab pots targeting king crab. Their principal predators are fish, New Zealand fur seals and New Zealand sea lions, however, king crabs are not known to be the exclusive diet of any other marine species.

They are probably omnivorous, although animal food (sessile, sedentary, and mobile invertebrates, and small fish), including dead material, is their predominant food.

The Intrinsic Productivity Level is categorised as Medium for this species. A comparison with similar species that are better known from other parts of the world may provide some insight into the king crab, although similarities are conjectural. The red king crab *Paralithodes camtshaticus* in the Alaskan fishery appears to have a lifespan of 15 to 20 years.

3. STOCKS AND AREAS

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

4. STOCK ASSESSMENT

4.1 Estimates of fishery parameters and abundance

There are no estimates of fishery parameters or abundance for any king crab fishstock.

4.2 Biomass estimates

There are no biomass estimates for any king crab fishstock.

4.3 Yield estimates and projections

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

5. STATUS OF THE STOCKS

For all Fishstocks there is insufficient information to estimate current stock status.

6. FOR FURTHER INFORMATION

Ahyong, S T (2010). King crabs of New Zealand, Australia, and the Ross Sea (Crustacea: Decapoda: Lithodidae). *NIWA Biodiversity Memoir 123*.

Arnaud, P M; Do-Chi, T (1977) Donnees biologiques et biometriques sur les lithodes *Lithodes aotearoa* (Crustacea: Decapoda: Anomura) des Iles Crozet (SW Ocean Indien). *Marine Biology 39*: 147–159.

Clark, M R; King, K J (1989) Deepwater fish resources off the North Island, New Zealand: results of a trawl survey, May 1985 to June 1986. *New Zealand Fisheries Technical Report No. 11*.

Dawson, E W (1989) King crabs of the world (Crustacea: Lithodidae) and their fisheries. A comprehensive bibliography. *New Zealand Oceanographic Institute Miscellaneous Publication 101*.

Food and Agriculture Organisation (1985) Southern Ocean CCAMLR Convention area, fishing areas 48, 58 and 88. pp. 89–92. FAO species identification sheets for fishery purposes. Vol. 1.

McClay, C L (1988) Brachyura and crab-like Anomura of New Zealand. *Leigh Laboratory Bulletin No. 22*.

Macpherson, E (2001) New species and new records of lithodid crabs (Crustacea, Decapoda) from the southwestern and central Pacific Ocean. *Zoosystema. Paris 23*: 797–805.

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

Miquel, J C; Arnaud, P M (1987) Aspects de la biologie de *Lithodes aotearoa* (Crustacea : Decapoda) aux Iles Crozet, Ocean Indien Subantarctique. *CNFRA 57*: 81–89.

Miquel, J C; Arnaud, P M; Do-Chi, T (1985) Population structure and migration of the stone crab *Lithodes aotearoa* in the Crozet Islands, Subantarctic Indian Ocean. *Marine Biology 89*: 263–269.

Naylor, J R; Webber, W R; Booth, J D (2005) A guide to common offshore crabs in New Zealand waters. *New Zealand Aquatic Environment and Biodiversity Report No. 2*. 47 p.

O'Driscoll, R L; Booth, J D; Bagley, N W; Anderson, O F; Griggs, L H; Stevenson, M L; Francis, M P (2001) Areas of importance for spawning, pupping or egg-laying, and juveniles of New Zealand deepwater fish, pelagic fish, and invertebrates. *NIWA Technical Report 119*. 377 p.

Webb, B F (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, R (1997) The royal family: king crabs at home and abroad. *Seafood New Zealand* May 1997: 81–84.