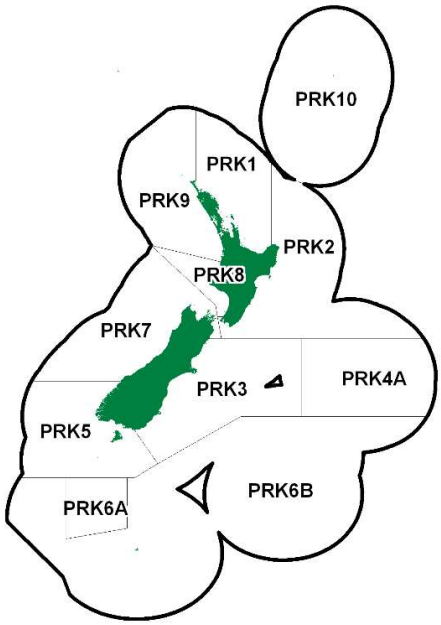
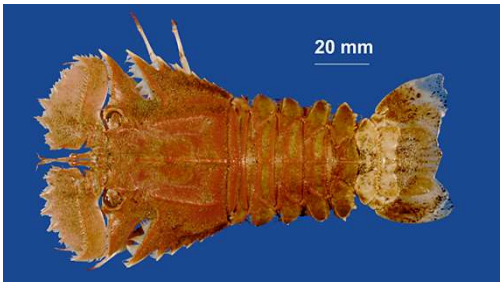
PRAWN KILLER (PRK)

(*Ibacus alticrenatus*)





1. FISHERY SUMMARY

1.1 Commercial fisheries

Prawn killer (*Ibacus alticrenatus*) was introduced into the Quota Management System on 1 October 2007, with a combined TAC of 37.4 t and TACC of 36 t. There are no allowances for customary non-commercial or recreational fisheries, and 1.4 t was allowed for other sources of mortality. Almost all prawn killer are taken as a bycatch in the scampi target bottom trawl fishery in SCI 1 and SCI 2. Reported catches in PRK 1 peaked at 42 t in 1992–93, but declined to less than 0.5 t since 2011–12. Landings in PRK 2 reached a maximum of 8 t in 2002–03, but have been minimal since with less than 0.01 t reported in 2018–19, and no landings reported in 2019–20 or 2020–21 (Table 1). Landings are minimal to non-existent in other QMAs. Years with higher landings coincide with years in which the scampi fleet fished at shallower depths than usual. They can be legally discarded under Schedule 6 of the Fisheries Act but it is still likely that reported catches are lower than actual catches due to non-reporting.

Table 1: TACCs and reported landings (t) of prawn killer by Fishstock from 1990–91 until the present from CELR and CLR data. QMAs are shown as defined in 2007–08. [Continued on next page]

	PRK 1		PRK 2		PRK 3		PRK 4A	
Fishstock	Landings	TACC	Landings	TACC	Landings	TACC	Landings	TACC
1990–91	11.59	–	0	–	0	–	0	–
1991–92	3.34	–	0.48	–	0	–	0	–
1992–93	42.24	–	6.86	–	0	–	0	–
1993–94	10.95	–	0.03	–	0	–	0	–
1994–95	0.52	–	0	–	0	–	0	–
1995–96	1.78	–	0	–	0	–	0	–
1996–97	23.13	–	0	–	0	–	0	–
1997–98	0	–	0	–	0	–	0	–
1998–99	0	–	0.19	–	0	–	0	–
1999–00	0.08	–	0	–	0	–	0	–
2000–01	0	–	0	–	0	–	0	–
2001–02	6.05	–	0.37	–	0	–	0	–
2002–03	20.99	–	8.09	–	0	–	0	–
2003–04	24.35	–	0.57	–	0.01	–	0.01	–
2004–05	3.25	–	1.15	–	0	–	0	–
2005–06	2.25	–	0.20	–	0	–	0	–
2006–07	4.6	–	0.10	–	0	–	0	–
2007–08	5.36	24.5	0.92	3.5	0.01	1	0.02	1
2008–09	0.22	24.5	0.08	3.5	0	1	0	1
2009–10	0.75	24.5	0.03	3.5	0	1	0	1

Table 1 [Continued]

	PRK 1		PRK 2		PRK 3		PRK 4A	
Fishstock	**Landings**	**TACC**	**Landings**	**TACC**	**Landings**	**TACC**	**Landings**	**TACC**
2010–11	3.55	24.5	0.08	3.5	0	1	0	1
2011–12	0.42	24.5	0.17	3.5	0	1	0	1
2012–13	0.26	24.5	0.02	3.5	0	1	0	1
2013–14	0.10	24.5	0.04	3.5	0	1	0	1
2014–15	0.00	24.5	0.04	3.5	0	1	0	1
2015–16	0.02	24.5	0.07	3.5	0	1	0	1
2016–17	0.35	24.5	0.15	3.5	0	1	0.01	1
2017–18	0.45	24.5	0.01	3.5	0	1	0	1
2018–19	0.30	24.5	< 0.01	3.5	0	1	< 0.01	1
2019–20	< 0.01	24.5	0	3.5	< 0.01	1	0	1
2020–21	0.02	24.5	0	3.5	0	1	0	1

	PRK 5		PRK 6A		PRK 6B		PRK 7	
Fishstock	**Landings**	**TACC**	**Landings**	**TACC**	**Landings**	**TACC**	**Landings**	**TACC**
1990–91	0	–	0	–	0	–	0	–
1991–92	0	–	0	–	0	–	0	–
1992–93	0	–	0	–	0.02	–	0	–
1993–94	0	–	0	–	0	–	0	–
1994–95	0	–	0	–	0	–	0	–
1995–96	0	–	0	–	0	–	0	–
1996–97	0	–	0	–	0	–	0	–
1997–98	0	–	0	–	0	–	0	–
1998–99	0	–	0	–	0	–	0	–
1999–00	0	–	0	–	0	–	0	–
2000–01	0	–	0	–	0	–	0	–
2001–02	0	–	0	–	0	–	0	–
2002–03	0	–	0	–	0	–	0	–
2003–04	0	–	0	–	0	–	0	–
2004–05	0	–	0	–	0	–	0	–
2005–06	0	–	0	–	0	–	0.01	–
2006–07	0	–	0	–	0	–	0.03	–
2007–08	0	1	0	1	0	1	1.2	1
2008–09	0	1	0	1	0	1	0.88	1
2009–10	0	1	0	1	0	1	0.48	1
2010–11	0	1	0	1	0	1	0.69	1
2011–12	0	1	0	1	0	1	0.73	1
2012–13	0	1	0	1	0	1	0.60	1
2013–14	0.001	1	0	1	0	1	0.66	1
2014–15	0	1	0	1	0	1	1	1
2015–16	0	1	0	1	0	1	1.66	1
2016–17	0	1	0	1	0	1	1.37	1
2017–18	0	1	0	1	0	1	0.55	1
2018–19	0	1	0	1	0	1	0.45	1
2019–20	0	1	0	1	0	1	0.01	1
2020–21	0	1	0	1	0	1	0.04	1

	PRK 8		PRK 9		TOTAL	
Fishstock	**Landings**	**TACC**	**Landings**	**TACC**	**Landings**	**TACC**
1990–91	0	–	0	–	11.58	–
1991–92	0	–	0	–	3.82	–
1992–93	0	–	0	–	49.12	–
1993–94	0	–	0	–	10.98	–
1994–95	0	–	0	–	0.52	–
1995–96	0	–	0	–	1.78	–
1996–97	0	–	0	–	23.13	–
1997–98	0	–	0	–	0	–
1998–99	0	–	0	–	0.19	–
1999–00	0	–	0	–	0.08	–
2000–01	0	–	0	–	0	–
2001–02	0	–	0	–	6.42	–
2002–03	0	–	0	–	29.08	–
2003–04	0	–	0	–	24.94	–
2004–05	0	–	0	–	4.40	–
2005–06	0	–	0.01	–	2.47	–
2006–07	0	–	0	–	4.73	–
2007–08	0	1	0	1	7.51	36
2008–09	0	1	0	1	1.18	36
2009–10	0	1	0	1	1.27	36
2010–11	0.01	1	0	1	4.33	36
2011–12	0	1	0	1	1.32	36
2012–13	0.01	1	0.01	1	0.90	36
2013–14	0.01	1	0.15	1	0.94	36
2014–15	0	1	0	1	1.04	36
2015–16	0.01	1	0.02	1	1.78	36
2016–17	0	1	1.26	1	3.14	36
2017–18	0	1	0	1	1.01	36

Table 1 [Continued]

	PRK 8		PRK 9		TOTAL	
Fishstock	**Landings**	**TACC**	**Landings**	**TACC**	**Landings**	**TACC**
2018–19	0	1	0.01	1	0.76	36
2019–20	0	1	0	1	0.01	36
2020–21	0	1	0.02	1	0.08	36

1.2 Recreational fisheries

Given the depths and locations at which prawn killer are found recreational catch is likely to be negligible or non-existent.

1.3 Customary non-commercial fisheries

Given the depths and locations at which prawn killer are found customary catch is likely to be negligible or non-existent.

1.4 Illegal catch

No quantitative information is available on the level of illegal catch of prawn killer. Given the low value and lack of markets illegal catches are unlikely.

1.5 Other sources of mortality

There is no quantitative information on other sources of mortality, although analysis of benthic invertebrate samples and the distribution of trawl tows in the Bay of Plenty (PRK 1) suggests that this species is negatively affected by trawling.

2. BIOLOGY

Ibacus alticrenatus is widely distributed around the New Zealand coast, principally in depths of 80–300 m. Prawn killers are found on soft sediment seafloors, where they dig into the substrate and cover themselves with sediment.

There is not much information about growth and development of *I. alticrenatus* in New Zealand waters, but females are thought to mature at a carapace length of about 40 mm. Trawl surveys of the Bay of Plenty and Hawke Bay and Wairarapa regions have found maximum carapace length of 46 and 52 mm for males and females respectively. Information from Australia suggests that this species has relatively low fecundity (1700–14 800 eggs, increasing with size) and spawns annually. Larval development takes 4–6 months, an intermediate duration for a Scyllarid lobster. Females of other *Ibacus* species reach maturity about two years after settlement and longevity is suggested to be five years or more. No ageing work has been carried out on prawn killer in either New Zealand or Australia.

Other slipper lobster species may also feature in catches – *Ibacus brucei, Antipodarctus aoteanus*, and *Scyllarus mawsoni* (which is thought to be rare).

3. STOCKS AND AREAS

For management purposes stock boundaries are based on those used for scampi. There is no biological information on stock structure, recruitment patterns, or other biological characteristics which might indicate stock boundaries, but there are three main fishing areas where they are caught: Bay of Plenty, and to a lesser extent Hawke Bay and Wairarapa and the northern west coast of the South Island. The lack of prawn killer bycatch in the scampi target fisheries on the Mernoo Bank (PRK 3) and around the Auckland Islands (PRK 6A) would suggest the prawn killer numbers are very low to non-existent south of the three main areas.

4. STOCK ASSESSMENT

4.1 Estimates of fishery parameters and abundance

There are no estimates of fishery parameters or abundance for any prawn killer fishstock. Sporadic and varying catches by the scampi fleet mean that development of reliable CPUE indices is not possible.

4.2 Biomass estimates

There are no reliable biomass estimates for any prawn killer fishstock. Combined trawl and photographic surveys for scampi in the Bay of Plenty (PRK 1) and Hawke Bay and Wairarapa (PRK 2) are the only trawl surveys that catch prawn killer regularly. Prawn killer biomass estimates from these surveys are variable from year to year and have high coefficients of variation. The focus of these surveys has changed over the years to focus more on photographic work and not all strata have been surveyed in all years.

4.3 Yield estimates and projections

There are no estimates of *MCY* or *CAY* for any prawn killer fishstock.

5. STATUS OF THE STOCKS

There are no estimates of reference or current biomass for any prawn killer fishstock. It is not known whether prawn killer stocks are at, above, or below a level that can produce *MSY*.

6. FOR FURTHER INFORMATION

Atkinson, J M; Boustead, N C (1982) The complete larval development of the scyllarid lobster *Ibacus alticrenatus* Bate, 1888 in New Zealand waters. *Crustaceana* 42: 275–287.

Booth, J D; Webber, W R; Sekiguchi, H; Coutures, E (2005) Diverse larval recruitment strategies within the Scyllaridae. *New Zealand Journal of Marine and Freshwater Research* 39: 581–592.

Brown, D E; Holthuis, L B (1998) The Australian species of the genus *Ibacus* (Crustacea: Decapoda: Scyllaridae), with the description of a new species and addition of new records. *Zoologische Mededelingen (Leiden)* 72(10): 113–141.

Cryer, M; Hartill, B; O'Shea, S (2002) Modification of marine benthos by trawling: toward a generalization for the deep ocean? *Ecological Applications* 12(6): 1824–1839.

Haddy, J A; Courtney, A J; Roy, D P (2005) Aspects of the reproductive biology and growth of Balmain bugs (*Ibacus* spp.) (Scyllaridae). *Journal of Crustacean Biology* 25(2): 263–273.

MacGibbon, D J (2015) Fishery characterisation for prawn killer, *Ibacus alticrenatus* (Spence Bate, 1888) (Scyllaridae), 1989–90 to 2012–13. *New Zealand Fisheries Assessment Report 2015/05*. 108 p.