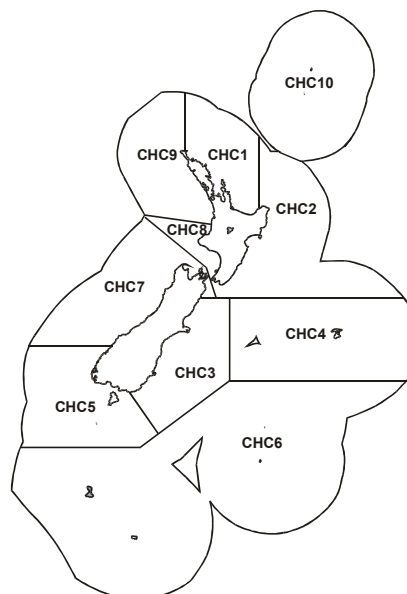


## RED CRAB (CHC)

*(Chaceon bicolor)*

## 1. FISHERY SUMMARY

## 1.1 Commercial fisheries

The red crab (*Chaceon bicolor*) was introduced into the Quota Management System on 1 April 2004 with a combined TAC of 48 t and TACC of 48 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. There were no commercial catches of this crab until 2001–02, when landings of about 1.5 t were reported. *C. bicolor*, along with several other deepwater crabs, was the focus of an exploratory fishing (potting) permit during 2000–02. Significant quantities have been found in the Bay of Plenty, east of Great Barrier Island, and east of Northland. The other region fished was the east coast of the North Island south of East Cape, where smaller catches were periodically reported.

There are two species of *Chaceon* known from New Zealand waters. *C. yaldwyni* is almost indistinguishable from *C. bicolor*, but is a very rarely caught species from the eastern Chatham Rise (only 3 or 4 specimens have ever been caught).

**Table 1: TACCs and reported landings (t) of red crab by Fishstock from 2001–02 to 2006–07 from CELR and CLR data.**

| Fishstock | CHC 1    |      | CHC 2    |      | CHC 3    |      | CHC 4    |      | CHC 5    |      |
|-----------|----------|------|----------|------|----------|------|----------|------|----------|------|
|           | Landings | TACC | Landings | TACC | Landings | TACC | Landings | TACC | Landings | TACC |
| 2001–02   | 1.132    | –    | 0.065    | –    | 0        | –    | 0        | –    | 0        | –    |
| 2002–03   | 0.604    | –    | 0        | –    | 0        | –    | 0        | –    | 0        | –    |
| 2003–04   | 0        | 10   | 0.009    | 10   | 0        | 4    | 0        | 4    | 0        | 4    |
| 2004–05   | 0        | 10   | 0.215    | 10   | 0        | 4    | 0        | 4    | 0        | 4    |
| 2005–06   | 0.021    | 10   | 0        | 10   | 0        | 4    | 0        | 4    | 0        | 4    |
| 2006–07   | 0        | 10   | 0        | 10   | 0        | 4    | 0        | 4    | 0        | 4    |

## RED CRAB (CHC)

Table 1: (Continued):

| Fishstock | CHC 6    |      | CHC 7    |      | CHC 8    |      | CHC 9    |      | CHC 10   |      |
|-----------|----------|------|----------|------|----------|------|----------|------|----------|------|
|           | Landings | TACC | Landings | TACC | Landings | TACC | Landings | TACC | Landings | TACC |
| 2001–02   | 0        | –    | 0        | –    | 0        | –    | 0        | –    | 0        | –    |
| 2002–03   | 0        | –    | 0        | –    | 0        | –    | 0        | –    | 0        | –    |
| 2003–04   | 0        | 4    | 0        | 4    | 0        | 4    | 0        | 4    | 0        | 0    |
| 2004–05   | 0        | 4    | 0        | 4    | 0        | 4    | 0        | 4    | 0        | 0    |
| 2005–06   | 0        | 4    | 0        | 4    | 0        | 4    | 0        | 4    | 0        | 0    |
| 2006–07   | 0        | 4    | 0        | 4    | 0        | 4    | 0        | 4    | 0        | 0    |
|           | TOTAL    |      |          |      |          |      |          |      |          |      |
| Fishstock | Landings | TACC |          |      |          |      |          |      |          |      |
| 2001–02*  | 1.27     | –    |          |      |          |      |          |      |          |      |
| 2002–03   | 0.604    |      |          |      |          |      |          |      |          |      |
| 2003–04   | 0.009    | 48   |          |      |          |      |          |      |          |      |
| 2004–05   | 0.215    | 48   |          |      |          |      |          |      |          |      |
| 2005–06   | 0.021    | 48   |          |      |          |      |          |      |          |      |
| 2006–07   | 0.017    | 48   |          |      |          |      |          |      |          |      |

\*In 2001–02 77.5 kg were reportedly landed, but the QMA is not recorded. This amount is included in the total landings for that year.

### 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

*C. bicolor* is a very large, purple and tan to yellowy tan coloured crab that reaches at least 192 mm carapace width (CW). It is found on and north of the Chatham Rise, and particularly along the east coast north of Hawkes Bay to North Cape. It has been found on both hard and soft substrates, but is considered to be a burrowing crab, living in soft sediments. It has been recorded from depths between 800 and 1100 m around New Zealand, and between 275 and 1620 m elsewhere in the Pacific.

*C. bicolor* was previously referred to as *C.* (sometimes *Geryon*) *quinquedens* and belongs to the family Geryonidae which has an almost world-wide distribution. There is no information on its reproduction or age, growth, or natural mortality in New Zealand waters—which may or may not be similar to the same or similar *Chaceon* species elsewhere.

Geryonid crabs such as *C. bicolor* tend to show partial sex aggregation, females being in shallower water than males. Small crabs are usually found in deeper water than the adults, as a result of juvenile settlement in deep water. There can be both seasonal and ontogenetic movements between depth zones.

Females carry a single clutch of eggs during the winter, which hatch the following summer. Clutch size increases with female size, and egg numbers are of the order of 100 000 to 400 000. The eggs are small (0.5–0.6 mm diameter), suggesting a relatively long larval life, probably resulting in widespread dispersal. Off Western Australia, however, *C. bicolor*, females may be ovigerous at any time of the

year. One study off Western Australia found that the lengths at 50% maturity were 90.5 mm and 94 mm carapace length (CL) for females and males respectively.

Pot catches usually yield a very biased sex ratio favouring males, which may be due to the fact that ovigerous females remain buried in the substrate during incubation.

### **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)**

The levels of incidental catch from crab fishing are unknown, but in both the Alaskan and Western Australian crab fisheries bycatch is typically low, and is not thought to impact on the abundance of the species caught. Ghost fishing is also not thought to be significant in these fisheries.

#### **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 *C. bicolor* on community structure.

#### **4.5 Spawning disruption**

There is no information on the reproductive patterns of this crab in New Zealand waters, although off Western Australia females may bear eggs throughout the year. Pot catches are predominantly male, possibly because egg-bearing females remain in the substrate during incubation. The effects of a largely 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 red crab fishstock.

## RED CRAB (CHC)

### 5.2 Biomass estimates

There are no biomass estimates for any red crab fishstock.

### 5.3 Estimation of Maximum Constant Yield (MCY)

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

### 5.4 Estimation of Current Annual Yield (CAY)

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

## 6. STATUS OF THE STOCKS

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

## 7. FOR FURTHER INFORMATION

- Dawson EW. and Webber WR. 1991. The deep-sea red crab *Chaceon* ("Geryon"): a guide to information and a reference list of the family Geryonidae. National Museum of New Zealand Miscellaneous Series No. 24.
- McLay CL. 1988. Brachyura and crab-like Anomura of New Zealand. Leigh Laboratory Bulletin No: 22. 463p.
- Manning RB., Dawson EW., and Webber WR. 1990. A new species of *Chaceon* from New Zealand (Crustacea: Decapoda: Geryonidae). Proceedings of the Biological Society of Washington 103: 602–607.
- Manning RB., and Holthuis LB. 1989. Two new genera and nine new species of geryonid crabs (Crustacea, Decapoda, Geryonidae). Proceedings of the Biological Society of Washington 102: 50–77.
- 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.
- Naylor JR., Webber WR., Booth JD. 2005. A guide to common offshore crabs in New Zealand waters. New Zealand Aquatic Environment and Biodiversity Report No. 2.
- Smith KD., Potter IC., Hall NG. 2004., Biological and fisheries data for managing the deep-sea crabs *Hypothalassia acerba* and *Chaceon bicolor* in Western Australia. Projects No. 1999/154 and 2001/055. FRDC Australia.
- Webber R., Dawson E., and Stephenson B. 1989. The deep-sea red crab – a new resource? Professional Fisherman 3(6):10–11.