



# Paddle crabs: a developing fishery

*The paddle crab fishery has considerable potential for growth. There are large areas of suitable coastline that are unfished commercially, and there is a substantial local market for high quality, hand-picked crabmeat.*

The paddle crab, *Ovalipes catharus*, supports a small commercial fishery in New Zealand, but is seldom targeted by recreational fishers. Landings total about 400 t per year and are sold locally rather than exported. At port prices of \$2500 per tonne, the fishery is estimated to be worth about \$1,000,000 a year.

Overseas, other swimming crabs, such as the American blue crab, the Australian sand crab, and the mangrove or mud crab, support major fisheries with broad export appeal. Similarities with other commercial species suggest that the paddle crab fishery may be under-exploited, and, therefore, has potential for further development.

## Commercial fisheries

Commercial interest in New Zealand paddle crabs began in 1977–78 when fishers caught marketable numbers of large crabs just outside the surf zone of Westshore Beach, Napier. Small landings were also taken off Paremata, Motueka, and Akaroa in 1977, and elsewhere the following year. Since then, the fishery has expanded rapidly. Annual catches show marked variations that are mainly due to marketing issues. Crabs are marketed live, cooked whole, or as crabmeat.

Commercial crab fishing methods include set-pots, lift-pots, set-nets, and, occasionally, trawling. Bycatch can be a problem with set-nets and it is labour intensive to remove the crabs. Crabs cannot legally be targeted by trawling,

By Darren Stevens, NIWA, Wellington  
Jeffrey Shields, Virginia Institute of Marine  
Science, Gloucester Point, VA, USA  
Matt Whittaker and Narina McBeath,  
Waikanae Crab, Reikorangi, Waikanae



but they are legally harvested as bycatch. Long trawl shots often damage the crabs. Static methods, such as lift-pots and set-pots, minimise damage and provide the best quality crabs. As in many crab fisheries, pots are the most effective means of catching crabs. Currently, only hand-gathering and potting (but not with rock lobster pots) are legal methods for commercially harvesting paddle crabs (unless special permits are held). Catch rates, however, vary considerably with method, season, and area.

Most paddle crabs are caught off the east coast of New Zealand, and in the Challenger and central west areas. For the 1989–90 and 1990–91 fishing years, the highest reported landings were in QMA 7. Since the 1991–92 fishing year, QMA 1 has reported the highest landings. These catches probably reflect greater effort and the larger market of the Auckland area rather than a greater biomass of crabs. There was a substantial increase in landings in QMA 2 in the 1997–98 fishing year, mainly due to expansion in the Napier fishery. There is some movement by crab fishers between areas and coasts depending on the prevailing weather patterns.

In QMAs 3, 4, 5, and 6 there is a minimum legal size of 75 mm carapace width (CW). This ensures that females have spawned and males have mated at least once. The female broodstock is further protected by the prohibition on taking egg-bearing crabs, and by the market demand for the larger male crabs (over 100 mm CW). Seasonal movements and differences in growth rates and sex ratios between areas need to be considered in the management of paddle crabs.

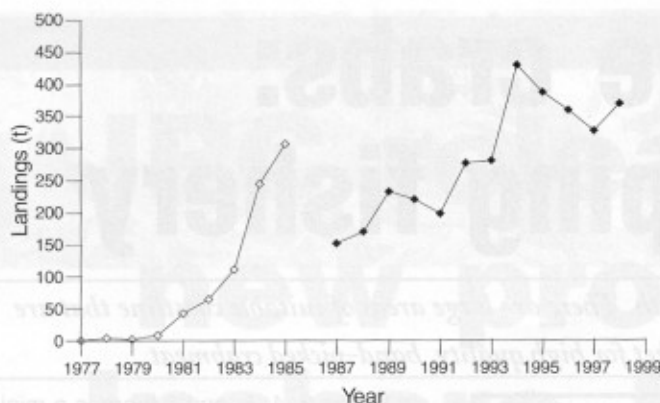
In QMAs 3, 4, and 5 there are annual competitive quotas of 100, 50, and 100 t respectively, which have never been reached. Catches in QMA 3 rarely approach 50 t, and QMAs 4, 5, and 9 rarely report landings over 1 t.

## Stock assessment

The available information suggests that paddle crabs in New Zealand waters (except perhaps the Chatham Islands) comprise one large stock, with possible sub-populations separated by latitudinal gradations. Latitudinal differences in growth rate, size at first maturity, and fecundity, particularly the number of broods per season, are probably environmentally regulated.

Because the fishery is market driven and lightly exploited, accurate yield estimates are not possible. Current commercial regulations which prohibit the taking of egg-bearing females and restrict fishing methods offer considerable protection to the fishery. The competitive quotas and the minimum legal size (MLS) set in some areas are inconsistent and do not constrain the fisheries.





Estimated total New Zealand annual landings of paddle crabs. Data are from FSU (1977-85) and LFRF (1987-98) sources.

Year	QMA										Total
	1	2	3	4	5	6	7	8	9	Unk.	
1989-90	20	57	38	<1	<1	0	94	22	0	0	231
1990-91	34	37	26	0	6	0	68	12	0	0	183
1991-92	96	32	31	<1	<1	0	83	21	0	0	265
1992-93	175	14	36	0	<1	0	59	25	0	0	308
1993-94	277	18	46	0	<1	0	49	27	6	0	423
1994-95	237	6	36	<1	<1	0	72	46	<1	0	397
1995-96	183	5	18	<1	1	55	82	58	<1	<1	403
1996-97	169	25	38	0	1	25	106	44	<1	1	410
1997-98	197	125	18	<1	13	8	63	26	<1	<1	449

Reported paddle crab landings (t) by QMA and fishing year. (Data are from CELR<sub>landed</sub> and CLR: Data in the figure and the table are from different sources and may differ.)

## Commercial prospects

Historically, paddle crabs were often difficult to market. They were perceived to be lowly subordinates to rock lobster and shellfish. There is also some confusion amongst consumers between crab meat and the crab-flavoured surimi sticks available at the local takeaway.

However, the paddle crab, like many large portunids, has a delicate, sweet flavour and is experiencing a surge in popularity throughout the country. Posi-

tive reviews by food critics and marketing improvements, such as printed serving suggestions and processing guides, have helped improve consumer awareness of the value of crabmeat.

There are two distinct markets for paddle crabs in New Zealand. There is a niche market for high quality, hand-picked crabmeat in top restaurants (many chefs throughout the country feature crab dishes on their menus) and a growing demand for whole cooked and fresh and live paddle crabs in supermarkets and seafood retailers, particularly in the Auckland area. The demand for high quality crabmeat greatly exceeds the supply.

The entire crab is used during processing. The carapaces are cooked and cleaned and used for decorative effects in gourmet meals, the claws are sold split or whole for buffet meals and smorgasbords, cooked remnants are used in seafood bisques, and the remainder is processed into fishing burley.

Crabmeat is highly valued in overseas markets. For example, canned meat from the Australian sand crab has begun to satisfy demands by American restaurants featuring crab cakes and crab-stuffed sole. At a retail value of \$US22 per kg (and more in Japan), picked crab meat is potentially lucrative, but labour costs, quality assurance, and market access need to be assessed.

Soft-shell crabs are a delicacy, and could become an important future export earner as the New Zealand crab fishery expands. The development of a soft-shell industry would require biological assessment, changes to regulations to allow smaller crabs to be taken, and market


analysis. Biological assessments should focus on the quickly growing (hence, moulting) sublegal crabs (50-70 mm CW). Moulting indicators, such as the "pink sign" visible on the legs of the American blue crab, would have to be developed.

In the USA, recirculating seawater systems allow fishers to hold pre-moult crabs for "shedding": the soft-shell crabs are then stored in seaweed or wet newspapers and shipped live at 4 °C. At \$US25 a dozen to as much as \$25 for two at dinner, soft-shell crabs are shipped live over moderate distances or blast frozen for foreign markets. Soft-shell crab makes up less than 10% of the blue crab catch in Chesapeake Bay, but it represents over 25% of the value of that fishery.

In the USA, pre-moult blue crabs have smaller legal sizes than "hard" crabs. Soft-shelled crabs do not generally feed, and so are difficult to catch in normal pots. Pre-moult female blue crabs are caught in pots baited with males (mating season) or in special "peeler pots" or traps (male moulting season) that provide "shelter" for the moulting males. Development of gear specific to the moulting paddle crab would be essential for the production of soft-shell paddle crab in New Zealand.

## Non-commercial fisheries

The 1996 national marine recreational fishing survey showed that paddle crabs are seldom targeted by recreational fishers, but are an important bycatch in beach and estuarine seining and set-nets. The nature and extent of Maori fisheries for paddle crab are not known.



## Maritime Studies 2001

Pre-sea training for a seafaring career! Gain three national qualifications in one, while preparing yourself for work in the fishing, charter boat and maritime industry.

*We have friendly staff, great facilities and offer assistance finding affordable accommodation.*

For further information contact:

The Information Centre  
Bay of Plenty Polytechnic  
Private Bag 12001, Tauranga  
Phone 0800 BOP POLY  
(0800 267 7659)  
Fax 07 544 2386

*Registered Member of the MTA*

**FORWARD >> thinking**

## WAIKANAE CRAB



### CRAB FISHERMEN WANTED

Any area - we will buy up to 500kg per day, per fisherman.

We also need experienced fishermen to fish our Permit PAD Areas 2, 8 & 7.

Will take bulk landings - also by-caught crab - we arrange all freight.

**Contact Matt Whittaker: phone 04 293 7314**

FISHERMEN • PROCESSORS • SUPPLIERS OF  
PURE NEW ZEALAND PADDLE CRAB PRODUCTS