

Broome Prawn Managed Fishery Status Report

Prepared by M. Kangas and E. Sporer, with management input by D. Harvey

FISHERY DESCRIPTION

The Broome Prawn Managed Fishery operates in a designated trawl zone off Broome and targets western king prawns (*Penaeus esculentus*) and coral prawns (a combined category of small penaeid species) using otter trawl.

Governing legislation/fishing authority

Broome Prawn Managed Fishery Management Plan 1999
Broome Prawn Managed Fishery Managed Fishery Licence

Consultation process

Department–industry meetings

Boundaries

The boundaries of this fishery are 'all waters of the Indian Ocean off the north-west coast of Western Australia east of 120° east longitude and west of 123°45' east longitude on the landward side of the 200 m isobath'.

Within this schedule, the permitted fishing area is 'all Western Australian waters bounded by a line commencing at the intersection of 17°20' south latitude and 121°50' east longitude; thence east to the intersection of 17°50' south latitude and 121°55' east longitude; thence north-east to the intersection of 17°40' south latitude and 122° east longitude; thence north to the intersection of 17°30' south latitude and 122° east longitude; thence north-west to the intersection of 17°20' south latitude and 122°55' east longitude; thence west to the commencement point'.

Management arrangements

Management controls for the Broome Prawn Managed Fishery are based on limited entry, seasonal closures and gear controls.

The fishery dates generally coincide with the seasonal closures for the Australian Government's Northern Prawn Fishery (NPF) and the Kimberley Prawn Managed Fishery. In 2003, as in 2002, the longer NPF mid-season closure allowed a longer fishing period in the Broome fishery, where the season commenced on 24 May and closed on 12 August. There were three fishing periods around the new moon phase, thus optimising the best catching periods for king prawns for the time available in this fishery.

Bycatch reduction devices (grids) were fully implemented in the 2003 season, with all vessels operating in the fishery required to install grids in all gear (except try nets).

Research summary

Research data for managing this small seasonal fishery are provided by detailed research log books completed by all boats. These data are used for stock assessment and monitoring which is discussed with industry at annual review meetings. A Delury depletion analysis is also

completed which assists in the assessment of the king prawn stocks within this region.

RETAINED SPECIES

Commercial production (season 2003): 201 tonnes

Landings

The total landings for the 2003 season were 201 t, including 73 t of king prawns and 128 t of coral prawns (Broome Prawn Figure 1). King prawn landings for 2003 were approximately 18% below the five-year average (89 t) but within the acceptable range. The catch of coral prawns was the highest recorded in this fishery and greater than the acceptable range. It is assumed that this was due to improved recruitment.

Fishing effort/access level

Five WA-based NPF (Gulf of Carpentaria) boats are licensed to operate in this fishery.

A total of 77 days were fished in 2003. Nominal effort recorded in the daily research log books for the fleet was 4,158 hours, 3% higher than recorded in 2002 and the highest on record. The increased effort reflects the additional days allocated for fishing in 2003 over the appropriate moon phases, and the fact that catch rates (of the two species combined) were maintained over the extended fishing period.

Catch rate

A lower catch rate (17.4 kg/hr) than last year was observed for king prawns throughout the fishing period. This was 42% down on the five-year average but remained constant between May and August. Lower king prawn catch rates were observed in all northern prawn fisheries in 2003 and may have been due to poor environmental conditions over fairly large spatial scales. The catch rate of coral prawns was 30.9 kg/hr, 22% higher than the five-year average. The catch rate of coral prawns increased from May to August.

Recreational component:

Nil

STOCK ASSESSMENT

Assessment complete:

Yes

A Delury depletion analysis incorporating lunar effects was carried out on the 2003 log book data to quantify the standing stock of king prawns in the Broome fishery. From this analysis, a standing stock of approximately 220 t was estimated. This indicates that for the 2003 season approximately 33% of the stock was taken by fishing, utilising the 4,158 hours of fishing recorded in this fishery. This compares with a stock estimate of 320 t in 2002 and an exploitation rate of 40%. The approach of using a depletion analysis has potential to examine variation in recruitment strength from year to year because the standing stock estimate for each year will reflect this. The depletion method applied has provided a good insight into stock levels. It has the advantage of being a very direct assessment method, with the potential to carefully control exploitation rates. It is intended to continue its use as the primary assessment method for this fishery.

Stock assessment is not undertaken for the coral prawn stock, as the small size of these species relative to the trawl mesh size ensures a low exploitation rate is maintained.

Exploitation status: **Under-exploited**

The exploitation rates obtained from the depletion analysis (30–40%) indicate that this fishery is still under-exploited (most prawn fisheries take 70–80%) despite the fishing effort being the highest on record over the last two seasons.

Breeding stock levels: **Adequate**

Depletion analysis indicated that approximately 67% of the king prawn stock was left when fishing ceased in the 2003 season. This stock would contribute to the spawning stock for 2004 and some females would have spawned prior to capture. These data indicate that the king prawn stock is being maintained well above the level of 20% of virgin biomass generally considered to be sufficient to sustain this type of prawn stock.

NON-RETAINED SPECIES

Bycatch species impact: **Low**

Owing to the short duration of this fishery and the small number of boats involved, the impact on bycatch species is considered to be minimal. In 2003, 50% of the gazetted fishing area was fished, which represents less than 1% of the total Broome Prawn Managed Fishery area. The introduction of fish escapement devices within the nets by 2004/05 should reduce this risk even further.

Protected species interaction: **Negligible**

The fishery operates in relatively deep water, and this fact, combined with the short season, restricted trawl area and small number of boats involved, means that interaction with protected species is minimal. The full implementation of bycatch reduction devices (grids) in the fishery in 2003 has further minimised the capture of large animals including turtles.

ECOSYSTEM EFFECTS

Food chain effects: **Low**

The short duration and limited spatial coverage of this fishery, combined with the small number of boats involved, results in a relatively small amount of biomass being taken by this fishery. Consequently the impacts on the food chain will be small to insignificant.

Habitat effects: **Negligible**

The fishery targets non-schooling king prawns with a secondary catch of coral prawns (common name due to colour, not habitat association) in relatively deep water. The fishery is permitted to operate only in a discrete area offshore, north-west of Roebuck Bay (which is the nursery area for this king prawn stock). The defined trawling area was surveyed by Fisheries Research Division and industry divers prior to establishment of the management plan to ensure minimal impact on the adjacent pearl fishery habitat. The sea floor in the trawl area was mud or sand, which is unlikely to be adversely impacted by trawling.

SOCIAL EFFECTS

The estimated employment generated by the fishery for the year 2003 was 20 skippers and crew over the three-month season. The vessels operate for the remainder of the year in the prawn fisheries further north.

ECONOMIC EFFECTS

Estimated annual value (to fishers) for year 2003:
\$1.3 million

Ex-vessel prices for prawns vary depending on the type of product and the market forces operating at any one time. Generally, average prices received by boats fishing off Broome for 2003 were as follows:

King prawns	\$13.20/kg
Coral prawns	\$2.50/kg

FISHERY GOVERNANCE

Acceptable catch range for next season: 55–260 tonnes

Under current effort levels and previous environmental conditions, the acceptable ranges of prawn catches are as follows:

King prawns	35–170 t
Coral prawns	20–90 t

For king prawns the acceptable range is based on the catches of the 1990s, while for coral prawns it is based on the seven-year range (1996–2002) since catches were first recorded. Therefore, the 73 t of king prawns taken in 2003 is in the lower end of the acceptable range for this species. The catch of 128 t of coral prawns is above the range. The acceptable catch range may need to be reviewed since more accurate reporting of coral prawn landings is now occurring.

New management initiatives (2003/04)

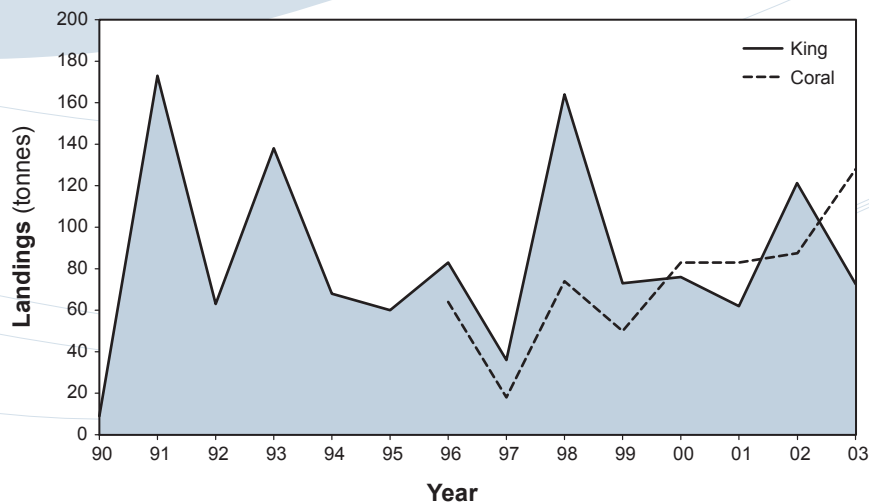
The Australian Government Department of Environment and Heritage is currently considering an application to certify the Broome Prawn Managed Fishery as environmentally sustainable under the provisions of the *Environment Protection and Biodiversity Conservation Act 1999*.

EXTERNAL FACTORS

Catches of king prawns in the Broome Prawn Managed Fishery have fluctuated between 36 t and 173 t since 1991. Before that time this fishing area was used on a casual basis by boats transiting to the Northern Prawn Fishery in the Gulf of Carpentaria. The success of this fishery depends on how the limited fishing season coincides with the king prawn recruitment and catchability, which is strongly influenced by the lunar period.

This fishery is valuable, despite its short season, because it allows up to 11 weeks of fishing by five boats in a way that complements their fishing activity in the NPF, and in other fisheries in Western Australia.

Broome Annual Prawn Catch



BROOME PRAWN FIGURE 1

Annual landings for the Broome Prawn Managed Fishery, 1990–2003.

Kimberley Prawn Managed Fishery Status Report

Prepared by M. Kangas, E. Sporer and G. Parry, with management input by G. Baudains

FISHERY DESCRIPTION

The Kimberley Prawn Managed Fishery (KPF) operates off the north of the state between Koolan Island and Cape Londonderry. It predominantly targets banana prawns (*Penaeus merguianus*) but also catches tiger prawns (*Penaeus esculentus*), endeavour prawns (*Metapenaeus endeavouri*) and western king prawns (*Penaeus latisulcatus*). Fishing is undertaken using otter trawl.

Governing legislation/fishing authority

Kimberley Prawn Fishery Management Plan 1993
Kimberley Prawn Fishery Managed Fishery Licence

Consultation process

Department–industry meetings

Boundaries

The boundaries of this fishery are ‘all Western Australian waters of the Indian Ocean lying east of 123°45’ east longitude and west of 126°58’ east longitude’. It abuts the western boundary of the Australian Government’s Northern Prawn Fishery (NPF).

Management arrangements

The management controls for the Kimberley Prawn Managed Fishery are based on limited entry, seasonal closures, gear controls and restrictions on boat replacements.

Seasonal dates for the Kimberley Prawn Managed Fishery are aligned with those of the adjacent Northern Prawn Fishery. A significant number of vessels hold authorisations to operate

in both the KPF and the NPF, and opening and closing dates are aligned to prevent large shifts of fishing effort into the Kimberley fishery. Consequently, the 2003 Kimberley season opened on 1 April and closed for the mid-season closure on 27 May. The fishery re-opened on 1 September with a promulgated final season closure on 9 November.

In 2003 a total effort cap system was introduced that restricts the number of fishing days available within the fishing season, based on historical effort levels in the fishery. This was split as 600 days for the first half of the season and 900 days for the second half.

The vessel monitoring system has been in operation in the fishery since 2001. From the second half of the 2003 season, bycatch reduction devices (specifically grids) were also required in all gear (except try nets).

Research summary

Research data for monitoring this fishery are provided by Western Australian fishers’ monthly returns, and by research log books collected by the Australian Fisheries Management Authority for NPF boats licensed to operate in the Kimberley fishery. Research assessments are provided to annual meetings of boat operators and provide the basis for recommending changes to management arrangements each year.

RETAINED SPECIES

Commercial production (season 2003): 390 tonnes

Landings

The total landings for the 2003 season were 390 t, comprising 309 t of banana prawns, 47 t of tiger prawns, 26 t of endeavour prawns and 7 t of king prawns (Kimberley Prawn Figure 1).

The banana prawn catch was within the projected catch range (240–370 t) calculated using the relationship between