

Broome Prawn Managed Fishery

MANAGEMENT OVERVIEW

The Broome Prawn Managed Fishery is a small trawl fishery off Broome. The fishery generally coincides with the seasonal closures for the Northern and Kimberley prawn fisheries. The dominant species caught are western king prawns (*Penaeus latisulcatus*) and coral prawns (a combined category of small penaeid species).

On 1 March 1999, the management plan for the Broome Prawn Managed Fishery came into effect. Essentially, the management plan encompasses the previous management arrangements for the interim managed fishery, with the addition of a provision for the Executive Director to direct licensees to install bycatch reduction devices if required, as well as the installation of vessel monitoring equipment.

COMPLIANCE AND COMMUNITY EDUCATION OVERVIEW

Fisheries Officers based in Broome control the operation of this six-week fishery each year. Gear and licence checks were carried out during the season, with infringement notices being served on the masters of two vessels for minor licensing offences.

This fishery continues to be generally self-regulating, with the major concern being crew licensing for the short season.

RESEARCH OVERVIEW

Research data for managing this small seasonal fishery is provided by detailed research logbooks completed by all vessels. This data is used for stock assessment and monitoring which is discussed with industry at annual review meetings. During 1997/98 the relationship between catch and moon phase was investigated and has resulted in some modifications to the management arrangements.

The following status report summarises the research findings for this fishery.

Fishery Status Report

Main Features

Stock assessment complete:

Yes

Exploitation status:

Fully exploited

Breeding stock levels:

Adequate

continued over

Previous catch projections for year 1998:

King prawns 35-140 tonnes (based on five-year range)

Catch current season (1998):

Penaeids 238 tonnes, comprising:

King prawns	164 tonnes
Coral prawns	74 tonnes

Estimated annual value (to fishers) for year 1998:

\$2.6 million

Catch projection next year (1999):

King prawns 36-164 tonnes

Recreational component:

Not applicable

Boundaries and Access

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'.

The permitted fishing area was opened for the 1998 fishing season on 15 June and closed on 15 September.

Five Western Australian-based Northern Prawn Fishery vessels are licensed to operate in this fishery.

Annual Production

Main fishing method

Otter trawl.

Landings

The total landings for the 1998 season were 238 tonnes, including 164 tonnes of king prawns and 74 tonnes of coral prawns.

King prawn landings for 1998 were 113% higher than the five-year average (77 tonnes) (Other Prawn Figure 5).

Fishing effort

Nominal effort recorded in the daily research logbooks for the fleet was 3,789 hours.

Catch rate

A catch rate of 40.9 kg/hr for king prawns and 18.3 kg/hr for coral prawns was recorded.

Stock Assessment

Catches for king prawns in the Broome Prawn Managed Fishery have fluctuated between 36 and 173 tonnes since 1991. Before that time this fishing area was used on a casual basis by vessels transiting to the Northern Prawn Fishery in the Gulf of Carpentaria. The success of this fishery depends on how the limited fishing season (approximately six weeks) coincides with the king prawn recruitment and catchability, which is influenced by the lunar period. Historically, the timing of this fishery has been set by calendar to coincide with the Northern Prawn Fishery mid-season closure rather than the appropriate lunar period. Consequently, the timing of the fishing period has not always been optimal for exploiting the king prawn stock.

Following advice from the Fisheries Research Division, the timing for the opening and closing of the season in 1998 was adjusted to match the lunar-phase-driven recruitment and catchability patterns in order to achieve the best catch rates available during this fishing period.

The catch of king prawns for the 1998 season was above average, producing 164 tonnes. It must be noted that the duration of the fishing season, at approximately 13 weeks (15 June to 15 September), was double the duration of past seasons. However, the initial six weeks' fishing resulted in a catch of 122 tonnes of king prawns, and as this period was of equivalent duration to the annual season fished from 1991 to 1997 inclusive, a direct comparison can be made which still indicates an above-average catch.

A Delury depletion analysis was carried out on the 1998 logbook data to quantify the standing stock of king prawns in the Broome fishery. From this a standing stock of approximately 233 tonnes was estimated. This indicates that approximately 70% of the stock was taken by fishing, utilising the 3,789 hours of fishing recorded in this fishery. It is estimated that, at the rate of depletion observed, it would theoretically take approximately 5,200 hours to catch the whole stock (reducing the catch rate to zero). The approach of using a depletion analysis has great potential to examine variation in recruitment strength from year to year because the standing stock estimate for each year will reflect this. When sufficient years of data have been assembled, it will be possible to relate the proportion of the king prawn stock unfished at the end of the fishing season (a measure of spawning stock) and the recruitment of king prawns the subsequent year.

Breeding Stock Levels

Depletion analysis indicated that approximately 30% of the king prawn stock was left when fishing stopped. This stock could continue to breed. In addition, some

spawning may have occurred by females prior to their capture. These data indicate that the king prawn stock is above the level of 20% of breeding stock biomass needed to sustain the fishery.

Catch Projection for Year 1999

Under current effort levels, the king prawn catch projection for the 1999 season is 36-164 tonnes, based on the five-year average.

Product Value for Year 1998

Wholesale prices for prawns vary depending on the type of product and the market forces operating at any one time. Generally, prices for 1998 were as follows:

King prawns	\$14.50/kg
Coral prawns	\$3.50/kg

General Comments

This fishery has benefited from advice from Fisheries WA relating to the timing of the fishing season. The catch of king prawns is affected by the lunar phase, with lower catches occurring during the full moon. By bringing the timing of the season in line with lunar period, fishing efficiency has been maximised, and more consistent annual catch levels of king prawns are anticipated.

This fishery is valuable despite its short season because it allows 13 weeks' fishing by five vessels in a way that complements fishing activity in the Northern Prawn Fishery, and in other fisheries in Western Australia. Without this fishery, Western Australian vessels fishing in the Northern Prawn Fishery would spend too much valuable time shifting locations with few opportunities to fish in transit.

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.