

North Coast Blue Swimmer Crab Fishery Status Report

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Fishery Description

The blue swimmer crab (*Portunus pelagicus*) is found along the entire Western Australian coast, in a wide range of inshore and continental shelf areas, from the inter-tidal zone to at least 50 m in depth.

The majority of the commercially and recreationally-fished stock, however, is concentrated in the coastal embayments between Geopraphe Bay in the south and Port Hedland in the north. Crabbing activity in the North Coast bioregion is centered largely on the inshore waters from Onslow through to Port Hedland, with most commercial and recreational activity occurring in and around the embayment of Nickol Bay.

Dedicated blue swimmer crab fishers in the North Coast bioregion use purpose-designed 'hourglass' traps. The Pilbara trawl fisheries target prawns, but also retain crabs as a by-product.

The majority of recreational fishers in the North Coast crab fisheries use drop nets, with a small proportion using scoop nets or diving for crabs.

Governing legislation/fishing authority

Exceptions to the Fish Traps Prohibition Notice 1990 and Fish Traps Restrictions Notice 1994

Exemptions under Section 7 of the *Fish Resources Management Act 1994*

Nickol Bay Prawn Fishery Management Plan 1991

Nickol Bay Prawn Managed Fishery Licence

Onslow Prawn Fishery Management Plan 1991

Onslow Prawn Managed Fishery Licence

Commonwealth Government *Environment Protection and Biodiversity Conservation Act 1999* (Export Exemption)

Consultation process

Meetings between the Department of Fisheries and industry

Boundaries

One dedicated commercial crab fisher is endorsed to operate two 200-trap allocations between longitudes 115° E and 120° E (approximately Onslow to Port Hedland), from the high water mark to the 200 m isobath. The other fisher is endorsed to use a maximum of 200 traps, with boundaries that mirror those of the first endorsement other than the waters of Nickol Bay (i.e. between longitudes 115° E and 120° E, other than the waters of Nickol Bay, from the high water mark out to the 200 m isobath).

The boundaries of the Onslow Prawn Managed Fishery are 'all Western Australian waters of the Indian Ocean below high water mark lying west of 116°45' east longitude and east of a line commencing at the high water mark on the mainland due south

of the southernmost extremity of Locker Island drawn due north to the high water mark at that extremity; thence northwesterly to the high water mark at the southernmost extremity of Serrurier Island; thence northerly along the high water mark of that island on its western shore to its northernmost point; thence due north'.

The boundaries of the Nickol Bay Prawn Managed Fishery are 'all the waters of the Indian Ocean and Nickol Bay between 116°45 east longitude and 120° east longitude on the landward side of the 200 m isobath'.

Management arrangements

Commercial access to blue swimmer crab stocks in WA is governed by a series of separate management arrangements provided for under the legislative framework of the *Fish Resources Management Act 1994*.

Individual fisheries are managed under an input control system, primarily through the regulation of vessel and trap numbers. Supplementary controls cover retainable species and associated minimum size limits, gear specifications, and seasonal and daily time restrictions.

Exemptions were issued in 2001 for 2 fishers to target blue swimmer crabs in the waters off the Pilbara coast between Onslow and Port Hedland. One of these fishers was granted two 200-pot endorsements attached to his licence, making a total of three 200-pot endorsements in the fishery.

The exemption carrying the two 200-pot endorsements permitted fishing between longitudes 115° E and 120° E (approximately Onslow to Port Hedland), from the high water mark to the 200 m isobath. However, a maximum of 200 pots could be used in the waters of Nickol Bay at any one time.

The second exemption endorsed fishing with 200 pots between longitudes 115° E and 117° E (approximately Onslow to just west of Nickol Bay), from the high water mark to the 200 m isobath. A submission was received from this exemption holder in 2003 to expand the boundaries of this exemption to match the other Pilbara crab endorsement. Following consultation with the various stakeholders, the boundaries of the second exemption were expanded to mirror the first endorsement other than the waters of Nickol Bay (i.e. between longitudes 115° E and 120° E, other than the waters of Nickol Bay, from the high water mark out to the 200 m isobath).

The principal management tool employed to ensure adequate breeding stock in the North Coast crab fisheries involves maintaining minimum size limits well above the size at sexual maturity. The legal minimum sizes range of 135 mm carapace width (CW) in the Pilbara fisheries is set well above the size at sexual maturity, and should ensure adequate egg production for associated blue swimmer crab stocks under typical environmental conditions.

Management controls for the Onslow and Nickol Bay Prawn Managed Fisheries are based on limited entry, seasonal and area closures, and gear controls including bycatch reduction devices.

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BioregionGascoyne Coast
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North Coast Bioregion

('grids'). The management system involves a total allowable effort arrangement whereby all boats have an equal allocation of headrope length for all areas.

The fleet is composed of trawlers up to 23 m; operating twin- or quad-rigged otter trawls to a maximum headrope length of 16 fathoms (29.27 m).

The Department of Fisheries' Vessel Monitoring System (VMS) continues to monitor the activities of all boats.

Recreational fishing for blue swimmer crabs in Western Australia is managed through a series of input and output controls. As with commercial fishing, the principal management tool employed to sustain an adequate breeding stock involves maintaining minimum size limits well above the size at sexual maturity.

A minimum legal size limit of 127 mm CW applies in State waters, along with a bag limit of 20 crabs per person or 40 crabs per boat for 2006. Restrictions also govern gear types that can be used to take blue swimmer crabs, along with localised spatial and temporal closures.

Research summary

Data for the assessment of blue swimmer crab stocks in the North Coast bioregion are obtained from fishers' compulsory catch and effort returns, voluntary daily log books and on-board catch monitoring conducted by Department of Fisheries' research staff.

Additional information on the biology and ecology of blue swimmer crabs has been provided by a number of projects funded by the Fisheries and Research Development Corporation (FRDC) and conducted by the Department of Fisheries and Murdoch University.

Retained Species

Commercial landings (season 2005/06): 55 tonnes

The total commercial catch of blue swimmer crabs taken in Western Australian waters during 2005/06 was 896 t. Total landings for the North Coast bioregion during 2005/06 was 55 t.

The annual blue swimmer crab catch from the Pilbara Experimental Crab Trap Fishery increased by 46% during 2005/06, with total landings of 53 t compared to 34 t landed the previous year (North Coast Blue Swimmer Crab Figure 1).

While landings from the Pilbara trawl fleet dropped marginally from 4.4 t in 2004/05 to 2.6 t in 2005/06, the catch was consistent with trawl fleet landings from previous years (North Coast Blue Swimmer Crab Figure 1).

Recreational catch estimate (season 2005/06):

Recreational catch: About 25% of total catch

Most of the recreational fishing for blue swimmer crabs in Western Australia occurs in the West Coast bioregion, with minimal recreational effort in the North Coast bioregion.

A survey of recreational crabbing in Nickol Bay estimated a recreational catch of blue swimmer crabs of 20 t for the 2000 calendar year. This represented the majority of the catch from Nickol Bay in that year, as commercial operations targeting blue swimmer crabs in the area did not begin until the following year.

No further surveys quantifying recreational catch have been undertaken since the 2000 survey. If this level of recreational effort has been maintained, it would provide for about 25% of the total catch.

Fishing effort/access level

Effort in the Pilbara Crab Fishery increased during 2005/06 in line with the increase in landings of blue swimmer crabs. Commercial crab fishers reported 33,040 trap lifts from 141 fishing days, up from 19,780 trap lifts over 110 fishing days the previous year (North Coast Blue Swimmer Crab Figure 2).

Stock Assessment

Assessment complete: Preliminary

Breeding stock levels: Adequate

Length-frequency data gathered from ongoing monitoring programs in the Pilbara Experimental Crab Trap Fishery suggests that management controls currently in place provide adequate measures to maintain a sustainable level of catch and effort.

Monitoring of the commercial catch in the North Coast bioregion has been conducted since 2002, with consistent size distributions being recorded between years within the fishery. The development of appropriate mesh sizes for use on commercial crab traps has eliminated the catch of juvenile crabs (< 80 mm CW) and significantly reduced the catch of crabs < 120 mm CW, without impacting on legal catches.

Improved work practices have reduced the mortality of returned under-size and berried crabs caught in commercial traps to negligible levels.

Catch rates from each fishery provide an index of abundance which can be used to assess fishery performance from year-to-year. Trap catch rates in the Pilbara Experimental Crab Trap Fishery (North Coast Blue Swimmer Crab Figure 2) have increased steadily since the commencement of exploratory fishing along the Pilbara coast. This reflects the more efficient fishing of blue swimmer stocks in the Pilbara region as the commercial operators' knowledge of the spatial distribution of resident stocks and localized environmental influences increased over time. The increase in catch rate can also be attributed to improvements to fishing gear and vessels.

The mean catch rate for the Pilbara Experimental Crab Trap Fishery during 2005/06 was 1.6 kg/trap lift, comparable to the 2004/05 catch rate of 1.7 kg/trap lift (North Coast Blue Swimmer Crab Figure 2).

Non-Retained Species

Bycatch species impact: Negligible

The pots are purpose-designed to minimise the capture of non-target species and are therefore an inefficient way to capture fish, the majority of which are able to escape through the entrance gaps when the pot is soaking or being hauled. Small numbers of fish are infrequently captured in crab pots, but the fishers are not permitted to retain them.

The low number of fish caught and returned by crab fishers is considered to pose a negligible risk to these breeding stocks.

Discarded crab bycatch from trawl fisheries taking crabs as a by-product is dealt with in those reports specific to the trawl fisheries.

Protected species interaction: Negligible
The crab trap longline system utilised in the targeted crab fisheries has little possibility of interacting with protected species. The fishery is conducted in a manner that avoids mortality of, or injuries to, endangered, threatened or protected species, and avoids or minimises impacts on threatened ecological communities.

Ecosystem Effects

Food chain effects: Low
As the commercial take of crabs represents a relatively small portion of the biomass, which is effectively renewed annually, secondary food chain effects are likely to be minimal in these fisheries.

Habitat effects: Negligible
Fishing with traps results in limited habitat disturbance, with only minor dragging of traps on the bottom occurring during trap retrieval. Sand and associated biota do not get brought to the surface in commercial blue swimmer crab traps, as the mesh used on traps is sufficiently large to allow the escape of any sand-dwelling macrobenthos.

Although seagrasses are occasionally brought to the surface with the trap, the infrequent nature of this occurrence, and the small amount of living seagrass removed, results in minimal habitat damage.

Social Effects

During 2005/06, approximately 6 people were employed as skippers and crew on vessels fishing for blue swimmer crabs along the Pilbara coast. Additional employment is also being created in the Pilbara region through the development of post-harvest processing of the crab catch.

Economic Effects

Estimated annual value (to fishers) for year 2005/06:
\$0.25 million

Despite the smaller overall state catch in 2005/06, beach prices for blue swimmer crabs remained between \$4/kg and \$6/kg live weight in the major fisheries, with the average price for the year

around \$4.50. The catch from the Pilbara region was valued at approximately \$250,000 and sold through local and interstate markets.

Fishery Governance

Target catch (or effort) range

The Pilbara Experimental Crab Trap Fishery is still in its developmental stage and target catch and effort have yet to be set.

Current fishing (or effort) level: Acceptable
The Pilbara Experimental Crab Trap Fishery has undergone a steady expansion since exploration of the commercial viability of fishing blue swimmer crab stocks between Onslow and Port Hedland commenced in 2002.

The remote nature of much of this coastline has provided significant logistical and financial challenges to the commercial viability of accessing crabs stocks and returning the harvested catch to market in an acceptable time period. Improvements to fishing gear and vessels, along with a substantial increase in the fisher's understanding of the influences of localised environmental influences such as tide and wind, has allowed them to maintain catch levels while undertaking fewer pot lifts.

Fishing effort in this region is further limited by the extreme climatic conditions experienced during the summer months, which restricts fishing effort to the cooler months between May and November.

Consequently, the levels of fishing effort in the Pilbara Experimental Crab Trap Fishery is considered acceptable.

New management initiatives (2006/07)

The Pilbara Experimental Crab Trap Fishery will form part of the 'Developing New Fisheries' review process that will take place during 2006 and 2007. This review will provide a framework to determine the future viability of a fishery in this region.

External Factors

Levels of recruitment to many of the crab fisheries fluctuate considerably. While the causes of this variation are not fully understood, it is considered most likely due to environmental influences on larval survival.

Currents and water movement play a significant role in determining recruitment success, as a specific window of time is available during the megalopal larval stage of the blue swimmer crab to reach and/or select a suitable settlement site. Both temperature and salinity influence the spawning behaviour, distribution, activity and movement of blue swimmer crabs, while juvenile growth is also markedly influenced by the availability of food.

The relationship between environmental factors, recruitment and catch will be further evaluated as data becomes available.

West Coast
Bioregion

Gascoyne Coast
Bioregion

North Coast
Bioregion

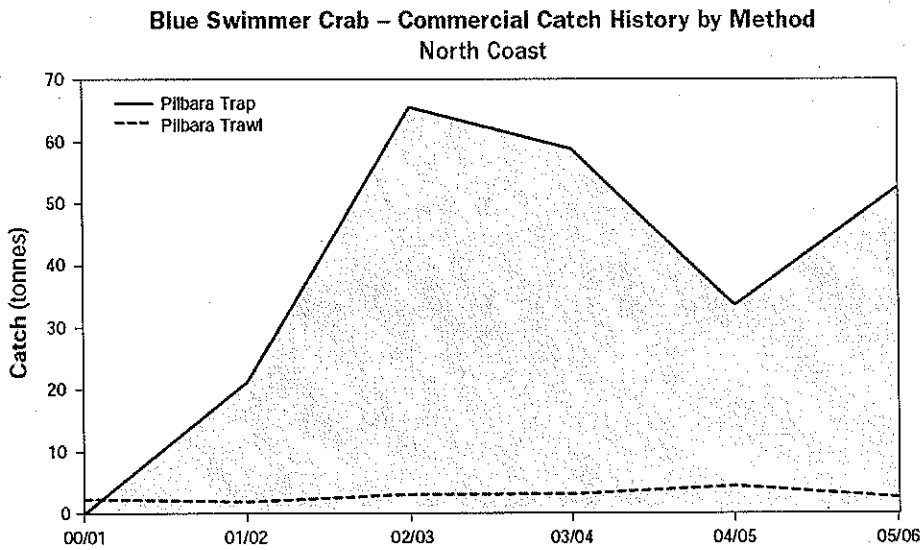
South Coast
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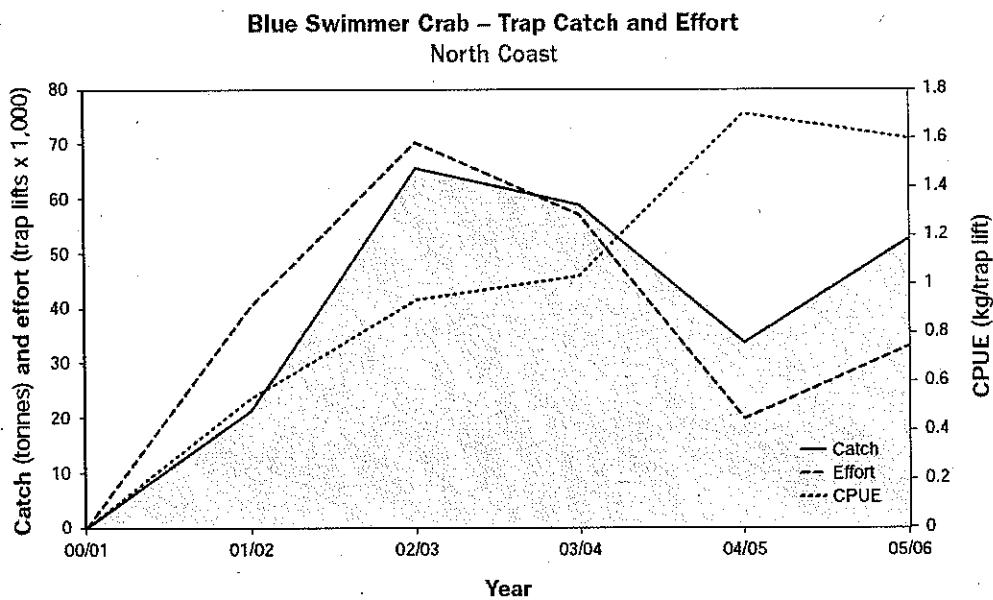
Southern Inland
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NORTH COAST BLUE SWIMMER CRAB FIGURE 1
Commercial catch history by method for the blue swimmer crab (*Portunus pelagicus*) in the North Coast bioregion between 2000/01 and 2005/06.



NORTH COAST BLUE SWIMMER CRAB FIGURE 2
Blue swimmer crab catch (tonnes), effort (trap lifts x 1,000) and catch per unit effort (kg/trap lift) in the North Coast bioregion between 2000/01 and 2005/06 using traps.