

# Annual status report Blue Swimmer Crab Fishery

2007



The Department of Primary Industries and Fisheries (DPI&F) seeks to maximise the economic potential of Queensland's primary industries on a sustainable basis.

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## Introduction

Blue swimmer crabs (*Portunus pelagicus*), often known as sand crabs, are found in coastal and estuarine waters along the entire Queensland coast but are fished mainly in the southern part of Queensland. They are an important species for both recreational and commercial fishers. The blue swimmer crab is targeted and harvested in all Australian states except for Victoria and Tasmania. This report covers the calendar year 2006.

### Fishery profile 2006

**Total harvest from all sectors:** approximately 921 t

**Commercial harvest (pot):** approximately 722 t

**Commercial harvest (trawl):** approximately 58 t

**Preliminary recreational harvest in 2005:** approximately 140 t

**Indigenous harvest in 2000–01:** < 1 t

**Charter harvest:** < 1 t

**Commercial Gross Value of Production (GVP):** \$5.8 million (pot harvest only)

**Number of licences:** 859 as of 30 June 2006<sup>1</sup>

**Commercial fishing boats accessing the fishery:** 190

**Fishery season:** year round, mainly targeted January–May, November–December

## Description of the fishery

### Fishing methods

Crab pots<sup>2</sup> (Figure 1) and collapsible traps<sup>3</sup> are the main apparatus used by commercial blue swimmer crab fishers. Recreational fishers use the same apparatus and are also permitted to use dillies.<sup>4</sup>

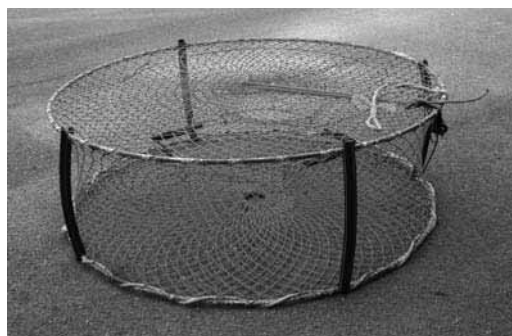


Figure 1: Crab pot

### Fishing area

The Blue Swimmer Crab Fishery comprises tidal waters on the east coast:

- east of longitude 142°31'49"
- north of latitude 10°48' south and between longitude 141°20' east and longitude 142°31'49" east

and in the Gulf of Carpentaria:

- between the 25 nautical mile line and the shore, south of latitude 10°48' south.

This essentially covers all Queensland tidal waters (Figure 2).

<sup>1</sup> As of 30 June 2006, the Commonwealth Department of the Environment and Water Resources (DEW) (formerly known as the Department of the Environment and Heritage) held 77 licences under the Great Barrier Reef Marine Park (GBRMP) Structural Adjustment Package.

<sup>2</sup> Under the Fisheries Regulation 1995, a crab pot is defined as 'a fishing apparatus comprising a cage with a round opening top, or an elongated opening (parallel to the base)'.

<sup>3</sup> Under the Fisheries Regulation 1995, a collapsible trap is defined as 'a trap made of rigid material, with one or more collapsible sides'.

<sup>4</sup> Under the Fisheries Regulation 1995, a dilly is 'a fishing apparatus comprising a frame and a net that hangs below the frame's horizontal plane when the apparatus is in use'.

## Main management methods used

The Department of Primary Industries and Fisheries (DPI&F), Queensland, manages the Blue Swimmer Crab Fishery in accordance with ecologically sustainable development principles. The fishery is managed under the Queensland *Fisheries Act 1994* and in accordance with the Queensland Fisheries Regulation 1995. Fishers taking blue swimmer crabs for trade or commerce must hold a primary commercial fishing licence endorsed with a C1 crab or T1 trawl fishery symbol. A range of input and output controls are in place to manage the harvest of blue swimmer crabs by commercial and recreational fishers, including:

- a minimum legal size limit that applies to both commercial and recreational fishers (11.5 cm carapace width)
- a prohibition on taking female crabs
- apparatus restrictions (50 pots per licence for the commercial sector and 4 pots per person for the recreational sector)
- a limit on the number of blue swimmer crabs that can be retained by trawl operators (100 in Moreton Bay and 500 elsewhere)
- limited entry to the commercial fishery (C1 endorsement required)
- restrictions on the number and size (no longer than 14 m) of commercial vessels (for the pot fishery)
- spatial closures, with areas of the fishery being closed to fishing under the Queensland Fisheries Regulation 1995 and through Marine Park zoning plans established under the Commonwealth *Great Barrier Reef Marine Park Act 1975* and the Queensland *Marine Parks Act 2004*.

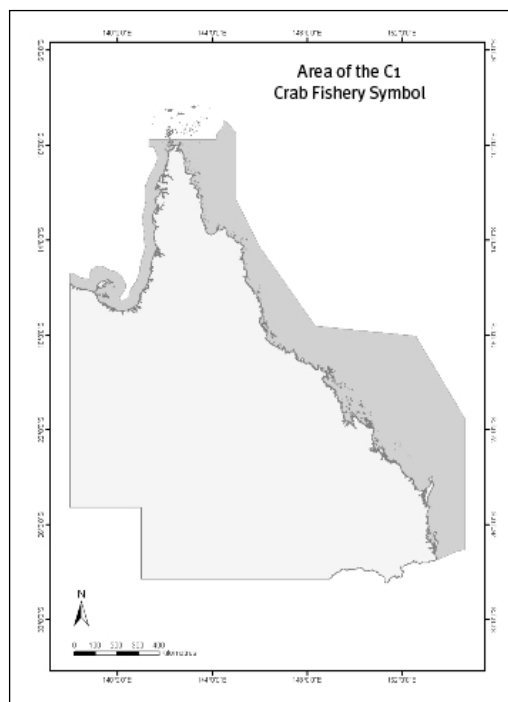


Figure 2: Boundary of the Blue Swimmer Crab Fishery.

## Approximate allocation between sectors

The fishery is predominantly commercial.

The majority of blue swimmer crabs are taken commercially by pot fishers (78%), followed by recreational fishers (15%) and then commercial trawl fishers (6%). Compared with the harvest by the commercial and recreational sectors, the annual harvest of blue swimmer crabs by the Indigenous and charter sectors is considered very low (less than 1 t).

## Fishery accreditation under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)

The fishery was granted a Wildlife Trade Operation (WTO) approval on 15 October 2004 under Part 13A of the EPBC Act. This accreditation acknowledges that the fishery is being managed in an ecologically sustainable manner and allows the export of the catch. The approval expires on 10 October 2007.

# Catch statistics

## Commercial

The total commercial catch of blue swimmer crabs is predominantly composed of product caught by pot. Blue swimmer crabs are listed as permitted species in the East Coast Otter Trawl Fishery and a small amount of product (approximately 6% of the total catch) is harvested in this fishery (Figure 3, Table 1).

With the introduction of the Fisheries (East Coast Trawl) Management Plan 1999, trawl operators were restricted to an in-possession limit of 100 blue swimmer crabs in Moreton Bay and 500 elsewhere. The effect of the regulation can be seen in the declining trawl catch and catch rate since 1999 (Figure 3). It should be noted that blue swimmer crabs were reported in fishers' daily logbooks as 'crab unspecified' before 1999 and, consequently, total catch figures during the 1990s may include some three-spot crabs.

The 2006 annual reported commercial pot catch of blue swimmer crabs increased slightly from 691 t in 2005 to 722 t (Figure 3, Table 1). The reported catch in 2005 and 2006 has returned to a level similar to the reported catch in 1999 and 2000 (Figure 3, Table 1).

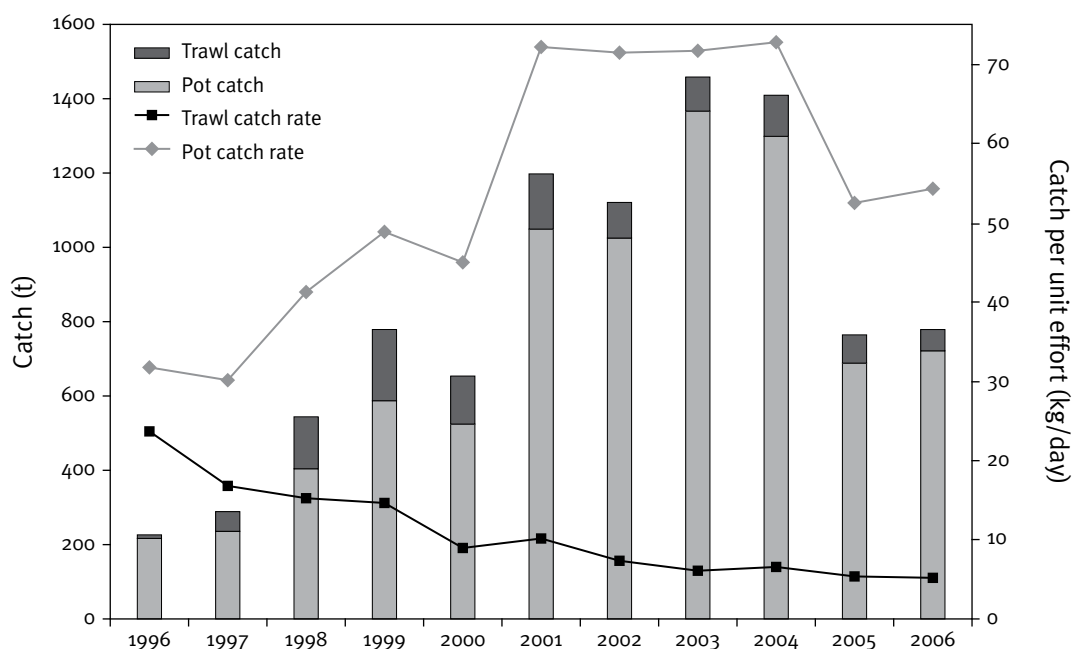


Figure 3: Reported total commercial catch and catch per unit effort (CPUE) of blue swimmer crabs, 1996–2006 (Source: DPI&F CFISH database, 23 April 2007).

Table 1: Fishery details for the commercial pot harvest of blue swimmer crabs, 2000–06 (Source: DPI&F CFISH database, 23 April 2007).

Year	Catch (t)	Days fished	Boats	CPUE (kg/day)	Days/boat	Catch/boat (t)	GVP (\$m)
2000	523	11 625	177	45.0	66	3.0	4.2
2001	1 053	14 612	199	72.0	73	5.3	8.4
2002	1 027	14 392	220	71.4	65	4.7	8.2
2003	1 370	19 162	262	71.5	73	5.2	11.0
2004	1 303	17 889	239	72.8	75	5.5	10.4
2005	691	13 171	190	52.4	69	3.6	5.5
2006	722	13 324	190	54.2	70	3.8	5.8

In 2006, commercial fishing effort increased slightly from 2005—with effort in both these years much lower than the peak observed from 2001–04 (Table 1). The decrease in effort in 2005 is a reflection of fewer boats accessing the fishery (Table 1), which may be in part a result of the licence buyout under the Great Barrier Reef Marine Park (GBRMP) Structural Adjustment Package. The Australian Government Department of the Environment and Water Resources (DEW) has purchased and surrendered 77 C1 crab fishing symbols, which will not be available for reallocation.

### Moreton Bay

The annual reported catch in the Moreton Bay region (see Figure 9) decreased from 289 t in 2005 to 261 t in 2006 (Figure 4). Moreton Bay has historically dominated the total harvest of blue swimmer crabs, with annual reported catches regularly around 300 t. The low reported catch in Morton Bay in 2005 and 2006 is consistent with the entire fleet and is likely to be associated with the observed decline in the number of days fished, from approximately 9060 in 2004 to 7280 in 2006. The extended drought experienced in south-east Queensland may also have affected crab numbers in Moreton Bay.

Catch per unit effort (CPUE) has remained relatively stable from 1999 onwards, excluding the peak in 2001 (Figure 4).

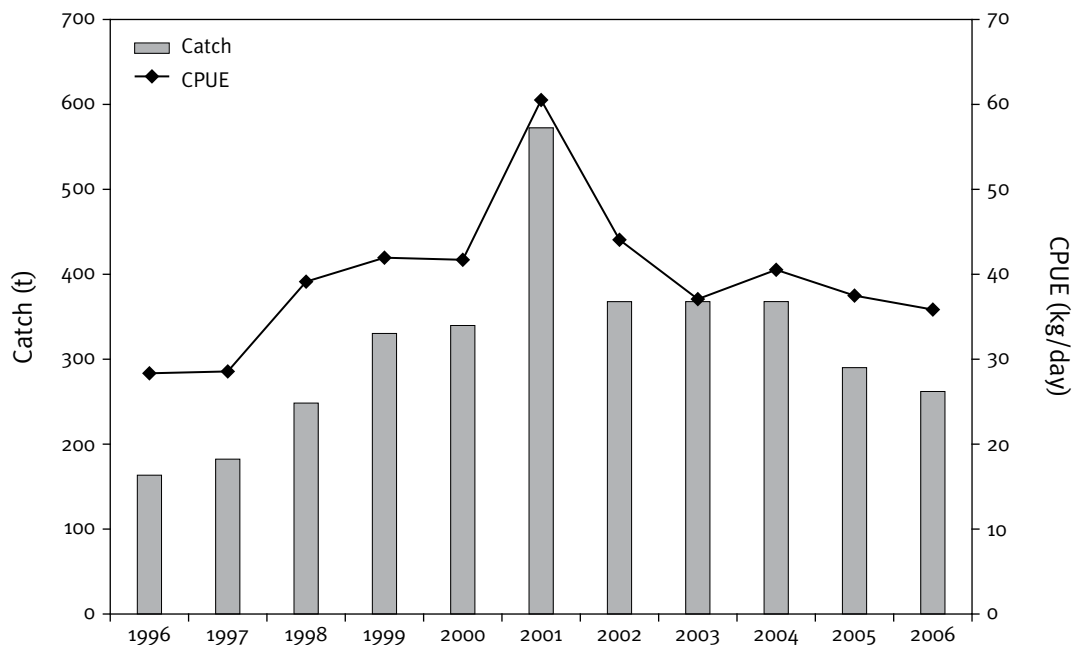


Figure 4: Reported catch and catch per unit effort in Moreton Bay (pot), 1996–2006 (Source: DPI&F CFISH database, 23 April 2007).

### Hervey Bay

The reported catch of blue swimmer crabs in the Hervey Bay region (see Figure 9) increased from 207 t in 2005 to 322 t in 2006 (Figure 5). The increase is likely to be associated with an increase in the number of days fished by approximately 600 days—the number of boats remained stable over the same period of time.

The observed increase in CPUE, from 85 kg/day in 2005 to 107 kg/day in 2006, indicates that the blue swimmer crab stocks in the Hervey Bay region are healthy (Figure 5).

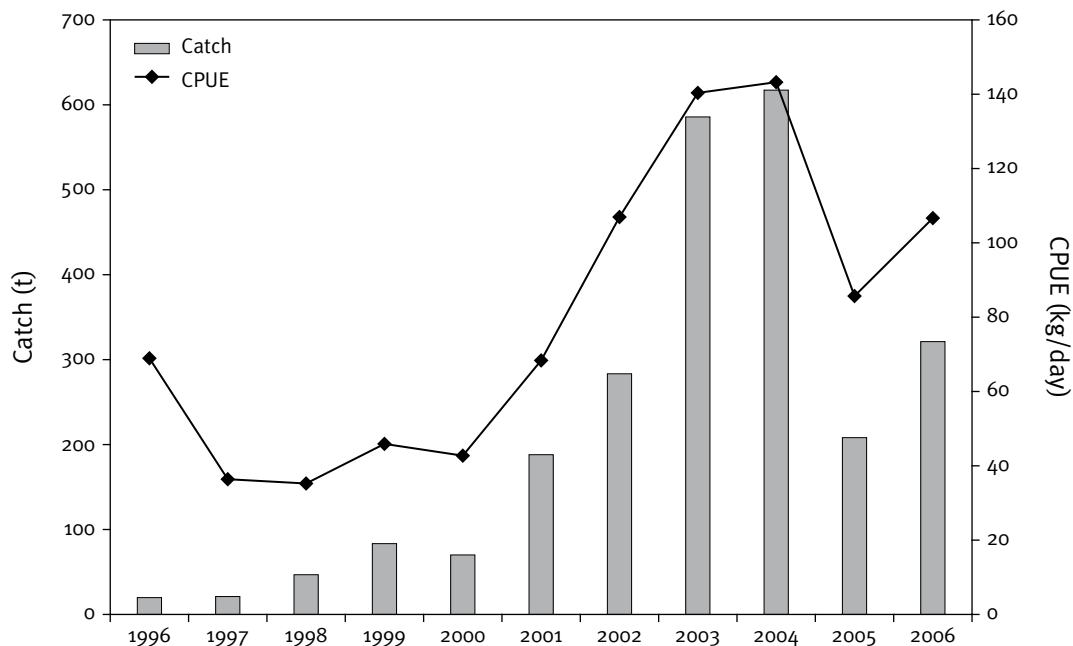


Figure 5: Reported catch and catch per unit effort in Hervey Bay (pot), 1996–2006 (Source: DPI&F CFISH database, 23 April 2007).

### Offshore region

The reported catch in the Offshore region (see Figure 9) decreased from 182 t in 2005 to 119 t in 2006 (Figure 6). The observed decrease is likely to be associated with the decrease in the number of boats accessing the fishery and the number of days fished declining almost 600 days from 2005 to 2006.

CPUE decreased slightly from 87 kg/day in 2005 to 80 kg/day in 2006 (Figure 6).

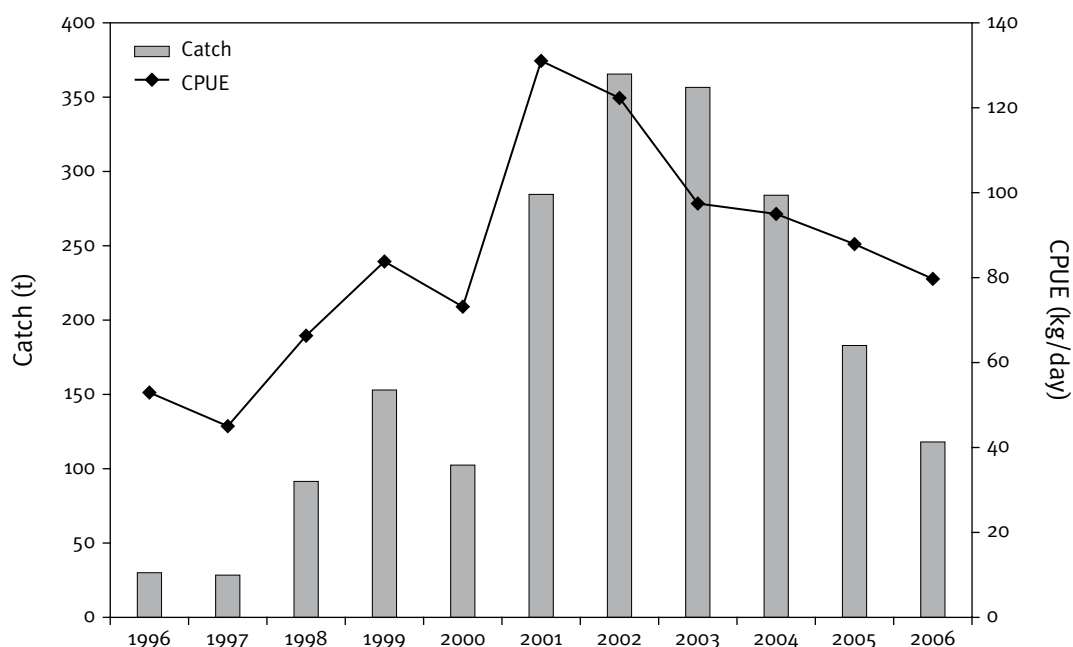


Figure 6: Reported catch and catch per unit effort in the Offshore region (pot), 1996–2006 (Source: DPI&F CFISH database, 23 April 2007).

## Recreational

The recreational harvest of blue swimmer crabs is significantly lower than the commercial harvest, contributing approximately 15% to the total fishery harvest. The most recent Recreational Fishing Information System (RFISH) diary survey, conducted in 2005, estimated that 1 185 135 blue swimmer crabs were captured, with 713 724 released (Table 2)—which represents little change from previous surveys.

Table 2: Recreational catch of blue swimmer crabs, estimated from RFISH surveys (1999, 2002 and 2005).<sup>5</sup>

	1999	2002	2005
<b>Number caught</b>	1 129 170	1 487 015	1 185 135
<b>Number released</b>	657 817	1 001 515	713 724
<b>Total estimated harvest</b>	471 353	485 499	467 827
<b>Estimated weight of total harvest</b>	Approx. 155 t	Approx. 160 t	Approx. 140 t

## Charter

Charter logbook data indicate that the charter harvest of blue swimmer crabs is negligible, with less than 70 kg a year having ever been taken. In 2006, charter operators reported a harvest of 13 kg.

## Indigenous

The Indigenous harvest of blue swimmer crabs in northern Queensland was estimated in the National Recreational and Indigenous Fishing Survey<sup>6</sup> (NRIFS). The study found that only 882 blue swimmer crabs (< 1 t) were harvested by Indigenous fishers. The low level of reported catch in northern Queensland is reflective of the distribution of blue swimmer crabs, which are more prolific in the southern part of Queensland.

## Spatial issues/trends

The Blue Swimmer Crab Fishery operates mainly along the south-east coast of Queensland. The two key blue swimmer crab regions are currently Moreton Bay (Brisbane region) and Hervey Bay (north of Maryborough). Moreton Bay has been fished since the mid-1900s, with a typically high proportion of the effort expended in this region, as was the case in 2006 (Figure 7). Recent further expansion of the blue swimmer crab pot fishery in regions outside Moreton Bay took place around 2000–02. Effort has since declined in regions outside Moreton Bay.

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<sup>5</sup> Recreational catch data for 2005 are preliminary as of April 2007. The Australian Bureau of Statistics (ABS) is currently calculating the associated standard errors for the estimated recreational harvest of blue swimmer crabs.

<sup>6</sup> GW Henry & JM Lyle, *The National Recreational and Indigenous Fishing Survey*, FRDC Project No. 99/158, Australian Government Department of Agriculture, Fisheries and Forestry, Canberra, 2003.

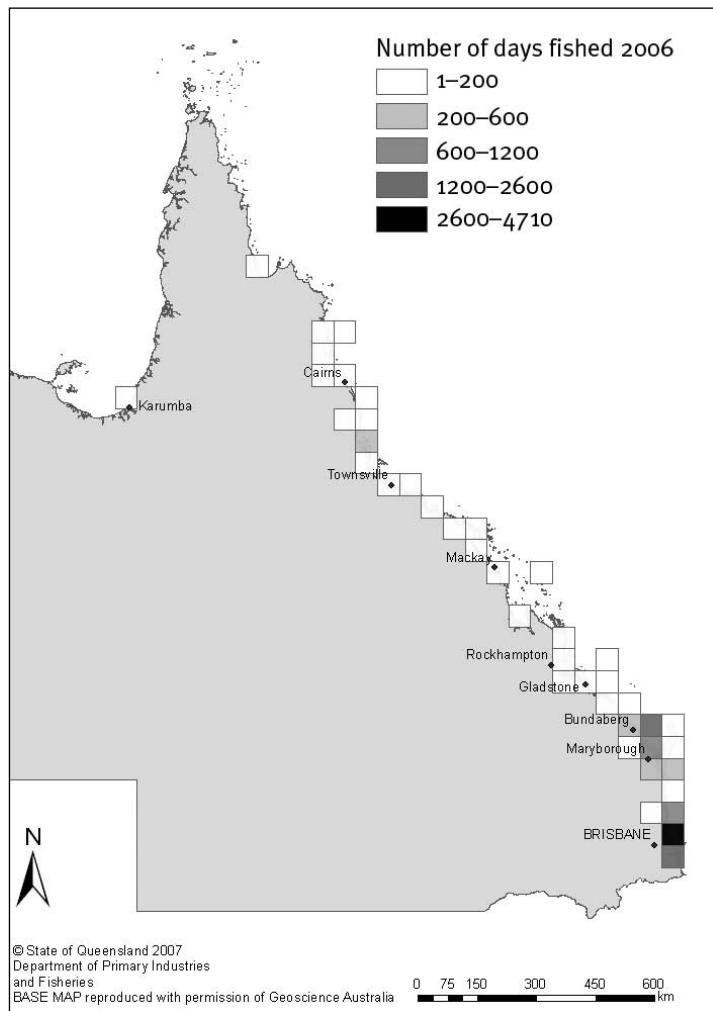


Figure 7: Distribution of effort (days fished) in the Blue Swimmer Crab Fishery (2006).

Historically, there have been differences in the catches and catch rates between the north and south of Queensland, mainly because of variation in the natural abundance of crabs.

### Socio-economic characteristics and trends

Blue swimmer crabs are sold to local and interstate markets. The dominant product form is fresh-chilled, with a portion of the harvest sold as crab meat and processed derivatives.

The price paid to fishers for blue swimmer crabs fluctuates between \$6/kg and \$10/kg, depending on season, harvest method and whether the product is ‘green’ or cooked. In 2006 the average per-kilogram price fishers received for pot-caught blue swimmer crabs was \$8.50.

Figure 8 shows the income distribution for the commercial sector of the fishery in 2005 and 2006. The percentage of the commercial fleet that earn less than \$2000 solely from harvest of blue swimmer crabs has increased since 2005. Excluding those that take less than \$2000 worth of product, the majority of the fleet earn between \$2000 and \$40 000 a year from blue swimmer crabs.

Many fishers operating in the Blue Swimmer Crab Fishery are endorsed for several fisheries and fishing may only account for a portion of their total annual income.

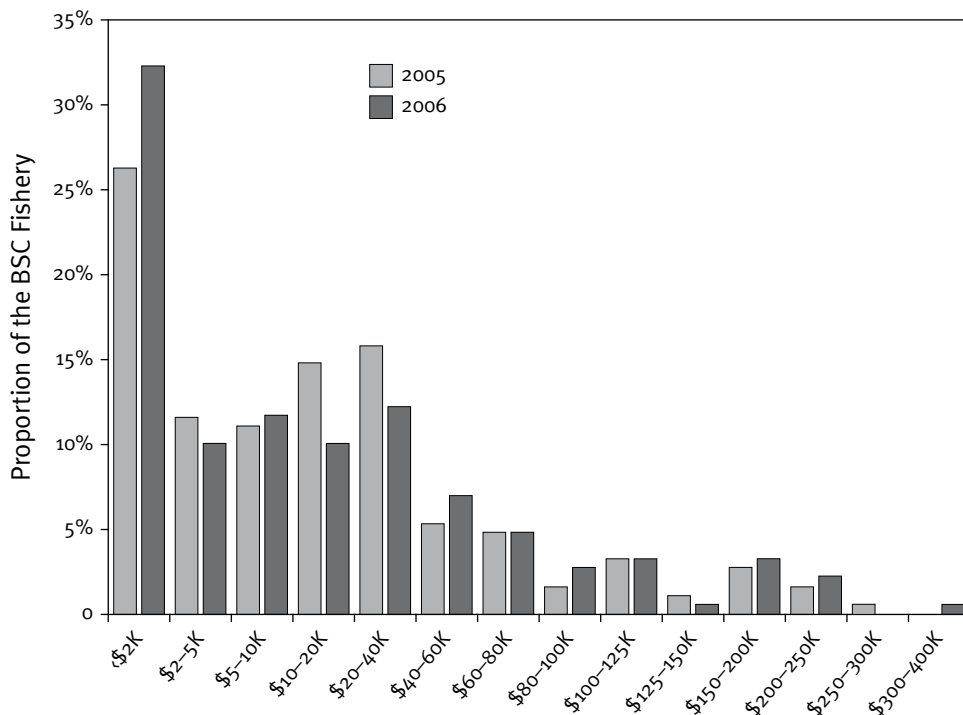


Figure 8: Income distribution in the Blue Swimmer Crab Fishery, 2005 and 2006 (Source: DPI&F CFISH database, 15 May 2007).

## Fishery performance

### Appraisal of fishery in regard to sustainability

The Queensland Blue Swimmer Crab Fishery is managed in a more precautionary manner than any other Australian blue swimmer crab fishery, which increases confidence in its sustainability. The prohibition on taking female and undersize crabs protects the spawning capacity of the stock from increases in effort. Significant areas where juvenile blue swimmer crabs occur in inshore waters are also protected by trawling closures.

An increase in the number of days fished in the commercial fishery was matched by an increase in total annual catch and CPUE in the 2006 season (see Catch statistics, Table 1). RFISH surveys conducted in 2002 and 2005 indicate that the recreational harvest has remained fairly stable over this period (see Catch statistics, Table 2).

The first assessment of the performance measures recently developed for this fishery triggered a review event for total annual catch for:

- Whole Fishery
- Moreton Bay region
- Offshore region
- North East region
- Gulf of Carpentaria

and for CPUE for the North East region (see Management performance).

Despite this, since the significant drop in catch and CPUE in 2005 (see Catch statistics, Figure 3), total catch and CPUE increased in 2006, indicating that overall blue swimmer crab stocks are healthy.

## Progress in implementing DEW recommendations

Recommendation	Progress	Improvements to management regime
DPI&F to inform DEW of any intended amendments to the management arrangements that may affect sustainability of the target species or negatively impact on bycatch, protected species or the ecosystem.	<i>Ongoing</i> No changes to management arrangements occurred during the 2006 fishery season.	N/A
DPI&F to actively engage with New South Wales in pursuit of collaborative or complementary management and research of shared blue swimmer crab stocks.	<i>Ongoing</i> DPI&F meets with New South Wales Department of Primary Industries on an annual basis to pursue opportunities for collaborative or complementary management and research of shared species.	Continue to meet on an annual basis. Current resources are allocated to developing collaborative/complementary management and research for shared shark and red snapper stocks, as these species are considered to be higher priorities at present.
As part of the management planning process, or no later than December 2006, DPI&F to develop fishery specific objectives linked to performance indicators and performance measures for target, bycatch, protected species and impacts on the ecosystem.	<i>Complete</i> DPI&F held a workshop with fisheries managers, researchers and industry representatives in May 2006 to develop operational objectives and performance measures for the Blue Swimmer Crab Fishery. Outcomes of this process were reviewed by the Crab Management Advisory Committee (CrabMAC). The final version was implemented as policy and provided to DEW in April 2007.	The effectiveness of fisheries management in ensuring the sustainable use of blue swimmer crab stocks and minimising any impacts on the broader ecosystem is being measured.
DPI&F to monitor the status of the fishery in relation to the performance measures once developed. Within three months of becoming aware of a performance measure not being met, DPI&F to finalise a clear timetable for the implementation of appropriate management responses.	<i>Ongoing</i> Performance measures will be regularly assessed and reported against in the time frames specified within the Performance Measurement System (PMS) itself.	The PMS was implemented in April 2007.
<p>DPI&amp;F to develop a compliance strategy for the Blue Swimmer Crab Fishery. The strategy will explicitly address the following issues and provide for the periodic review of the effectiveness of the strategy (by end 2007):</p> <ul style="list-style-type: none"> <li>• commercial and recreational catch and effort data validation</li> <li>• compliance with commercial and recreational gear restrictions (type and number)</li> <li>• compliance with restrictions on the take of female crabs and minimum size limit in the commercial and recreational sectors</li> <li>• the potential for Queensland-harvested female and undersize crabs to be laundered in other jurisdictions with different management measures</li> <li>• the black market sale of recreationally caught crabs.</li> </ul>	<i>Complete</i> DPI&F conducted a compliance risk assessment for the Blue Swimmer Crab Fishery in November 2006 in order to determine compliance priorities and allow for the most effective use of Queensland Boating and Fisheries Patrol (QBFP) resources. Outcomes of the risk assessment have been incorporated into QBFP district operational plans from 2007.	A compliance risk assessment is used by the QBFP in undertaking operational planning activities associated with management of the fishery. Through identification and prioritisation of compliance risks associated with the fishery, planning and operational processes at the district level may be improved.

Recommendation	Progress	Improvements to management regime
<p>From 2005, DPI&amp;F to report publicly on the status of the fishery on an annual basis, including explicit reporting against each performance measure once developed.</p>	<p><i>Ongoing</i></p> <p>The 2007 Annual Status Report will be the third to be completed for the Blue Swimmer Crab Fishery.</p>	<p>Public reporting on the status of Queensland's fisheries is an important aspect of managing fisheries on behalf of the Queensland community. These reports provide an important catalogue of historical information on the status of Queensland fisheries, links to ecological assessments demonstrating to the Australian Government that fisheries meet sustainability guidelines, and the most up-to-date information on Queensland's fisheries.</p>
<p>DPI&amp;F to develop a system to ensure that catch data collected in compulsory logbooks is validated on an ongoing basis and to investigate methods for documenting and validating effort in the fishery.</p>	<p><i>In progress</i></p> <p>DPI&amp;F has implemented a fishery-independent monitoring program to provide an index of abundance for blue swimmer crabs to monitor changes in areas adjacent to high concentrations of human population that may be at greater risk of overfishing. These data are available for comparison with trends in logbook data.</p>	<p>DPI&amp;F will use Long Term Monitoring Program (LTMP) data in future fishery assessments, along with investigating the use of commercial fisher research logbooks to provide a reliable source external to the LTMP on commercial catch rates and the level of bycatch associated with the Blue Swimmer Crab Fishery.</p>
<p>As part of the management planning process, or no later than December 2006, DPI&amp;F to assess the appropriateness and effectiveness of current management arrangements for the offshore component of the fishery with regard to the sustainable harvest of the target species, minimisation of bycatch and interactions with threatened species.</p>	<p><i>Complete</i></p> <p>DPI&amp;F undertook an Ecological Risk Assessment (ERA) in May 2006. The outcomes of this process were presented to CrabMAC for review, finalised and provided to DEW in 2007. The outcomes from the ERA will be incorporated into ongoing management planning processes.</p>	<p>Completion of an ERA is one of many aspects of DPI&amp;F's commitment to progress sustainable fisheries management. The ERA identified the following issues as high risk (with consequence scores of three or above):</p> <ul style="list-style-type: none"> <li>• capture of blue swimmer crabs through fishing activity</li> <li>• direct impact without capture of blue swimmer crabs through gear loss</li> <li>• impact on blue swimmer crab populations through addition of non-biological material through gear loss</li> <li>• capture of blue swimmer crabs through other capture fishery methods</li> <li>• direct impact without capture of three-spot crabs through gear loss</li> <li>• impact on three-spot crab populations through addition of non-biological material</li> <li>• capture of three-spot crabs through other fishery methods.</li> </ul>

Recommendation	Progress	Improvements to management regime
By 31 December 2004, DPI&F to develop a strategy to remove or substantially reduce the amount of latent effort in the fishery. The strategy is to influence clearly defined management actions linked to specific timeframes. DPI&F to implement the strategy prior to the introduction of the management plan.	<i>In progress</i> The new licensing and fees policy introduced as of 1 July 2006 is anticipated to result in a reduction in latent effort. It is expected that the policy will considerably reduce the retention of unused licences. Changes in crab fishery licence numbers will be reported in future Annual Status Reports.	Impact of the new licensing and fee structure in terms of latent effort removal will be assessed after July 2007 (one year after implementation). If it is ineffective, DPI&F will investigate another strategy before the introduction of the management plan.
As part of the management planning process, DPI&F to review existing management measures designed to control blue swimmer crab harvest by recreational fishers, to ensure that these measures are appropriate and adequately constrain recreational effort to within sustainable levels. Should the review indicate that existing measures are not appropriate, DPI&F will develop new measures in a timely manner.	<i>Not started</i> Management planning process for the Blue Swimmer Crab Fishery has not yet commenced because of priority being given to other fisheries such as the East Coast Inshore Fin Fish Fishery.	The 2005 RFISH survey indicated that estimated retained recreational catch of blue swimmer crabs has reduced by 12% since 2002.
DPI&F to identify fishery areas at risk of overfishing within two years. DPI&F to undertake independent surveys in these areas with a view to detecting any significant changes in crab abundance and take appropriate management action to address resource sustainability concerns.	<i>Ongoing</i> Areas at higher risk from overfishing were assessed in a review of commercial and recreational catch and effort data in 2005. <sup>7</sup> A blue swimmer crab LTMP has been designed and trialled; data collection began in March 2006.	N/A
DPI&F to develop a system for the collection and monitoring of information on discarded undersize and female blue swimmer crab and key bycatch species, sufficient to enable identification of long-term trends in bycatch and discards.	<i>In progress</i> Species of Conservation Interest (SOI) logbooks are used to document interactions with species listed in the EPBC Act. DPI&F is currently investigating the use of other methods to collect information on composition and rate of discards in the Blue Swimmer Crab Fishery.	DPI&F is currently considering the implementation of commercial fisher research logbooks. On a voluntary basis, commercial fishers would collect information on catch of legal and regulated crabs <sup>8</sup> and bycatch species, providing a reliable source external to the LTMP on commercial catch rates and the level of bycatch associated with the Blue Swimmer Crab Fishery.
Within one year, to support the implementation of SOCI logbooks, DPI&F to ensure that an education program for fishers, both recreational and commercial, is developed and implemented to promote the importance of protected species protection and accurate incident reporting.	<i>Complete</i> A comprehensive education program was released to commercial and recreational fishers in September 2005. This information is available through the DPI&F Business Information Centre on 13 25 23.	DPI&F and the Queensland fishing industry are committed to minimising impacts of fishing on protected species. The education package has increased the level of confidence in the data obtained from SOCI logbooks.

7 | Webley, *Fisheries Long Term Monitoring Program—Addressing the Department of the Environment and Heritage’s recommendations for monitoring Queensland’s Mud Crab and Blue Swimmer Crab fisheries*, Department of Primary Industries & Fisheries, Brisbane, Australia, 2005.

8 Regulated crabs include undersize and female blue swimmer crabs and spanner crabs, which cannot be retained in the Blue Swimmer Crab Fishery.

Recommendation	Progress	Improvements to management regime
<p>DPI&amp;F will implement measures to mitigate interaction with protected species at risk of interacting with the fishery, in particular measures to mitigate against capture and entanglement of marine turtles, to ensure that any risks to protected species can be minimised. DPI&amp;F to also identify areas of the fishery where the risk of protected species interactions is higher, and to take appropriate management actions.</p>	<p><i>In progress</i></p> <p>DPI&amp;F undertook an ERA in May 2006. The outcomes of this process were presented to CrabMAC for review, finalised and provided to DEW in 2007. The outcomes from the ERA will be incorporated into ongoing management planning processes. There has been a proposal to prescribe a maximum size opening in crab apparatus to minimise interactions with juvenile turtles. This proposal will be subject to community consultation, anticipated to be undertaken in the later part of 2007.</p>	<p>Completion of an ERA is one of many aspects of DPI&amp;F's commitment to progress sustainable fisheries management.</p>

## Management performance

Performance measures for the Queensland Blue Swimmer Crab Fishery (Table 3) were developed in collaboration with CrabMAC and other stakeholders, including members of the commercial fishing sector, fisheries managers, researchers and assessment and monitoring staff.<sup>9</sup> Input from a broad range of stakeholders was sought to ensure that the Performance Measurement System (PMS) was meaningful, defensible and precautionary, taking into account data limitations but incorporating the most appropriate information available. The PMS was approved by the delegate of the Chief Executive and it is a formal instrument for measuring performance of this fishery.

Under the guidelines for the PMS, DPI&F has three months to develop a timetable to respond to a performance measure being triggered.

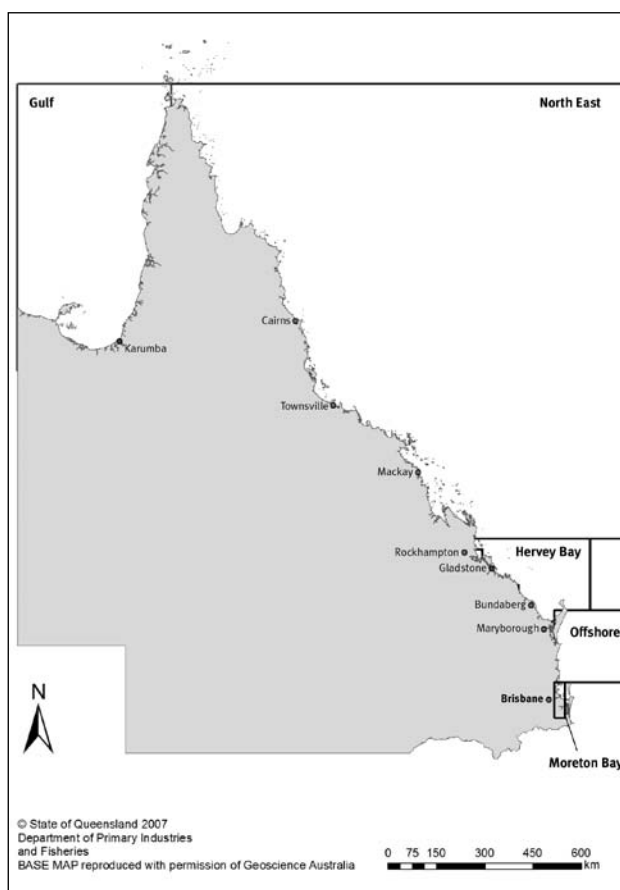


Figure 9: Queensland regional boundaries for the Blue Swimmer Crab Fishery.

<sup>9</sup> The PMS for the Blue Swimmer Crab Fishery is available online at: [www.dpi.qld.gov.au/fishweb](http://www.dpi.qld.gov.au/fishweb)

Table 3: Performance measures for the Blue Swimmer Crab Fishery.

Performance measure	Measured	Performance in 2006
An annual limit reference point (LRP) of 30% above or below the average commercial catch and catch rate for the previous five years for: <ul style="list-style-type: none"> <li>the Whole Fishery</li> <li>Moreton region</li> <li>Offshore region</li> <li>Hervey Bay region</li> <li>North East region</li> <li>Gulf region</li> </ul> (see Figure 9 for regional boundaries).	<i>Measured</i>	<i>Triggered</i> The Whole Fishery, Moreton, Offshore, North East and Gulf regions total annual catch was more than 30% below the annual limit reference point. Not triggered for Hervey Bay region total annual catch. The North East region CPUE was more than 30% below the annual limit reference point. Not triggered for the Whole Fishery, Moreton, Offshore, Hervey Bay or Gulf region CPUE.
The risk ranking assigned to bycatch species in the ERA process increases from the previous assessment.	N/A	A revision of the ERA has not been undertaken for the Blue Swimmer Crab Fishery. Fishery performance against this measure could not be assessed.
Interactions with turtles do not exceed the highest historical number of interactions reported through SOCI logbooks (2003–05)	<i>Measured</i>	<i>Not triggered</i>

### Timetable for response

Following initial consideration by the fishery manager after seeking scientific advice, no immediate management responses are proposed or considered necessary to address the triggered review events. Detailed discussions of the issues surrounding these triggers will be undertaken with CrabMAC at its next full meeting, scheduled for October 2007, to confirm the appropriateness of this position. The next annual performance review will be considered by the Crab Scientific Advisory Group (CrabSAG) for further advice to CrabMAC.

### Rationale for response

#### *Whole Fishery*

Review events related to annual commercial catch for the whole fishery in 2006 have been triggered primarily because four of the previous five years (2001–04) represent the highest levels of effort and catch reported for the fishery since the inception of the logbook system (Figure 10). Despite this review having been triggered, 2006 still represents the fifth-highest annual catch for the fishery. The elevated catch levels for these years in turn appear to be the result of atypically higher catch rates. While the reasons for these higher rates and the subsequent return to more typical catches are unknown, these years are a benchmark of debatable value. Therefore, triggering review reference points related only to these years is not considered to warrant an immediate management response.

Although there has been a reduction in catch rate for the whole fishery from an average of around 72 kg/day in 2001–04 to 52.4 kg/day in 2005 and 2006, these later catch rates are still higher than for any year before 2001—the average annual catch rate for the fishery from 1996–2000 was around 40 kg/day. Since the significant drop in catch and CPUE in 2005, total catch and CPUE have increased in 2006, indicating that overall blue swimmer crab stocks remain healthy.

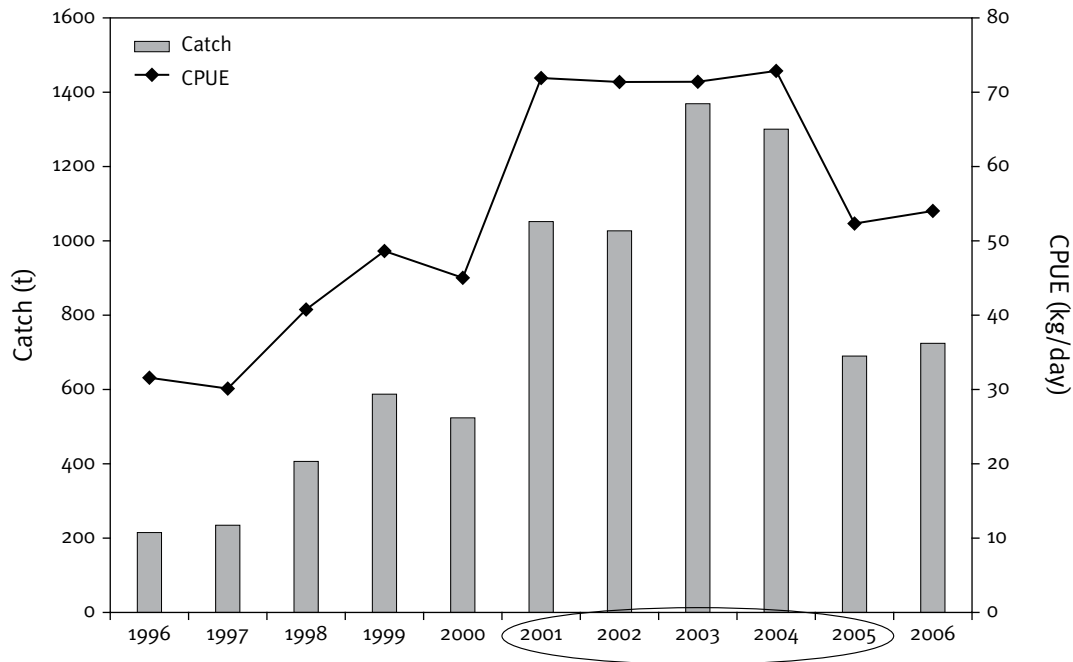


Figure 10: Reported catch and CPUE for the Whole Fishery, 1996–2006  
(Source: DPI&F CFISH database, 23 April 2007).

### Moreton region

Total annual catch triggered for the Moreton region. Reported catch and CPUE for the years 1996–2006 in the Moreton region are shown in Figure 11. The average catch for the years 2001–05 was around 392 t, largely because of the influence of the highest ever annual catch of 572 t being harvested in 2001. As for the whole of the fishery, this peak in catch was largely the result of a parallel increase in catch rates. If this outlying year is disregarded, then there is no overall decreasing trend in CPUE, with catches remaining relatively stable since the late 1990s.

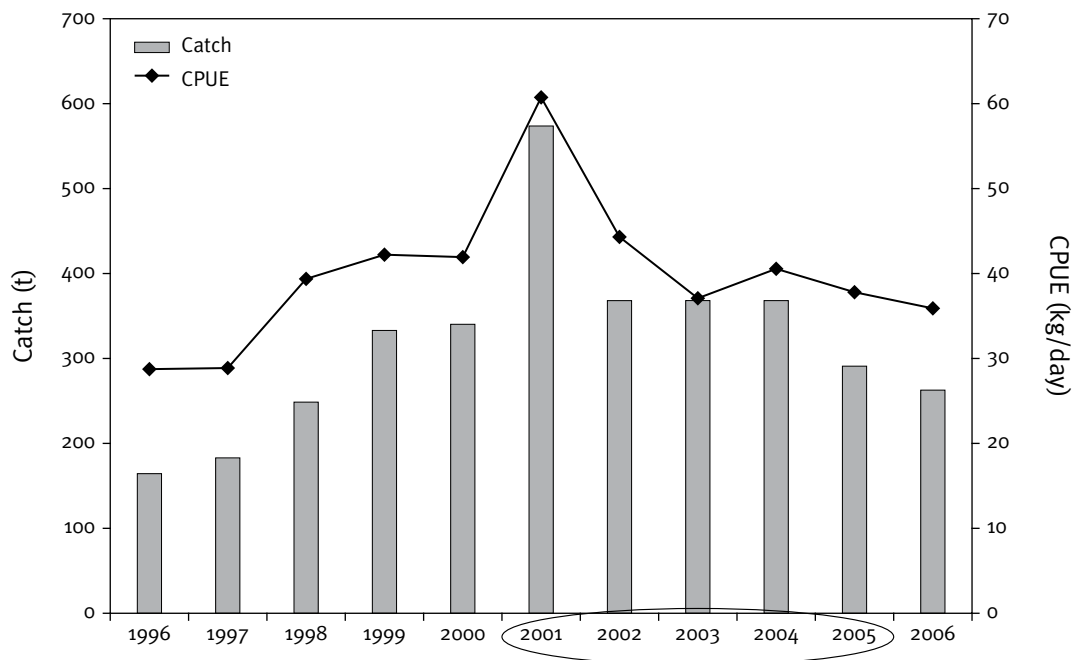


Figure 11: Reported catch and CPUE in the Moreton region, 1996–2006  
(Source: DPI&F CFISH database, 23 April 2007).

### Offshore region

Total annual catch triggered for the Offshore region. Reported catch and CPUE for the Offshore region are shown in Figure 12. Annual catch decreased from 182 t in 2005 to 119 t in 2006. The observed decrease is likely to be associated with the number of boats accessing the fishery, as the number of days fished declined almost 600 days from 2005 to 2006. This result may stem from a range of external factors, including the high price of fuel, which would be a significant disincentive for travelling the larger distances involved in accessing this section of the fishery (see Figure 9). It is also possible that the decline in annual catch is the result of the impacts of additional fishing effort from 2001 on a stock of mature crabs which had not been accessed before that time. This issue will be considered by the CrabSAG and will be reported on in the 2008 Blue Swimmer Crab Annual Status Report.

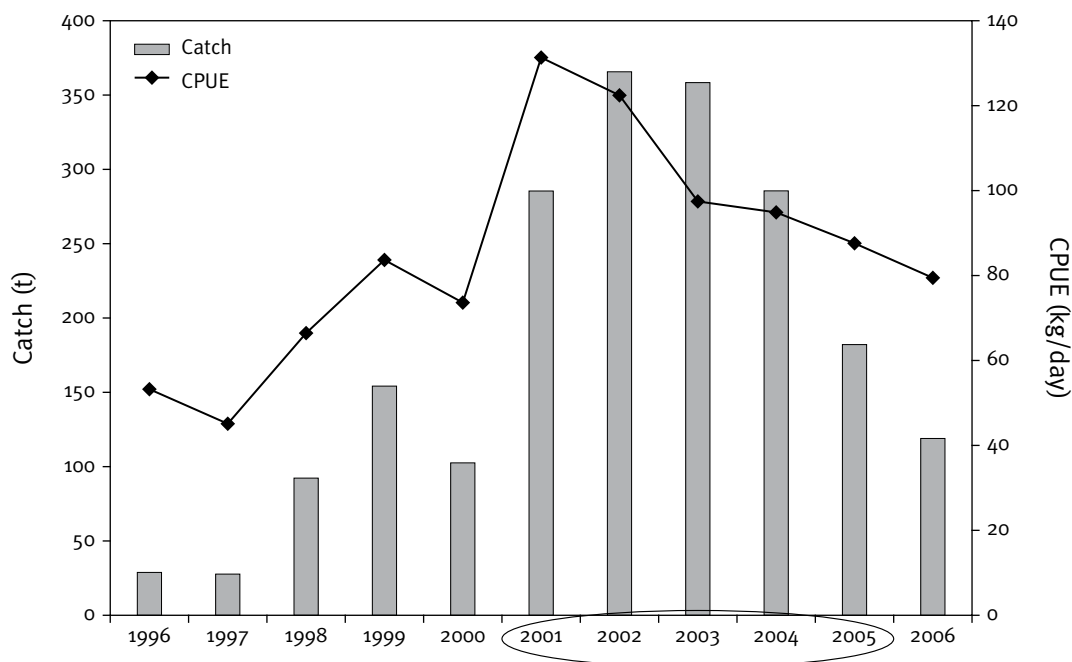


Figure 12: Reported catch and CPUE in the Offshore region, 1996–2006  
(Source: DPI&F CFISH database, 23 April 2007).

### North East region

Both catch and CPUE have triggered for the North East region (Figure 13). Reported catches in the North East region have historically been very low, in the order of 1–2 t per year. The only years when reported catch was greater than 5 t were 2003, 2004 and 2006. The significance of the very high reported catch and CPUE of 47.4 t and 57 kg/day in 2003 is unknown. This year is clearly an outlier and is the reason that both annual catch and CPUE triggered for this region in 2006. An investigation of the database will be undertaken to ensure that there is no alternative explanation for the 2003 result, and this will form part of the deliberation of the CrabSAG.

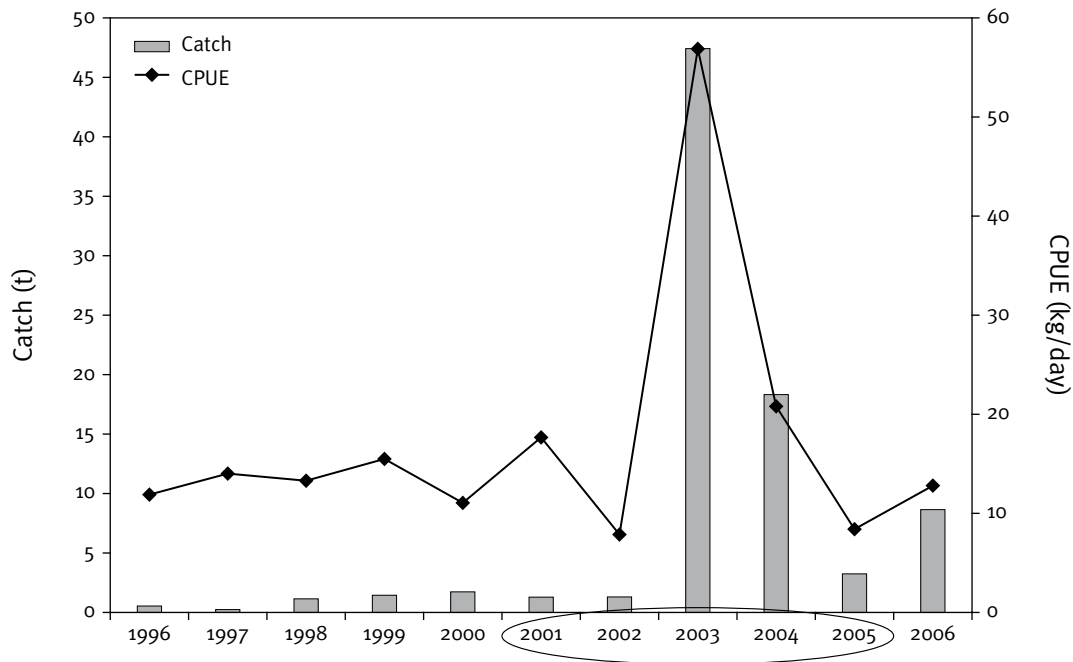


Figure 13: Reported catch and CPUE in the North East region, 1996–2006  
(Source: DPI&F CFISH database, 23 April 2007).

### Gulf region

Annual catch for the Gulf region triggered in the 2006 fishing year. Reported catch and CPUE for the Gulf region are shown in Figure 14. Historically, overall catch has been very low, being less than 0.4 t for all years except 2006. Although the 2006 total catch is significantly higher at approximately 1.4 t, such low catch levels are unlikely to have an impact on the blue swimmer crab stocks in the region.

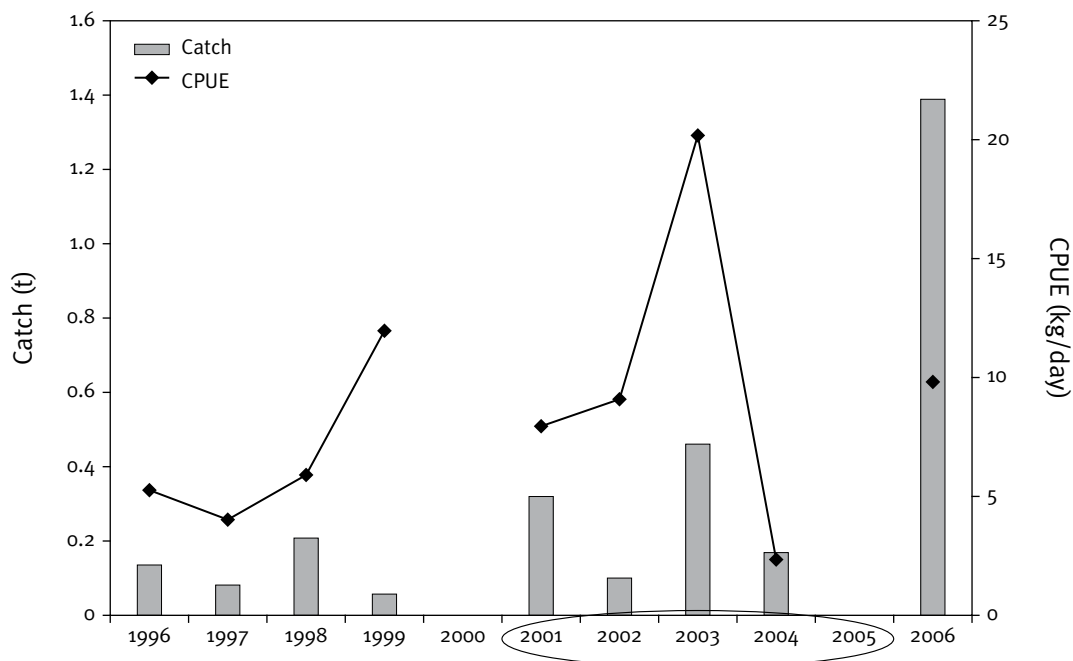


Figure 14: Reported catch and CPUE in the Gulf region, 1996–2006  
(Source: DPI&F CFISH database, 23 April 2007).

## Resource concerns

As a result of the ecological assessment<sup>10</sup> of the Blue Swimmer Crab Fishery undertaken by DEW in 2004, latent effort in this fishery was identified as a risk to the long-term sustainability of Queensland's crab stocks. DPI&F intends to monitor the effects of the new licensing and fee arrangements that were implemented on 1 July 2006, to determine if C1 licence holders surrender previously unused fishery symbols. If this does not result in the removal of latent effort, alternative approaches will be investigated. It should be noted that the GBRMP Structural Adjustment Package removed 77 crab licences from the fishery.

DPI&F considers that the latent effort in the fishery poses minimal risk to the sustainability of blue swimmer crabs, given the precautionary minimum size limit in place and the prohibition on taking females—which theoretically caps the proportion of the population that can be harvested to approximately 25%.<sup>11</sup>

DEW has highlighted concern regarding recreational harvest pressure on a species that is already affected by pressures from coastal population growth and development. DPI&F acknowledges that expanding coastal populations may lead to an increased recreational fishing pressure on blue swimmer crabs, and monitors recreational fishing participation on a regular basis. It should be noted that DPI&F RFISH surveys have shown a decline in the number of recreational fishers fishing. In 2005, the total recreational harvest of blue swimmer crabs was estimated at 140 t, a reduction from the 2002 estimate of 160 t. Notwithstanding this, the precautionary management arrangements that protect all female and undersize male blue swimmer crabs from harvest theoretically ensure that approximately 75% of the Queensland blue swimmer crab population is protected.<sup>12</sup>

## Ecosystem

### Non-retained species/bycatch

Observations made during research surveys<sup>13</sup> indicated that the level of bycatch associated with the fishery is low. Economic considerations such as the time associated with sorting the catch, damaged target species and decreased value of by-product have prompted commercial fishers to address bycatch issues since the fishery was first developed.<sup>14</sup> The composition and rates of bycatch were found to be associated with the substrate of the region being fished—pots placed close to reefs and rubble areas were found to experience an increase in bycatch compared with those placed in more open sandy/mud areas, which are common in Moreton Bay. The surveys also indicated that gear with larger mesh size resulted in lower levels of bycatch.

The species composition of bycatch that was observed included spanner crabs and three-spot crabs, as well as fish species such as leatherjackets, juvenile snapper, pearl perch and red emperor. Survival of bycatch after discard is considered to be high, given that pots are checked regularly and are typically set in shallow areas, minimising the possibility of fish experiencing barotrauma.

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<sup>10</sup> Available online at: [www.environment.gov.au/coasts/fisheries/qld/index.html](http://www.environment.gov.au/coasts/fisheries/qld/index.html)

<sup>11</sup> M Doohan (Department of Primary Industries & Fisheries), discussion, October 2006.

<sup>12</sup> *ibid.*

<sup>13</sup> W Sumpton, S Gaddes, M McLennan, M Campbell, M Tonks, N Good, W Hagedoorn & G Skilleter, *Fisheries biology and assessment of the blue swimmer crab (Portunus pelagicus) in Queensland*, FRDC Project No. 98/117, Department of Primary Industries, Brisbane, Australia, 2003.

<sup>14</sup> *ibid.*

## Interactions with protected species

In 2006, no interactions with protected species were reported by crab fishers in Queensland.

## Fishery impacts on the ecosystem

The impact of the fishery on the ecosystem is considered to be low. The apparatus used to harvest the crabs is believed to have little, if any, impact on the physical environment because of its lightweight and stable structure, and also because pots are typically set on sandy substrates.

## Other ecosystem impacts

Blue swimmer crabs can be susceptible to impacts from habitat modification or pollution, because juvenile blue swimmer crabs rely on protected inshore areas such as seagrass beds, sand and mud banks. Recent research indicated that estuaries throughout the world are increasingly subjected to anthropogenic impacts that result in changes in intertidal and nearshore habitat. These changes can affect organisms at various stages of their life cycles and thus compromise ecosystem functions and services.

Loss of preferred blue swimmer crab habitat adjacent to highly populated regions around south-east Queensland, and in particular Moreton Bay, may pose a threat to the long-term sustainability of blue swimmer crabs. DPI&F has undertaken a comprehensive baseline coastal habitat mapping project to facilitate long-term monitoring of changes in these habitat areas.

Hydrological drought is associated with periods of low flow of coastal rivers and previous research has found that high river flow into marine environments can have positive effects on the productivity of commercial fisheries. It is possible that the drought conditions Queensland has been experiencing in recent years may have had an impact on blue swimmer crab stocks.

## Research and monitoring

### Recent research and implications

A recently published study indicated that the catch rates of blue swimmer crabs may be related to the extent of mangrove habitat. The study found a correlation between the catch rate of blue swimmer crabs and the extent of mangrove habitat. Blue swimmer crabs do not directly rely on mangroves for habitat—mangroves create a protected shallow inshore environment that is highly productive and rich in nutrients.

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15 Y Zharikov, GA Skilleter, NR Loneragan, T Taranto & BE Cameron, 'Mapping and characterising subtropical estuarine landscapes using aerial photography and GIS for potential application in wildlife conservation', *Biological Conservation*, vol. 125, 2005, pp. 87–100. 11 M Doohan (Department of Primary Industries & Fisheries), discussion, October 2006.

16 C De Vries, KF Danaher & MC Dunning, 'Assessing and monitoring Queensland's fish habitats using Landsat TM and ETM+ imagery', *Proceedings of the 11th Australasian Remote Sensing and Photogrammetry Conference*, Brisbane, Australia, 2002.

17 P Humphries & DS Baldwin, 'Drought and aquatic systems: an introduction', *Freshwater Biology*, vol. 48, 2003, pp. 1141–46.

18 NR Loneragan & SE Bunn, 'River flows and estuarine ecosystems: Implications for coastal fisheries from a review and a case study of the Logan River, southeast Queensland', *Australian Journal of Ecology*, vol. 24, 1999, pp. 431–40.

19 FJ Manson, NR Loneragan, BD Harch, GA Skilleter & L Williams, 'A broad-scale analysis of links between coastal fisheries production and mangrove extent: a case study for northeastern Australia', *Fisheries Research*, vol. 74, 2005, pp. 69–85.

## Monitoring programs and results

### Long Term Monitoring Program

The DPI&F Long Term Monitoring Program undertook a pilot study in early 2006 to assess the feasibility of monitoring juvenile blue swimmer crabs using fishery-independent surveys. Two surveys were carried out: one in Moreton Bay and one in Hervey Bay. These areas had been assessed previously as areas at highest risk of overfishing, particularly because of their proximity to major urban centres.

The pilot study has resulted in a routine monitoring program being initiated to estimate abundance and length structure of male and female blue swimmer crab populations. These data will be used to provide annual crab abundance indices. Annual surveys are carried out between mid-February and late March, commencing in Hervey Bay and finishing in Moreton Bay. Approximately eight nights of sampling are carried out in each bay using a 5 m beam trawl, which is towed for 0.5 nm/site. Sites are chosen randomly throughout each bay as existing data have proven unsuitable for stratifying the survey design.

Results of the surveys carried out earlier this year are currently being collated and prepared for analysis. Once this is complete, a summary report will be prepared and finalised in late 2007. Several years of data will be required to establish the most suitable method for estimating an annual index using the data collected during the fishery-independent surveys.

Large numbers of blue swimmer crabs are also measured during fishery-independent surveys for juvenile snapper (*Pagrus auratus*), eastern king prawns (*Penaeus plebejus*), tiger prawns (*Penaeus semisulcatus*, *Penaeus mondon* and *Penaeus esculentus*), Endeavour prawns (*Metapenaeus endeavouri* and *Metapenaeus ensis*) and scallops (*Amusium japonicum balloti*). The juvenile snapper and eastern king prawn surveys are carried out in the same general area as the targeted blue swimmer crab survey, whereas the scallop and tiger/Endeavour prawn surveys are carried out in offshore and more northern waters. The data collected during these surveys will be reviewed in the context of the results of the targeted blue swimmer crab survey to assess their long-term value to the monitoring of the species.

The monitoring program has received strong support from CrabMAC. In the long term, the data collected during the targeted surveys will be potentially useful as a performance indicator for the fishery, particularly if a correlation can be found with the harvest or catch rate of male crabs. In the meantime, the results of the surveys will be used to monitor the status of the blue swimmer crab stocks in southern Queensland adjacent to major urban centres.

DPI&F are currently considering the value and methods of collecting additional fishery-dependent data, including:

- length structure of crabs retained by the different sectors in the fishery (recreational, commercial pot and commercial trawl).

A proposal to select specific commercial fishers to provide information on incidental catch of female crabs and bycatch through a 'research logbook' is currently being developed by DPI&F. Any future monitoring will be subject to further investigations and stakeholder consultation.

### Collaborative research

No collaborative research projects are currently under way. Informal networks between government researchers have been established over time, particularly between Queensland, Western Australia and South Australia. DPI&F will continue to work with researchers from other jurisdictions whenever possible.

# Fishery management

## Compliance report

During 2006, 573 units were inspected in the Blue Swimmer Crab Fishery. Of these, 77 were commercial vessel inspections. The majority of the remaining inspections were of recreational fishers, with the remainder comprising marketing premises.

During this period, 26 offences were detected in association with 23 inspections, corresponding to a compliance rate of 96.0% on units inspected. This does not include offences relating to unattended, incorrectly marked equipment. A summary of offences is provided in Table 4.

## Offences

Offences are reported as a Fisheries Infringement Notice (FIN); a Caution (FIN Caution or official caution issued by DPI&F legal officers); or a Prosecution (to proceed by complaint summons).

Table 4: Offences recorded in the Blue Swimmer Crab Fishery (2006).

Offence	FIN	Prosecution	Caution
Take, possess or sell blue swimmer crabs regulated by size	3	3	9
Take, possess or sell blue swimmer crabs regulated by gender		1	
Possession of certain crabs/crab meat (e.g. crab claws, carapace missing)			1
Recreational fisher use more than the prescribed number of apparatus	4		
Recreational fisher use prohibited fishing apparatus (e.g. incorrectly marked)			2
Failed to have a document required to be available for immediate inspection	1		1
Fail to comply with a requirement to keep documents in the approved form	1		
<b>Total<sup>20</sup></b>	<b>9</b>	<b>4</b>	<b>13</b>

In addition to the above inspections and offences, a total of 622 incorrectly marked crab pots were seized from tidal waters in Queensland, including the Gulf of Carpentaria, during 2006.

A compliance risk assessment was conducted for this fishery in November 2006 in order to determine compliance priorities and allow the most effective use of QBFP resources.

The assessment identified the following activities in the Blue Swimmer Crab Fishery as having a high or extreme level of risk. The QBFP will therefore direct their compliance resources to addressing:

- interference with fishing apparatus
- use of unauthorised gear in the commercial fishery
- use of unauthorised gear in the recreational fishery
- take/possession of regulated fish (females, undersize males) by recreational fishers; and
- recreational fishers taking crabs for commercial purposes.

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<sup>20</sup> Of these offences, six were by commercial operators.

There are also a number of activities rated as having moderate risk, which should be addressed, but at lower priority. It was also recognised that the following is an important issue and should also be addressed through targeted enforcement:

- possession/sale of certain crabs or crab meat.

Detailed strategies to address the risks identified by this assessment will be developed through the QBFP strategic and operational planning processes that are reviewed annually.

## **Changes to management arrangements in the reporting year**

There were no changes to management arrangements in 2006.

## **Outcomes of review processes**

Management arrangements for the Blue Swimmer Crab Fishery are included in the Fisheries Regulation 1995. Although it was anticipated when the ecological assessment for this fishery was completed in 2004 that a Management Plan would be developed by 2006, this process has been delayed by the development of the higher-priority East Coast Inshore Fin Fish Fishery Management Plan.

DPI&F, in consultation with key industry and government stakeholders, has developed operational objectives, indicators and performance measures for ecological components of the fishery in the Performance Measurement Systems recently completed for this fishery. This information is available at the DPI&F website ([www.dpi.qld.gov.au/fishweb](http://www.dpi.qld.gov.au/fishweb)).

## **Consultation/communication/education**

Promotion of regulations applying to both commercial and recreational fishers, including those relating to blue swimmer crabs, is an ongoing role for DPI&F.

Consultation with stakeholders in the fishery mainly occurs through CrabMAC, with meetings generally held twice a year. CrabMAC provides advice to DPI&F on management measures for the fishery. Consultation with stakeholders also occurred as part of the ERA and PMS development process in May 2006.

## **Complementary management**

Queensland's management of blue swimmer crab stocks is unique in Australia in that the harvest of females is prohibited and there is no recreational possession limit in place. When a comprehensive review of the blue swimmer crab management arrangements is undertaken, DPI&F will collaborate with other states (particularly New South Wales) on determining the potential for implementing complementary management arrangements for the species.

### **Information compiled by**

Fiona Hill

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### **Image**

Blue swimmer crab (*Portunus pelagicus*)

