

Annual status report 2005

Queensland Blue Swimmer Crab Fishery

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

This publication provides information on the Blue Swimmer Crab Fishery for 2004.

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Introduction

Blue swimmer crabs (*Portunus pelagicus*), often known as sand crabs, are found in coastal and estuarine waters in the southern part of Queensland. They are an important species for both commercial and recreational fishers and are mostly caught between November and May.

Description of the fishery

Fishing methods

Crab pots (right) and collapsible traps are the main apparatus used by commercial fishers. Recreational fishers use the same apparatus, but in addition, are permitted to use dillies.



Fishing area

The fishery area comprises tidal waters in the following areas:

- (a) east of longitude 142°31'49" east
- (b) north of latitude 10°48' south and between longitude 141°20' east and longitude 142°31'49" east
- (c) in the Gulf of Carpentaria between the 25 nautical mile line and the shore, south of latitude 10°48' south.

This essentially encompasses all Queensland tidal waters.

Main management methods used

The blue swimmer crab fishery is managed using a range of input and output controls, including:

- a minimum legal size limit that applies to both commercial and recreational fishers (11.5 cm notch to notch)
- 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)
- a limit on the number of commercial operators with the potential to access the fishery.

Approximate allocation between sectors

The blue swimmer crab fishery is predominantly a commercial fishery, with recreational fishers taking only about one-tenth of the total harvest.

Fishery accreditation under EPBC Act

A Wildlife Trade Operation (WTO) approval, acknowledging that the fishery was being managed in an ecologically sustainable manner and allowing the continued export of blue swimmer crabs caught in Queensland, was granted in October 2004 under Parts 13 and 13A of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*. This approval expires in October 2007.

Fishery profile

Total harvest from all sectors: approximately 1560 t

Commercial harvest 2004: approximately 1400 t

Recreational harvest 2002: approximately 160 t

Indigenous harvest 2000: less than 1 t

Charter harvest 2004: negligible

Commercial Gross Value of Production (GVP) for 2004: approximately \$10 million

Number of Licences: 879 (including 75 held by DEH under the Great Barrier Reef Marine Park Structural Adjustment Package) as of June 2005

Commercial fishing boats accessing the fishery in 2004: approximately 240. Fewer than 5 charter boats report catches of blue swimmer crab

Catch and effort (target species)

Commercial

The total commercial catch is predominantly made up of product caught by pot; however, a small amount is also taken as by-product in the East Coast Otter Trawl Fishery.

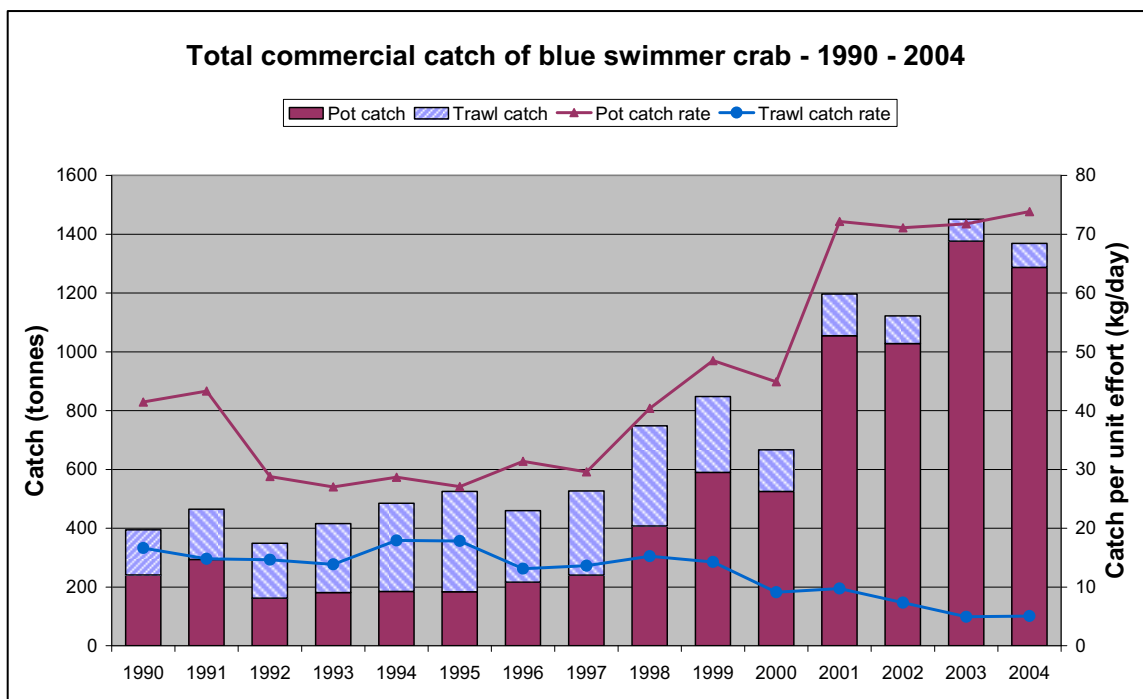


Figure 1: Total commercial catch and effort of blue swimmer crab 1990–2004

With the introduction of the *Fisheries (East Coast Trawl) Management Plan 1999*, operators are restricted to an in-possession limit of 100 blue swimmer crabs in Moreton Bay and 500 elsewhere. The effect of this regulation can be seen in the declining trawl catch and catch rate since 1999 (Figure 1 and Table 1). This has meant that the catch of blue swimmer crab by trawl has remained consistently low. It should be noted that blue swimmer crabs were reported as 'crab unspecified' prior to 1999 and consequently, total catch figures during the 1990s may include some three spot crab.

The commercial catch of blue swimmer crab by pot has increased since 2000. The overall catch rate has remained steady over that period, although the catch rate in the Fraser / Burnett region has risen, while the catch rate in Moreton Bay has declined (Figures 2 and 3). Moreton Bay has historically dominated the total harvest, with annual catches regularly around 300 t. Catches in 2001 increased to almost 600 t, with a correspondingly high catch rate observed. This one year of high catch stands out from a consistent annual catch. Given the consistency in catches before and after 1999, it is likely that the decrease in catch rate is simply a result of the catch returning to the average level. It is unlikely to be a cause for concern.

Table 1: Fishery details for the commercial pot harvest of blue swimmer crab since 2000

| | Catch (t) | Days fished | Boats | Kg/day | Days/boat | Catch/boat (t) | GVP (\$m) |
|-------------|-----------|-------------|-------|--------|-----------|----------------|-----------|
| 2000 | 523 | 11 635 | 178 | 45 | 66 | 3.0 | 4.19 |
| 2001 | 1 053 | 14 651 | 198 | 72 | 74 | 5.3 | 8.42 |
| 2002 | 1 028 | 14 539 | 219 | 71 | 66 | 4.7 | 8.23 |
| 2003 | 1 372 | 19 160 | 262 | 72 | 73 | 5.2 | 10.98 |
| 2004 | 1 282 | 17 528 | 237 | 73 | 74 | 5.4 | 10.25 |

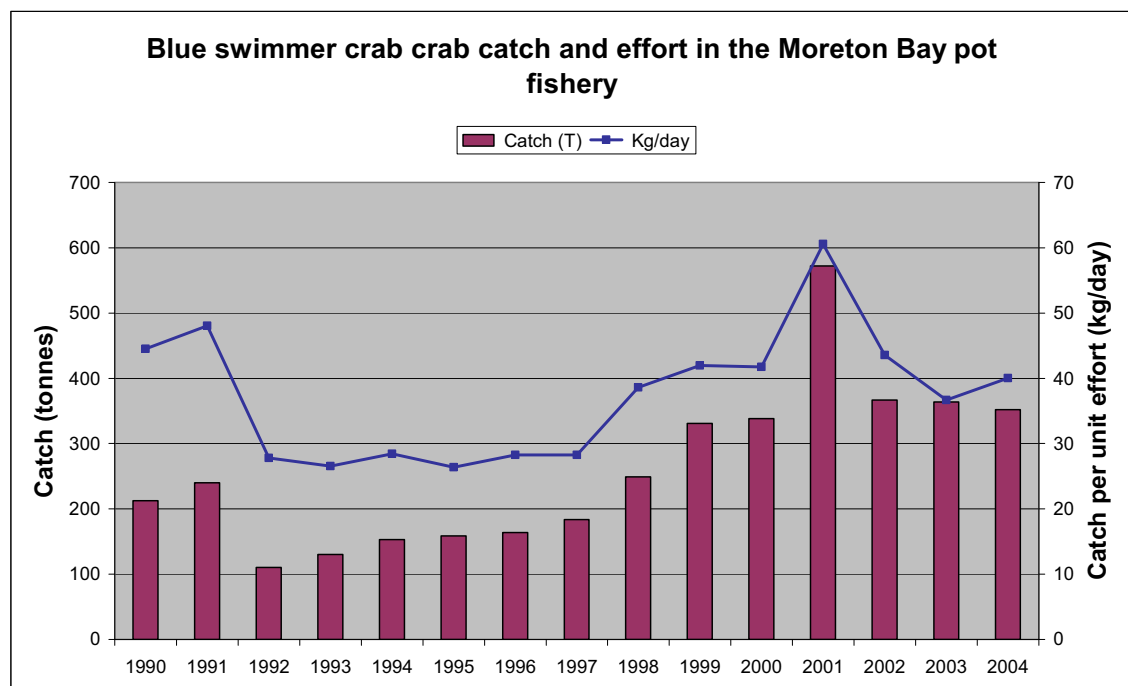


Figure 2: Catch and effort in Moreton Bay 1990–2004

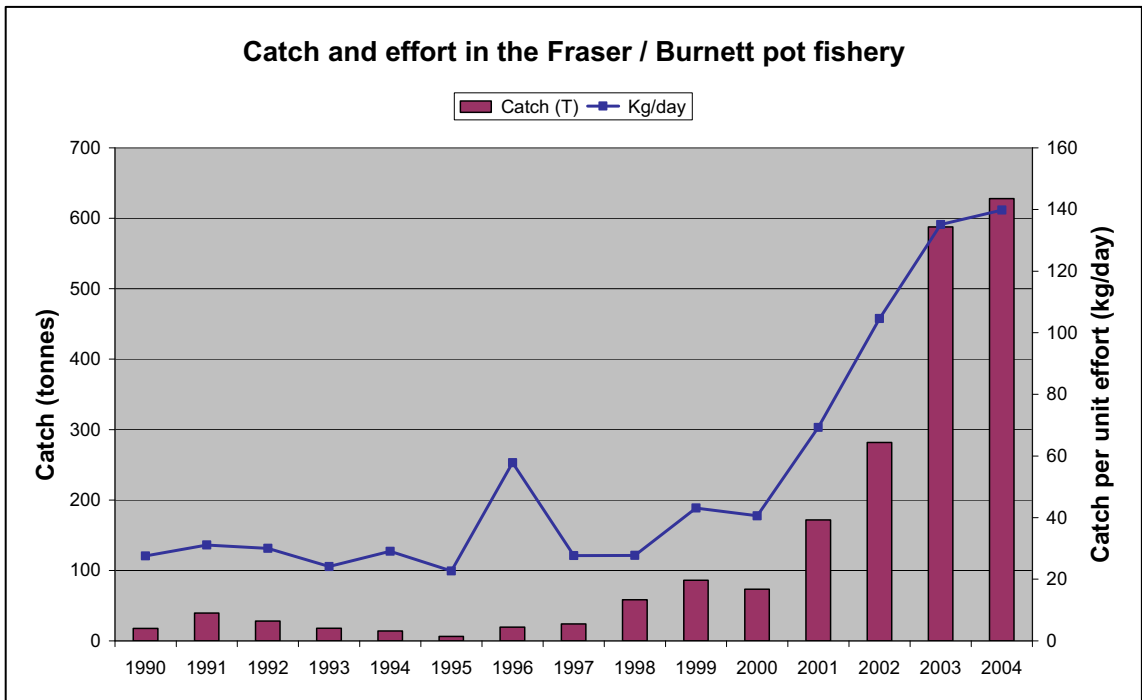


Figure 3: Catch and effort in the Fraser / Burnett region 1990–2004

A significant increase in the commercial catch has occurred in the Fraser / Burnett region since 2000, with catches increasing from around 50 t to over 600 t because of the expansion of effort into previously unexploited offshore areas. The increase in catch in the Fraser / Burnett has resulted in the overall increase in catch seen in the fishery at the broader state level.

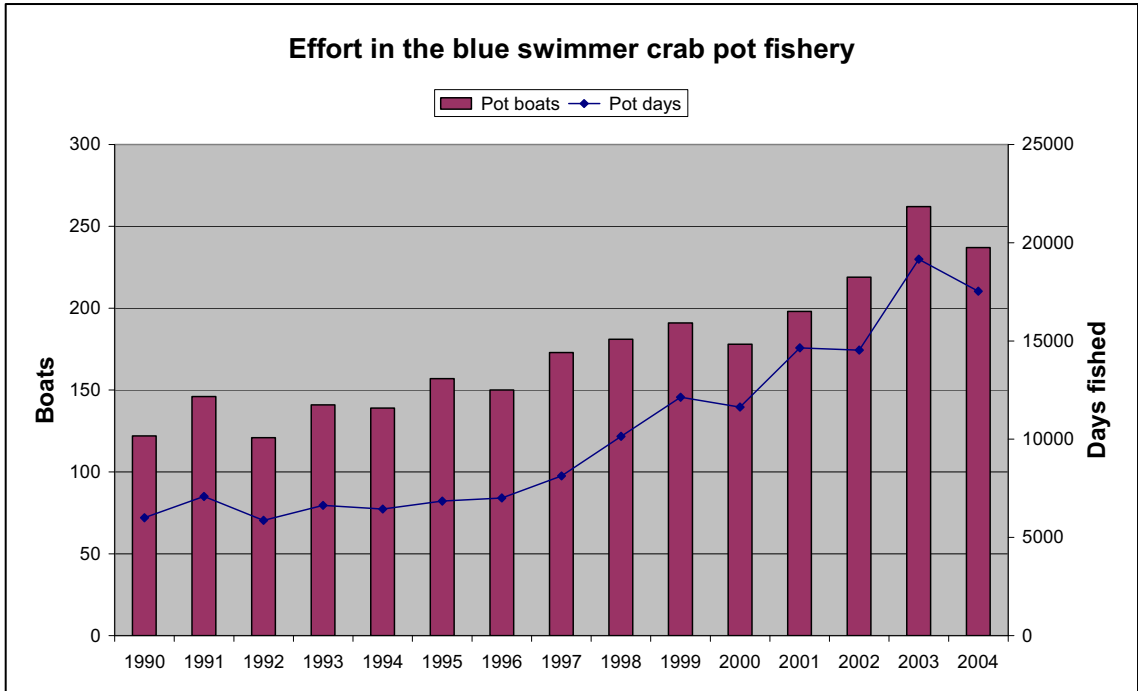
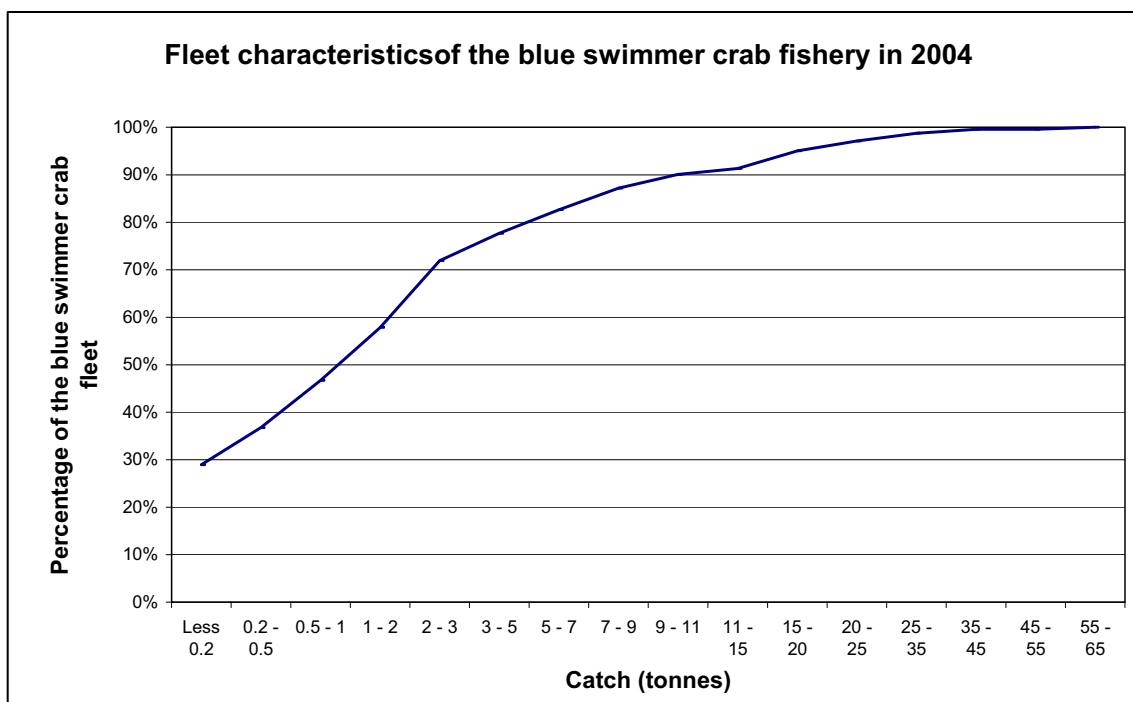


Figure 4: Effort in the blue swimmer crab pot fishery 1990–2004

Commercial fishing effort has increased steadily since the mid 1990s. In 2004 the number of boats and days fished dropped slightly compared to 2003 (Figure 4). Of the 879 commercial fishers with a C1 fishery symbol that can potentially access the fishery, only around 250 are known to harvest blue swimmer crabs.

Figure 5 shows that approximately 90% of the fleet catch less than approximately 10 t a year. Approximately 30% of the fleet take only a small amount of blue swimmer crab product (less than 400 kg).

Figure 5: Fleet characteristics of the blue swimmer crab fishery 1990–2004



Recreational

The recreational harvest of blue swimmer crabs is significantly lower than the commercial harvest, contributing only about 10% to the total fishery harvest. The most recent Recreational Fishing Information System (RFISH) diary survey, conducted in 2002, estimated that approximately 485 000 blue swimmer crabs were harvested, with around 1 million released (Table 2). While the number of crabs kept has remained steady since the 1999 survey, more blue swimmer crabs were caught in total and more were released in 2002 compared to 1999.

Table 2: Recreational catch of blue swimmer crab estimated from RFISH surveys 1999 and 2002

| | 1999 | 2002 |
|--|--|---------------------|
| Number caught | 1 129 000 | 1 487 015 |
| Number released | 657 800 | 1 001 515 |
| Total estimated harvest | 471 400 | 485 499 |
| Estimated weight of total harvest | Approximately 155 t (175 t including 'unspecified crab') | Approximately 160 t |

The National Recreational and Indigenous Fishing Survey (NRIFS)¹ estimated that Queenslanders harvest only 46 t of blue swimmer crab, a figure significantly lower than the estimates provided by the RFISH surveys. DPI&F has undertaken an investigation

¹ Henry, GW & Lyle, JM 2003, *The National Recreational and Indigenous Fishing Survey*, FRDC Project No. 99/158, Australian Government Department of Agriculture, Fisheries and Forestry, Canberra.

into the factors which may be responsible for the differences between the two sets of figures. Contributing factors include the different survey methods used (telephone versus diary), the number of fishers surveyed and the avidity of anglers surveyed. The investigation concluded that the RFISH and NRIFS estimates were incomparable to some extent.

Charter

The charter logbook data indicates that the charter harvest of blue swimmer crabs is negligible, with less than 60 kg a year having ever been taken. In 2004, charter operators reported a harvest of 29 kg.

Indigenous

The Indigenous harvest of blue swimmer crabs in northern Queensland was estimated as part of the NRIFS. It was estimated that only 882 blue swimmer crabs were harvested by Indigenous fishers, reflecting the greater abundance of the species in the southern part of Queensland, with small numbers also near Townsville.

Non-retained species / bycatch

Based on a range of observations made during independent surveys², DPI&F considers the level of bycatch to be low. The species composition of bycatch that has been observed includes spanner crabs and three spot crabs, as well as fish species such as leatherjackets, juvenile snapper, pearl perch and red emperor. Levels of bycatch were higher in offshore areas than in Moreton Bay. The surveys also showed that larger mesh size resulted in lower levels of bycatch. Survival of bycatch after discard is considered to be high given that pots are checked regularly and usually set in shallow areas, minimising the likelihood of fish experiencing barotrauma. There are some fishing areas where pots are set in deeper water and barotrauma may affect certain fish species that are incidentally captured.

Interactions with protected species

A total of seven interactions with protected species were recorded by commercial net and crab fishers between 2003 and 2004. Four interactions occurred with crocodiles, three of which were released alive. It is unlikely these interactions were reported by blue swimmer crab operators since crocodiles are not generally found in the fishery area. A total of three interactions were recorded with turtles, two with hawksbill turtles and one with a green turtle. All three turtles were released alive.

Fishery impacts on the ecosystem

The fishery's impact on the ecosystem is considered to be low. The apparatus used is benign in its impact on the physical environment because of its lightweight and stable structure, and because pots are generally laid on sandy substrate.

² Sumpton, W, Gaddes, S, McLellan, M, Campbell, M, Tonks, M, Good, N, Hagedoorn, W & Skilleter, G 2003, *Fisheries biology and assessment of the blue swimmer crab (Portunus pelagicus) in Queensland*, FRDC Project No. 98/117, Queensland Department of Primary Industries, Brisbane.

General ecosystem health

Juvenile blue swimmer crabs rely on protected inshore areas such as seagrass beds and sand and mud banks. Loss of this habitat in highly populated areas such as around Moreton Bay may pose a threat to the long-term sustainability of blue swimmer crabs.

Spatial issues / trends

Two key fishery areas, Moreton Bay and Hervey Bay, have developed at different rates during the evolution of the fishery. Expansion of fishing effort has recently occurred in Hervey Bay and in offshore areas of south-east Queensland.

Socioeconomic characteristics and trends

Interstate prices for blue swimmer crabs tend to be highly variable depending on supply of the product, availability of other crab product, time of year and product form (i.e. trawl-caught versus pot-caught). Prices average about \$8/kg for pot-caught product and \$5/kg for trawl-caught product. A downward trend in prices in 2004³ may reflect higher product sales within Queensland instead of interstate.

Figure 6 shows the income distribution for the blue swimmer crab fleet in 2004. Excluding operators who take less than \$2000 worth of product, the modal income for the fleet is between \$20 000 and \$40 000 a year.

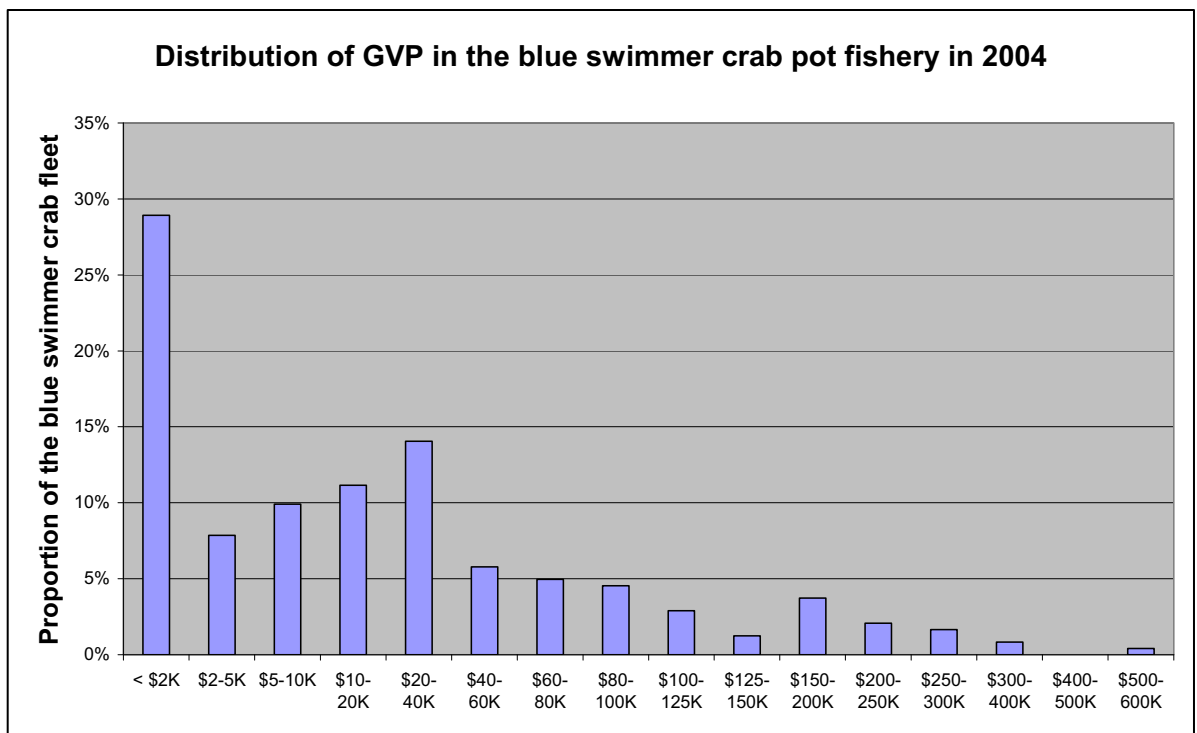


Figure 6: Income distribution for the blue swimmer crab pot fishery 2004

³ Based on prices obtained from the Sydney Fish Markets (<http://www.sydneyfishmarket.com.au/>)

Research and monitoring

Recent research and implications

There has been no recent research into blue swimmer crabs in Queensland since the ecological assessment submitted to the Australian Government Department of the Environment and Heritage (DEH) in early 2004. However, research on the habitat preferences of juvenile blue swimmer crabs has recently begun as part of a PhD project at Griffith University. This research is due to be completed within three years and should assist in assessing the ecological impacts of the fishery.

A recently published study⁴ has helped to confirm the belief that the catches of certain species of commercial interest (including blue swimmer crab) are related to the extent of mangrove habitat. A correlation was found between the catch rate of blue swimmer crab and the extent of mangrove habitat. While blue swimmer crabs do not rely on mangroves directly for habitat, mangroves help to create a protected shallow inshore environment that is highly productive and rich in nutrients.

Monitoring programs and results

DEH has made a number of recommendations relating to the monitoring of blue swimmer crab stocks. These recommendations include:

- developing an appropriate monitoring program taking into account target species, bycatch, protected species and the ecosystem more generally
- identifying areas at risk of overfishing and completing fishery independent surveys in these areas.

The development of a new monitoring program to meet these recommendations is being investigated as part of a broader independent review into the monitoring of Queensland's crab resources (mud, blue swimmer and spanner crabs). DPI&F will consider the outcomes of the review and implement programs that assist in meeting DEH recommendations if appropriate.

Collaborative research

No collaborative research projects are currently underway. However, 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 wherever possible.

Fishery management

Compliance report

Compliance activities for the blue swimmer crab fishery are currently reported together with other crab fisheries. Data from the Queensland Boating and Fisheries Patrol (QBFP) indicates that a total of 574 commercial crab fishing operations were inspected during the 2003–04 financial year, with 22 breaches recorded.

⁴ Manson, FJ, Loneragan, NR, Harch, BD, Skilleter, GA & Williams, L 2005, 'A broad-scale analysis of links between coastal fisheries production and mangrove extent: a case study for northeastern Australia', *Fisheries Research*, 74, pp. 69-85.

Figures for the 2004–05 financial year show that of the 492 crab fishing operations that were inspected, 19 were breached for illegal activity and 34 were cautioned. These figures show an average non-compliance rate of approximately 7%. Offences included possession of undersize crabs, possession of females, use of illegal apparatus and missing carapaces. Of the 65501 recreational fishers inspected across Queensland in 2004-05, 472 were breached and 751 were cautioned.

In late 2004, the QBFP undertook a large-scale inspection of crab pots in southern Moreton Bay. A total of 148 illegal crab pots were seized that were unmarked or marked incorrectly (Figure 7).



Figure 7: Examples of seized crab pots

A new Compliance Activity System is currently being developed by DPI&F that will record detailed information on QBFP activities. The new system will include:

1. Breach Reports Issued (including offences and court outcomes)
2. Unattended Breach Reports
3. Fisheries Infringement Notices (FINS) issued
4. All field activities (from new Field Occurrence Logs)
5. Complaints made via the Fishwatch hotline (including follow-up actions).

As part of this project a number of new code categories have also been developed to allow consistent reporting:

1. Fishery Codes
2. Offence Codes.

All offences and field activities will also be recoded to six nautical mile commercial fishing grids. This will allow enforcement activities and offences to be represented spatially and to guide review of compliance strategies. Progress to date includes the development of the new system to record Breach Reports, Unattended Breach Reports and Fisheries Infringement Notices. The new Field Occurrence Logs were trialled in Cairns and released to the rest of the patrol in July 2005.

Changes to management arrangements in the reporting year

No changes to management arrangements have been made since the submission of the blue swimmer crab ecological assessment report to DEH in early 2004. An investment warning that was issued in September 2003 is still current.

Consultation / communication / education

One of the DPI&F's ongoing roles is the promotion of regulations applying to commercial and recreational fishers, including those relating to blue swimmer crab. Nearly 160 000 recreational fishing brochures giving size and possession limits were distributed in 2004. In addition, approximately 500 stakeholders were sent the four editions of the fisheries newsletter, *Fish*, produced during 2004. The newsletter highlights recent achievements, latest research, and proposed changes to management arrangements. In February 2004, DPI&F introduced *FishFlash*, an email-based newsletter with links to the latest fisheries news. Approximately 300 stakeholders subscribe to *FishFlash*, which is now up to its 17th issue. DPI&F regularly distributes 'crab gauges' specifically designed to measure mud and blue swimmer crabs. A total of 5000 gauges were made and distributed in 2004. Demand for the gauges is extremely high, particularly from the recreational sector, so an additional 10 000 have been produced for distribution in 2005.

Consultation also occurs through the Crab Fisheries Management Advisory Committee (CrabMAC). Meetings are generally held twice a year and provide an opportunity for stakeholders to advise DPI&F on proposed management measures for blue swimmer crab stocks.

Complementary management

Queensland's management of blue swimmer crab stocks is unique in Australia in that it prohibits the harvest of females and has no recreational possession limit in place. Despite the differences in management arrangements, fisheries managers continue to work together to ensure that the combined range of management measures are adequate to protect blue swimmer crab stocks.

Fishery Performance

Appraisal of the fishery in regard to sustainability

Commercial logbook data suggests that the harvest of blue swimmer crabs is sustainable at current levels. While concern has been expressed regarding the expansion of effort into offshore areas, no decline in catch rate has been observed where this is thought to be occurring (i.e. Fraser / Burnett region). DPI&F will continue to monitor the catch and effort in this region.

The prohibition on taking female and undersized crabs in Queensland is a precautionary approach to management that has the capacity to protect the fishery from increases in effort. The fishery is regarded as being managed in a precautionary and sustainable manner.

Progress in implementing DEH recommendations

The DEH recommendations designed to address the uncertainties or risks facing the blue swimmer crab fishery can be found at:

<http://www.deh.gov.au/coasts/fisheries/qld/blue-swimmer-crab/report.html>. DPI&F has made significant progress in implementing a number of these recommendations.

- DPI&F anticipates that recommendations arising from a broad review of the crab monitoring program will be considered shortly. The review addresses a

number of the monitoring enhancements suggested in the DEH recommendations.

- Development of a protected species education program for commercial and recreational fishers is well advanced. The program includes reviewing and updating the Endangered and Threatened Species Awareness Course that new master fishers are required to undertake.
- The QBFP is currently undertaking compliance risk assessments for most fisheries. A risk assessment for the blue swimmer crab fishery will be undertaken and results reported in the 2006 status report.
- The development of performance measures for a range of fisheries is progressing and is considered a priority over the next 12 months.
- The amount of latent effort in the fishery is being monitored (this is discussed more fully in the following section).

It is anticipated that all recommendations that are due to be completed within the first 12 months of the WTO will be met.

Management performance

Performance measures and/or reference points have not yet been developed for the fishery. DPI&F intends to develop these measures over the next 12 months, in consultation with CrabMAC.

Resource concerns

DEH is concerned that the amount of latent effort in the blue swimmer and mud crab fisheries may be a risk to the long-term sustainability of Queensland's crab stocks. DEH recommended that a strategy be developed to substantially reduce the amount of latent effort in the fishery by December 2004.

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%. Notwithstanding this, DPI&F has advised DEH that it intends to monitor the effect of the implementation of new licensing and fee arrangements 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 acknowledged that the new licensing and fee arrangements were not intended to remove latent effort; however, they may have this effect.

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