

Annual status report 2005

Queensland Rocky Reef Finfish 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 Rocky Reef Finfish Fishery for 2004.

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Introduction

The rocky reef finfish fishery comprises a number of demersal and pelagic species associated with inshore rocky reefs, including snapper, pearl perch and teraglin jew. The fishery is restricted mainly to the southern part of Queensland, where the recreational sector takes the majority of the catch. Other minor species in the fishery include black kingfish, dolphin fish, yellowtail kingfish, amberjack and samson fish.

Description of the fishery

Fishing methods

The rocky reef fishery is a line fishery; both commercial and recreational fishers are permitted to use up to six hooks. Commercial operators generally use handlines, while recreational anglers use rod and reel.

Fishing area

Commercial operators in possession of an L1, L6 or L7 fishery symbol are permitted to take rocky reef product across Queensland, provided they have the appropriate line endorsement for the area. However, the majority of rocky reef finfish product is taken south of the Great Barrier Reef (GBR).

Main management methods used

Management of the rocky reef fishery is the responsibility of the Queensland Department of Primary Industries and Fisheries (DPI&F). The range of input and output controls used to manage the harvest of rocky reef species include:

- minimum size limits for snapper (35 cm), pearl perch (35 cm) and teraglin (38 cm) for both commercial and recreational fishers
- recreational in-possession limits for snapper, pearl perch and teraglin (a limit of 5 for each species)
- apparatus restrictions with a limit on the number of hooks that can be used by both commercial and recreational fishers
- a limit on the number of commercial operators with the potential to access the fishery.

Approximate allocation between sectors

The recreational sector continues to take twice as much as the commercial sector, despite a decline in recreational harvest since 1999.

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 rocky reef finfish caught in Queensland, was granted in July 2005 under Parts 13 and 13A of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*. This approval expires in July 2008.

Fishery profile

Total harvest from all sectors: approximately 470 t

Commercial harvest 2004: approximately 110 t of snapper, 40 t of pearl perch and 20 t of teraglin jew

Recreational harvest 2002: approximately 240 t of snapper and approximately 55 t of pearl perch

Indigenous harvest: no estimates available

Charter harvest: approximately 40 t

Commercial GVP for 2003: approximately \$1 million

Number of licences: 1542 primary L1, L6 and L7 licences and 1702 tender licences as of June 2005. 386 commercial fishing tour (charter) permits

Commercial boats accessing the fishery in 2004: approximately 140 reporting snapper catches, 80 pearl perch and 30 teraglin jew. Approximately 160 charter operators reporting rocky reef finfish catches.

Catch and effort (target species)

Commercial

Commercial catch data for line fishing in waters south of Baffle Creek (24°30'S) has been sourced from the compulsory daily logbook database maintained by DPI&F (CFISH). The misreporting of tropical snappers and sea perches (i.e. lutjanids) from the Great Barrier Reef area has the capacity to affect the quality of rocky reef data. Because of this, data are provided only for southern Queensland, where the majority of the rocky reef catch is taken.

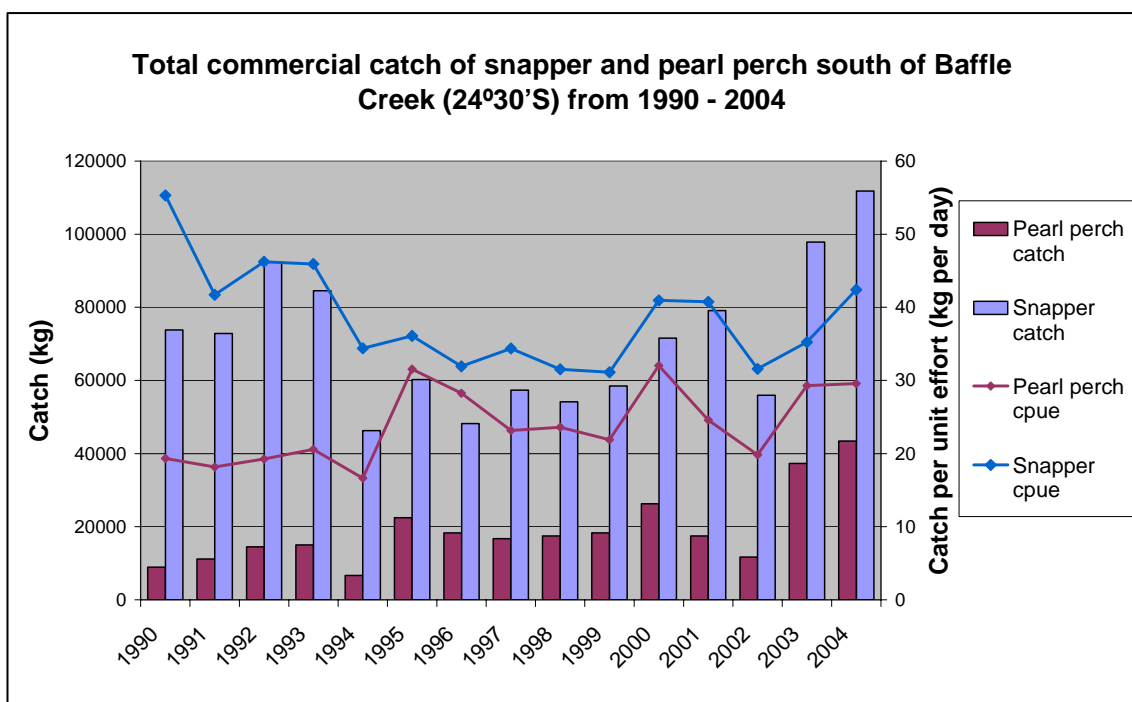


Figure 1: Total commercial catch of the major rocky reef finfish species 1990–2004

The commercial catch has increased for all target species since 2002 (Figure 1). The increase in snapper and pearl perch catches and catch rates may reflect changes in fleet dynamics. Figure 2 shows that the number of boats reporting snapper catches has

dropped by approximately 15%. At the same time, the number of operators that take the majority of their catch from the rocky reef fishery (i.e. greater than 60%) has increased. It is possible these changes are a response to management changes that occurred in 2003 and 2004. The introduction of the *Fisheries (Coral Reef Fin Fish) Management Plan 2003* and the increase in areas closed to fishing under new zoning arrangements introduced by the Great Barrier Reef Marine Park Authority (GBRMPA) in 2004 have reduced both the total area available for fishing for all species, and the number of people permitted to line fish for coral reef species. These changes may have transferred some additional effort into the rocky reef fishery. These trends in fishing effort, combined with increases in catches and catch rates for all the target species, may indicate that line fishers, who traditionally did not harvest a large amount of rocky reef finfish product, are now targeting rocky reef species more often.

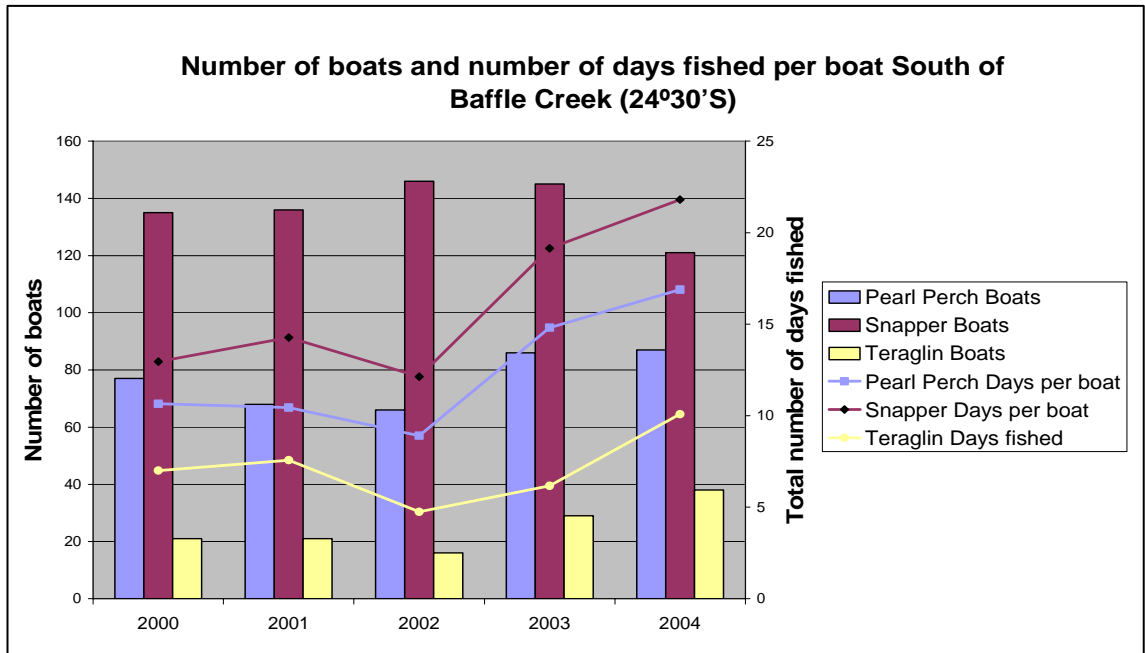


Figure 2: Effort in the rocky reef fishery 2000–04

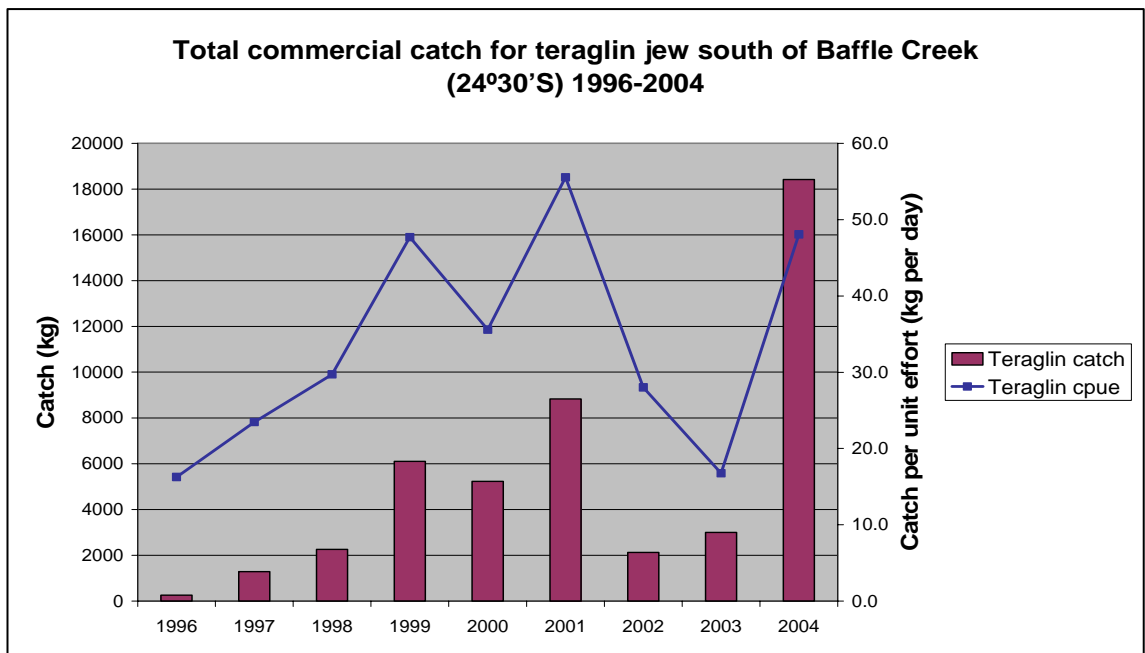


Figure 3: Total commercial catch of teraglin jew 1996–2005

The increase in teraglin catch (Figure 3) is almost certainly a result of the decrease in size limit from 45 cm to 38 cm in December 2002. Prior to the change, operators reported that for every legal fish caught, up to ten undersized fish were released. The reduced size limit has minimised the discard rate and increased the efficiency of targeting teraglin, as shown by a sharp increase in both the catch and catch rate in 2004.

Rocky reef finfish are regularly taken as by-product by operators targeting other species such as coral reef finfish or pelagic species. To provide a more accurate view of the trends in the commercial fishery, the data in Figure 4 have been sourced from operators who report that rocky reef species make up more than 60% of their total annual catch.

The data shows a slight decrease in the snapper catch rate in 2003, which was expected with the introduction of the increased minimum size limit. The snapper catch rate then increased in 2004. Similar trends are evident with pearl perch.

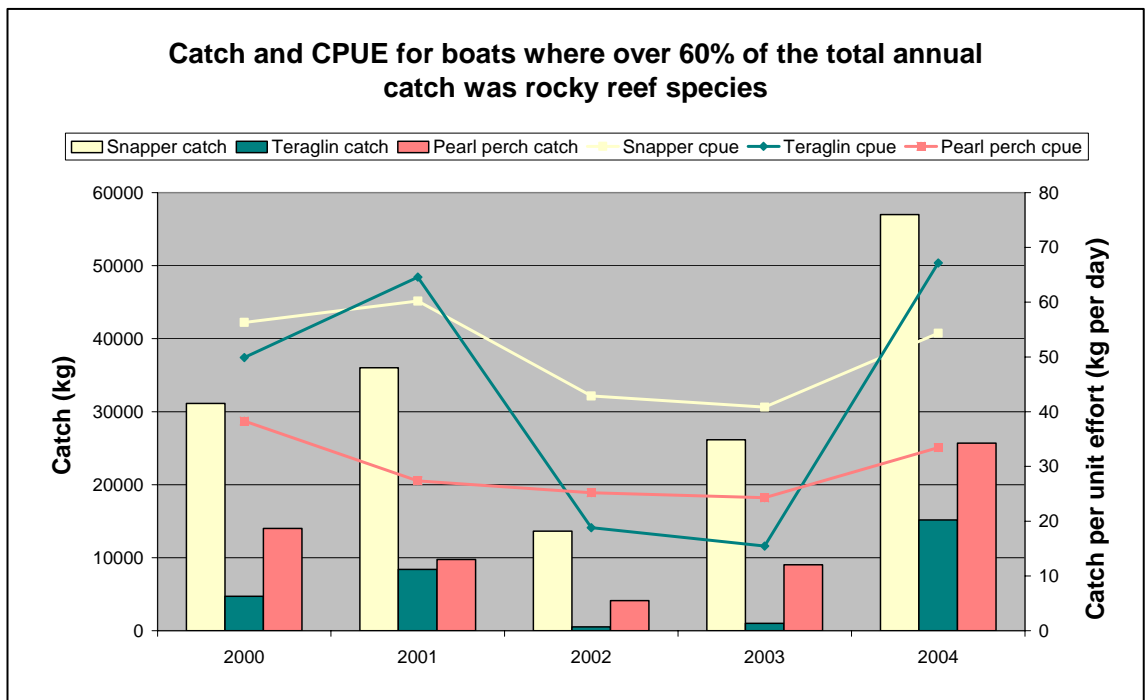


Figure 4: Catch by operators targeting rocky reef finfish 2000–04

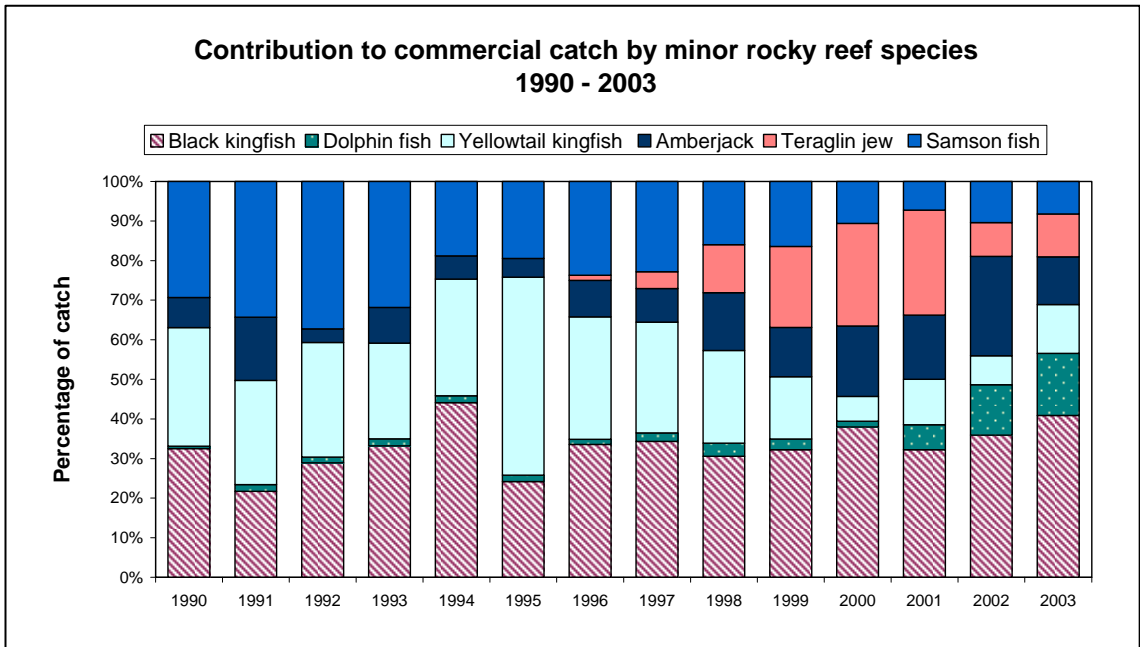


Figure 5: Contribution to commercial catch (by weight) by minor rocky reef species 1990–2003

The commercial catch of minor rocky reef species is generally less than 10 t per year for each species and has remained fairly stable over time. The contribution of different species to the overall catch has however fluctuated over time, as demonstrated by Figure 5. The proportion of yellowtail kingfish and samson fish has decreased since the late 1990s, with a shift towards teraglin jew, amberjack and dolphin fish.

Recreational

DPI&F's most recent Recreational Fishing Information System (RFISH) diary survey, conducted in 2002, indicates that approximately 300 000 snapper and 42 000 pearl perch were harvested by recreational fishers in Queensland (Table 1). The total harvest weight for snapper in 2002, based on the average weight of a legal sized fish (plus 10%), was between approximately 170 t and 230 t. The snapper harvest has declined significantly in comparison to surveys conducted in 1997 and 1999. This would appear to be a result of an increase in the number of fish released, since the total number of fish caught has remained stable. The survey was conducted during 2002, before the introduction of the increased size limit, suggesting that even at the previous size limit (30 cm) fishers may have been catching a large proportion of undersized fish and releasing them.

RFISH figures indicate that the number of pearl perch caught decreased by approximately 30% between the 1999 and 2002 surveys. A similar reduction can be seen in the number of fish harvested. The proportion of fish released appears to have remained stable.

Table 1: Estimated recreational catch of snapper and pearl perch from the 1997, 1999 and 2002 RFISH diary surveys

	Snapper			Pearl perch		
	1997	1999	2002	1997	1999	2002
Number caught	1 327 000	1 284 000	1 253 135	NA	109 000	74 376
Number released	750 000	757 000	956 695	NA	43 700	32 474
Total estimated harvest	577 000	527 000	296 440	NA	64 400	41 903
Estimated weight of total harvest	461 t ^a	421 t ^a	237 t ^a	NA	83 t ^b	54 t ^b

^aUsing an average weight of 0.8 kg per fish for a legal sized fish (and plus 10%), based on the length/weight relationship from www.fishbase.org.

^bUsing an average weight of 1.3 kg per fish, estimated from charter logbook data.

Results from the National Recreational and Indigenous Fishing Survey (NRIFS), undertaken in 2000¹, suggest that Queensland fishers harvested 232 000 snapper. This was estimated to be the equivalent of approximately 300 t.

Reliable estimates of catches for pearl perch and teraglin jew cannot be determined from the NRIFS as they were grouped with a number of other species.

In regard to some of the minor species caught in the rocky reef fishery, the NRIFS estimated that approximately 5000 kingfish and samson fish were taken in Queensland.

Charter

Figure 6 shows the total catch of snapper has decreased since 2001 as recorded in the compulsory charter logbooks. The data also shows that pearl perch catches have risen steadily since 1996.

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.

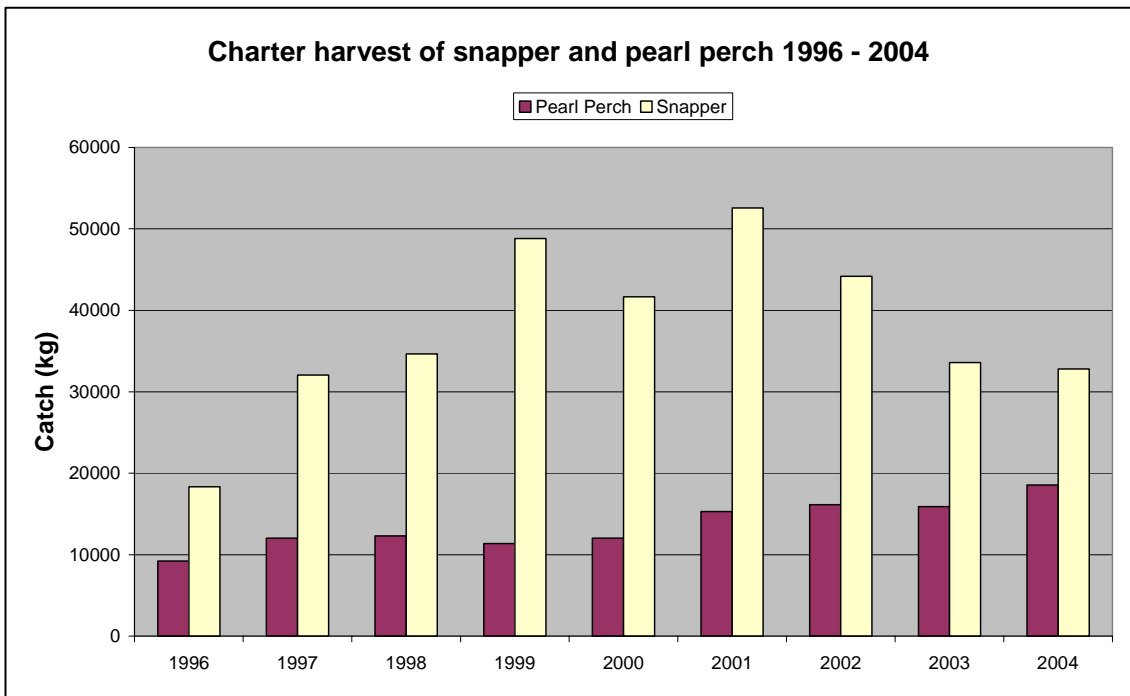


Figure 6: Charter catch of snapper and pearl perch as reported in logbooks 1996–2004

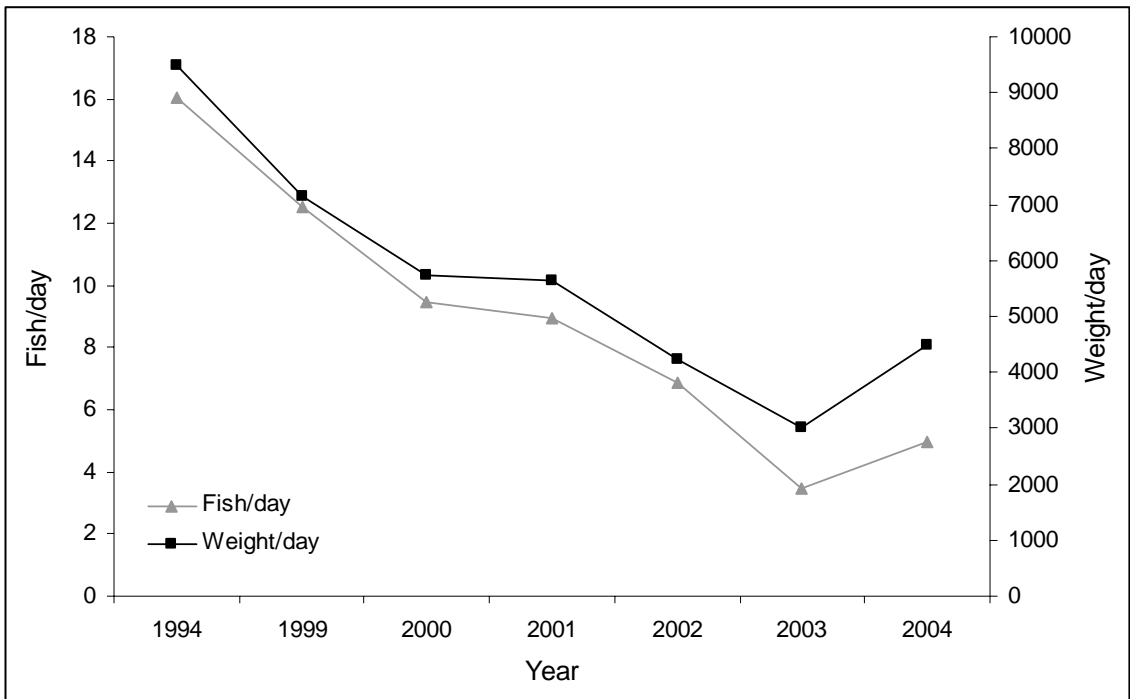


Figure 7: Charter catch rate for snapper Gold Coast fishery 1994–2004

Note: Data represent a >50% sample of the charter boat catch from the Gold Coast fishery
 Source: Data collected by the Australian Marine Life Institute

Figure 7 shows the relationship between catch rates (fish/day) and yield (weight/day) for snapper, in the Gold Coast charter fishery. Catch rates and yield are shown to decline between 1994 and 2003. Following 2003, an increase in the catch rates and the yield of snapper is evident, with yield increasing more than catch rates. This is most likely due to the positive impacts of an increase in the minimum size limit, introduced in late 2002. Following 2002, it would be expected that the catch and catch rates would initially decline but then recover as larger fish recruit to the fishery.

Indigenous

The NRIFS did not provide estimates for the Indigenous harvest of any of the rocky reef target species.

Non-retained species / bycatch

As reported in the ecological assessment² submitted to the Department of the Environment and Heritage (DEH) (see: <http://www.deh.gov.au/coasts/fisheries/qld/rocky-reef-finish/submission.html>), the level of bycatch in the commercial fishery is considered to be relatively low (approximately 10%).

Species such as kingfish and amberjack (and other species in Figure 5) that are taken incidentally when commercial fishers target snapper and pearl perch are often retained for sale, effectively reducing the amount of fish discarded. However, commercial operators are also known to take certain coral reef finfish incidentally when targeting rocky reef fish. Since the introduction of the *Fisheries (Coral Reef Fin Fish) Management Plan 2003*, these fish can only be retained if line fishers possess an RQ (reef quota) fishery symbol which allows them to take coral reef finfish for commercial purposes. However, commercial fishers operating without an RQ symbol may keep the recreational in-possession limit for coral reef finfish species listed under the plan. The quantity of coral reef finfish discarded in the rocky reef fishery has not been quantified but is likely to be low.

Juvenile snapper have also been reported in trawl bycatch, particularly in the Moreton Bay trawl fishery. Under a model developed by Sumpton and Jackson³, it was estimated that approximately 30 t of snapper was caught and released by trawl operators annually, with the majority dying.

Bycatch in the recreational sector includes any fish that is released, regardless of whether it is discarded because it is undersized or because of a 'catch and release' philosophy. Release rates for some rocky reef species have been estimated through the RFISH surveys and the NRIFS. The release rate for snapper is estimated to be particularly high, with the RFISH survey suggesting approximately 75% of fish are released, and the NRIFS suggesting a release rate of 66% across Australia. In regard to pearl perch, the RFISH survey estimates that between 40% and 45% of fish are released. There is some concern that the mortality rates of some released rocky reef fish, particularly snapper, amberjack, teraglin jew and samson fish, may be quite high because of their susceptibility to barotrauma.

Teraglin jew is considered to have an extremely high post-release mortality rate (between 45% for males and 97% for females). The likelihood of catching undersized teraglin is also considered to be high, because the species tends to congregate in schools of similar sized individuals. In December 2002, the possession limit was reduced from 10 fish to 5 fish and the minimum size limit was reduced from 45 cm to

² Kingston, A & Ryan, S 2004, 'Ecological Assessment of the Queensland Rocky Reef Finfish Fishery – A report to the Australian Government Department of Environment and Heritage on the ecologically sustainable management of a multi-species subtropical line fishery' Queensland Department of Primary Industries and Fisheries.

³ Sumpton, W & Jackson, S 2005, 'The effects of incidental trawl capture of juvenile snapper (*Pagrus auratus*) on yield of a sub-tropical line fishery in Australia: an assessment examining habitat preference and early life history characteristics', *Fisheries Research*, 71, pp. 335–47.

38 cm, in an attempt to reduce the number of teraglin jew dying after release. Anecdotal evidence from charter operators suggests that the number of undersized fish being caught is now negligible. A recreational in-possession limit of 5 is also in place to help protect the sustainability of teraglin populations.

An FRDC funded project—*Investigating the survival of fish released in Australia's tropical and subtropical line fisheries*—is underway, and may provide some information on the survival of line-caught rocky reef species. In addition, DPI&F is working with commercial line fishers to develop a general code of practice for discarding fish.

Interactions with protected species

A Species of Conservation Interest (SOI) logbook has not yet been introduced for the general line fishery. It is anticipated that the logbook will be introduced by the end of 2005.

Fishery impacts on the ecosystem

The fishery is unlikely to have any significant physical impact on the ecosystem because of the relatively benign line fishing method used. It is possible there may be some effect on community composition in localised areas where snapper numbers have been reduced, but this has not been quantified. Anecdotal evidence suggests that tailor, sweep and grinders are now the dominant species in areas where snapper was once taken in significant numbers.

General ecosystem health

Rocky reef habitat is integral to the maintenance of pearl perch, snapper and teraglin populations. The loss of these habitats may lead to reduced viability of stocks and limit the ability of stocks to recover from overfishing.

The charter industry is currently developing an industry monitoring program to document areas where rocky reef habitat may have been modified.

Spatial issues / trends

Concern for the sustainability of snapper populations in the Gold Coast area has been expressed through the Reef Management Advisory Committee (ReefMAC). Only a small number of commercial fishers operate in the Gold Coast area, where the abundance of snapper is thought to be low. Interpreting meaningful results from logbook returns submitted by these operators is dangerous because of the large annual variability in fishing effort. Concerns for the sustainability of snapper stem from information gathered via charter operators working out of the Gold Coast. A collaborative project between the Queensland Charter Vessel Association and DPI&F is currently underway analysing this data; it is hoped that it will lead to a better assessment of the population status in the region.

It is important to note that Queensland snapper populations are at the northern limit of the species distribution and that their numbers are therefore likely to be highly variable. Given the proximity of the Queensland fishery to the New South Wales (NSW) border

and the estimate that NSW fishers take over 300 000 snapper⁴, it is likely that the recreational take of snapper in NSW may influence the snapper population in Queensland waters. However, the exact movements of snapper, including spawning locations and juvenile movement, are still to some extent unknown, making the influence of NSW catches uncertain.

Socioeconomic characteristics and trends

Commercial operators sell exclusively on the domestic market, with prices between \$6/kg and \$9/kg (whole weight) for pearl perch and snapper. Prices have remained stable over the past few years. Teraglin jew is less regularly available on seafood markets and sells for between \$5/kg and \$7/kg.⁵ DPI&F is undertaking a project to estimate the value of the charter sector, based on the price paid per client.

Research and monitoring

Recent research and implications

No specific research projects are underway to look at rocky reef biology, status or habitat. ReefMAC has however identified this as a priority area for research. DPI&F researchers continue to communicate with NSW Fisheries researchers about rocky reef stocks.

Monitoring programs and results

No independent monitoring program is currently in place for rocky reef species.

Fishery management

Compliance report

A total of 1207 commercial reef line fishers were inspected by the DPI&F Queensland Boating and Fisheries Patrol (QBFP) in 2003–04; however, only 40 of these inspections occurred in southern Queensland, where the rocky reef fishery mainly operates. Of the 40 inspections, only 2 fishers were breached and prosecuted for non-compliance with fisheries regulations. Figures from the 2004–05 financial year show that 79 fishers were inspected in the south, with 9 breached and 2 cautioned. This equates to a non-compliance rate of approximately 11%, however not all of these breaches were prosecuted. Offences included possession of undersized fish and being in excess of the possession limit. It is likely that some of these breaches will relate to coral reef finfish species that are also taken by line. Of the 65501 recreational fishers inspected across Queensland in 2004-05, 472 were breached and 751 were cautioned.

The QBFP records inspections of charter operators separately. In 2003–04, there were 24 commercial fishing tour (charter) operators inspected in southern Queensland, with 2 breaches recorded. Figures for 2004-05 show that 52 operators were inspected in the south, with 3 fishers breached and 3 cautioned. These figures equate to a non-compliance rate of less than 6%.

⁴ 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.

⁵ Prices obtained from the Sydney Fish Markets (<http://www.sydneyfishmarket.com.au/>)

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

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 reviews 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 ecological assessment report to DEH in late 2004. An investment warning for snapper, pearl perch and teraglin jew 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 rocky reef finfish. 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.

Consultation also occurs through ReefMAC and its associated Scientific Advisory Committee (SAG). Meetings are generally held two to three times a year. ReefMAC provides advice to DPI&F on the management of rocky reef fish.

Complementary management

Discussions are ongoing with NSW Fisheries in regard to complementary management, including the possibility of NSW mirroring the higher size limit on snapper in Queensland. Fisheries managers meet at least once annually to discuss management arrangements. DPI&F has also recently met with Commonwealth fisheries managers of the adjacent coral sea fishery and offshore demersal fish fishery off south-east Queensland (and further south) for the first time for the specific purpose of exchanging information on rocky reef fin fish in the year now under review.

Fishery Performance

Appraisal of fishery in regard to sustainability

Despite an increase in catches and catch rates over the last two years in southern Queensland, ReefMAC considers the snapper fishery to be recruitment overfished and the pearl perch fishery to be potentially growth overfished. While commercial logbook data does suggest some recovery has occurred over the last two years, catch rates have been acknowledged as a poor indicator of abundance for the target rocky reef species and may be an inappropriate basis for assessment. Given the lack of independent monitoring information, it would be reasonable to suggest the status of the fishery is uncertain.

Progress in implementing DEH recommendations

The DEH recommendations for addressing the uncertainties or risks facing the fishery will be made available at <http://www.deh.gov.au/coasts/fisheries/gld/rocky-reef-finish/index.html>. While DEH has only recently approved the Wildlife Trade Operation, DPI&F is already investigating ways of implementing a number of recommendations.

- DPI&F is working towards developing a stock assessment program and identifying areas of localised depletion by analysing charter industry data to determine the level of risk to snapper populations associated with the Gold Coast charter fishery.
- ReefMAC has undertaken to develop an issues and options paper that will set out details of possible recovery strategies to be used in the fishery.
- 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.

Management performance

Performance measures and/or reference points have not yet been developed for the fishery. DPI&F intends to develop these measures by the end of 2006, in consultation with ReefMAC.

Resource concerns

Stakeholders have indicated concern regarding the possible loss of rocky reef habitat, particularly in the Gold Coast region, and its impact on snapper populations. Spanner crab fishers operating out of the Gold Coast have reported that they are laying dillies on sandy bottom areas that were once significant rocky reef habitat, suggesting that a number of reefs have been covered in sand and silt. If certain rocky reef habitats no longer support populations of snapper, then potential future management measures which would be designed to protect snapper on those reefs (such as spatial closures) may be ineffective. In addition, the loss of habitat may lead to a concentration of fishing effort on remaining reefs, placing additional pressure on rocky reef fish populations.

The post-release mortality associated with these species and their susceptibility to barotrauma is also a matter for concern. This susceptibility may limit the effectiveness of future management measures that aim to reduce the total harvest (e.g. changes to size limits).

Trawl by-catch of juvenile snapper is also a concern; however this source of mortality has been reduced over recent years as the level of trawling in Moreton Bay has declined by approximately 30%⁶ since the introduction of the *Fisheries (East Coast Trawl) Management Plan 1999*.

Information compiled by

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Acknowledgements

Len Olyott, Jim Higgs, Wayne Sumpton, Mark Elmer, Grant Hansen, Rod Supple.

Front cover image

Top: pearl perch Bottom: adult snapper

⁶ Gaddes, S 2004, *Review of the Moreton Bay Otter Trawl Fishery – Analysis of M1 and M2 Vessels from 1996-2003*, Queensland Department of Primary Industries and Fisheries, Brisbane.