Annual status report

Gulf of Carpentaria Development Finfish Trawl Fishery

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Queensland Government
Department of **Primary Industries and Fisheries**

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Introduction

The Gulf of Carpentaria Developmental Finfish Trawl Fishery (DFTF) is a limited entry, quota-managed, semi-demersal trawl fishery that has operated under jurisdiction of the Queensland Fisheries Joint Authority (QFJA) since June 1998. DFTF operators predominantly capture red snappers (*Lutjanus erythropterus*—crimson snapper, and *Lutjanus malabaricus*—saddletail snapper). Most of the product is sold to domestic processors as whole fish.

The DFTF remains a developmental fishery. Any change to licensed status will depend on the fishery continuing to demonstrate commercial viability, social acceptability and ecological sustainability.

This report covers fishing activity during the 2005 calendar year.

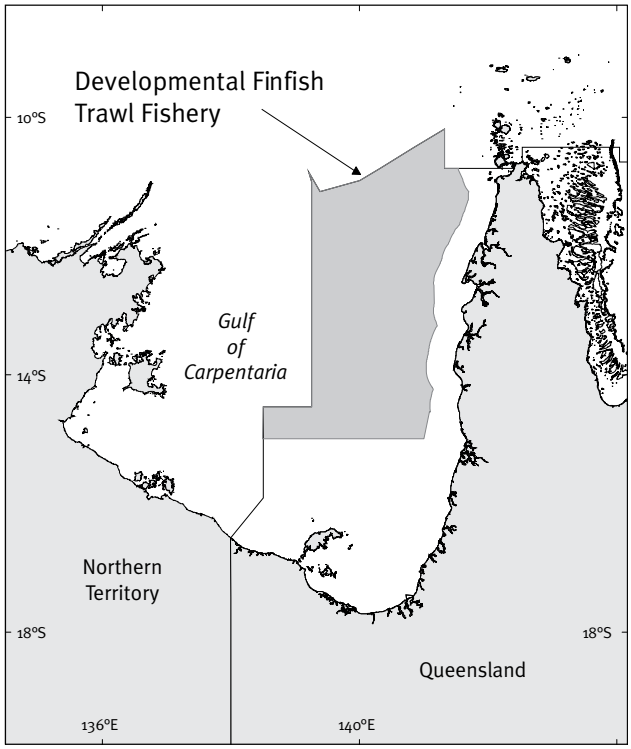

Figure 1: Fishery area of the Developmental Finfish Trawl Fishery.

Description of the fishery

Fishery profile 2005

Total harvest from all species: 479 t

Commercial harvest: 479 t

Recreational harvest: Not applicable to the fishery

Indigenous harvest: Not applicable to the fishery

Charter harvest: Not applicable to the fishery

Commercial Gross Value of Production (GVP): Approximately $1.5 million

Number of authorities: 3

Commercial boats accessing the fishery: 2

Fishery season: All year

Fishing methods

Operators in the DFTF use semi-demersal fish trawl nets separated by two otter boards. The net is used from the sea floor to a distance of approximately 5.5 m above the sea floor. Trawling speeds are between 3.5 and 4 knots, and trawl duration ranges from 30 to 90 minutes.

Fishery area

The DFTF operates in Gulf of Carpentaria (GOC) waters beyond 25 nautical miles (nm) from the Queensland coast to the boundary of the Australian Fishing Zone (Figure 1). The western edge of the fishery is the Queensland – Northern Territory border and the southern boundary is 15° S. In 2005, most of the fishing effort was concentrated in the north-eastern sector of the DFTF, near Weipa.

Main management methods used

The DFTF is a quota-managed fishery with a maximum commercial total allowable catch (TAC) of 1500 t of crimson snapper, saddletail snapper, red emperor and other emperor. The commercial TAC has been conservatively set below the estimated sustainable yields for the combined species of tropical snappers in the Australian sector of the Gulf of Carpentaria, which is estimated to be between 2900 t and 9000 t.[1] Currently, 1250 t of the 1500 t is allocated.

The QFJA manages the DFTF under Queensland law. The QFJA, established under the *Fisheries Act 1994,* manages all northern demersal and pelagic finfish fisheries in waters adjacent to Queensland in the GOC.

The full description of input and output controls in this fishery can be found in the DPI&F report *Ecological Assessment of the Gulf of Carpentaria Developmental Finfish Trawl Fishery.*[2]

Approximate allocation between sectors

The DFTF is an entirely commercial fishery.

The Indigenous, recreational and charter harvest of target, byproduct and bycatch species caught within the area of the DFTF is very low and considered negligible.

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

The DFTF was granted a Wildlife Trade Operation (WTO) approval under Part 13A of the Commonwealth EPBC Act on 1 December 2004. The WTO approval acknowledges that the fishery is being managed in an ecologically sustainable manner and allows the continued export of product caught in the fishery. The current approval expires in December 2007.

Catch statistics

Commercial

Total catches in the DFTF in 2005 were the highest since 1998 (Table 1, Figure 2) and have been increasing since 2001. Fishing effort in 2005 was similar to 2004; however, there was a slight increase in catch per unit effort (CPUE). The new fishing grounds, available to the fleet since 2004 with the expansion of the permitted trawl area south to 15° S, have been particularly productive for catches of the target species.

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[1] McLoughlin, K, Wallner, B and Staples, D (eds) 1995, *Fishery Status Reports 1994 Resource Assessments of Australian Commonwealth Fisheries*, Bureau of Resource Sciences, Canberra.

[2] Roelofs , A and Stapley, J 2004, *Ecological Assessment of the Gulf of Carpentaria Developmental Finfish Trawl Fishery, A report to the Australian Government Department of Environment and Heritage on the ecologically sustainable management of developmental multi-species tropical demersal finfish trawl fishery*, Department of Primary Industries and Fisheries, Brisbane, 77 pp. This can be downloaded from www.deh.gov.au

Crimson snapper continues to be the main species harvested (Table 1), comprising about 36% of the total catch by weight. Crimson and saddletail snappers and mangrove jack catches were all higher in 2005. The increased levels of take for crimson snapper may also have been influenced by the lowering of the minimum legal size for this species in 2004, which has allowed a greater proportion of the catch to be retained.

There was also an increase in the 'other fish' and mixed reef fish categories caught in 2005. The 'other fish' group comprises a number of species, including coral trout, fingermark bream, parrot fish and bat fish, and unspecified fish species. The higher number of unidentified species is not unexpected given an additional boat with an inexperienced crew began operating in the fishery in late 2004. With assistance from at-sea observers, fishers have been learning to identify the species caught. The accuracy of catch reporting is expected to increase as this operator gains more experience.

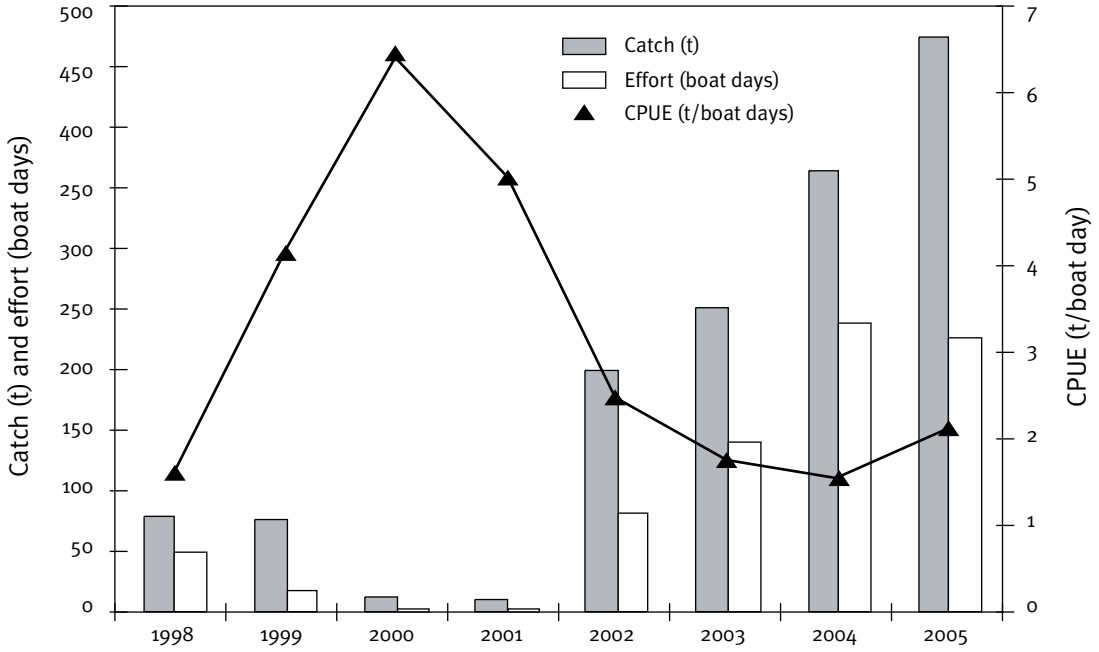

Figure 2: Total harvest (t) of all species combined in the DFTF from 1998 to 2005 (Source: DPI&F CFISH database. Data correct as at 31.10.2006).

Table 1: Species composition of the total catch in tonnes (t) for the DFTF from 1998 to 2005 (Source: DPI&F CFISH database. Data correct as at 31.10.2006).

Common name	1998	1999	2000	2001	2002	2003	2004	2005
Crimson snapper*	41	20	5	4	61	98	142	175
Saddletail snapper*	14	13	1	1	53	48	59	76
Mangrove jack	4	13	5	2	35	37	48	74
Blackall	8	13	1	1	15	12	30	30
Spotted scale seaperch*		2			6	25	28	23
Gold band snapper*					7	11	22	16
Red spot emperor*	2	3	0.5	0.2	10	10	12	8
Trevally—unspecified	0.1				0.1	3	16	27
Cod—unspecified	1	3	0.1	0.4	2	2	5	8
Fish—mixed reef	1						1	14
Red emperor*	3	3	0.2	0.5	2	2	1	2
Spanish mackerel		2	0.1	0.5	5	1	0.4	1
Other fish	6	3	0.2	1	5	4	6	26
Total	**78**	**75**	**13**	**10**	**201**	**252**	**368**	**479**

*Quota species

Spatial issues/trends

Management changes to the DFTF in 2004 have made it difficult to interpret recent spatial patterns in fishing effort. In 2004, the southern boundary of the DFTF was amended from 13.5° to 15° S, and an additional boat started operating in the fishery.

Recognising these changes have influenced fishing fleet dynamics since 2004—the major spatial trend was a shift in fishing effort from a concentrated area west of Weipa in 2003, to a general spreading of effort to the north-east and south-west corners of the fishery area in 2005. Large quantities of crimson snapper, saddletail snapper and mangrove jack were harvested from the south-west corner in 2005. These previously unfished areas appear to be highly productive.

Socio-economic characteristics and trends

The DFTF relies on bulk tonnages of low value ($3–4 per kg), unprocessed whole fish for a profitable return. There is limited value-adding to the product by operators. The southward extension in 2004, from 13.5° to 15° S, has facilitated the expansion of the DFTF to new productive fishing grounds which contributed to the increase in catches in 2005. The close proximity of these southern fishing grounds to Karumba has also created greater economic opportunity for operators by providing an additional port for transport of product to the domestic market and effectively extending the fishing season to all year. Road access in and out of Karumba is less affected during the tropical wet season months (January to March) than Weipa (previously the only port for transfer of DFTF product to the domestic market).

The future direction of the DFTF remains uncertain while it remains a developmental fishery.

Fishery performance

Appraisal of fishery in regard to sustainability

From 2004, the DFTF observer program has collected biological information on target and byproduct species. The program also collects information of the size and composition of bycatch. The information is being used to assess the current status of target and byproduct species, and help determine sustainable exploitation levels for the DFTF.

Concern for the future sustainability of red snapper stocks across northern Australia was recently expressed in the 2005 ACIAR project, Shared stocks of snapper in Australia and Indonesia.[3] More recently, however, a genetic population study has shown that the GOC crimson and saddletail snapper stocks are separate from those in Indonesia (which are considered to be overfished).[4] From a Queensland perspective, the unknown level of illegal, unlicensed and unreported (IUU) fishing for red snappers by foreign vessels in the GOC is of particular concern.

[3] Blaber, S, Dichmont, C, Buckworth, R, Badrudin, B, Sumiono, B, Nurhakim, S, Iskandar, B, Fegan, B, Ramm, D and Salini, J 2005, 'Shared stocks of snappers (Lutjanidae) in Australia and Indonesia: Integrating biology, population dynamics and socio-economics to examine management scenarios', *Reviews in Fish Biology and Fisheries*, vol. 15, pp111–127.

[4] Salini, JP, Ovenden, JR, Street, R, Pendrey, R, Haryanti and Ngurah 2006, 'Genetic population structure of red snappers (*Lutjanus malabaricus* Bloch and Schneider, 1801 and *Lutjanus erythropterus* Bloch, 1790) in central and eastern Indonesia and northern Australia', *Journal of Fish Biology*, vol 68(SB) pp217–234.

Progress in implementing Department of the Environment and Heritage (DEH) recommendations

Recommendation	Progress
DPI&F to inform DEH of any intended amendments to the management arrangements that may affect sustainability of the target species or negatively impact on protected species or the ecosystem.	*Ongoing* There have been no management changes during the reporting period. Future management arrangements to be considered during 2007.
By the end of 2006 DPI&F to develop fishery specific objectives, performance indicators and precautionary performance measures for target, by-product, bycatch, protected species and impacts on the ecosystem. Data collection programs appropriate to monitor the performance measures to be implemented.	*In progress* Ecological Risk Assessment (ERA) completed for all protected, bycatch, by-product and target species for the GOC. Performance measures developed—awaiting Gulf MAC endorsement and DPI&F implementation.
DPI&F to monitor the status of the fishery in relation to the performance measures once developed. Within 3 months of becoming aware that a performance measure has not been met, DPI&F to finalise a clear timetable for the implementation of appropriate management responses.	*In progress* Performance measures developed—DFTF fishery performance will be measured against Performance Measurement System (PMS) in 2006 season.
From 2005, DPI&F to report publicly on the status of the fishery on an annual basis, including explicitly reporting against each performance measure, once developed.	*Ongoing* This annual status report is the second to be completed.
DPI&F to maintain data validation mechanisms for target, byproduct, bycatch and protected species interactions and implement alternative data collection validation techniques if observer trips are no longer feasible or are insufficient to provide robust information on the fishery.	*Ongoing* At-sea observers validate logbook data for the DFTF. Four observer trips were conducted in 2005.
Within 18 months, DPI&F to develop a process to improve estimates of recreational and Indigenous take and factor these into stock assessments and management controls to ensure overall catch levels are sustainable.	*In progress* DPI&F are assessing methodologies and designs of pilot studies to collect Indigenous catch data and to improve estimates of recreational catch at the regional level.

Recommendation	Progress
DPI&F to continue to seek out alternative cost effective, fishery independent sampling techniques, particularly for target species, and report outcomes in the annual status report from 2005.	*In progress* DPI&F are continuing to seek out alternative cost effective fishery independent sampling/monitoring techniques, particularly for target species in the DFTF.
DPI&F to continue to cooperate with other relevant jurisdictions to pursue complementary management and research of shared stocks for all target and byproduct species that may be affected by cross-jurisdictional issues.	*In progress* DPI&F have management and scientific representation at NAFMF, QFJA meetings and on Gulf MAC. A stock assessment of red snappers in collaboration with Northern Territory scientists commenced in 2005.
DPI&F to implement appropriate management measures for species identified through the risk assessment as being high risk within 12 months of completion of the risk assessment.	*Completed* ERA including all GOC fisheries species completed. Report published June 2006. No species in the DFTF were identified as high risk.
DPI&F to continue to pursue reduction in the amount of bycatch, including protected species, taken in the DFTF through the refinement of management measures and to investigate methods for further increasing the survivability of bycatch species. Any suitable methods identified to be implemented in a timely manner.	*In progress* One operator has trialled turtle excluder devices (TEDs)/bycatch reduction devices (BRD) in the finfish trawl fishery in Western Australia. Gulf MAC will consider the use of BRDs, including square mesh cod ends and hoppers, and advise DPI&F when developing future management arrangements.
DPI&F to review the appropriateness of the bycatch performance measure within 1 year.	*Ongoing* New bycatch performance measures to be incorporated into the fishery's performance management system in 2007.
To support the implementation of the SOCI logbook DPI&F to develop and implement an education program for fishers to promote the importance of protected species protection and accurate incident reporting within one year.	*In progress* Education package providing advice on minimising harmful interactions with protected species was provided by DPI&F to all Queensland commercial fishers in 2005. SOCI logbook to be implemented at start of 2007 season—collected data will improve our level of knowledge of interactions with protected species.

Management performance

DPI&F is satisfied that the DFTF is being managed in an ecologically sustainable manner despite some breaches in permit conditions governing the conduct of fishing operations in the DFTF.

A new PMS was developed for the DFTF in 2006 and has been endorsed by Gulf MAC.

Resource concerns

There are no resource concerns for the species at current harvest levels. Outcomes of the DPI&F/Northern Territory assessment of the DFTF target and byproduct species will assist in determining maximum exploitation levels for these species.

Ecosystem

Non-retained species/bycatch

Two types of net are used in the DFTF—the full wing Wendy net and the Champion cutaway wing net. Both are considered environmentally-friendly nets. The correct operation of these types of net design can reduce the number of interactions with sponges, corals and other unwanted species associated with traditional demersal trawl operations.

Documentation and assessment of bycatch in the DFTF was undertaken in 2005 through the observer program where it was estimated that 53% of the catch by weight was discarded as bycatch, and mainly comprised unmarketable finfish (38%) and benthos (15%).

DPI&F is continuing to monitor the amount of bycatch in the DFTF through onboard observers. Should the observed level of impact show the amount and level of interaction with bycatch and the environment is increasing significantly, DPI&F may consider further management measures to mitigate these impacts.

Interactions with protected species

Operators in the DFTF occasionally encounter threatened species. Observer reports from four separate trips onboard each of the two vessels that operated in 2005 indicated that twelve sea turtle, four sawfish, twenty-two sea snake and three seahorse interactions occurred and that approximately 50% of these animals were released alive.

A Species of Conservation Interest (SOCI) logbook has been developed to provide more detailed information on the level of interactions with protected species in GOC fisheries. DPI&F plan to implement the SOCI logbook along with new catch logbooks for the start of the 2007 fishing season. Until the new logbook is implemented, fishers are legally required to report interactions with all protected species directly to DEH.

Fishery impacts on the ecosystem

The semi-demersal trawl net used in the DFTF is designed to minimise habitat disturbance while maintaining viable levels of catch. The net design reduces the catch of sponges, corals and other unwanted species that are associated with traditional demersal trawl operations.

Beyond the removal of fish, there is little evidence to suggest that the DFTF impacts significantly on benthic or pelagic ecological communities in the area as a whole. Local impacts may, however, occur.

Foreign and illegal fishery activities

Australian fisheries managers consider the recently reported increase in IUU fishing vessel incursions into GOC waters to be a serious threat to the sustainability of northern Australian fisheries. IUU activities appear to be targeting sharks and other pelagics, although demersal finfish are also being taken. Concerns are also held for the take of protected species and other species of conservation interest.

IUU harvest levels are not well known at present. This lack of accurate information may affect the accuracy of resource assessment models, which in turn may influence the measurement of the effectiveness of fisheries management practices in the region. DPI&F continues to seek improved data from Australian Government agencies responsible for fisheries enforcement and compliance.

General ecosystem health

Given the limited effects on the environment caused by this commercial fishery at current levels of fishery effort, the general ecosystem health of the GOC appears under minimal threat from the DFTF.

Research and monitoring

Recent research and implications

A preliminary fisheries assessment by DPI&F of crimson and saddletail snapper harvested in the DFTF commenced in 2006 using Queensland and Northern Territory logbook data and samples collected by the fisheries observer program.[5] The short time series of highly variable commercial catch data available will make it difficult to detect statistically significant trends. Variation in the commercial catch and effort data will also affect resolution of a stock production model.

The outcomes of the ACIAR Shared Snapper Stocks[6] assessment in 2003 concluded that, on a regional basis, fishing northern red snapper stocks in Australian and Indonesian waters at levels of effort at that time was not likely to be sustainable. The lack of reliable quantitative red snapper catch and effort data for the Indonesian fisheries is highlighted by Blaber et al '2005'.

The genetic population structure of red snapper stocks in central and eastern Indonesia and northern Australia were better defined recently.[7] The study indicates that northern Australian genetic stocks are separate to central and eastern Indonesia; an important consideration for management. Other recent research[8] on red snappers in the GOC and Indonesia has determined regional differences in age at first maturity and spawning periods for *L. malabaricus* and *L. erythropterus*.

[5] Gribble, NA, Lloyd, J, McPherson, G and Fairweather, C 2006, Trawl Finfish Report 2006 Queensland Gulf of Carpentaria, Unpublished report, Department of Primary Industries and Fisheries, Brisbane.

[6] Blaber, S, Dichmont, C, Buckworth, R, Badrudin, B, Sumiono, B, Nurhakim, S, Iskandar, B, Fegan, B, Ramm, D and Salini, J 2005, 'Shared stocks of snappers (Lutjanidae) in Australia and Indonesia: Integrating biology, population dynamics and socio-economics to examine management scenarios', *Reviews in Fish Biology and Fisheries*, vol 15, pp111–127.

[7] Salini, JP, Ovenden, JR, Street, R, Pendrey, R, Haryanti and Ngurah 2006, 'Genetic population structure of red snappers (*Lutjanus malabaricus* Bloch & Schneider, 1801 and *Lutjanus erythropterus* Bloch, 1790) in central and eastern Indonesia and northern Australia', *Journal of Fish Biology*, vol 68(SB), pp217–234

[8] Fry, GC, Milton, DA, van der Velde, TD, Stobutzki, IC, Andamari, R and Badrudin, B 2005, 'Are there life history differences between populations of the red snappers; *Lutjanus erythropterus* (Bloch 1790) and L. *malabaricus* (Schneider 1801), across northern Australia and eastern Indonesia?', *Estuarine Coastal Shelf Sci* (in press).

Monitoring programs

The DFTF is monitored through catch and effort data collected through the DPI&F compulsory daily logbook program. The results of this program are outlined in the commercial catch and effort section of this report.

Since 2004, DPI&F fisheries observers and the Long Term Monitoring Program (LTMP) have collected age, reproductive status and size structure information for the major red snapper species in the DFTF. The objectives of the program are to obtain the biological parameters and fishery data required to assess the status of the Gulf of Carpentaria populations of crimson and saddletail snappers and mangrove jack. Length structure information was also collected for three additional fishery byproduct species (red emperor, large-scale seaperch and goldband snapper). Outlined below are the key findings from the monitoring so far:

- Length/weight relationships have been established for biomass conversions which are to be used in stock assessments.
- Gonosomatic Index values have been established which indicate that spawning is likely to occur all year round for the target snapper species.
- Sex ratio information indicates that there were slightly higher numbers of females than males for both species and that there were more immature individuals in the northern compared to the southern region.

Age structure data, together with the length and reproductive information, will provide an accurate description of the biological characteristics for the major species harvested.

DPI&F monitors each fishing operators' adherence to the boundaries of the DFTF through the location data collected from the Vessel Monitoring System (VMS). Each vessel is required under permit conditions to carry VMS equipment. Current data shows good spatial compliance rates.

Fishery Observer Program

As part of the permit conditions for the DFTF, onboard observers monitor retained catches and bycatch. Fishing activities were observed for 24 days on four separate trips on board each of the two vessels that operated in 2005. This equated to approximately 10% of the fishing effort for 2005. The observer program objectives are formulated alongside scientific and management priorities as stipulated in the QFJA Developmental Fishery Policy.

Collaborative research

A stock assessment of red snappers in collaboration with Northern Territory scientists commenced in 2005.

Fishery management

Compliance report

Compliance and enforcement in the DFTF are the responsibility of DPI&F's Queensland Boating and Fisheries Patrol (QBFP).

During 2005, three commercial fishing vessel and four market premise inspections were conducted in the fishery. Two prosecutions are still pending for this period relating to a commercial fisher contravening a condition of an authority. Both offences are for the take/possession/sale of fish regulated by size.

Changes to management arrangements in the reporting year

There have been no management changes during the reporting period.

Consultation, communication and education

Consultation with stakeholders in the DFTF mainly occurs through Gulf MAC. One meeting was held in 2005. Gulf MAC provides advice to DPI&F and the QFJA on management measures for the DFTF.

Fishery observers also undertake an educational role while on board the DFTF vessels, confirming identification of fish species with fishers and ensuring fishers are aware of their reporting requirements in relation to any protected species interactions.

Complementary management

State, territory and federal fisheries managers meet annually at the Northern Australian Fisheries Management (NAFM) workshop to review recent research results, set research priorities and consider complementary management strategies for shared resources. DPI&F is represented at NAFM and the associated Stock Assessment Group.

The recent NAFM workshop discussed the threats posed to northern Australian fisheries by IUU fishing. One of the outcomes of these discussions was the development of a research strategy and a list of short-term projects to assess the ecosystem impacts of IUU fishing on northern Australian target commercial species and species at high risk. Project implementation was discussed at the 2006 workshop.

A management plan for the shared stocks of red snappers with Indonesia is currently being prepared by AFMA in consultation with Queensland DPI&F, Western Australia and Northern Territory.

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Acknowledgements

Neil Gribble, Jason Stapley, Mark Doohan, Malcolm Dunning, Sue Helmke, Darren Rose, Leonard Olyott, Kate Yeomans

Front cover Image

Crimson snapper (*Lutjanus erythropterus*)