



Australian Government

Department of the Environment and Heritage

Assessment of the
Queensland Deepwater Finfish Fishery

October 2005

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ISBN: 0 642 55120 0

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This document is an assessment carried out by the Department of the Environment and Heritage of a commercial fishery against the Australian Government Guidelines for the Ecologically Sustainable Management of Fisheries. It forms part of the advice provided to the Minister for the Environment and Heritage on the fishery in relation to decisions under Parts 13 and 13A of the Environment Protection and Biodiversity Conservation Act 1999. The views expressed do not necessarily reflect those of the Minister for the Environment and Heritage or the Australian Government.

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Assessment of the ecological sustainability of management arrangements for the Queensland Deepwater Finfish Fishery

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EXECUTIVE SUMMARY

Background

The Queensland Department of Primary Industries and Fisheries (DPI&F) has submitted documents for assessment of the Queensland Deepwater Finfish Fishery (DFF) under Parts 13 and 13A of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The draft document, *Ecological Assessment of the Queensland Deepwater Finfish Fishery* (the submission), was received by the Department of the Environment and Heritage (DEH) in August 2004. The submission was released for a thirty-day public comment period that expired on 10 September 2004. One public comment was received. DPI&F provided a response to the issues raised but no changes were made to the submission as a result of public comment.

The submission reports on the DFF against the Australian Government *Guidelines for the Ecologically Sustainable Management of Fisheries*. The DEH assessment considers the submission, associated documents, public comments and DPI&F's response to the comments.

Table 1: Summary of the Deepwater Finfish fishery

Area	Tidal waters deeper than 200 m that are east of longitude 142°31' 49" east and the 200 m bathometric line, out to the eastern extent of the Queensland east coast Offshore Constitutional boundary. Approximately 38% of the area of the DFF is included in the Great Barrier Reef Marine Park (GBRMP). The fishery relates to the Queensland line fishing endorsement area L8.
Fishery status	Unknown.
Target species	Finfish belonging to the Families Serranidae (cods and groupers), Polyprionidae (wreckfishes), Lutjanidae (tropical snappers and sea perches), Lethrinidae (emperors) and Carangidae (trevallies) may be taken under an L8 endorsement. Barramundi, coral reef finfish, snapper and Spanish mackerel are prohibited from being taken in the fishery, although those L8 operators that have received a reef quota (RQ) allocation under the <i>Fisheries (Coral Reef Fin Fish) Management Plan 2003</i> (the CRFFF Plan), are entitled to take coral reef finfish. Primary target species are Bar cod (<i>Epinephelus ergastularius</i>), deepwater snappers (including Flame (<i>Etelis coruscans</i>), Ruby (<i>E. carbunculus</i>) and Goldband snapper (<i>Pristipomoides multidens</i>)), Rosy jobfish (<i>P. filamentosus</i>) and Hapuka (<i>Polyprion oxygeneios</i>).
Byproduct species	Other species retained include cods and groupers (Serranidae) and other jobfish (Lutjanidae).
Gear	Multiple hook apparatus, such as droplines or bottom set longlines, and traditional line and hand line fishing methods.
Commercial harvest	Uncertain, but thought to be less than 100 t annually.
Value of commercial harvest	Estimated to be between \$5-9 million depending on the product, quantity caught at the time and competition faced from imports. It is also difficult to estimate the value of the fishery due to its overlap with the Coral Reef Finfish Fishery.
Recreational harvest	The recreational catch in waters greater than 200 m is limited. However many of the target species are taken by recreational fishers outside of the area of the DFF.

Licences issued	7 as at September 2005, of which five have RQ licences under the CRFFF Plan.
Season	No set season, but peak fishing activity usually occurs in winter.
Management arrangements	<p>Key management measures specific to the DFF are:</p> <ul style="list-style-type: none"> • limited entry; • gear controls: a maximum of 6 droplines with a maximum of 50 hooks /line or a maximum of 3 trotlines with a maximum of 300 hooks in total; • the DPI&F Boat Replacement Policy; and • closed areas. <p>Most of the DFF target species are designated coral reef finfish species under the CRFFF Plan. The key features of that Plan as they apply to species taken in the DFF are:</p> <ul style="list-style-type: none"> • quota management for ‘other coral reef finfish’; • size limits; • possession limits for recreational and charter fishers; and • recreational fisheries restricted to a maximum of three lines and six hooks in total per person.
Export	Deepwater cod and jobfish are exported to North America, Hawaii and to a lesser extent south-east Asia.
Bycatch	Uncertain, but thought to be mainly discards of undersized target species.
Interaction with Threatened Species/ecological communities	<p>The potential exists for interactions with protected species of sharks, fish, marine turtles, cetaceans and seabirds. Information available from logbooks and observer reports indicates that the extent of interactions is rare.</p> <p>There are no threatened ecological communities in the area of the DFF.</p>

The DFF is a multi-species, multi-gear, deepwater (>200 m) fishery operating over a large latitudinal extent (from around 10°S to around 27°S). In practice, there is little differentiation between target and byproduct species. The primary target species are Bar cod (*Epinephelus ergastularius*), deepwater snappers (including Flame snapper (*Etelis coruscans*), Goldband snapper (*Pristipomoides multidentis*) and Ruby snapper (*Etelis carbunculus*)), Rosy jobfish (*P. filamentosus*) and Hapuku (*Polyprion oxygeneios*). All of these species are covered by the CRFFF Plan.

Other ‘byproduct’ species known to be taken in the DFF include Eight bar cod (*Epinephelus octofasciatus*), Lavender jobfish (*P. sieboldii*), Pearl perch (*Glaucosoma scapulare*), Maori cod (*Epinephelus undulatostratus*), Blue Maori cod (*E. cyanopodus*), Bass groper/Hapuka (*Polyprion americanus*), Large-mouthed nannygai (*Lutjanus malabaricus*), Samson fish (*Seriola hippos*), Amberjack (*S. dumerili*), Small-toothed jobfish (*Aphareus furca*), Sharp tooth jobfish (*Pristipomoides typus*), Rusty jobfish/ironjaw (*Aphareus rutilans*), Mozambique bream (*Wattsia mossambica*), Blue-eye trevalla (*Hyperoglyphe antarctica*), Ocean blue-eye trevalla (*Schedophilus labrinthicus*). Of these, Pearl Perch, Samson fish, Amberjack, Blue-eye trevalla and Ocean blue-eye trevalla are not covered by the CRFFF Plan.

Snapper (*Pagrus auratus*) has also been recorded as retained catch in the DFF despite the catch of snapper being prohibited in the DFF.

A number of other species, while not recorded as being caught, are considered likely to be taken, in the DFF. These include Speckled grouper (*Epinephelus magniscuttis*), Oblique banded groper (*E. radiatus*), Pale snapper (*Etelis radiosus*), Saddleback snapper (*Paracaesio kusakarii*), Cocoa

snapper (*P. stonei*), Ornate jobfish (*Pristipomoides argyrogrammicus*) and Golden-eye jobfish (*P. flavipinnis*). All are covered by the CRFFF Plan.

There is relatively little information on the distribution and spatial structure of the wide variety of species caught in the DFF. The distribution, abundance, spawning and other life history characteristics of these species differs considerably. Many of the species targeted in the DFF are characterised by early growth to maximum size, long life, relatively large size at sexual maturity, hermaphroditic reproductive strategies, aggregative spawning and low levels of natural mortality. These biological characteristics may make them vulnerable to anything other than low levels of fishing.

Licensed fishers in the DFF are authorised to use multiple hook apparatus, such as droplines or bottom set longlines (trotline) with a maximum of 300 hooks in waters deeper than 200 m. Fishers can also use traditional line fishing and hand line fishing methods. Most fishers favour the use of droplines. Droplines are dropped vertically into the water to within about 10 m from the bottom and are pulled up after a soak time of between 20 and 60 minutes.

Fishing is concentrated in the winter months and fishing trips range from single days to five to six days depending on the size and capacity of the vessel. The majority of the catch is landed as gilled and gutted whole or chilled whole fish.

While bycatch data has not been collected it is thought that bycatch consists predominantly of discarded target species. Given that most species taken in the fishery suffer barotrauma when brought to the surface from deep water these discards are likely to have high rates of post-release mortality. This factor, along with the lack of market demand for live DFF species, also precludes participation of the DFF in the live export trade.

Many of the species, particularly cods and grouper (Serranids), tropical snappers and sea perches (Lutjanids) and emperors (Lethrinids), taken in these waters are also commonly found in more shallow waters and are taken by most other Queensland east coast line fisheries, notably the Coral Reef Finfish Fishery and the Rocky Reef Finfish fishery, and in fisheries in New South Wales (NSW) (eg the NSW deepwater line fishery). The extent of finfish catch by recreational and charter fishers in the DFF area is considered to be relatively minor, however DFF species are also taken by recreational and charter fishers elsewhere in Queensland and NSW.

Some species that may be affected by this fishery are currently listed protected species under the EPBC Act and include sharks, syngnathids, seabirds, sea turtles, sea snakes, dolphins and whales. The limited information available and knowledge about the operation of the fishery suggests that interactions with any protected species group are very low. These interactions are assessed under Principle Two of this report.

The DFF is managed under the Queensland *Fisheries Act 1994* and the *Fisheries Regulation 1995*. Provisions of the Commonwealth *Great Barrier Reef Marine Park Act 1975* also apply to the area of the fishery which is inside the GBRMP. Under those instruments the DFF is managed by limited entry, gear controls, a boat replacement policy and closed waters. The CRFFF Plan also imposes catch limits, size limits and recreational/charter possession limits for a range of species taken in the DFF. Of the species taken in the DFF that are not covered by the CRFFF Plan, Snapper is considered to be at very high risk of overexploitation (mainly from fisheries other than the DFF), Pearl perch at moderate/high risk and Samson fish and Amberjack at low/moderate risk (White and Sumpton, 2002). No risk assessment has been carried out for Blue-eye trevalla or Ocean blue-eye trevalla. The introduction of the CRFFF Plan and various policy interventions by DPI&F has

effectively reduced the number of DFF operators to seven. Five of these licenses were also allocated RQ fishery symbols under the CRFFF Plan, allowing them to target coral reef finfish species.

Overall assessment

The material submitted by DPI&F demonstrates that the management arrangements for the DFF meet the requirements of the Australian Government *Guidelines for the Ecologically Sustainable Management of Fisheries*.

While the fishery is relatively well managed, DEH has identified a number of risks and uncertainties that must be managed to ensure that impacts are minimised:

- ambiguous and out of date fishery dependent data and a lack of biological data on many of the stocks fished;
- no stock assessment for key target species;
- lack of bycatch data;
- lack of verified catch and effort data;
- absence of fishery independent data;
- absence of clear, fishery-specific objectives, performance indicators and performance measures; and
- lack of a compliance risk assessment.

DEH recognises the fishery has the basis upon which good management arrangements can be implemented and that a number of current research projects and management commitments made by DPI&F will help to address deficiencies identified in the fishery.

DEH has made a number of recommendations to further address the issues identified above and to ensure that the risk of impact is minimised in the longer term. Through the implementation of the recommendations, the continuation of a responsible attitude to the management of the fishery, and implementation of other management commitments made by DPI&F, management arrangements are likely to be sufficiently precautionary and capable of controlling, monitoring and enforcing the level of take from the fishery while ensuring the stocks are fished sustainably. However, the longer-term sustainability of the fishery will be heavily dependent on the findings of current research and management actions taken in response to those findings. The CRFFF Plan is a key component of the management arrangements of the DFF. The recommendations made in this report should be read in conjunction with those made in DEH's *Assessment of the Queensland Coral Reef Finfish Fishery* (DEH, 2005).

The management regime aims to ensure that fishing is conducted in a manner that does not lead to over-fishing and for fishing operations to be managed to minimise their impact on the structure, productivity, function and biological diversity of the ecosystem. On balance, the fishery is being managed in an ecologically sustainable manner and is working to address existing problems and minimise environmental risks.

The operation of the fishery is consistent with the objects of Part 13A of the EPBC Act. Given the management arrangements, DEH considers that the fishery will not be detrimental to the survival or conservation status of the taxon to which it relates in the short term. Similarly, it is not likely to threaten any relevant ecosystem in the short term. DEH therefore recommends that the fishery be declared an approved Wildlife Trade Operation (WTO) with the actions specified in the recommendations to be undertaken by DPI&F to contain the environmental risks in the long term. DEH considers that the fishery, as managed in accordance with the management regime is not likely

to cause serious or irreversible ecological damage over the period of the export decision. Specifically, the WTO declaration would allow the export of product from the fishery for a period of three years. The WTO declaration will require annual reporting on the progress of implementing the recommendations of this report and other managerial commitments.

As the official fishery area encompasses Commonwealth as well as State waters, consideration under Part 13 of the EPBC Act is required regarding the impact of the fishery on listed threatened species, listed migratory species, cetaceans and listed marine species.

Protected species occurring in the fishery area include sharks, marine turtles and seabirds. The fishery has no recorded interactions with these species groups. The actual and potential impact on Part 13 species under the management arrangements is considered low and adequate protection is provided. There are no listed threatened ecological communities in the fishery area.

DEH recommends that the DFF management regime be declared an accredited management regime under sections 208A, 222A, 245 and 265 of the EPBC Act. In making this judgement, DEH considers that the fishery to which the regime relates does not, or is not likely to, adversely affect the survival in nature of listed threatened species or a population of that species, or the conservation status of a listed migratory species, cetacean species or listed marine species or a population of any of those species. DEH also considers that the regime requires that all reasonable steps are taken to avoid the killing or injuring of protected species, and the level of interaction under current fishing operations is low. On this basis, DEH considers that an action taken by an individual fisher, acting in accordance with the regime would not be expected to have a significant impact on a listed threatened species or listed migratory species protected by the EPBC Act.

The assessment also considered the possible impacts on the World Heritage Values of the GBRMP. Approximately 40% of the area of the DFF is included in the GBRMP. DPI&F notes that it is committed to protecting the values of the park and that line fishing gear has negligible impacts on benthic communities. DEH believes that the management regime of the DFF, together with increased area closures in the park under the Representative Areas Program and the implementation of recommendations made in this assessment, will provide adequate protection for the World Heritage Values of the GBRMP.

Recommendations

1. 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 bycatch, protected species or the ecosystem.
2. By the end of 2006 DPI&F to develop fishery specific objectives linked to performance indicators and performance measures for target species, bycatch, protected species and impacts on the ecosystem.
3. 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.
4. From 2006, DPI&F to report publicly on the status of the DFF on an annual basis including explicitly reporting against performance measures, once developed.
5. DPI&F to implement a program to validate logbook data in the DFF by June 2006.
6. DPI&F to enhance fishery specific data collection in the DFF to inform stock status assessments.

7. DPI&F to instigate measures to ensure compliance with the CRFFF Plan and relevant legislation, in particular, compliance with the prohibition of the take of Snapper by DFF operators and take of coral reef finfish by DFF operators without appropriate quota symbols.
8. DPI&F to implement an ongoing and robust program to collect information on the composition, abundance and life status of bycatch (including shark species and discards of target species) in the DFF by June 2006.
9. DPI&F to assess the need for bycatch mitigation measures in the DFF based on relevant research and bycatch data, when collected, and implement such measures where required, by June 2008.

PART I - MANAGEMENT ARRANGEMENTS

The DFF is managed by DPI&F. The management regime is described in the following documents, all of which are publicly available:

- the *Fisheries Act 1994*;
- the *Fisheries Regulation 1995*;
- the *Fisheries (Coral Reef Fin Fish) Management Plan 2003* (the CRFFF Plan);
- the *Great Barrier Reef Marine Park Act 1975*; and
- the DPI&F Boat Replacement Policy.

A number of other documents, including research reports, scientific literature and discussion papers, are integral to the management of the fishery. Of particular note is the *Assessment of the deep water line fishery in Queensland* (White and Sumpton, 2002).

DEH considers it important that management arrangements remain flexible to ensure timely and appropriate managerial decisions. Due to the importance of the management arrangements outlined in the documents referred to above to DEH's assessment of the fishery, an amendment could change the outcomes of our assessment and decisions stemming from it. DEH needs to be advised of any changes that are made to the management regime and make an assessment that the new arrangements are equivalent or better, in terms of ecological sustainability, than those in place at the time of the original decision

Recommendation 1: *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 bycatch, protected species or the ecosystem.*

DPI&F receives management advice on the DFF from the Reef Fisheries Management Advisory Committee (ReefMAC), which is the consultative stakeholder forum for the fishery. ReefMAC currently includes representatives from all the major stakeholder sectors including commercial, recreational and charter tour fishers, scientific advisers, government managers (DPI&F and the Great Barrier Reef Marine Park Authority (GBRMPA)) and representatives from the conservation and seafood marketing sectors. ReefMAC receives scientific advice from its Scientific Advisory Group (SAG). DEH considers the level of consultation to be adequate and is confident that the management agency will continue to ensure interested parties are consulted appropriately.

The *Fisheries Act 1994* has broad objectives for the management of Queensland fisheries but there is little in the way of fishery specific operational objectives in relation to target, byproduct, bycatch and protected species and ecosystem impacts. There are currently no fishery specific performance indicators or precautionary performance measures by which the effectiveness of the management arrangements can be measured. DEH acknowledges that the CRFFF Plan applies to the majority of species taken in the DFF and that this plan includes broad objectives and review events which represent performance measures for that fishery. However, if the DFF is to remain a separate management entity to the CRFFF then DEH believes that it is appropriate that objectives and performance measures specific to the DFF be developed. These may be based on those contained in the CRFFF Plan.

Recommendation 2: *By the end of 2006 DPI&F to develop fishery specific objectives linked to performance indicators and performance measures for target species, bycatch, protected species and impacts on the ecosystem.*

Recommendation 3: *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.*

There is no recent, publicly available information on the DFF. The fishery is not identified separately in the most recent edition of *Queensland's Fisheries Resources: current condition and recent trends 1988-2000* (Williams, 2002). DEH believes that public reporting of performance on a fishery-by-fishery basis would be beneficial and suggests that DPI&F publicly report against specified fishery performance measures when developed.

Recommendation 4: *From 2006, DPI&F to report publicly on the status of the DFF on an annual basis including explicitly reporting against performance measures, once developed.*

The DFF is managed under the *Fisheries Act 1994*, the *Fisheries Regulation 1995* and the CRFFF Plan. Management of species taken commercially in the DFF relies on input and output controls, supplemented by the use of minimum size limits and closed areas. Input controls include limited entry, restrictions on the numbers of lines and hooks and a boat replacement policy. Output controls take the form of individual transferable quotas, applied under the CRFFF Plan, for the majority of the primary species taken in the fishery. Recreational and charter fishers are subject to possession limits and restrictions on the numbers of lines and hooks. DEH is satisfied that this combination of input and output measures is capable of controlling the level of harvest in the fishery in the short to mid term.

The Queensland Boating and Fisheries Patrol (QBFP) is responsible for ensuring compliance with relevant fishery legislation in the DFF. The QBFP conducts at-sea surveillance of offshore areas. Compliance activities also include inspection of recreational possession limits, fishing gear and configuration, line and area endorsements, licences and logbooks. GBRMPA uses aerial surveillance flights to monitor compliance with Marine Park legislation. The submission provides no indication of the extent or effectiveness of compliance/enforcement activity.

The introduction of quotas under the CRFFF Plan has resulted in additional compliance activities to ensure the integrity of the total allowable catch (TAC). DEH has recommended that a compliance risk assessment and risk-based compliance strategy be developed for the CRFFF by December 2006. DEH believes that this will address the most pressing compliance requirements in the DFF.

A compliance issue for the DFF appears to be the catch of snapper, which is prohibited in the DFF and, potentially, the catch of coral reef finfish species by operators without the appropriate RQ. DEH has recommended that DPI&F instigate measures to ensure compliance with restrictions on prohibited species (**Recommendation 7**).

The CRFFF Plan requires that a general review of the Plan be undertaken between five and nine years of implementation. In addition, the Plan must be reviewed within at least four years to determine whether the annual catch is sustainable and whether there has been any consistent localised depletion near population centres. The commercial TAC for 'other coral reef finfish' must be reviewed biennially. DEH believe that these requirements constitute a suitable basis for review of the management arrangements.

Fishery-dependent data relating to target and byproduct species¹ are collected on a regular basis in the fishery, however DEH has some concerns about the quality of the data. Bycatch data are not

¹ In practice there is no distinction between target and byproduct species in the DFF.

collected on a regular basis and there is limited fishery-independent data available on the fishery. Discussion of the information collection system can be found in Part II of this report.

An analysis of the fishery's capacity for assessing, monitoring and avoiding, remedying or mitigating any adverse impacts on the wider marine ecosystem in which the target species live and the fishery operates is contained under Principle 2 of this report.

Many of the species taken in the DFF are also harvested in other Queensland line fisheries such as the Coral Reef Finfish Fishery and the Rocky Reef Finfish fishery. Management arrangements in the DFF generally take into account the management arrangements for those fisheries.

DEH considers that the current management arrangements comply with all relevant threat abatement plans, recovery plans, the National Policy on Fisheries Bycatch, and bycatch action strategies developed under that policy. DEH expects that DPI&F will also ensure compliance with any future plans or policies as they are developed.

No regional or international management regimes to which Australia is a party are of direct relevance to the fishery. The prime international regime affecting the fishery is the United Nations Convention on the Law of the Sea. The management regime essentially complies with this. Other international regimes are applicable to fisheries management but do not explicitly involve this fishery, for example the 1992 Convention on Biological Diversity and in particular the 1995 Jakarta Mandate requiring that, in relation to the sustainable use of marine and coastal biological diversity, the precautionary principle should apply in efforts to address threats to biodiversity. While these agreements are not specifically addressed in the submission, the fishery's compliance with their requirements can be assessed by examination of Part II of this report. The application of the International Convention for the Prevention of Pollution from Ships (MARPOL) to vessels operating in the fishery is addressed under Principle 2, Objective 3.

DEH considers it is incumbent on all authorities to develop a thorough understanding of the framework of national, regional and international agreements and their applicability to export-based fisheries for which they are responsible.

Conclusion

DEH considers that the DFF management regime is documented, publicly available and is developed through a consultative process. The management arrangements are adaptable, however there is a need for the development of specific management objectives and performance criteria for the fishery against which the effectiveness of the management arrangements can be measured and reviewed. In addition, there is scope to increase the transparency regarding performance of the fishery.

The management arrangements are capable of controlling the harvest through a combination of input and output controls and technical measures appropriate to the size of the fishery. Periodic review of some of the key aspects of the management arrangements are provided for. The nature and level of enforcement of the management arrangements appear to be generally appropriate to the scale of the fishery.

The management regime takes into account arrangements in other jurisdictions, and adheres to arrangements established under Australian laws and international agreements.

DEH considers that there is scope to further refine the management arrangements and has provided a number of recommendations for improvements in the longer term.

PART II – GUIDELINES FOR THE ECOLOGICALLY SUSTAINABLE MANAGEMENT OF FISHERIES

Stock Status and Recovery

Principle 1: *‘A fishery must be conducted in a manner that does not lead to over-fishing, or for those stocks that are over-fished, the fishery must be conducted such that there is a high degree of probability the stock(s) will recover’*

Maintain ecologically viable stocks

Objective 1: *‘The fishery shall be conducted at catch levels that maintain ecologically viable stock levels at an agreed point or range, with acceptable levels of probability’*

Information requirements

Fishery-dependent data from the commercial sector of the DFF is collected through compulsory fishing logbooks as part of DPI&F's Commercial Fisheries Information System (CFISH). Up until the introduction of the CRFFF Plan in 2003, DFF operators completed an LF03 logbook. From July 2004, the DFF licence holders allocated RQ under the CRFFF Plan have also been required to complete the CRFFF's LF04 logbook. DPI&F has indicated that a specific logbook will be introduced for all DFF licence holders, although it is not yet clear when this will occur or what information will be collected.

The LF03 and LF04 logbook collect daily information including:

- date, fishing method, number of fishing lines used, number of dories used, location (recorded as latitude/longitude or as 6 nm grids);
- number and estimated weight of retained fish by species; and
- since July 2004, RQ licence holders in the DFF completing the LF04 have also been required to report on interactions with species of conservation interest (SOC). While this requirement does not yet apply to the two operators without RQ licences, these fishers have contributed only minimal effort in the DFF (one fished for three days over the last two years and the other took only 123 kg).

Since the introduction of quota management in the CRFFF, landed fish notices and buyers records of transactions of coral reef finfish species are now required to be reported by RQ licence holders. These will provide a mechanism for validation of logbook data from the five RQ licence holders. This will not apply to the logbooks of the other two operators in the DFF.

DEH notes that 20 days of observer coverage (over two trips) has been allocated to the fishery, with the first ten-day trip undertaken in April/May this year. The aim of the trip was to record any interactions with species of conservation interest, bycatch/discards produced from the fishery and length/weight frequencies for all species captured. The second trip was planned for July 2005, however the L8 endorsed vessels had not returned to the fishery. It is the intention of DPI&F to complete the second ten-day observer trip as soon as possible. At the completion of this trip, a report on the findings will be prepared for DPI&F management. Depending on the results of the report, further or ongoing observer trips may be planned for the DFF.

Since 1996 all charter fishing vessels have been required to complete a logbook collecting similar information to that collected in commercial logbooks. Charter operators must also report the number of fish kept (to monitor possession limits) and the number of fish released.

Information on recreational catch and effort in Queensland waters is derived from the Recreational Fishing Information System (RFISH). The system includes data from three surveys conducted in 1996/87, 1998/99 and 2001/02. The National Recreational and Indigenous Fishing Survey (NRIFS) conducted in 2000/01 (Henry and Lyle, 2003) also provided some information on recreational and indigenous catch of species taken in the DFF.

Limited fishery-independent data is available on the fishery. Relatively little research has been conducted on even the key target species in the DFF. This reflects a research focus on target species taken in the CRFFF due to the significantly greater catch, effort and economic value of these species. However, the Effects of Line Fishing (ELF) project being conducted by the Cooperative Research Centre for the Great Barrier Reef World Heritage Area (CRC-Reef) is of relevance to the DFF in so far as it monitors impacts on species common to both the CRFFF and the DFF.

DEH considers that the information collection systems in the DFF are generally appropriate to the scale of the fishery. However, given the reliance on fishery-dependent data, DEH believes that the lack of data validation together with some data deficiencies that are evident for the fishery (such as uncertainty surrounding the level of catch), warrant the introduction of a system to validate logbook data in the DFF. DEH notes that DPI&F has recently placed observers on vessels in the DFF as a means of validating catch data and commends DPI&F on this initiative. DEH considers that continuation of the observer program in the DFF would be beneficial to the fishery and could form part of a data validation program for the fishery.

Recommendation 5: *DPI&F to implement a program to validate logbook data in the Deepwater Finfish Fishery by June 2006.*

Assessment

The current status of target and byproduct species in the DFF is unknown. A wide range of species is taken over the large latitudinal extent of the fishery and there are significant differences between the biology of these species. The submission indicates that while some information is available on the biology or stock status in Queensland waters of the target and byproduct species taken in the DFF, relatively little information is available on the distribution and spatial structure of these species. The submission notes that many of the species caught:

- have complex biology and life history strategies;
- have a tendency to form spawning aggregations;
- are long-lived; and
- may undergo sex inversion.

These factors increase the difficulty of accurate and reliable assessment methodologies for these species. White and Sumpton (2002) reviewed the likelihood of sustainability problems in the DFF generally and the susceptibility of key species to fishing. The review was based on available biological information on the target species, CFISH data, information from fish processors and information from commercial fishers in the DFF. The resultant risk assessment is summarised in Table 2.

Table 2: Vulnerability of key DFF species to overexploitation

Species	Biological risk	Fishing pressure in the DFF	Risk due to fishing pressure overall	Overall Risk of overexploitation
Snapper	Moderate/High	Low (not to be taken with multihook apparatus)	Very high	Very high
Rosy/Lavender jobfish	High	High	High	Very High
Large-mouthed nannygai	Moderate/High	Low	High	High
Goldband snapper	Moderate	High	High	High
Maori cod/Blue Maori cod	Moderate	High	High	High
Bass groper/Hapuka	High	Moderate	High	High
Pearl perch	High	Moderate	Moderate/High	Moderate/High
Flame snapper	Moderate	High	Moderate/high	Moderate/High
Red emperor	Moderate	Low (not to be taken with multihook apparatus)	Moderate/High	Moderate/High
Bar Cod	Moderate	Moderate	Moderate	Moderate
Eight bar groper	Moderate	Moderate	Moderate	Moderate
Samson fish/Amberjack	Moderate	Low	Low/Moderate	Low/Moderate

DEH notes that one of the primary target species identified by DPI&F, ruby snapper, was not considered by White and Sumpton's risk assessment. DEH also notes that snapper is a prohibited species in the DFF and considers that this is appropriate given the outcomes of the risk assessment. Given this, DEH is concerned that catches of snapper are still recorded and that, in the absence of bycatch data, it is unknown what level of mortality for this species may be incurred by the DFF.

DEH notes all of the species assessed by White and Sumpton are designated CRFFF species, except for Snapper, Pearl perch and Samsonfish/Amberjack. Given the Very High overall risk rating for Snapper and the Moderate/High overall risk rating of Pearl Perch, DEH believes that management of these species warrants further consideration by DPI&F.

In the assessment of the CRFFF (DEH, 2005), DEH has recommended that DPI&F conduct a risk assessment of 'other coral reef finfish' as defined in the CRFFF Plan. This recommendation will apply to the majority of species taken in the DFF, however DEH encourages DPI&F to identify those species taken in the DFF that are not covered by the CRFFF and ensure that risk assessments are also conducted for these species.

While logbooks have been in place in the DFF since 1988 the data collected remains ambiguous. The DPI&F claims that less than 100 t are landed annually, however the logbook data indicate that catch since 1998 has been in excess of 275 t in each year. The data provided in the submission includes all catches by fishers with DFF endorsements, of species likely to be caught by multiple

hook equipment, although not all of the catches were necessarily made with that equipment. These estimates include the catches of DFF fishers in other line fisheries and hence overestimate the catch of the DFF. The most recent data provided are for 2001.

The data provided in the submission indicate the substantial overlap between the species caught by DFF operators and those by operators in other fisheries. In 2001 the total weight of the top 10 species/groups in the DFF taken in other Queensland fisheries was more than 5 times that taken in the DFF. The impact of this on particular species is difficult to estimate given the mixed nature of many of the recording categories. However the data emphasise the importance of ensuring that stock assessment and management arrangements for the DFF take into account the impacts of other fisheries. In this regard DEH notes the significance of the application of the CRFFF Plan to most of the species in the DFF.

Species of the Families Serranidae, Lethrinidae and Lutjanidae that are taken in the DFF are also caught by recreational and charter fishers in Queensland. While few of these species are thought to be taken by recreational fishers in waters deeper than 200 m (ie in the waters of the DFF) this catch may have an impact on populations taken in the DFF. Estimates of the numbers of these species taken are available from the RFISH surveys however there are currently no weight estimates associated with these and the standard errors associated with the estimates are very high. In the CRFFF assessment (DEH, 2005) DEH has recommended that DPI&F develop a process to improve estimates of recreational take.

The charter logbook information available suggests that many DFF target species are taken but outside the area of the DFF, predominantly in the CRFFF. The submission indicates that catches by charter operators have been increasing but it is not clear whether this is simply a reflection of the introduction of a compulsory logbook program in 1996.

DEH notes the uncertainty surrounding the level of catch taken by L8 operators and the dated nature of the data included in the submission (i.e. up to 2001). It is imperative that DPI&F determine a means of ensuring that unambiguous and current data is available for the fishery. DEH notes DPI&F's intention to introduce a logbook specific to the DFF, although no details of the data to be collected in that logbook have been provided.

Recommendation 6: *DPI&F to enhance fishery specific data collection in the DFF to inform stock status assessments.*

From 1998 specific method descriptions became more commonly used in the logbook. The data available indicates most fishing is done by hand-line and droplining. The logbook data shows that ten species/groups comprised over 88% of the total annual catch weight by DFF fishers in each year from 1998 to 2001. Public comments expressed concern at the lack of species-specific data available from logbooks. The logbook data provided in the submission indicated that the data are dominated by species recorded in 'mixed categories' such as mixed jobfish, large mouthed nannygai/nannygai, mixed cod, mixed reef fish, and mixed fish. In 2001 these categories accounted for nearly 60% of the total annual catch. Given the variation in life history and biological characteristics of the range of species taken in the DFF, and hence in their vulnerability to fishing, DEH considers that the identification and recording of catch to species level is a priority. DEH notes that the introduction of catch quotas under the CRFFF Plan has necessitated the need for more accurate species identification and that the LF04 logbook now requires recording of catch to species level.

DEH notes that significant catches of species prohibited to be taken in the DFF, such as snapper, have been recorded in DFF logbooks. Between 1998 and 2001 snapper comprised 11% and 7% in

1998 and 1999 respectively. It is of concern to DEH that this species has comprised a relatively significant proportion of the retained catch (although DEH recognised that some of the catch reported in logbooks as 'snapper' may actually be tropical snapper species which are permitted catch in the DFF). DEH believes that, given the significance of this species to other fisheries, there is a need to investigate ways in which compliance with the prohibition on take of snapper can be enforced.

Recommendation 7: *DPI&F to instigate measures to ensure compliance with the CRFFF Plan and relevant legislation, in particular compliance with the prohibition of the take of snapper by DFF operators and take of coral reef finfish by DFF operators without appropriate quota symbols.*

Management response

The major management responses have been the introduction of limited entry in 1999, the restrictions on gear hook usage and the introduction in 2004 of a quota system under the CRFFF Plan for the majority of species taken in the DFF.

The introduction of limited entry resulted in the number of operators in the DFF falling from 40 to 12. The recent introduction of the CRFFF Plan and various policy interventions by DPI&F have reduced the number of operators to seven, of which only five have been allocated RQ. The catch of these five operators is now limited through the allocation of quota for 'other coral reef finfish species' (OS) which includes most of the species taken by the DFF. Under the Plan minimum size limits applying to OS have also been refined. The CRFFF Plan also provides for regular review of the sustainability of the OS category. Those operators who do not hold RQ licences are only able to take species not covered by the CRFF Plan

The TAC and quota allocation process under the CRFF Plan does not provide an upper catch limit on any individual species included in the OS category. Public comments questioned the effectiveness of the TAC for OS given that it was not based on any sound estimate of potential productivity and that it was applied as a blanket TAC to a range of species, which DPI&F acknowledges are vulnerable to overfishing. However, DEH notes that the CRFFF Plan (Section 147) allows for individual species or groups within the 'other species' category to be reviewed independently if catches increase by 10%, for a species of other coral reef finfish, or 20%, for a group of species (fish of the same family), above the catch in 2004/05. The effectiveness of this review event will largely depend on the accuracy of the data. DEH has made a recommendation relating to validation of logbook data that should ensure that data is accurate (**Recommendation 5**).

The CRFFF Plan specifies a range of review events which trigger a review of the achievement of the main objective of the plan. These events relate to trends in estimated abundance, fish size and age distribution, bycatch, catch (commercial, recreational and charter), economic efficiency and level of compliance.

DEH has made recommendations relating to the development of performance indicators and measures for the DFF (**Recommendation 2**) and the need for clearer specification of the process and timing for implementation of management responses where triggers are breached (**Recommendation 3**). Public comments made in response to the draft submission emphasised the need for such procedures given the relatively high vulnerability of many of the species taken in the DFF.

Conclusion

There is very limited information available on the status of target/byproduct stocks in the DFF. DEH acknowledges the contribution of the introduction of quota under the CRFFF Plan to management of species taken in the DFF. However, DEH remains concerned about the uncertainties surrounding the biology and catch of the wide range of species taken by the DFF.

DEH considers however, that the relatively small scale of the fishery, the CRFFF Plan, the recommendations made by DEH in relation to the operation of that Plan in its assessment of the CRFFF (DEH, 2005) and the implementation of the recommendations made above, will ensure that the management regime is appropriately precautionary.

Promote recovery to ecologically viable stock levels

Objective 2: *‘Where the fished stock(s) are below a defined reference point, the fishery will be managed to promote recovery to ecologically viable stock levels within nominated timeframes’*

The status of stocks is unknown and there are no defined reference points, although these will be developed as a result of the implementation of **Recommendation 2**. The submission provides no basis on which to judge whether the stocks are overfished.

Conclusion

There is currently a lack of information on which to judge stock status. DEH believes that the recent reduction in effort together with the introduction of a cap on catch of the primary species will ensure that the stocks are not overfished in the short term. Further, DEH believes that should any evidence of overfishing become apparent, DPI&F would put in place measures to ensure the recovery of stocks in a timely fashion.

Ecosystem impacts

Principle 2: *‘Fishing operations should be managed to minimise their impact on the structure, productivity, function and biological diversity of the ecosystem’*

Bycatch protection

Objective 1: *‘The fishery is conducted in a manner that does not threaten bycatch species’*

Information requirements

There is no routine collection of bycatch data in the DFF. DEH believes that it is important that the composition and quantity of bycatch is monitored. In particular, given that most bycatch is comprised of discards of target species, the lack of information on mortalities of these species arising from bycatch may compromise their management and the integrity of the TAC for ‘other coral reef finfish’ under the CRFFF Plan.

DEH believes that the lack of an ongoing bycatch data collection system is a serious deficiency in the management arrangements for the DFF. DEH has recommended that a data validation program

be implemented in the fishery (**Recommendation 5**) and considers that such a program could be used to collect bycatch data or to validate data collected via another mechanism such as logbooks.

Public comments noted the need for compliance with the requirements of the *National Plan of Action (NPOA) for the Conservation and Management of Sharks* (Shark Advisory Group and Lack, 2004). DEH encourages DPI&F to consider the requirements of the NPOA, namely that all catches of shark, including bycatch, are recorded by species, when implementing a bycatch data collection program for the DFF.

Recommendation 8: *DPI&F to implement an ongoing and robust program to collect information on the composition, abundance and life status² of bycatch (including shark species and discards of target species) in the DFF by June 2006.*

The collection of information on bycatch of threatened, endangered and protected species is discussed under Objective 2.

Assessment

Line fishing is generally regarded as relatively benign in terms of bycatch (Australian Marine Conservation Society, 2004; Morgan and Chuenpagdee, 2003). This assumption has been supported by preliminary results of the observer program for the DFF, which have shown that no protected species were caught, and only a very small bycatch/discard rate was evident. Other information available for the DFF suggests that most bycatch is of undersized species that would otherwise be retained. McLeay *et al.* (2002) have concluded that the risk to bycatch in line fisheries such as the DFF is largely a function of the susceptibility of the individual species to post release mortality. DEH notes that the SAG has recently identified the need to estimate the survival of released/discarded line-caught fish as a research priority. However, DEH notes that this priority relates largely to pelagic species and shark and may not include the deeper water species taken in the DFF. DEH strongly urges DPI&F to consider expanding any such research to include post-release survival of species taken in the DFF.

The submission acknowledges that since the fishery operates in waters greater than 200 m, most species caught in the fishery suffer barotrauma when brought to the surface and have poor post-release survival rates. The National Strategy for the Survival of Released Line Caught Fish aims to quantify and increase the post-capture survival of released line-caught fish. As part of the Strategy McLeay *et al.* (2002) conducted a preliminary risk assessment of the major line-caught species in each State. Of the species taken in the DFF, that assessment identified Nannygai (*Lutjanus malabaricus* and *L. erythropterus*), Jobfish (*Pristipomoides* spp.), Pearl perch (*Glaucosoma scapulare*) and Tropical snapper and Seaperches (*Lutjanus* spp.) as having a relatively high risk of post-release mortality. The submission acknowledges that the risk assessment probably under-rates the susceptibility of some of the species caught in deeper water.

In response to McLeay *et al.*'s findings a Fisheries Research and Development Corporation (FRDC) project 'National strategy for the survival of released line-caught fish: investigating survival of fish release in Australia's tropical and subtropical line fisheries' (FRDC Project 2003/019) was initiated in 2003 and will be completed by the end of 2007.

Management response

There are no bycatch mitigation measures in place in the DFF. It is DPI&F's intention to await the completion of FRDC project 2003/019 in 2007 before considering any action to reduce bycatch.

² Life status means "dead", "injured" or "alive".

DPI&F expect that the project will enhance the survival of released fish by identifying changes to line fishing techniques such as hook design and barotrauma relief procedures and that it will improve stock assessments through better estimates of mortality. DPI&F has indicated that changes to fishery regulations may be necessary to reduce the impact of line fishing on populations of juveniles and undersized fish. Management responses may include:

- seasonal/spatial closures (eg nursery or spawning areas);
- incentive schemes to reduce discard rates;
- gear restrictions (eg hook size); and
- education schemes.

The submission claims that, given the overlap between target and bycatch species, the monitoring arrangements for target species contribute to the monitoring of an indicator group of bycatch species. DEH does not accept this claim since the monitoring of target species does not include discards (bycatch) of those species. In addition, although there is no data available to confirm it, it is likely that species other than target species are taken as bycatch. While the level of effort and catch in the DFF may be relatively low it cannot be assumed, as noted in public comments, that this translates to a relatively small impact on sustainability of bycatch.

DEH has recommended that a robust bycatch data collection program be initiated in the DFF (**Recommendation 8**). The results of this program, together with the outcomes of FRDC project 2003/019, should be used to assess the need for bycatch mitigation measures in the DFF. Public comments noted that minimising bycatch should be the priority rather than maximising post-capture survival. DEH agrees that reducing bycatch is the core objective of the National Policy on Fisheries Bycatch (National Council on Forestry, Fisheries and Aquaculture, 1999) and that this should be the focus of DPI&F's bycatch management activities. DEH notes that DPI&F's proposed management responses, such as seasonal/spatial closures and gear restrictions, are consistent with this objective.

Recommendation 9: *DPI&F to assess the need for bycatch mitigation measures in the DFF based on relevant research and bycatch data, when collected, and implement such measures where required, by June 2008.*

Conclusion

DEH is not confident that there is sufficient information available to determine whether the level of bycatch is jeopardising the sustainability of DFF species. The inability to quantify bycatch of these species and the lack of estimates of post-release mortality together with the absence of stock assessments for these species represents a situation of high uncertainty.

DEH notes that some research is underway that will provide advice on mortality rates and measures to mitigate mortality of bycatch. DEH has recommended that bycatch data collection programs be implemented in the DFF and is aware that the CRFFF Plan will require collection of data on bycatch from RQ operators in the DFF and that some observer coverage has been implemented in the DFF. DEH has recommended that the bycatch data, when available, together with the results of relevant research be used to assess the need for and implement where necessary, bycatch mitigation measures. DEH believes that the implementation of these recommendations will ensure that the risk of unacceptable impact on bycatch species is detected and minimised in the longer term.

Protected species and threatened ecological community protection

Objective 2: *'The fishery is conducted in a manner that avoids mortality of, or injuries to, endangered, threatened or protected species and avoids or minimises impacts on threatened ecological communities'*

Information requirements

A number of species present in the waters of the DFF are protected under the EPBC Act, the *Great Barrier Reef Marine Park Regulations 1983*, the *Nature Conservation Act 1992* and the *Fisheries Regulation 1995*. There are no threatened ecological communities within the area of operation of the DFF.

Fisheries, researchers and managers generally consider the DFF to have only limited potential to cause fatality or injuries to endangered, threatened or protected species due to the relatively benign fishing methods employed in the fishery. However, limited information has been collected to support this assumption. In order to rectify this deficiency, the LFO4 commercial logbook which is completed by operators with RQ has, since July 2004, required Queensland line fishers to record, on a daily basis, any interaction with SOCI. If an interaction has occurred the fisher must complete a separate SOCI logbook sheet detailing date, time and location of interaction, fishing gear, species (using species codes), release condition, and tag or band details. While this requirement does not yet apply to the two operators without RQ, DEH considers that this risk is minimal given the limited effort they have exhibited in the DFF over the last two years.

Future RFISH surveys will be expanded to include a requirement to report interactions with SOCI ensuring that similar fishery-dependent information is gathered for both recreational and commercial fishers. Charter fishing logbooks make no provision for the reporting of interactions with endangered, threatened and protected species. DEH encourages DPI&F to revise the charter fishing logbook to require the provision of information on interactions with endangered, threatened and protected species.

DEH notes that one of the biggest barriers to successful commercial reporting of protected species interactions is the capacity of fishers to identify the species involved. In addition, many operators may not be aware of the importance of this reporting. DPI&F has committed to the introduction of an education program for recreational and commercial fishers to address this problem.

DEH believes that there is a need for validation of all logbook data, including SOCI data. DEH has recommended that a data validation program be implemented in the DFF (**Recommendation 5**) and notes that the observer coverage that has already occurred in the DFF is likely to have enabled the validation of SOCI data collected from logbooks.

Assessment

The submission identifies the potential for interaction of the DFF with endangered, threatened and protected species of finfish, shark, turtles, marine mammals and seabirds. There has been no formal assessment of the impact of the DFF on these species. The submission acknowledges that a detailed risk assessment of the actual and potential impacts on protected species is still some time off. However, the submission provides a summary of a preliminary assessment on the likelihood and severity of interactions with protected species in Queensland's line fisheries.

The assessment considered that any likelihood of interactions with Great white sharks (*Carcharodon carcharias*) were remote in the DFF.

Dobbs (2001) identified line fisheries as likely to have a minimal impact on marine turtles due to the relatively low rates of hooking turtles on line fishing gear and the short release time involved if a turtle is hooked. However there remains a risk of infection or injury following capture and release. The preliminary risk assessment compiled by DPI&F indicated that it was possible that the fishery might interact with Green (*Chelonia mydas*), Loggerhead (*Caretta caretta*) and Hawksbill (*Eretmochelys imbricata*) turtles but that these interactions were neither common nor likely. The likelihood of interactions with Olive Ridley/Pacific Ridley (*Lepidochelys olivacea*) or Leatherback turtles (*Dermochelys coriacea*) was rated as remote and with Flatback turtles (*Natator depressus*) as rare.

Haines and Limpus (2000) identified the ingestion of discarded fishing lines as a cause of mortality of turtles. The submission makes no reference to any initiatives to reduce the loss of gear at sea in order to minimise the potential impact on turtle populations.

The submission notes that there has been limited research into the interactions between line fishing and seabird populations and that the effects of the DFF on seabirds are unknown. The submission notes that the impact on seabird populations of discarded products is minimal in the DFF since filleting and processing of fish at sea, with waste thrown overboard, is relatively uncommon in the DFF. The CRFF Management Plan requires that all coral reef finfish species be landed whole unless DPI&F have issued the operator a filleting permit. While the majority of the catch in the DFF is landed as gilled and gutted whole fish, it is considered that any waste that is discarded would be dispersed by water currents and consumed by a variety of large reef associated predators.

In addition the submission claims that there is limited prospect of incidental mortality of seabirds in the DFF since the fishery targets large, demersal fish species. The preliminary risk assessment compiled by DPI&F indicates that endangered, threatened and protected species of Albatrosses, Giant Petrels, Frigatebirds and Terns and the Brown booby could take bait from DFF operations. DEH notes that the SAG is preparing a paper for consideration by ReefMAC on seabird interactions in the CRFFF. DEH suggests that this paper also consider the potential for seabird interactions in the DFF.

The GBRMPA's Whale and Dolphin Conservation Policy (GBRMPA, 2000) identifies direct impacts of fishing on cetaceans as including accidental entanglement in fishing gear, behavioural modification and vessel strikes/interaction and indirect effects as habitat degradation and broader ecosystem impacts such as depletion of cetacean prey species. DPI&F's preliminary risk assessment indicates that the likelihood of DFF interactions with endangered, threatened and protected species of cetaceans is remote.

There are no listed ecological communities in the fishery area.

Management Response

There are no specific management measures for endangered, threatened and protected species in the DFF. The reduction in latent effort and catch limits imposed on target species under the CRFFF Plan will afford some indirect protection to protected species in the area of the fishery. Further, DEH notes that the extensive area closures in the GBRMP afford protection to endangered, threatened and protected species.

No formal trigger points relating to protected species have been incorporated into the CRFFF Plan since the fishing methods employed are relatively benign in terms of both the potential for interaction and the likelihood of a successful release should an interaction occur. In the assessment of the CRFFF (DEH, 2005), DEH has recommended that DPI&F develop explicit objectives and performance measures relating to protected species.

Conclusion

DEH notes that, owing to the small scale of the fishery and the fishing methods used, there are minimal interactions with protected species in this fishery and considers that the fishery is conducted in a manner that avoids mortality of, or injuries to, endangered, threatened or protected species and avoids or minimises impacts on threatened ecological communities. Should this situation change, or a risk assessment process indicate otherwise, DEH suggests that appropriate actions be undertaken to ensure the fishery avoids mortality, injury to these species and avoids or minimises impacts on threatened ecological communities.

Minimising ecological impacts of fishing operations

Objective 3: *'The fishery is conducted, in a manner that minimises the impact of fishing operations on the ecosystem generally'*

Information requirements and Assessment

There is no information available to determine the impacts of the DFF on the ecosystem and environment generally. DEH is concerned at the lack of information collection and research covering the fishery's impact on the ecosystem and environment generally. However, DEH understands that this lack of information is the case across a range of Australian and international fisheries and until appropriate research techniques and programs are developed and implemented this will continue to be the case. DEH strongly supports research in this area.

Despite the lack of information collected on ecosystem impacts of the DFF, the submission claims that the fishery does not have a significant impact on the marine environment because of the small scale of the fishery and the fishing methods used. Due to the relatively extreme depths in which the fishery operates, anchoring is rare. In addition, the filleting, processing and disposal of processing waste at sea is relatively uncommon in the DFF.

Management response

DPI&F has implemented a range of management measures that minimise the risk of significant impact of fishing on ecosystems and their components. Most management measures were established to protect target species and their habitats. However the introduction of the Representative Areas Program in the GBRMP will provide significant additional protection to the ecological communities within the DFF.

DEH notes that the CRFFF Plan does not include any review events specifically relating to broader marine ecosystem impacts. The submission claims that this is because any broader ecosystem impacts in the DFF would most likely be a flow-on effect from direct and indirect impacts to the bycatch species. DEH does not believe that this provides adequate protection to the ecosystem. Impacts on the ecosystem may occur well before the current review events in relation to target species are triggered. DEH has recommended (**Recommendation 2**) that DPI&F develop objectives and performance indicators and measures relating to impacts on the ecosystem.

Impacts on water quality through the discharge of plastic wastes and pollution from vessels are controlled under MARPOL legislation. Operators are required to comply with the legislation and must retain any plastic waste and dispose of it only when the vessel returns to port.

Conclusion

DEH considers that the fishery is conducted in a sufficiently precautionary manner to minimise the impact of fishing operations on the ecosystem generally. DEH notes that, should circumstances alter significantly in the fishery, appropriate assessments and additional actions should be promptly identified and implemented. A recommendation has been made (**Recommendation 2**) that will ensure that the risk of significant impact by the DFF on the marine environment generally is detected and minimised in the longer term.

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LIST OF ACRONYMS

CFISH	Commercial catch database
CRC-Reef	Cooperative Research Centre for the Great Barrier Reef World Heritage Area
CRFFF	Coral Reef Finfish Fishery
CRFFF Plan	Fisheries (Coral Reef Fin Fish) Management Plan 2002
DEH	Department of the Environment and Heritage
DFP	Deepwater Finfish Fishery
DPI&F	Department of Primary Industries and Fisheries
ELF	Effects of Line Fishing
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
FRDC	Fisheries Research and Development Corporation
GBRMP	Great Barrier Reef Marine Park
GBRMPA	Great Barrier Reef Marine Park Authority
MARPOL	International Convention for the Prevention of Pollution from Ships
NPOA	National Plan of Action for the Conservation and Management of Sharks
NRIFS	National Recreational and Indigenous Fishing Survey
NSW	New South Wales
OS	Other coral reef finfish species
QBFP	Queensland Boating and Fisheries Patrol
ReefMAC	Reef Management Advisory Committee
RFISH	Recreational catch database
RQ	Reef Quota
SAG	Scientific Advisory Group
SOCI	Species of Conservation Interest
TAC	Total Allowable Catch
WTO	Wildlife Trade Operation