



Australian Government

Department of the Environment and Heritage

Assessment of the
Queensland Marine Aquarium Fish Fishery

October 2005

© Commonwealth of Australia 2005

This work is copyright. Apart from any use as permitted under the Copyright Act 1968, no part may be reproduced by any process without prior written permission from the Commonwealth, available from the Department of the Environment and Heritage. Requests and inquiries concerning reproduction and rights should be addressed to:

Assistant Secretary
Marine Environment Branch
Department of the Environment and Heritage
GPO Box 787
Canberra ACT 2601

ISBN: 0 642 55200 2

Disclaimer

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.

While reasonable efforts have been made to ensure that the contents of this report are factually correct, the Australian Government does not accept responsibility for the accuracy or completeness of the contents, and shall not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance on, the contents of this report. You should not rely solely on the information presented in the report when making a commercial or other decision.

Assessment of the ecological sustainability of management arrangements for the Queensland Marine Aquarium Fish Fishery

TABLE OF CONTENTS

EXECUTIVE SUMMARY	4
Background.....	4
Overall assessment.....	6
Recommendations.....	8
PART I - MANAGEMENT ARRANGEMENTS	10
Conclusion.....	14
PART II – GUIDELINES FOR THE ECOLOGICALLY SUSTAINABLE MANAGEMENT OF FISHERIES. 16	
STOCK STATUS AND RECOVERY	16
<i>Maintain ecologically viable stocks.....</i>	<i>16</i>
Information requirements	16
Assessment	17
Management response.....	18
Conclusion	19
<i>Promote recovery to ecologically viable stock levels</i>	<i>19</i>
ECOSYSTEM IMPACTS	19
<i>Bycatch protection.....</i>	<i>19</i>
Information requirements	19
Conclusion.....	20
<i>Protected species and threatened ecological community protection.....</i>	<i>20</i>
Information requirements	20
Assessment	20
Management response.....	20
Conclusion	21
<i>Minimising ecological impacts of fishing operations</i>	<i>21</i>
Information requirements	21
Assessment	21
Management response.....	22
Conclusion.....	22
REFERENCES	23
LIST OF ACRONYMS	24

EXECUTIVE SUMMARY

Background

The Queensland Department of Primary Industries and Fisheries (DPI&F) has submitted a document for assessment under Parts 13 and 13A of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The draft document *Ecological Assessment of the Queensland Marine Aquarium Fish Fishery* (the submission) was received by the Department of the Environment and Heritage (DEH) in August 2005. The submission was released for a thirty-day public comment period that expired on 30 September 2005. No public comments were received.

The submission reports on the Queensland Marine Aquarium Fish Fishery (MAFF) against the Australian Government *Guidelines for the Ecologically Sustainable Management of Fisheries* (the Guidelines). The DEH assessment considers the submission and associated documents.

Table 1: Summary of the MAFF

Area	The MAFF area comprises all waters south of latitude 10°41' south and east of longitude 142°31'49' east (State and Commonwealth waters).
Fishery status	Considered underfished.
Target Species	The MAFF targets over 100 species of marine invertebrates and fish including <i>Hippocampus</i> seahorses and Maori wrasse, which are listed under the Convention on the International Trade of Endangered Species (CITES). A small number of EPBC listed syngnathid species are also harvested.
By-product Species	No byproduct is permitted.
Gear	Harvested by hand with the assistance of self-contained underwater breathing apparatus (SCUBA) and hookah. The use of fishing lines, cast, scoop or seine nets, and a herding device may be used when collecting.
Season	Year round although peak seasons occur in February/March, July and October/November.
Commercial harvest 2003	197,669 individual specimens.
Value of commercial harvest 2003	Uncertain.
Recreational harvest	Unknown.
Commercial licences issued	49 commercial permits issued, 48 currently active (44 A1 authorisations, 5 A2 authorisations).
Management arrangements	<p>The fishery is managed through a range of output and input controls including:</p> <ul style="list-style-type: none"> ▪ bag limits (A2 authorisations are restricted to 10 individual fish comprising not more than two fish of any one species); ▪ effort restrictions – no more than 3 persons may take fish at the same time under each authority and only two boats may be used under each authority; ▪ gear restrictions; ▪ limited entry (49 endorsements); and ▪ closed waters. <p>Recreational harvesters are not permitted to use SCUBA or Hookah equipment and are subject to bag limits.</p>

Export	Exported live primarily to the USA, Asian and European markets.
Bycatch	Bycatch is minimal due to the highly selective nature of harvest.
Interaction with Threatened Species	Apart from the targeting of syngnathids in the fishery, interactions with threatened species is considered negligible due to the highly selective nature of harvest and limited number of vessels in the fishery.

The area of the fishery includes waters adjacent to the state of Queensland south of latitude 10°41' south and east of longitude 142°31'49' east. Part of the fishery occurs in Commonwealth waters, however the entire fishery is managed by DPI&F under Offshore Constitutional Settlement (OCS) arrangements between the Commonwealth and Queensland governments.

The MAFF targets a wide range of marine aquarium fish and invertebrates. Approximately 6 families represent more than 60% of all fish harvested (Pomacentridae, Chaetodontidae, Pomacanthidae, Labridae, Pomacentridae, Gobiidae), however a range of echinoderms (starfish, sea urchins); sponges; ascidians and polychaete worms are also harvested. The harvest of coral, star sand, shells and shell grit, anemones and some sea cucumber species is prohibited.

A number of species targeted by the fishery are currently listed under CITES, including *Hippocampus* seahorses and, by special permit, Maori wrasse. Syngnathids, which are listed under Part 13 of the EPBC Act, are also harvested from State waters (harvest from Commonwealth waters is prohibited under the EPBC Act). No byproduct is permitted for harvest in the fishery.

Due to the large number of species taken in the fishery it is not possible to provide biological details on each species targeted. The submission provides a range of information including biological characteristics, reproduction and recruitment and is available from the DEH website: <http://www.deh.gov.au/coasts/fisheries/index.html>.

The fishery dates back to the 1970s, when improved technology enabled fish to be kept alive successfully both during transport and in marine aquarium tanks. Prior to 1986, Master Fishermen were permitted to take fish for display purposes under an appropriate endorsement, however in the late 1980s and early 1990s, the fishery came under additional controls including non transferable Authorities to take fish for display purposes and a Limited Entry Policy. A range of new management measures were put in place in 2002 including transferable authorities, A1 and A2 symbols to replace the previously existing A symbol, the introduction of 5 Special Management Areas (SMAs) for the A1 fishery symbol. In 2004, the Great Barrier Reef Marine Park (GBRMP) underwent significant rezoning through the Representative Areas Program (RAP). Approximately 25% of the habitat type previously fished by MAFF collectors has been closed to collecting and protected from all forms of fishing as a result of the RAP process.

Marine aquarium fish and invertebrates are marketed live and exported to Asia, Europe and USA. Currently the Australian export trade is small in comparison to other world suppliers including Indonesia and the Philippines. The estimated total commercial catch of marine aquarium fish for 2003 was 197,669 specimens.

Commercial harvesters in the MAFF are permitted to harvest stock using a range of gear including fishing lines or cast scoop or seine nets with the assistance of SCUBA or hookah equipment. A single barbless hook must be used when using a fishing line and a herding device may be used when taking fish. Restrictions on the size of nets are in place and harvesters are required to remain within 100 m of a net when it is in use. Recreational harvesters are not permitted to use SCUBA or hookah

gear, however they are permitted to use a mask and snorkel. Harvesters in the MAFF are also subject to a range of measures under the Queensland *Fisheries (Coral Reef Fin Fish) Management Plan 2003* (CRFF Management Plan), if harvesting coral reef fin fish. Part I provides further details on management arrangements for the MAFF.

Direct information on bycatch in the fishery is limited, however the level of bycatch is negligible given the highly selective nature of harvest.

Some species that may be affected by this fishery are currently listed protected species under the EPBC Act, including seasnakes, cetaceans, sharks and syngnathids. Possible interactions in the fishery include boat strikes however this is extremely unlikely given the low number of operators in the fishery. Syngnathids, listed under Part 13 of the EPBC Act, are harvested from State waters in the MAFF. These interactions are assessed under Principle Two of this report.

Harvest by the indigenous sector is not significant and there is no reliable estimate of recreational take. Recreational take of marine aquarium species is controlled by some management measures, including gear and species restrictions.

The fishery is managed under the Queensland *Fisheries Act 1994* and the Queensland *Fisheries Regulation 1995*. The MAFF is also subject to various provisions of the Queensland *Nature Conservation Act 1992*. As the MAFF operates in the GBRMP provisions of the Australian Government *Great Barrier Reef Marine Park Act 1975* also apply to the fishery.

Overall assessment

The material submitted by DPI&F demonstrates that the management arrangements for the MAFF meet the requirements of the Guidelines.

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

- lack of fishery specific performance indicators or reference points for key target species, and for species listed as EPBC Act protected species and CITES listed species;
- lack of precautionary trigger limits specifically for key target species, CITES and EPBC Act listed species;
- lack of data validation for fishery dependent information;
- minimal information on key target species biology and ecology; and
- lack of a robust risk assessment for target stocks or CITES and EPBC Act listed specimens.

Recommendations to address these issues have been developed to ensure that the risk of impacts are minimised in the longer term. Through the implementation of the recommendations and the continuation of a responsible attitude to the management of the fishery, 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.

DPI&F has made considerable progress in developing sound management arrangements for the MAFF. 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 specified in the submission, the commitment to developing a management plan for the fishery and the commitment to implementing recommendations outlined in this report, DEH considers that the fishery will not be detrimental to the survival or conservation status of the taxa 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 3 years. The WTO declaration will require annual reporting on the progress of implementing the recommendations of this report and other managerial commitments. The implementation of the recommendations will be monitored and reviewed as part of the next DEH review of the fishery in 3 years time.

As the 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. Various offence provisions of the EPBC Act state that it is an offence to kill, injure, recklessly take, trade, keep, or move a member of a listed marine species, if it was taken in or on a Commonwealth area. It is also an offence to kill, injure, recklessly take, trade, keep, or move members of listed threatened species, listed migratory species and cetaceans. Sections 208A, 222A, 245 and 265 of the EPBC Act state that the Minister may accredit a plan of management for a fishery if satisfied that the plan requires persons engaged in fishing under the plan to take all reasonable steps to ensure that members of listed threatened species, listed migratory species, cetaceans and listed marine species are not killed or injured as a result of the fishing. Syngnathids, which have been harvested in the MAFF in small numbers in the past, are listed marine species under Part 13 of the EPBC Act. The MAFF does not contain any management arrangements that prohibit the targeted take of these species in Commonwealth waters, nor do they prohibit the targeted take of listed threatened species, listed migratory species or cetaceans. Consequently, accreditation of the fishery under Part 13 of the EPBC Act cannot be granted at this time. If operators in the MAFF wish to target members of listed marine species in Commonwealth waters in the future, a wildlife conservation plan will need to be negotiated between DPI&F and DEH to allow such harvest to take place. This arrangement has been included as a condition on the WTO declaration for this fishery.

The assessment also considered the possible impacts on species harvested in the MAFF which are listed under CITES. As a party to the Convention, Australia must apply all CITES provisions of the EPBC Act to maori wrasse and *Hippocampus* species imports and exports as appropriate. Under these provisions, export of CITES specimens may only occur where a permit, supported by a non-detriment finding, has been issued by the CITES Management Authority of the country of export. As Part 13A of the EPBC Act incorporates the requirements of CITES, there are no changes to the criteria for export approval, aside from administrative changes to the permits issued. As a result of the listing, specimens of maori wrasse and *Hippocampus* seahorses (which may only be harvested from State waters) taken from the wild, may only be exported under a single use CITES permit, while specimens bred in captivity may be exported under either a single use or a multiple use CITES permit.

Given the precautionary management controls that have been implemented by DPI&F, as well as the extremely low number of syngnathids taken in the fishery in the past, DEH considers that the harvest of these species from the fishery will not be detrimental to the survival of the taxon in the wild.

The assessment also considered the possible impacts on the World Heritage values of the Great Barrier Reef World Heritage Area (GBRWHA). In conducting this assessment and formulating recommendations, DEH has liaised closely with GBRMPA, the principal advisor to the Australian Government on the care and development of the GBRWHA, which has a responsibility to ensure that impacts on the values of the GBRWHA are minimised.

Since the GBRMP RAP came into effect on 1 July 2004, approximately 25% of the GBRMP has been closed to the MAFF, ensuring that marine aquarium specimens are protected in a representative portion of a range of habitats. For this reason, together with the nature of the fishery and the range of measures in place, DEH considers that an action taken by an individual fisher, acting in accordance with the MAFF management arrangements, would not be expected to have a significant impact on the World Heritage values of the GBRMP protected by the EPBC Act.

On this basis DEH considers that an action taken by an individual fisher, acting in accordance with the MAFF management regime, would not be expected to have a significant impact on the world heritage values of the GBRWHA.

The implementation of recommendations and other commitments made by DPI&F in the submission will be monitored and reviewed as part of the next DEH review of the fishery in 3 years time.

Recommendations

1. DPI&F to inform DEH of any intended amendments to the management arrangements that may affect the sustainability of the target stock or negatively impact on protected species or the ecosystem.
2. Within 3 years DPI&F to develop fishery specific objectives linked to performance indicators and performance measures for target stocks, protected species and impacts on the ecosystem. DPI&F will develop precautionary harvest limits for CITES and EPBC Act listed species within 12 months.
3. DPI&F to monitor the status of the fishery in relation to the fishery specific objectives, performance indicators and performance measures specified in the MAFF regime once developed. Within 3 months of becoming aware of a breach in a performance indicator or a performance measure not being met, DPI&F to finalise a clear timetable for the implementation of appropriate management responses.
4. Within 18 months DPI&F to conduct a compliance risk assessment for the MAFF, including specific analysis of compliance risks in the harvest of CITES and EPBC Act listed species. If significant risks are identified, DPI&F to develop and implement strategies to address these risks.
5. DPI&F to implement data validation mechanisms for fishery dependent data collected on the harvest of CITES and EPBC Act listed species for the MAFF within 18 months.
6. DPI&F to develop a research strategy for CITES and EPBC Act listed species within 3 years. Research strategies will be developed for other key target species identified at high risk through the ecological risk assessment process. DPI&F will cooperate with other Australian jurisdictions with marine aquarium fisheries to undertake research.
7. Within 2 years, DPI&F to undertake an ecological risk assessment to identify key target species CITES and EPBC Act listed species (other than finfish managed under the CRFFF Management Plan) most at risk from the MAFF and areas at risk from overfishing. DPI&F

to develop and implement responses to mitigate identified high risks within 12 months of the completion of the ecological risk assessment.

8. Within 2 years DPI&F to investigate the potential for localised and serial depletion of key target groups within the fishery as part of the ecological risk assessment process. DPI&F will implement management measures to mitigate any risks identified within 12 months of the completion of the ecological risk assessment.
9. Within 2 years, DPI&F to develop and implement a process to improve estimates of recreational take and factor these into stock assessments and management controls to ensure overall catch levels are sustainable.

PART I - MANAGEMENT ARRANGEMENTS

The MAFF is managed by DPI&F.

The management regime is described in the following documents, all of which are, or will be publicly available:

- the Queensland *Fisheries Act 1994*;
- the Queensland *Fisheries Regulation 1995*;
- the Australian Government *Great Barrier Reef Marine Park Act 1975*;
- Queensland *Nature Conservation Act 1992*;
- the CRFF Management Plan; and
- relevant Gazetted notices and licence conditions.

A number of other documents, including research reports, scientific literature and discussion papers are integral to the management of the fishery.

DEH considers it important that management arrangements remain flexible to ensure timely and appropriate managerial decisions. Because of the importance of the management regime and documents referred to above to DEH's assessment of the fishery, an amendment could change the outcomes of the assessment and decisions stemming from it. Decisions resulting from this assessment relate to the arrangements in force at the time of the decision. In order to ensure that these decisions remain valid, 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 protected species or the ecosystem.*

Management of the fishery incorporates a sound range of consultative mechanisms and a clear commitment to effective consultation with a variety of stakeholders. DEH considers the level of consultation to be adequate and is confident that DPI&F will continue to ensure interested parties are consulted appropriately.

The Queensland Harvest Fisheries Management Advisory Committee (HarvestMAC) provides advice on the management of Queensland harvest and developmental fisheries to DPI&F. HarvestMAC is comprised of a DPI&F appointed chair, harvesters in the fishery, DPI&F, Great Barrier Reef Marine Park Authority (GBRMPA), Queensland Park and Wildlife Service (QPWS), Queensland Boating and Fisheries Patrol (QBFP), recreational fishers, scientists and a permanent DEH observer. A standing invitation is in place for representatives of both indigenous and conservation groups, however no representatives from these groups currently attend HarvestMAC. DEH encourages DPI&F to pursue representatives from both conservation and indigenous groups. HarvestMAC meets twice a year to discuss recent developments in a range of harvest fisheries and to consider the adequacy of management arrangements.

In 1999 DPI&F (then the Queensland Fisheries Management Authority) released the "Discussion Paper – Queensland Marine Aquarium Fish and Coral Collecting Fisheries" (the Discussion Paper). The Discussion Paper sought comment on a range of issues facing the fishery and was the first step in developing a formal management plan for the fishery. The development of a formal management plan remains a priority for DPI&F. In the meantime, the MAFF is managed under the legislation described above and is also significantly affected by the recently implemented CRFF Management

Plan. No timeline for the development and implementation of a management plan for the fishery has been developed. DEH is concerned that no fishery specific objectives or performance indicators are currently in place to ensure that the performance of the fishery can be measured and management action taken as required. DEH considers that the development of fishery specific objectives, linked to performance indicators and performance measures for target stock, protected species and impacts on the ecosystem is a priority for the MAFF, and should be developed through the ecological risk assessment process (**Recommendation 7**). DEH considers that in the meantime, precautionary harvest limits should be put in place for CITES and EPBC Act listed species to ensure that take over the 3 year period is sustainable.

Recommendation 2: *Within 3 years, DPI&F to develop fishery specific objectives linked to performance indicators and performance measures for target stocks, protected species and impacts on the ecosystem. DPI&F will develop precautionary harvest limits for CITES and EPBC Act listed species within 12 months.*

Once developed, the MAFF should be regularly monitored in relation to the objectives, indicators and performance measures. A clear process for responding to a breach in a performance measure is also required to ensure that prompt management action is taken to address any threats to sustainability.

Recommendation 3: *DPI&F to monitor the status of the fishery in relation to the fishery specific objectives, performance indicators and performance measures specified in the MAFF regime once developed. Within 3 months of becoming aware of a breach in a performance indicator or a performance measure not being met, DPI&F to finalise a clear timetable for the implementation of appropriate management responses.*

Management of the fishery is reviewed by HarvestMAC twice a year, however this review is rudimentary and is not strategically conducted against fishery specific management objectives and performance indicators, as these have not been developed. Once these objectives and indicators have been developed, DEH encourages Harvest MAC to use these to strategically review the performance of the fishery.

Management of the fishery is based on a mixture of input and output controls, which apply to commercial and recreational fishers. Such controls are implemented under the management regime for the MAFF and under the recently implemented CRFF Management Plan, which controls the take of all Coral Reef Finfish in Queensland waters. These controls are outlined in Table 2 below:

Table 2: Summary of MAFF Management Controls implemented through the MAFF management regime and the CRFF Management Plan.

Control under MAFF management regime:	A1 Authorities:	A2 Authorities:	Recreational Harvesters:
Area Closures	Access to all fishery areas, including 5 SMAs. No access to closed zones within the GBRMP or closed zones in Queensland Marine Parks.	Access to fishery area, not including 5 SMAs. No access to closed zones within the GBRMP or closed zones in Queensland Marine Parks.	No access to closed zones within the GBRMP or closed zones in Queensland Marine Parks (area generally limited to shallow areas due to restrictions on gear).

Gear Restrictions	Harvest by hand with the assistance of SCUBA or hookah. The use of fishing lines, cast, scoop, seine nets and herding devices may be used.	Harvest by hand with the assistance of SCUBA or hookah. The use of fishing lines, casts, scoop, seine nets and herding devices may be used.	The use of SCUBA or hookah prohibited (snorkel equipment permitted).
Limited Entry 49 authorities (48 active)	44 authorities active, not more than three persons acting as nominees to take possess and sell Aquarium Fish under their authority.	5 authorities active.	No limit.
Prohibited species	Prohibition on the take of barramundi, beche-de-mer (except beche-de-mer not targeted by dedicated Queensland beche-de-mer fisheries), shell grit and sand star, any species of coral, anemones, oyster pearl shell or trochus. Prohibition on the take of any species protected under the Fisheries Act and Regulations.	Prohibition on the take of barramundi, beche-de-mer (except beche-de-mer not targeted by dedicated Queensland beche-de-mer fisheries), shell grit and star sand, any species of coral, oyster pearl shell or trochus. Prohibition on the take of any species protected under the Fisheries Act and Regulations.	Prohibition on the take of any species protected under the Fisheries Act and Regulations.
Bag Limits	None.	Restricted to 10 fish comprising not more than 2 fish of the same species.	None.
Control under CRFF Management Plan			
Area Closures	A seasonal closure for all CRFF species, covering waters east of longitude 142°31.82' east between latitude 10°41.00' south and latitude 24°50.00' south. In 2005 applies from: 27 September to 5 October; 27 October to 4 November; 25 November to 3 December. Additional closures to protect Grey Nurse Shark Habitat.	A seasonal closure for all CRFF species, covering waters east of longitude 142°31.82' east between latitude 10°41.00' south and latitude 24°50.00' south. In 2005 applies from: 27 September to 5 October; 27 October to 4 November; 25 November to 3 December. Additional closures to protect Grey Nurse Shark Habitat.	A seasonal closure for all CRFF species, covering waters east of longitude 142°31.82' east between latitude 10°41.00' south and latitude 24°50.00' south. In 2005 applies from: 27 September to 5 October; 27 October to 4 November; 25 November to 3 December. Additional closures to protect Grey Nurse Shark Habitat.
Size Limits	A1 authority holders may possess an undersized specimen of any species managed under the CRFF Management Plan with the exception of hussar and Spanish flag fish.	A2 authority holders may possess an undersized specimen of any species managed under the CRFF Management Plan with the exception of hussar and Spanish flag fish.	All size limits apply as outlined in the CRFF Management Plan.

Prohibited Species	Taking or possessing barramundi cod, chinamanfish, CITES listed humphead Maori wrasse, paddletail, potato cod, Queensland grouper and red bass is prohibited. One exemption to harvest a controlled number of Maori wrasse was issued in 2004.	Taking or possessing barramundi cod, chinamanfish, CITES listed humphead Maori wrasse, paddletail, potato cod, Queensland grouper and red bass is prohibited.	Taking or possessing barramundi cod, chinamanfish, CITES listed humphead Maori wrasse, paddletail, potato cod, Queensland grouper and red bass is prohibited.
Bag Limits (referred to as Possession Limits in the CRFF Management Plan)	Combined take and possession limit of 20 fish.	Combined take and possession limit of 20 fish.	Combined take and possession limit of 20 fish. Some exemptions apply for tourism charter operations.

The QBFP is responsible for ensuring compliance with relevant fishery legislation in all Queensland fisheries. Compliance activities in the MAFF are currently limited due to the small scale of the fishery. DPI&F state that no major compliance issues have been reported in the MAFF, however anecdotal reports suggest that some illegal harvest of anemones has been occurring, particularly in the southern zone of the fishery. While there is no evidence to support these reports, DEH is concerned at the potential illegal take of prohibited species, by both commercial and recreational sectors of the MAFF. Further, DEH is concerned that no compliance activities are planned for the MAFF to ensure that no EPBC Act listed marine species are taken from Commonwealth waters, in line with a condition on the WTO declaration. DEH therefore recommends that DPI&F conduct a compliance risk assessment for the fishery, including an analysis of compliance risks in the harvest of CITES and EPBC Act listed species. If significant compliance risks are identified, DPI&F will develop and implement strategies to address these risks.

Recommendation 4: *Within 18 months DPI&F to conduct a compliance risk assessment for the MAFF, including specific analysis of compliance risks in the harvest of CITES and EPBC Act listed species. If significant risks are identified, DPI&F to develop and implement strategies to address these risks.*

A new Compliance Activity System is being developed that will record detailed information on activities performed by the QBFP, with respect to fishery breaches. The new system will include a range of activities including improved spatial recording of offences and enforcement. DEH encourages DPI&F to implement this improved system as soon as possible.

Fishery-dependent data relating to the target species is collected on a regular basis in the fishery. Some fishery independent information is also collected. 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 lives and the fishery operates is contained under Principle Two of this report.

A number of the families harvested in the MAFF have wide distributional ranges and stocks may be shared with other jurisdictions including the Northern Territory and to a lesser degree, Western

Australia. DEH therefore encourages DPI&F to pursue complementary management arrangements and joint research opportunities with relevant states, where appropriate.

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.

Other than CITES obligations discussed above, 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 (UNCLOS). 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 discussed 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.

The MAFF has been operating within the area of the GBRMP since the 1970s. Under the EPBC Act, a person may not take an action that has, will have or is likely to have a significant impact on the world heritage values of a declared World Heritage property. People that are taking actions that are a lawful continuation of a use of land, sea or seabed, which was occurring immediately before the commencement of the EPBC Act, may continue to take those actions. An enlargement, expansion or intensification of a use is not a continuation of a use. As outlined above, the RAP has protected a proportion of the GBRPWHA from MAFF harvest. Additionally, all MAFF harvest in the GBRMP is controlled under permits issued by the GBRMPA. Harvesters must comply with all permit and reporting conditions outlined by GBRMPA. For this reason, and the outcomes of the assessment as listed throughout this report, DEH considers that fishing activities as currently practiced in this fishery are unlikely to have a significant impact on the world heritage values of the GBRMP in the next three years. Any significant change to existing practices, which is likely to significantly impact on the GBRMP World Heritage values, may require approval by the Australian Government Minister for the Environment and Heritage.

Conclusion

DEH considers that the MAFF management regime is documented, publicly available and transparent, and is developed through a consultative process. The management arrangements are adaptable and will be underpinned by appropriate objectives and performance criteria by which the effectiveness of the management arrangements can be measured, enforced and reviewed, once **Recommendation 2** is implemented.

The management arrangements are capable of controlling the harvest through a combination of input and output controls appropriate to the size of the fishery. Periodic review of the fishery is provided for, as are the means of enforcing critical aspects of the management arrangements.

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 are obtained through compulsory logbooks, which are completed daily and submitted monthly. Harvesters are required to provide information on the family groups collected, location of collection (lat/long, reef name and 6x6 nm grid), number of divers/assistants, time spent collecting, harvest methods used and number of specimens of fish collected. This information is entered into the Commercial Fisheries Information System (CFISH), in place since 1988. Proposed changes to the logbook are currently under review and include improved reporting to species level for the major families and to standardise the common name used for reporting marine aquarium species. These changes will be implemented in 2006. DEH commends DPI&F for improving the current logbook reporting system and considers that the changes to the logbooks should include a requirement that CITES or EPBC Act listed species (including *Hippocampus* seahorses, syngnathids and maori wrasse harvested under special permit) be reported to species level.

Fishery independent data collection is limited. A number of studies have been conducted, both within Australian and internationally on the potential impacts of harvesting aquarium species from the wild, however few have direct relevance to the MAFF. Butler (1991) conducted a study on the effects of collecting anemone fish from the northern and central Great Barrier Reef (GBR) for the aquarium trade. DPI&F note that while the study concluded that collection was not detrimental to the species and that the local population had not been depleted by collection, the study is not entirely reliable due to the limited number of study sites utilised. Information has also been collected through the Australian Institute of Marine Science (AIMS) Long term Monitoring Program, which is designed to detect changes in reef communities over time at a regional scale. The program aims to monitor the status and changes in distribution and abundance of reef biota on a large scale and to provide environmental managers with a context for assessing impacts of human activities within the GBRMP and provide them with a basis for managing the GBR for ecologically sustainable use (Sweatman et al 2001). While the study monitors a range of marine species including a number of reef fish targeted in the MAFF, the program does not provide specific information to inform management of the MAFF.

While these studies provide some information on species taken in the fishery, fishery dependent data is realistically the only source of data focused on the fishery. DEH considers that, given the importance of this data to the management of the fishery and given the harvest of CITES and EPBC Act listed species, DPI&F should implement data validation mechanisms for the fishery to ensure that all fishery dependent data is robust and sufficiently reliable to base management decisions on.

Recommendation 5: *DPI&F to implement data validation mechanisms for fishery dependent data collected on the harvest of CITES and EPBC Act listed species for the MAFF within 18 months.*

No research is proposed specifically for the MAFF. Gaps in the knowledge of stock status, biology and ecology exist for a number of key family groups targeted in the MAFF, including CITES listed Maori wrasse and *Hippocampus* seahorses and EPBC Act listed syngnathids. DEH therefore recommends that DPI&F implement a research strategy for the fishery, to gather further information on the stock status, biology and ecology of key target groups, including CITES and EPBC Act listed species. DEH understands that the strategy will need to be implemented within the constraints of available resources and should focus initially on CITES and EPBC Act listed species until the ecological risk assessment process (**Recommendation 7**) provides further information on the risk of the fishery to other key target stocks. DEH considers that the improved logbook system will assist in providing more detailed information on which species are being most heavily targeted in the MAFF and commends DPI&F for its commitment to the implementation of the improved logbook systems by the next financial year (June 2006).

Recommendation 6: *DPI&F to develop a research strategy for CITES and EPBC Act listed species within 3 years. Research strategies will be developed for other key target species identified at high risk through the ecological risk assessment process. DPI&F will cooperate with other Australian jurisdictions with marine aquarium fisheries to undertake research.*

Overall, given the range of fishery dependent data gathered by DPI&F and the commitment to implement **Recommendations 5 and 6**, DEH considers that there will be a reliable information collection system in place appropriate to the scale of the fishery.

Assessment

No formal stock assessments are undertaken for the MAFF and no sound estimate of the potential productivity of the harvested stocks and proportion that could be sustainably harvested are therefore available.

DEH notes that recent trends in the catch data for the MAFF indicate a decrease in catch and effort trends since 2000. Anecdotal information provided by industry members suggests that this was due to a change in market demand for certain species and a reduction in the number of licensed fishers rather than a decline in the availability of target stocks. DPI&F also advise that the most recent catch data for the fishery indicates an increase in catch and effort since 2003. DEH considers that while catch limits, including the 20 fish limit in place under the CRFFF Management Plan and the 10 fish limit in place for A2 authority holders, are likely to provide some protection for the majority of finfish, no risk assessment process has been undertaken to ascertain which, if any, species groups are at risk from the MAFF. As information on sustainable harvest levels are not available for these groups, DEH recommends that DPI&F undertake an ecological risk assessment to identify key target species, CITES and EPBC Act listed species most at risk from the fishery and to identify areas at risk from overfishing. DEH considers that this process will not need to include finfish species currently managed under the CRFFF Management Plan. DPI&F will develop and implement responses to mitigate identified high risks within 12 months of the completion of the ecological risk assessment and use the process to assist in the implementation of other recommendations made throughout this report.

Recommendation 7: *Within 2 years, DPI&F to undertake an ecological risk assessment to identify key target species CITES and EPBC Act listed species (other than finfish managed under the CRFFF Management Plan) most at risk from the MAFF and areas at risk from overfishing. DPI&F to develop and implement responses to mitigate identified high risks within 12 months of the completion of the ecological risk assessment.*

The majority of the families harvested in the MAFF have broad distributions and are found throughout the Indo-Pacific area and in coral reef systems throughout the world. A number of species however are endemic to Australia and in some cases may be found in only one area.

DPI&F note that in 2003, 62% of all marine aquarium fish were harvested from four MAFF collection grids located in the Cairns region. Further, the second most important area, near Fraser Island contributed an additional 27% of all marine aquarium fish caught in 2003.

DEH is concerned that while the majority of species harvested in the fishery have a wide distribution and high fecundity, a number of species, including EPBC Act listed syngnathids, may be at risk of localised and serial depletion as 89% of all harvest occurs in 5 zones. DEH considers that DPI&F needs to investigate the potential for localised and serial depletion of target species and, if significant risks are identified, implement management measures to mitigate these risks.

Recommendation 8: *Within 2 years DPI&F to investigate the potential for localised and serial depletion of key target groups within the fishery as part of the ecological risk assessment process. DPI&F will implement management measures to mitigate any risks identified within 12 months of the completion of the ecological risk assessment.*

Potential removals from the marine aquarium fish and invertebrate population include direct harvest by the MAFF, recreational take and harvest of the target species in other fisheries. Indigenous harvest of marine fish for aquarium purposes is considered negligible.

As outlined above, commercial harvest from the MAFF is recorded in compulsory daily logbooks which are processed by DPI&F through the CFISH system. DEH has made recommendations (**Recommendations 4 & 5**) to ensure that this data is validated and reliable.

Limited information is available on the scale of recreational harvest in the fishery. As outlined in Table 2, recreational harvesters are subject to a number of restrictions, through the MAFF management regime and the CRFFF Management Plan, however little work has been done to establish the level of recreational take or compliance of the recreational sector with management arrangements. DEH considers that harvest by the recreational sector may have a significant impact on the overall harvest from the fishery and therefore recommends that DPI&F develop a process to improve estimates of recreational take and factor these into future stock assessments and management controls to ensure overall catch levels are sustainable.

Recommendation 9: *Within 2 years, DPI&F to develop and implement a process to improve estimates of recreational take and factor these into stock assessments and management controls to ensure overall catch levels are sustainable.*

Marine aquarium fisheries operate in other jurisdictions. Ideally, management arrangements affecting a single stock should be under a single jurisdiction, or at least complementary across jurisdictions. DEH believes that it is unlikely that stocks are shared between these fisheries, but that DPI&F should work with other jurisdictions to establish complementary management measures.

Management response

The current MAFF management regime aims to maintain ecologically viable stock levels through a range of input and output controls. These measures are outlined in Table 1, Table 2 and Part I of this report.

DEH considers that the combination of the input and output controls together with the implementation of recommendations outlined above should ensure adequate protection of the target stocks.

No reference points to trigger management action are currently in place for the MAFF. DPI&F state that the development of reference points will be considered in the future development of the MAFF management plan. DEH considers that reference points should be established as a priority in the fishery, particularly given the harvest of CITES and EPBC Act listed species and the lack of a timeline for the development and implementation of a MAFF management plan (**Recommendation 2**).

No byproduct species are taken in the MAFF.

Conclusion

DEH considers that the management regime in the MAFF is appropriately precautionary and provides for the fishery to be conducted in a manner that does not lead to overfishing. DEH considers that the information collection system and stock assessment and management arrangements generally are sufficient to ensure that the fishery is conducted at catch levels that maintain ecologically viable stock levels with acceptable levels of probability.

DEH considers that there is scope to further refine some of the existing information collection, assessment and management responses and has provided a number of recommendations for improvements in the longer term.

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’*

DEH considers that the MAFF stock are not overfished but should that occur in the future, the fishery is conducted such that there is a high degree of probability the stock would recover to ecologically viable stock levels within nominated timeframes.

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

Due to the highly selective nature of harvesting in the fishery (hand collection of live specimens) no bycatch is taken in the MAFF apart from commensal organisms living on or within invertebrates. Bycatch of commensal organisms is unlikely to have a significant impact on the survival of the species in the wild due to the limited amount taken and management controls on the level of take of species in which commensal organisms live.

Conclusion

DEH considers that there is a high likelihood the fishery is conducted in a manner that does not threaten bycatch species. Should this situation change, or a risk assessment process indicate otherwise, DEH expects that DPI&F would undertake appropriate actions to ensure that bycatch species are not threatened by this fishery.

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

Protected species occurring in the area include cetaceans, dugongs, syngnathids, sea snakes, sharks and marine turtles. No interactions with endangered, threatened or protected species have been recorded to date, with the exception of syngnathid harvest, which is permitted in State waters under MAFF authorities.

Monthly logbook data provides information on the number of syngnathids harvested in the MAFF. Fishers are not required to report on any other interactions with endangered, threatened or protected species.

Assessment

With the exception of syngnathids, limited data are available on protected species interactions in the MAFF and no assessment of the impact of the fishery on protected species has been undertaken. Given the low impact and benign fishing method used in the fishery, the most likely negative impact on protected species, apart from the harvest of syngnathids, would be boat strikes, however, boat strikes are unlikely due to the limited number of vessels permitted in the fishery.

No assessment on the impact of harvest on syngnathids has been conducted to date, however given the low level of harvest to date (<8% of the total MAFF harvest in 2003), and the commitment of DPI&F to implement the recommendations arising from this report, adverse impacts to syngnathids species are unlikely.

No listed ecological communities are found in the fishery area.

Management response

The current management arrangements for the MAFF do not prohibit or control the harvest of listed threatened, endangered or protected species in the fishery. DEH is therefore unable to accredit the fishery under Part 13 of the EPBC Act (as outlined in the Executive Summary).

Measures to manage the impact of the MAFF on protected species are limited, however DEH considers that the implementation of **Recommendations 5, 7 & 8** will assist in obtaining further information on the impact of harvest on syngnathids and improve management strategies to protect these species.

Conclusion

DEH notes that there are minimal interactions with protected species in the MAFF (apart from the permitted harvest of syngnathids in State waters) 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, or 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

Research regarding ecosystem impacts is not available for the MAFF due to its relatively small size and limited number of participants. Impacts are believed to be minimal due to the relatively benign method of fishing and the range of management measures in place (outlined in Part II, Objective 1) that prevent harvest in certain locations of the fishery area.

Assessment

The potential of the MAFF to impact unacceptably and unsustainably on the marine environment generally is considered to be low, due to the highly selective nature of harvest in the fishery.

The impact of vessel discharge on the ecosystem is considered to be low. The Queensland *Transport Operations (Marine Pollutions) Act 1995* requires all vessels to be maintained to appropriate standards and not discharge any materials into the water. The Queensland Department of Transport is responsible for checking vessel maintenance and safety through annual survey inspections. The number of vessels permitted in the fishery is strictly regulated and no breaches have been reported in the MAFF.

Fishing gear is not regarded as posing a significant risk to the physical environment in the fishery as harvesters are limited to hand collection with the assistance of SCUBA or hookah breathing apparatus. Nets are permitted to be used, however the collector must be within 100 m of the net at all times during harvesting.

The impact of removing finfish, syngnathids and invertebrates from the ecosystem is not well understood, however it is generally believed that the species play an important role in water quality, benthic communities and structure and productivity flows of the ecosystem.

Given that the majority of species are found in abundance and across a wide distribution, the impacts of removal of these species is unlikely to have a significant impact on the ecosystem. The removal of syngnathids and some species of fish and invertebrates may be compounded by the possibility of localised depletion of these species. The implementation of **Recommendation 7** should provide further information on these potential impacts.

Management response

No management measures are in place to specifically minimise the effects of harvesting aquarium species on the wider ecosystem. Management measures to protect the target species, including limited entry, gear restrictions and catch limits may provide some mitigation for the ecosystem effects of harvesting finfish invertebrates and syngnathids.

DEH considers that the risk of localised depletion of a number of target species and subsequent impacts on the ecosystem have not been adequately addressed in management arrangements. DEH has made a recommendation (**Recommendation 8**) to address the issue of localised depletion and serial depletion, which should also help to address potential ecosystem impacts and to ensure that the impact of removal of the species on the ecosystem is minimised.

Conclusion

DEH considers that the fishery is conducted in a sufficiently precautionary manner that minimises the impact of fishing operations on the ecosystem generally. Recommendations have been developed throughout this report to ensure that the risk of significant impact by the fishery on the marine environment is minimised in the longer term.

REFERENCES

Butler, I. 1991 – *An investigation of the effects of collecting anemone fish for the aquarium trade*. Honours thesis, Department of Marine Biology, James Cook University, North Queensland.

Queensland Fisheries Management Authority 1999 – *Discussion Paper No. 10: the Queensland Marine Aquarium Fish and Coral Collecting Fisheries*. Queensland Fisheries Management Authority, Queensland.

Sweatman, H., Cheal, A., Coleman, G., Delean, S., Fitzpatrick, B., Miller, I., Ninio, R., Osbourne, K., Page, C., and Thompson, A. 2001 – *Long-term Monitoring of the Great Barrier Reef*. Status Report Number 5. 2000. Australian Institute of Marine Science in conjunction with the CRC: Reef Research Centre. Townsville, Queensland.

LIST OF ACRONYMS

AIMS	Australian Institute of Marine Science
CFISH	Commercial Fisheries Information System
CITES	International Convention on the International Trade in Endangered Species of Flora and Fauna
CRFF Management Plan	Queensland <i>Fisheries (Coral Reef Fin Fish) Management Plan 2003</i>
DEH	The Australian Government Department of the Environment and Heritage
DPI&F	The Queensland Department of Primary Industries and Fisheries
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
GBR	Great Barrier Reef
GBRMP	Great Barrier Reef Marine Park
GBRMPA	Great Barrier Reef Marine Park Authority
GBRMP WHA	Great Barrier Reef Marine Park World Heritage Area
HarvestMAC	Queensland Harvest Management Advisory Committee
MAFF	Queensland Marine Aquarium Fish Fishery
MARPOL	International Convention for the Prevention of Pollution from Ships
OCS	Offshore Constitutional Settlement
QBFP	Queensland Boating and Fisheries Patrol
QPWS	Queensland Parks and Wildlife Service
RAP	Representative Areas Program
SCUBA	Self Contained Underwater Breathing Apparatus
SMA	Special Management Area
UNCLOS	United Nations Convention on the Law of the Sea
WTO	Wildlife Trade Operation

