

Annual status report 2008

Marine Aquarium Fish Fishery



Photograph courtesy of Helen Taylor



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Introduction

The Queensland Marine Aquarium Fish Fishery (MAFF) is one of a range of harvest (hand collection) fisheries managed by the Department of Primary Industries and Fisheries (DPI&F). The commercial fishery is focused on the collection of marine aquarium fish and invertebrates that are marketed both domestically and internationally. Specimens can also be collected recreationally for display in home aquaria.

This report covers fishing activity during the 2007 calendar year.



Figure 1: Map of fishery area.

Fishery profile 2007

Commercial harvest: 136 554 individual fish from 58 species groups

Recreational harvest: No estimate of level of harvest for 2007

Indigenous harvest: No estimate of level of harvest for 2007

Charter harvest: Not applicable to the fishery

Commercial Gross Value of Production (GVP): No estimate available

Number of authorities: 49 (44 A1; 5 A2)

Commercial boats accessing the fishery: 34

Fishery season: All year (however three 9-day spawning closures apply for coral reef fin fish in October, November and December)

Source: DPI&F CFISH database, 14 March 2008

Description of the fishery

The MAFF harvests from a diverse suite of marine fish and invertebrate species, most of which are associated with shallow and deeper water coral reef and inter-reef habitats. MAFF authority holders are allowed to collect fish and invertebrates species only for display purposes and not for human consumption. Fish species targeted in the MAFF mainly belong to the families (in no particular order):

- Pomacentridae—damselfish and anemone fish
- Pomacanthidae—angelfish
- Labridae—wrasses
- Chaetodontidae—butterflyfish
- Gobiidae—gobies.

Invertebrate species commonly harvested include: coral shrimp, small non-commercial colourful sea cucumbers, nudibranchs, gastropods and other molluscs, sponges and ascidians.

The MAFF operates under an 'A1' or an 'A2' fishery symbol. Fishers endorsed with an A2 fishery symbol have possession limits of 10 fish comprising not more than two fish of the same species. Introduced in September 2003, the fishery symbols and associated regulations addressed latent effort for the fishery and issues of localised concentration of effort and its potential effects on ecological sustainability.

Marine aquarium fish and invertebrates are also collected by recreational fishers for personal home aquaria. Recreational fishers are limited by all existing in-possession and size limits and apparatus restrictions for fisheries, as outlined in the Queensland Fisheries Regulation 2008. Recreational fishers are not permitted to sell their catch.

Collection and trade levels in the MAFF are small compared to the global aquarium trade which ranges from 20–24 million individuals annually (Wabnitz et al. 2003).

Fishing methods

Commercial harvesters in the MAFF are permitted to harvest fish and invertebrate species using a range of gear types, including fishing lines, cast scoop and 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. Attendance rules and size restrictions govern the use of nets.

Recreational harvesters are not permitted to use SCUBA or hookah gear.

Fishing area

The fishery operates along the east coast of Queensland within the bounds of the Offshore Constitutional Settlement (Figure 1). Operators in the MAFF are permitted to harvest aquarium fish and invertebrates along the entire Queensland east coast in areas that are not closed through general fisheries closures or marine parks zoning under the Commonwealth *Great Barrier Reef Marine Park Act 1975* and the Queensland *Marine Parks Act 1982*. The fishery area also comprises five Special Management Areas (SMAs) that can only be accessed by certain holders of an A1 symbol. Allocation of access to these areas was undertaken in 2003 based on a licensee's historic participation in the region. The remainder of the fishery area is open to both A1 and A2 authority holders. The majority of commercial aquarium fish collecting occurs in coastal and reef waters in northern Queensland.

Main management methods used

Under Offshore Constitutional Settlement (OCS) arrangements between the Commonwealth and Queensland governments, management of aquarium fish species adjacent to the east coast of Queensland falls under Queensland law. Fisheries in the Coral Sea (outside of the OCS) are managed by the Commonwealth Government.

The MAFF has been subject to a limited entry policy (no new licences issued) since 1997.

A variety of input and output controls are used to manage harvest in the MAFF (see Ryan & Clarke 2005), including the following:

- Commercial fishing controls — limited entry, limits on the number of operators under an authority, gear restrictions (type and dimensions), in-possession limits (for A2 symbol holders) and size limits for particular species, Special Management Areas, and spatial and seasonal closures.

- Recreational fishing controls — gear restrictions (type and dimensions), in-possession and size limits for certain species, and spatial and seasonal closures.

Approximate allocation between sectors

The MAFF is considered to be a predominantly commercial fishery. There are no quantitative data available on the level of take for the recreational harvest of marine aquarium species. Hobby aquarists are known to harvest some marine aquarium species; however, the scale is believed to be negligible relative to the number of fish harvested in the commercial MAFF.

Collecting ornamental marine fish and invertebrate species is not considered to be a part of traditional or customary fishing practice by Indigenous fishers (Ryan & Clarke 2005) and will not be reported on further in this report.

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

The MAFF was granted a Wildlife Trade Operation (WTO) approval under Part 13A of the Commonwealth EPBC Act in November 2005. The WTO approval acknowledges that the fishery is being managed in an ecologically sustainable manner and allows the continued export of product caught in this fishery. The current approval expires on 25 November 2008.

Catch statistics

Commercial

The total annual number of specimens collected in the MAFF and the number of effort days continued to decline in 2007 compared with previous years (Figure 2). This is lower than previous years which have been around 200 000 individuals. Commercial fishing effort was approximately 200 days less in 2007 and contributed to the lower overall harvest.

Most of the overall reduction in fishing effort was in the Cairns region where the number of fishing days (369 days in 2007) is approximately 60% of the 2003 level (611 days). Industry representatives believe the reduction in effort and harvest in the Cairns region can be directly attributed to the loss of the highly productive offshore reefs closed under the Representative Areas Program (RAP) in July 2004 (Lyle Squire Jnr., (Pro-Vision Reef), email, 31 July 2008). The Commonwealth Government Structural Adjustment Package process recognised this loss of productive ground and compensated MAFF operators who could substantiate they had been affected since the introduction of the RAP. Pro-Vision Reef suggests this has resulted in a significant change to the makeup of the fleet and the types of fishing operations in the Cairns region. One type of operation (smaller companies) now concentrate effort in the less productive inshore reef areas while the other (larger operators) are geared for long distance fishing trips to more productive reefs outside of the Cairns SMA and into the Coral Sea. Operators south of Cairns appear similarly affected through loss of highly productive reef areas under RAP. Changes to fishing operations (boat refits etc.) to undertake long distance trips takes time and is further reducing fishing effort in the MAFF.

Overall catch composition has remained similar to previous years with damselfish (Family Pomacentridae), angelfish (Family Pomacanthidae) and wrasses (Family Labridae) the most commonly harvested taxa in 2007 (Figure 3). However, catch levels across these groups were lower in 2007 than 2006. Pomacentrids (includes damselfish, chromis and anemone fish) dominated the catch in 2007.

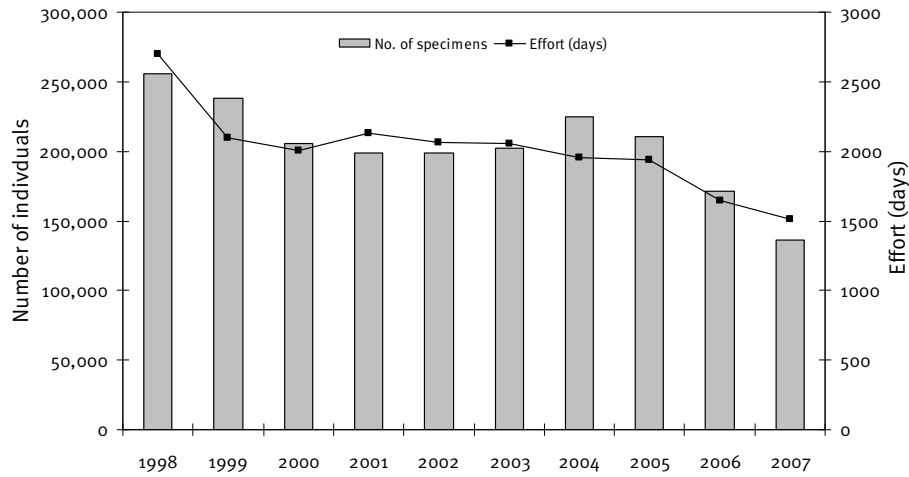


Figure 2: Commercial catch and effort for the Queensland Marine Aquarium Fish Fishery, 1998–2006 (Source: DPI&F CFISH database, 14 March 2008).

The collection of sea stars (Order Asteroidea) increased in 2007 compared with 2006 (Figure 3). This may reflect more accurate reporting by collectors in the new more detailed AQo4 logbook (implemented in November 2006) as there was a subsequent reduction in the number of Echinoderms reported (includes Asteroidea). Other non-fish species groups commonly collected in the reporting year were crustaceans (coral shrimps, hermit crabs, spiny lobsters etc.) and molluscs (octopus, cuttlefish, squid etc.).

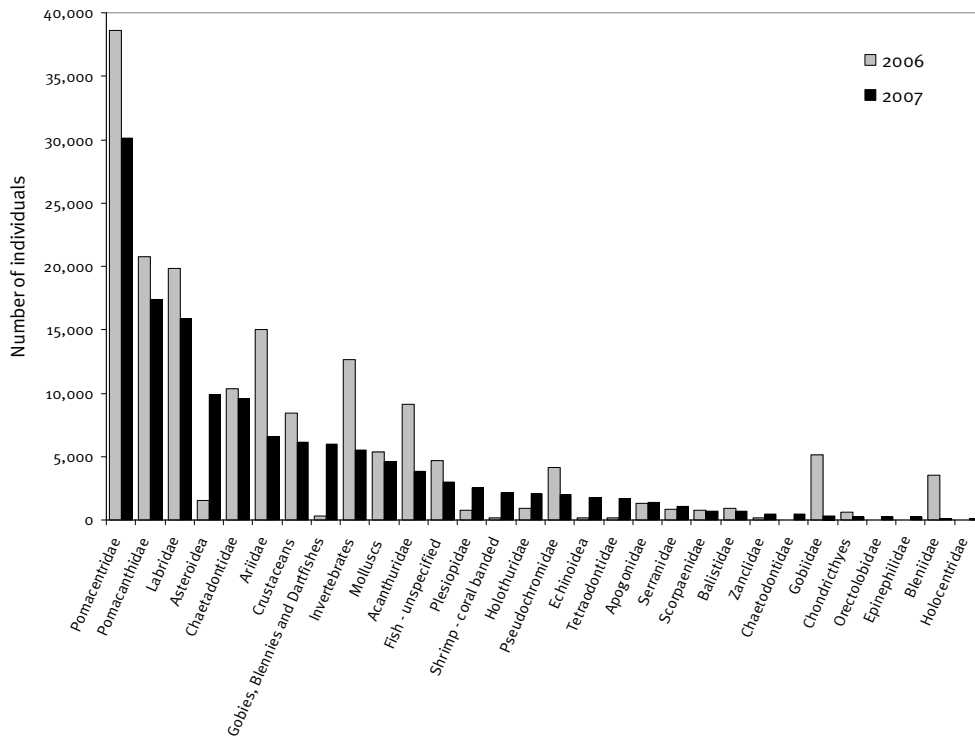


Figure 3: Composition of the top 30 families and species groups (by number in 2007) collected in the Queensland Marine Aquarium Fish Fishery in 2006 and 2007 (Source: DPI&F CFISH database, 14 March 2008).

Special Management Areas

Five Special Management Areas (SMA) are monitored annually for indications of unsustainable harvest levels brought about by localised concentration of effort (Figure 4). There were no indications of unsustainable fishing occurring in the SMAs in 2007.

The highest numbers of specimens collected in the SMAs came from Cairns in 2007. Similar catches were also made outside the SMAs. Total catches in the Cairns SMA in 2007 appear steady compared with 2006 although catches overall have been declining since 2003. Catch efficiency remained steady at around 130 individuals per day.

Rough weather negatively affects the number of effort days that can be applied in the MAFF and reduces the catch efficiency of operators. In 2007, the Cairns region experienced similar inclement weather to 2006 and contributed to the observed lower catch levels.

Only Moreton Bay and the Sunshine Coast SMAs showed increased catch levels in 2007 compared with 2006. Harvest levels and catch efficiency increased slightly in the Moreton Bay SMA in 2007. This region has been reasonably consistent in catches since 2004.

Whitsunday SMA catches were nearly absent in 2007. There was very little licence activity in the region in 2007.

Recreational

Recreational aquarium fishers generally take only a few specimens of each species for personal displays. Recreational collection of fish while using scuba or hookah is prohibited so harvest is effectively limited to shallow areas accessible by free-diving (generally no deeper than five metres). There are limits placed on a variety of species caught by recreational fishers as prescribed under the *Fisheries Act 1994* and subordinate legislation. The take of hump-headed Maori wrasse, potato cod, barramundi cod, Queensland groper, red bass, Chinaman fish and paddletail is prohibited within Queensland waters under the Fisheries (Coral Reef Fin Fish) Management Plan 2003. Under this plan and in addition to individual take and possession limits, all coral reef fin fish species have a combined take and possession limit of 20.

There is no information available on the level of recreational harvest of marine aquarium species. DPI&F's recreational fishing telephone survey and diary rounds (RFISH) are not suitable for estimating recreational catches for the MAFF. Investigations are underway to determine appropriate methods for collecting information on recreational harvest in this fishery.

Reports of black marketing of recreationally caught aquarium specimens are investigated by the Queensland Boating and Fisheries Patrol. No significant breaches of this nature were brought to the fishery manager's attention in 2007.

Indigenous

There is no information available on the indigenous harvest of marine aquarium species. Marine aquarium species are not believed to be of high value to indigenous fishers (Ryan & Clarke 2005).

Spatial issues/trends

Commercial catch and effort in the MAFF is concentrated in waters off Cairns and South East Queensland. These population centres have good, close access to fishing grounds and domestic and international airports. Operators in South East Queensland also have access to the expanding domestic market in the area. Smaller concentrations of catch and effort are found in the Mackay/Whitsundays region and around Gladstone.

DPI&F are ensuring that fishing activities in the MAFF do not exacerbate potential climate change impacts on aquarium fish species and the ecosystem that supports them. Coral bleaching events in the Keppel region in 2006 led to DPI&F developing a draft Coral Stress Response Plan for Coral and Marine Aquarium Fish Fisheries. The plan is expected to be finalised and implemented in

2009. The Performance Measurement System for the MAFF refers to the plan as the preferred management response in the event that a bleaching event impact is detected.

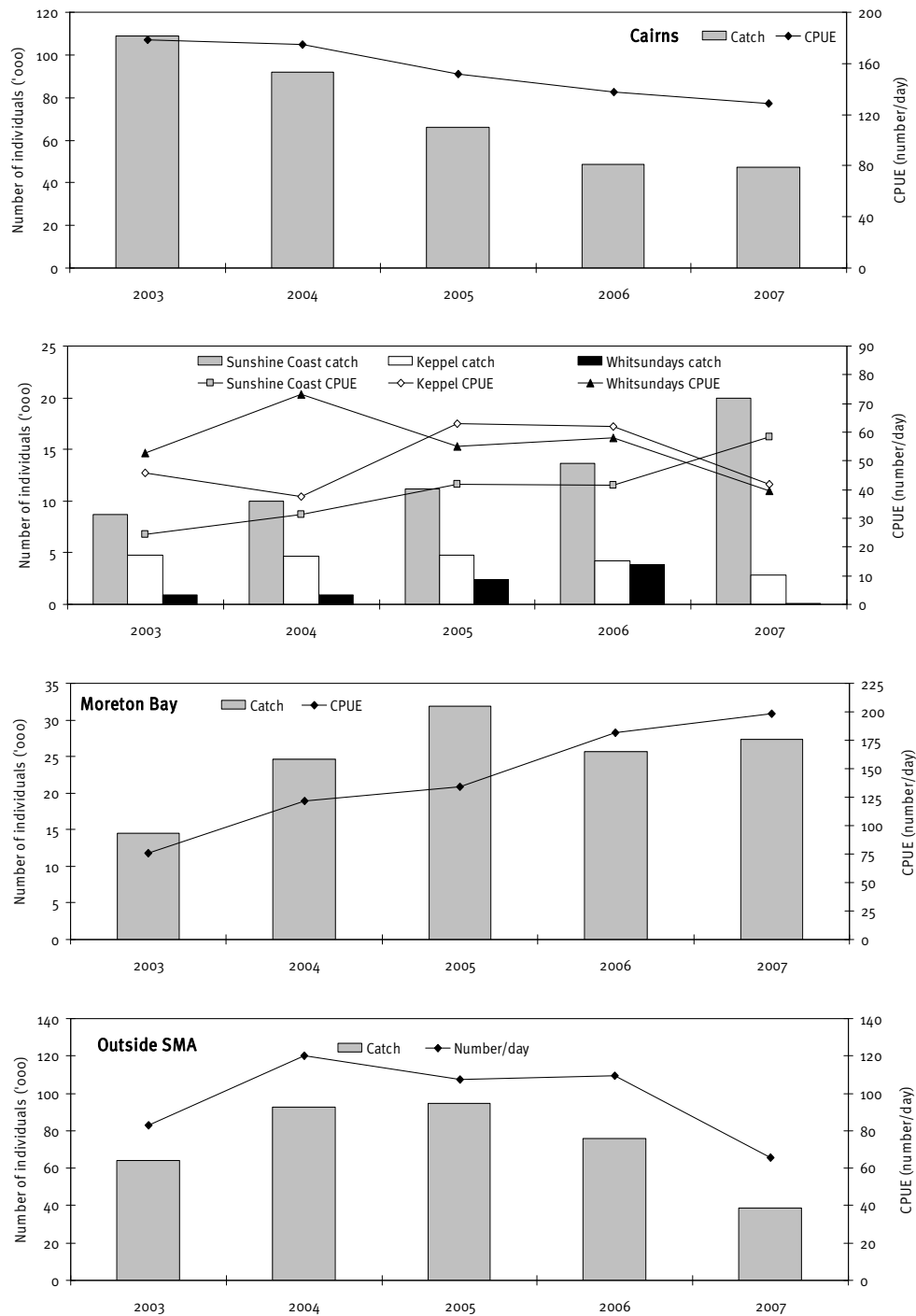


Figure 4: Commercial catch (numbers of individuals) and catch per unit effort data (number/day) for the Special Management Areas (introduced in 2003) in the Queensland Marine Aquarium Fish Fishery, 1998–2006 (Source: DPI&F CFISH database, 14 March 2008).

Socio-economic characteristics and trends

There are currently 49 commercial MAFF licences in Queensland.

There are no Gross Value of Production (GVP) estimates for the fishery. The small size of the fishery, its multi-species focus and variations in market prices make it difficult to accurately estimate GVP.

Many operators in the MAFF also participate in the Queensland Coral Fishery (QCF). There has been a gradual global shift in the aquaria market from aquaria dominated by fish to 'reef' displays dominated by live corals (Lyle Squire Jnr. (Pro-Vision Reef), email, 31 July 2008). The ability to export corals has provided an opportunity for MAFF operators with QCF licences to respond to this demand and better export prices for live coral by shifting effort away from the collection of fish and invertebrates and dedicating fishing trips to coral collection. This is further reducing the level of fishing effort in the MAFF.

Fishery performance

Appraisal of fishery in regard to sustainability

Catch and fishing effort data from commercial fisher logbooks indicate that the MAFF fishery continues to be managed by DPI&F in a sustainable manner. There have been no significant changes to harvest levels in the fishery as a whole, at a local scale, or at the species group level. An Ecological Risk Assessment (ERA) of the MAFF in 2007 reinforced that the fishery is managed for sustainability. The ERA determined the risks to the ecological sustainability of the target species in the fishery, based on the best available data on catch levels, biological characteristics and the distribution of harvested species. From the 600 species presently collected in the fishery, only two species were identified as moderate risk and six species as low risk.

Progress in implementing Department of the Environment, Water, Heritage and the Arts (DEWHA) recommendations

Recommendation	Progress
<p>DPI&F to inform DEWHA of any intended amendments to the management arrangements that may affect sustainability of the target stock or negatively impact on protected species or the ecosystem.</p>	<p><i>Ongoing</i></p> <p>There have been no management changes during the reporting period.</p>
<p>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 species within 12 months.</p>	<p><i>In progress</i></p> <p>A draft Performance Measurement System (PMS) was developed in 2008 following the outcomes of the Ecological Risk Assessment (ERA).</p> <p>A draft performance measure has been developed to ensure that the harvest of Convention on International Trade in Endangered Species (CITES) and EPBC Act listed species is managed in an ecologically sustainable way. This measure has been incorporated into the draft PMS.</p> <p>Outputs from the ERA provided the basis for developing performance indicators aimed at measuring management performance in maintaining ecological sustainability of the species supporting the MAFF. The two species identified as moderate risk and the six species identified as low risk from the operation of the MAFF, will be monitored through the PMS.</p>

Recommendation	Progress
<p>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.</p>	<p><i>In progress</i></p> <p>The outcomes of the ERA informed the setting of fishery specific objectives and performance measures for the MAFF. Performance measures will be regularly assessed and reported against in the timeframes specified within the PMS after it is implemented in 2008.</p>
<p>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 an appropriate compliance strategy to address these risks within 12 months.</p>	<p><i>Completed</i></p> <p>A compliance risk assessment was completed in October 2006. Strategies addressing the identified risks have been developed and are incorporated in the Queensland Boating and Fisheries Patrol current operational plan.</p> <p>Compliance risk assessments are used by the QBFP in undertaking operational planning activities associated with management of the fishery. Through identification and prioritisation of compliance risks associated with the fishery, planning and operational process in specific areas may be improved.</p>
<p>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.</p>	<p><i>Completed</i></p> <p>Validation of logbook information provides confidence in the accuracy of reporting by commercial fishers. With greater reliance on logbook data for ecological assessments, there is a need for authentication of the information reported by fishers through the logbook program.</p> <p>The logbook validation process for this fishery was completed in May 2007. DPI&F's validation program will be undertaken every two to three years. The next validation exercise for the MAFF is planned for 2009.</p>
<p>DPI&F will develop a research strategy for CITES and EPBC Act listed species within three 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.</p>	<p><i>In progress</i></p> <p>A five year Research and Development (R&D) plan is being developed for all of Queensland hand harvest fisheries. The plan will identify research priorities and assist research agencies in lobbying for funding. DPI&F plans to complete the recommendation by the due date (end of 2008), incorporating the results of the ERA and any research activities undertaken in other jurisdictions (especially Northern Territory and Western Australia) into the R&D plan for the fishery.</p>

Recommendation	Progress
<p>Within 2 years, DPI&F to undertake an ecological risk assessment to identify key target species and CITES and EPBC Act listed species (other than finfish species managed under the <i>Fisheries (Coral Reef Fin Fish) Management Plan 2003</i> 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 process.</p>	<p><i>Completed</i></p> <p>An ERA workshop was held in August 2007 to identify ecological sustainability issues in the fishery. From the 600 species presently collected in the fishery, only two species were identified as a moderate risk and six species as a low risk. No areas were identified as at risk from overfishing. The current MAFF logbook is adequately recording data on catch levels of the species recorded at higher than negligible risk for monitoring purposes. A draft document reporting on the outcomes of the ERA has been completed.</p> <p>Outputs from the ERA provided DPI&F with confidence in the management regime in place in the MAFF aimed at ensuring ecological sustainability. The ERA has provided a basis for the development of a PMS for the MAFF.</p>
<p>Within 2 years DPI&F to investigate the potential for localised and serial depletion of key target species groups within the fishery as part of the ERA process. DPI&F to implement management measures to mitigate any risks identified within 12 months of the completion of the ERA.</p>	<p><i>Completed</i></p> <p>A sustainability assessment of the 600 species presently collected in the MAFF has been completed. By ranking each species vulnerability characteristics and their potential to recover from impacts, DPI&F identified species potentially at risk from fishing. These species were included as priority issues in the scope of the subsequent ERA workshop. A draft document reporting on the outcomes of the sustainability assessment has been completed.</p> <p>Outputs from the ERA indicated there is little risk for local concentrations of harvesting effort in the MAFF to lead to localised and serial depletion of key target species.</p>
<p>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.</p>	<p><i>Ongoing</i></p> <p>Stock assessments are not deemed appropriate for any of the species targeted in this fishery. The MAFF is a highly diverse fishery with no single species targeted to the extent that it requires an estimate of standing stock. This is supported by the ERA which found that the fishery poses no significant risk to the ecology of the taxa that supports it.</p> <p>While DPI&F are investigating appropriate methods to collect information of recreational harvest, information on collection by the recreational and indigenous sectors is</p>

	<p>considered a lower priority given:</p> <ol style="list-style-type: none"> 1. the low risk the fishery poses to species collected; 2. there are no requirements to collect information for stock assessment purposes; 3. small size of the recreational and indigenous sectors; 4. in-possession limits imposed on recreational collectors of coral reef fish and invertebrate species; 5. protection measures in place through marine protected areas (e.g. GBRMP).
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Management performance

A draft Performance Measurement System (PMS) has been developed for the MAFF. The PMS is planned to be implemented in 2008.

Resource concerns

DPI&F are satisfied that there are no resource concerns in this fishery at the current participation levels and with the suite of management controls that are in place. Outcomes from the recent Sustainability Assessment and ERA of the MAFF support the low resource impact nature of this fishery which is based more on quality than quantity. Natural catastrophic events such as coral bleaching and cyclones are likely to have more localised impact on aquarium fish resources than fishery activity at the present level of effort in the fishery. Further management measures, perhaps at a local or regional scale, may be required to mitigate the impacts of the fishery on resources if linkages with these events can be demonstrated.

Non-retained species/bycatch

There is no bycatch or by-product from this fishery due to the highly selective harvesting methods used.

Interactions with protected species

Commercial operators are required to fill in a Species of Conservation Interest (SOI) logbook if they have interactions with protected species. Because of the selective, relatively benign harvesting method and high attendance of fishing gear, operators pose negligible risk to protected species. There have been no reported interactions with SOI during this reporting period.

Fishery impacts on the ecosystem

The physical impact on the broader ecosystem is considered negligible as a result of the selective fishing method and the small number of individual animals that are collected relative to the available resource.

Outcomes from the MAFF ERA indicate that MAFF operations are not likely to negatively impact on natural food webs and critical predator/prey relationships. Broader ecosystem impacts from natural events, such as cyclone damage to reefs and coral bleaching, are likely to have greater

ecological impacts than the fishery operations. DPI&F is responsible however, for ensuring fishing activities post-impact are managed in a sustainable manner, taking into account the status of target species populations and their capacity to recover from such natural events. Recognising coral reefs are a critical ecosystem supporting the fishery, DPI&F developed a draft Coral Stress Response Plan for the Marine Aquarium and Coral Fisheries to ensure fishery impacts are mitigated in the event of severe natural disturbances on these environments. The draft framework supports the adoption of a tiered approach to determine and implement an appropriate management response that is dependent on factors such as the severity and longevity of the impact.

Research and monitoring

Recent research and implications

None to report.

Monitoring programs and results

Compulsory logbook program

Logbook data provide the DPI&F with detailed information on catch trends in the commercial fishery. No independent monitoring is currently undertaken by the DPI&F.

Summaries of logbook data are provided to the Harvest MAC for consideration by representatives from industry, scientists and managers. Data is assessed further, if required, by the DPI&F Harvest Fishery Scientific Advisory Group (Harvest SAG).

Collaborative research

DPI&F were not involved in collaborative research during the 2007 reporting period.

Fishery management

Compliance report

Compliance and enforcement in the MAFF are the responsibility of DPI&F, Queensland Boating and Fisheries Patrol (QBFP).

During 2007, 40 inspections were conducted in the MAFF, including 29 commercial fishing vessel inspections, with the remainder comprising recreational fishers, motor vehicles and marketer premises.

During this period, four offences were detected, corresponding to a compliance rate of 90% on units inspected. A summary of offences is provided in Table 1. Offences are reported as either a Fisheries Infringement Notice (FIN) or FIN Caution. All of the offences were by commercial fishers.

A compliance risk assessment was conducted for the MAFF in October 2006 to determine compliance priorities and allow the most effective use of QBFP resources. The risk assessment identified take/possession of non-permitted species as the highest priority for enforcement and compliance in the fishery. There were also a number of activities rated as having a moderate risk, which are also being addressed. In addition to this, the QBFP monitors black marketing in all Queensland fisheries. Information is occasionally received relating to black marketing in the MAFF and all complaints of this nature are investigated. There were no significant enforcement issues identified during 2007.

Table 1: Offences recorded in the Marine Aquarium Fish Fishery (2007).

OFFENCE	FIN	FIN Caution
Take, possess or sell fish regulated by size	1	-
Authority holder failed to ensure the boat mark was placed on the primary/tender boat as required	-	1
Failed to have a document required to be available for immediate inspection	1	1
TOTAL	2	2

Changes to management arrangements in the reporting year

No changes have been made to the management arrangements in the reporting year.

Consultation, communication and education

Consultation with stakeholders in the MAFF mainly occurs through the Harvest MAC. Two meetings were held in 2007. Harvest MAC provides advice to the DPI&F on management measures for the MAFF.

Complementary management

There were no complementary management issues in the reporting period.

References

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Front cover image

Yellowface Angelfish (*Pomacanthus xanthurus*)—photo courtesy of Helen Taylor