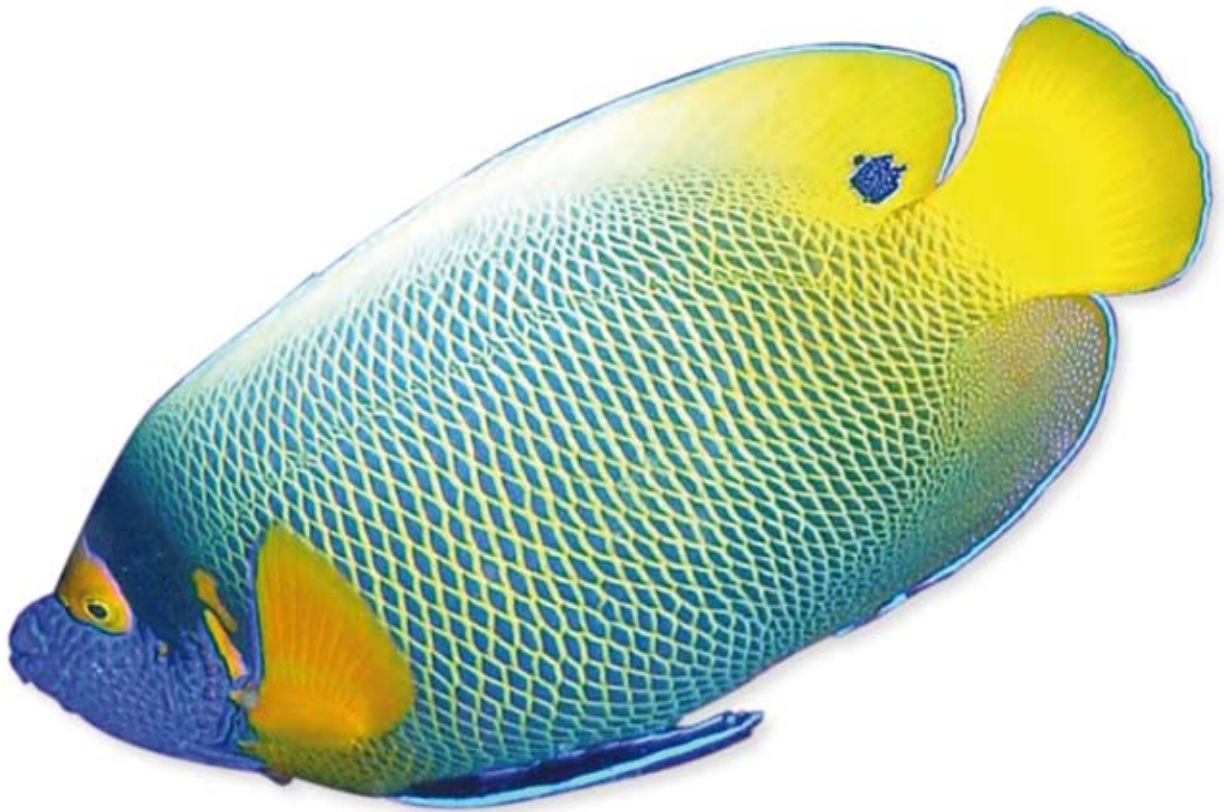


Annual status report 2007

Marine Aquarium Fish Fishery



The Department of Primary Industries and Fisheries (DPI&F) seeks to maximise the economic potential of Queensland's primary industries on a sustainable basis.

While every care has been taken in preparing this publication, the State of Queensland accepts no responsibility for decisions or actions taken as a result of any data, information, statement or advice, expressed or implied, contained in this report.

© The State of Queensland, Department of Primary Industries and Fisheries 2008.

Copyright protects this material. Except as permitted by the *Copyright Act 1968* (Cth), reproduction by any means (photocopying, electronic, mechanical, recording or otherwise), making available online, electronic transmission or other publication of this material is prohibited without the prior written permission of the Department of Primary Industries and Fisheries, Queensland.

Inquiries should be addressed to:

Intellectual Property and Commercialisation Unit
Department of Primary Industries and Fisheries
GPO Box 46
Brisbane Qld 4001

or

copyright@dpi.qld.gov.au
Tel: +61 7 3404 6999

Introduction

The Queensland Marine Aquarium Fish Fishery (MAFF) is one of a range of harvest fisheries managed by the Department of Primary Industries and Fisheries (DPI&F). Commercially collected marine aquarium fish and invertebrates are marketed both domestically and internationally. Aquarium specimens can also be collected recreationally.

This report covers fishing activity during the 2006 calendar year.

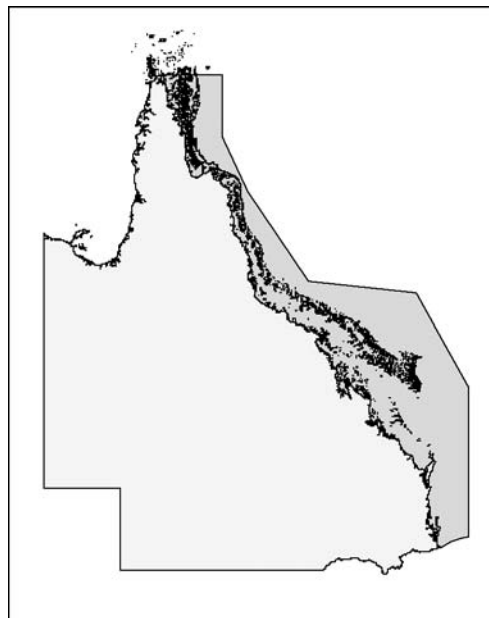


Figure 1: Map of fishery area.

Fishery profile 2006

Commercial harvest: 171 641 individual fish from 57 species groups

Recreational harvest: No estimate of level of harvest for 2006

Indigenous harvest: No estimate of level of harvest for 2006

Charter harvest: Not applicable to the fishery

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

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

Commercial boats accessing the fishery: 34 boats

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 Regulations 1995. Recreational fishers are not permitted to sell their catch.

The total annual number of fish and invertebrate specimens collected in the MAFF is around 200 000 individuals (since 2000). Trade levels in the MAFF are small compared to the global aquarium trade which ranges from 20–24 million individuals annually¹.

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.²

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 Australian Fishing Zone (AFZ)(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 licence's historic participation in the region. Licences that met the criteria of historical participation were granted access to one or more areas. 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.

¹ C Wabnitz, M Taylor, E Green and T Razak, *From Ocean to Aquarium. The global trade in marine ornamental species*, UNEP-WCMC, Cambridge, United Kingdom, 2003.

² S Ryan, and K Clarke, *Ecological assessment of the Queensland Marine Aquarium Fish Fishery. A report to the Australian Government Department of Environment and Heritage on the ecologically sustainable management of the Queensland marine aquarium harvest fishery*, Department of Primary Industries and Fisheries, Brisbane, Australia, 2005.

Main management methods used

Under Offshore Constitutional Settlement (OCS) arrangements between the Commonwealth and Queensland governments, management of aquarium fish species throughout most of the AFZ adjacent to the east coast of Queensland falls under Queensland law. Consequently, harvest of aquarium fish from the east coast of Queensland south of 10°41' is managed under Queensland law by DPI&F while fisheries in offshore waters of the Coral Sea 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 MAFF³, 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 and will not be reported on further in this report.⁴

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 in November 2008.

Catch statistics

Commercial

The total annual number of specimens collected in the MAFF decreased to approximately 170 000 in 2006 (Figure 2). This is lower than previous years which have been around 200 000 individuals. Commercial fishing effort was approximately 300 days less in 2006 and would have contributed to the lower overall harvest.

³ ibid

⁴ ibid

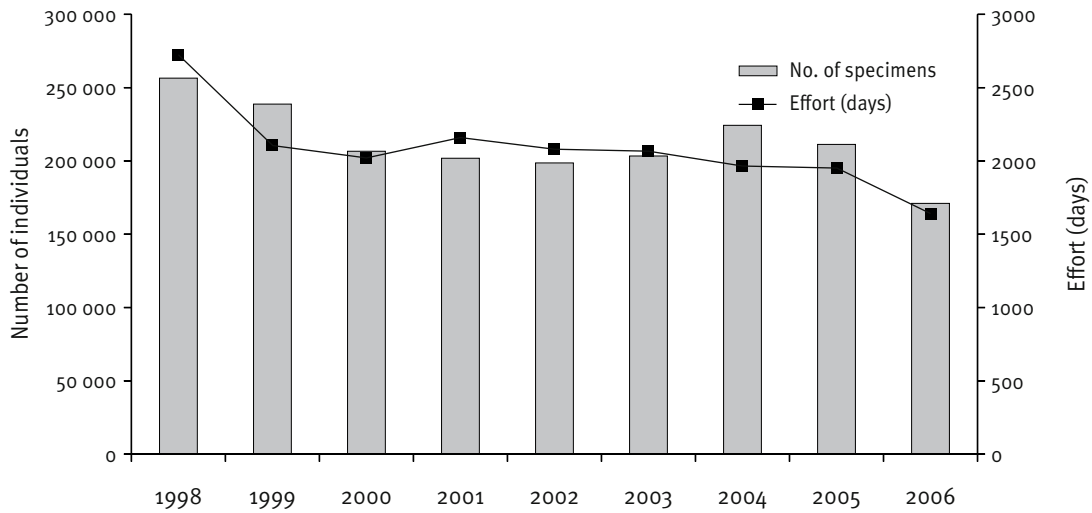


Figure 2: Commercial catch and effort for the Queensland Marine Aquarium Fish Fishery, 1998–2006 (Source: DPI&F CFISH database, 14 March 2008).

Overall catch composition has remained similar to previous years with damselfish (Family Pomacentridae), angelfish (Family Pomacanthidae), wrasses (Family Labridae), catfish (Family Ariidae) and mixed invertebrates the most commonly harvested taxa in 2006 (Figure 3). MAFF operators collected more than twice as many Pomacentrids than any other species group in 2006. The family Pomacentridae comprises popular aquarium fish such as damselfish, chromis and anemone fish. Of the non-fish species collected in the reporting year, the most common were crustaceans (coral shrimps, hermit crabs, spiny lobsters etc.), molluscs (octopus, cuttlefish, squid etc.) and echinoderms (sea urchins, starfish etc.).

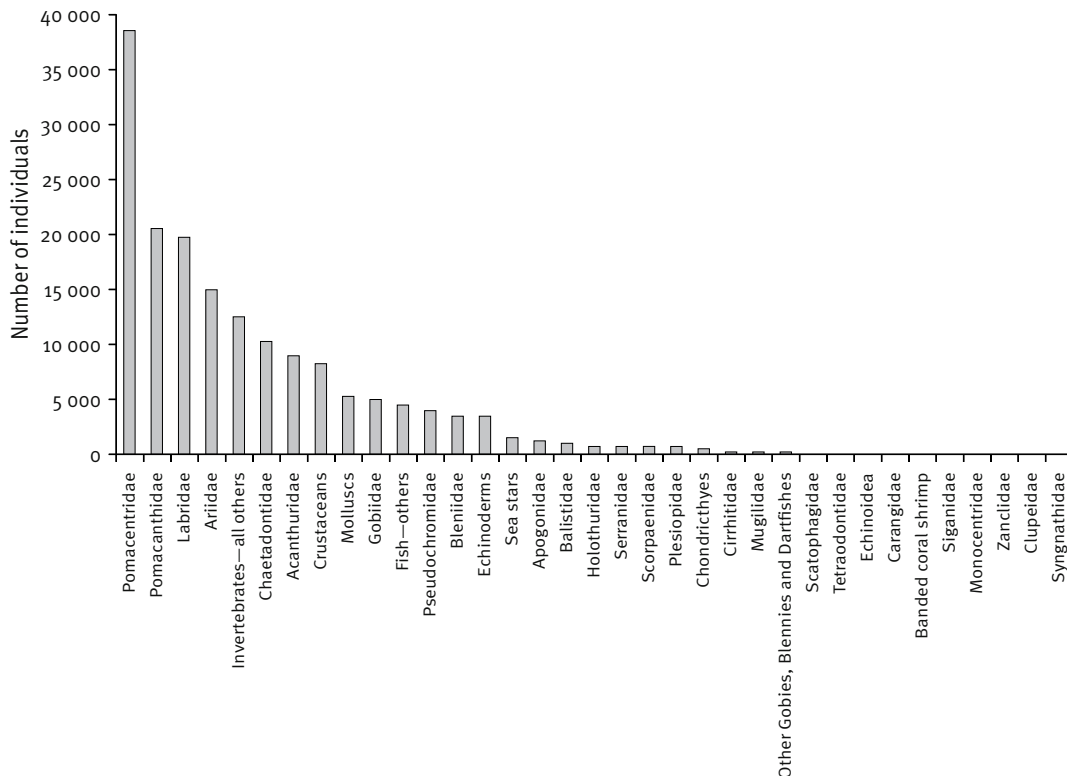


Figure 3: Composition of the commercial catch for the Queensland Marine Aquarium Fish Fishery in 2006 (does not show taxa where less than 100 individuals were caught) (Source: DPI&F CFISH database, 14 March 2008).

Special Management Areas

The five special management areas (SMA) represent areas with high historical concentrations of fishing effort. The number of licences that can access these areas remains capped. Access was limited to A1 licence operators who had demonstrated a history of participation in each area. SMAs are monitored annually for indications of unsustainable harvest levels brought about by localised concentration of effort. There were no indications of unsustainable fishing occurring in the SMAs in 2006.

The highest numbers of specimens collected in the SMAs came from Cairns in 2006; however more specimens were collected overall from areas outside of SMAs (Figure 4). Total catches in the Cairns SMA have been decreasing since 2003 (Figure 4). Catch efficiency remained high however at around 130 individuals per day. Inclement weather in 2006 resulted in less effort being applied in the Cairns SMA and contributed to the observed lower overall catch levels.

Harvest levels in the Moreton Bay SMA were lower than previous years (Figure 4), halting the increasing catch trend which began in 2002. The Keppel and Sunshine Coast SMAs continue to produce steady catch levels although catch efficiency had risen in the Keppel region in 2006 (Figure 4 overleaf).

Whitsunday SMA catch levels rose sharply in 2006. The majority of the increase comprised Butterflyfish and Damsel fish. There are only three licences in the Whitsundays SMA and catches consequently appear to be quite variable.

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 to a depth of about five metres.

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 2006.

There are limits placed on a variety of species caught by recreational fishers as detailed 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.

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 fishers⁵.

⁵ S Ryan and K Clarke 2005, *Ecological assessment of the Queensland Marine Aquarium Fish Fishery. A report to the Australian Government Department of Environment and Heritage on the ecologically sustainable management of the Queensland marine aquarium harvest fishery*, Department of Primary Industries and Fisheries, Brisbane, Australia, 2005.

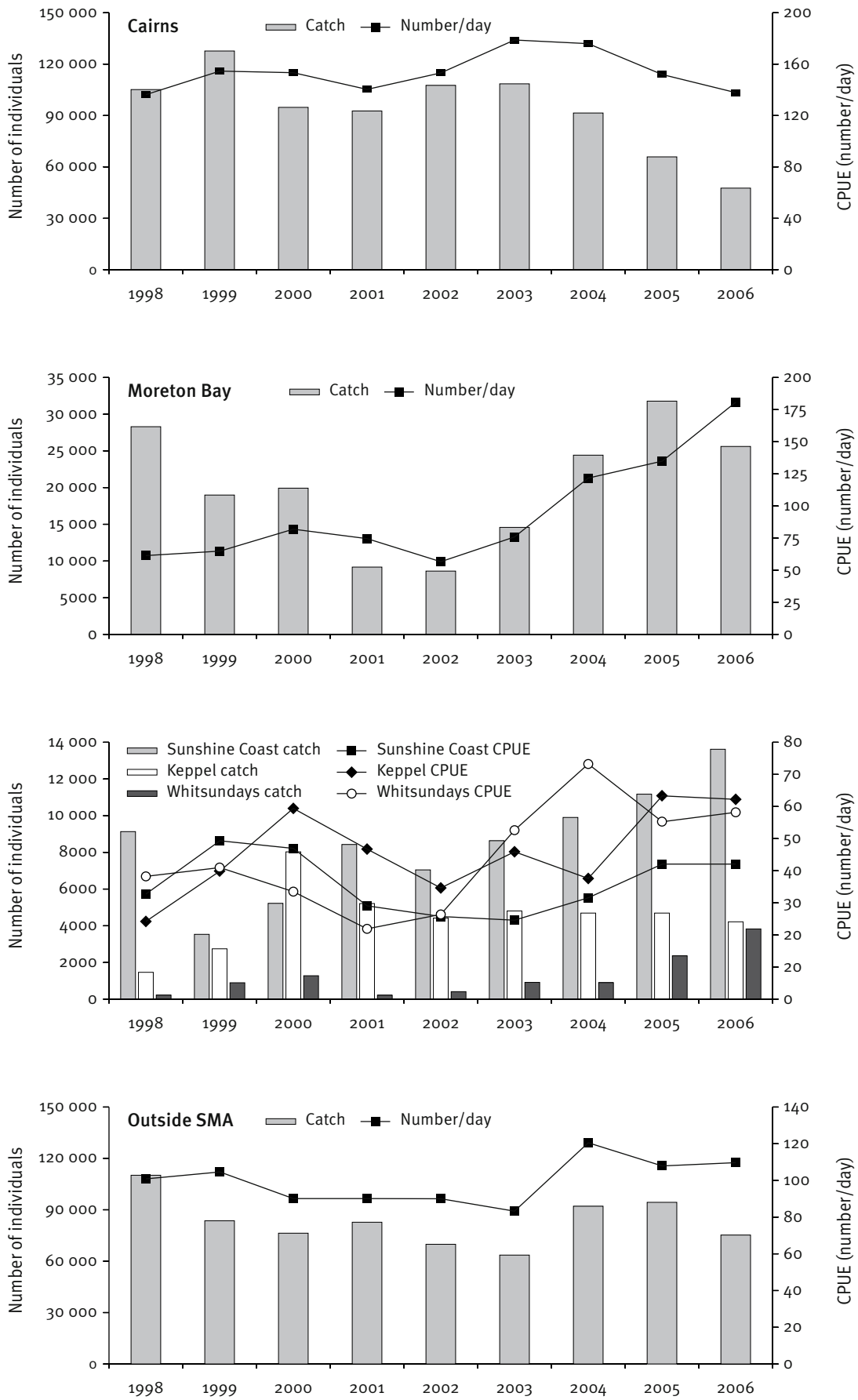


Figure 4: Commercial catch (numbers of individuals) and catch per unit effort data (number/day) for the Special Management Areas (introduced in 2003) in the Queensland Marine Aquarium Fish Fishery, 1998–2006 (Source: DPI&F CFISH database, 14 March 2008).

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.

Recent coral bleaching events in the Keppel region have caused local concern for aquarium fish stocks. A working group under the Harvest Management Advisory Committee (Harvest MAC) was formed by DPI&F to investigate whether this presents any sustainability issues for the MAFF. The MAFF industry peak representative body, Pro-Vision Reef, has instigated a moratorium for the Keppel Region, prohibiting the commercial take of certain anemone fish and their parent anemones as a proactive move to facilitate recovery following the bleaching event.

An outcome of these bleaching events is the development by DPI&F of a draft Coral Bleaching Response Plan for Coral and Marine Aquarium Fish Fisheries. The plan is expected to be finalised and implemented in 2008. The Performance Measurement System for the MAFF (to be developed) will refer to the plan as the preferred management response in the event that a bleaching event impact is detected.

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.

Fishery performance

Appraisal of fishery in regard to sustainability

Catch and fishing effort data from commercial fisher logbooks suggest 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 or at the species group level. The MAFF underwent an Ecological Risk Assessment (ERA) in 2007. 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	Improvements to management regime
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.	<i>Ongoing</i> There have been no management changes during the reporting period.	N/A
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.	<i>In progress</i> A Performance Measurement System (PMS) is planned for development in 2008 following the outcomes of the Ecological Risk Assessment (ERA). 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.	Outputs from the ERA will provide a 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.
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.	<i>In progress</i> The outcomes of the ERA will inform 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 developed and implemented in 2008.	N/A
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.	<i>Completed</i> A compliance risk assessment was completed in October 2006. Detailed strategies addressing the identified risks have been developed and are incorporated in the Queensland Boating and Fisheries Patrol current operational plan.	A compliance risk assessment is 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.

Recommendation	Progress	Improvements to management regime
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.	<i>Completed</i> The logbook validation process for this fishery has been developed and the first data validation tasks completed. DPI&F's commitment to continually assess the validity of fishery-dependent data means that the validation exercise for this fishery will be undertaken every two to three years. The next validation exercise is planned for 2009.	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.
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.	<i>In progress</i> DPI&F plans to complete this task by the due date (end of 2008), taking into account the results of the ERA and any research activities undertaken in other jurisdictions (especially Northern Territory and Western Australia).	A Research and Development 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.
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.	<i>Completed</i> 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.	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 will inform the development of a PMS for the MAFF.
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.	<i>Completed</i> 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, we 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.	Outputs from the ERA indicate there is little risk for local concentrations of harvesting effort in the MAFF to lead to localised and serial depletion of key target species.

Recommendation	Progress	Improvements to management regime
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.	<i>Ongoing</i> DPI&F are investigating methodologies to collect recreational data on the take of marine aquarium fish species.	N/A

Management performance

A Performance Measurement System (PMS) has not yet been developed for the MAFF. A PMS development workshop is planned for mid 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 and Ecological Risk Assessments 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 (SOCI) 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 SOCI 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 recent 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.

Research and monitoring

Recent research and implications

DPI&F has developed a draft response plan for the Coral Fishery and the MAFF in the event that the supporting fisheries habitat (e.g. coral reef) is impacted by ecological disturbances (e.g. coral bleaching). The draft framework supports the adoption of a tiered approach to determining and implementing an appropriate management response that is dependent on factors such as the severity and longevity of the impact.

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 2006 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 2006, 33 units were inspected in the Marine Aquarium Fish Fishery, including 21 commercial fishing vessels, with the remainder comprising recreational fishers and marketer premises. One Fisheries Infringement Notice was issued for a recreational fisher taking fish in a prohibited way, namely, taking fish using underwater breathing apparatus other than a snorkel. There were no significant enforcement issues identified throughout this year.

A compliance risk assessment was conducted for the MAFF in October 2006 in order 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.

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 2006. 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.

Information compiled by

Anthony Roelofs

Acknowledgements

Tara Smith, Tracey Scott-Holland, Nadia Engstrom, Anna Garland.

Front cover image

Yellowface Angelfish (*Pomacanthus xanthometapon*)

