Marine aquarium fish fishery harvest strategy: 2021–2026



Business unit ownerManagement & ReformEndorsed byDeputy Director-General (Fisheries & Forestry) in accordance with delegated
powers under Part 2, Division 1 (Harvest Strategies) of the Fisheries Act 1994Approved byMinister responsible for fisheries in accordance with section 16 of the Fisheries Act
1994

Revision history

Version no.	Approval date	Comments	
0.01	September 2020	Draft harvest strategy for consultation	
1.00	June 2021	Approved harvest strategy	

 Enquiries and feedback regarding this document can be made as follows:

 Email:
 info@daf.qld.gov.au

 Telephone:
 13 25 23 (Queensland callers only) (07) 3404 6999 (outside Queensland) Monday, Tuesday, Wednesday and Friday: 8 am to 5 pm, Thursday: 9 am to 5 pm

 Post:
 Department of Agriculture and Fisheries GPO Box 46 BRISBANE QLD 4001 AUSTRALIA

 Website:
 daf.qld.gov.au

Interpreter statement



The Queensland Government is committed to providing accessible services to Queenslanders from all culturally and linguistically diverse backgrounds. If you need an interpreter to help you understand this document, call 13 25 23 or visit daf.qld.gov.au and search for 'interpreter'.

© State of Queensland, 2021

The Queensland Government supports and encourages the dissemination and exchange of its information. The copyright in this publication is licensed under a Creative Commons Attribution 4.0 International (CC BY 4.0) licence.

Under this licence you are free, without having to seek our permission, to use this publication in accordance with the licence terms.



You must keep intact the copyright notice and attribute the State of Queensland as the source of the publication.

Note: Some content in this publication may have different licence terms as indicated.

For more information on this licence, visit https://creativecommons.org/licenses/by/4.0/.

The information contained herein is subject to change without notice. The Queensland Government shall not be liable for technical or other errors or omissions contained herein. The reader/user accepts all risks and responsibility for losses, damages, costs and other consequences resulting directly or indirectly from using this information.

Contents

What the harvest strategy is trying to achieve 4
Fishery overview
Stocks covered by the harvest strategy
Management units for the harvest strategy5
Summary of management information
Fishery objectives
Catch shares7
Managing the performance of the fishery
Management of target species
Management of secondary and by-product species
Management of ecological risks from fishing10
Monitoring social and economic performance11
Data collection, validation and assessment
Information and research priorities
Schedule of performance monitoring, assessment and review
Acronyms and definitions15

What the harvest strategy is trying to achieve

This harvest strategy has been developed in line with the *Queensland harvest strategy policy* to manage the marine aquarium fish resources of Queensland. The sustainability risk to marine aquarium fish stocks within the marine aquarium fish fishery (MAFF) is considered low. In addition to the substantial protection provided by marine park zoning, hand-collection fishing methods used in the MAFF produce minimal bycatch and have negligible impacts to the broader ecosystem.

The MAFF is primarily managed through effort-based input controls for commercial fishing. The decision rules are risk-based and designed to ensure harvesting remains sustainable by monitoring harvesting trends. Other management tools (e.g. size limits, spawning closures etc.) may also be used to support the sustainable management of stocks under this harvest strategy.

Fishery overview

The MAFF operates along the Queensland east coast, from the tip of Cape York south to the Queensland–New South Wales border. It is a small fishery that collects a wide variety of fish and invertebrates for the live aquarium trade, most of which are exported. It is a handcollection fishery operating primarily on the Great Barrier Reef, with licence conditions to ensure sustainability of the resource. Marine aquarium fish and invertebrates are collected using hand-held fishing gear, including fishing lines, small nets and herding devices. Divers in the fishery use scuba or surface-supplied air from hookah (hose) apparatus. The MAFF does not use any chemicals to take fish.

The fishery comprises five special management areas that can only be accessed by holders of an A1 symbol. Authority to access these areas is based on historical participation in the region, and an A1 authority holder may be granted access to one or more areas. The remainder of the fishery area is open to both A1 and A2 authority holders.

The MAFF is not a quota managed fishery, instead using input controls to manage and



limit effort placed on the resource. Fish collected within the fishery are only to be sold if being used for display as an aquarium fish or used as broodstock.

There is no information available on the traditional or recreational harvest of marine aquarium species. Hobby aquarists do catch some marine aquarium species; however, the number of fish taken is believed to be very small.

Stocks covered by the harvest strategy

The MAFF focuses on a wide variety of marine species principally associated with shallow and deeper water coral reef and inter-reef habitats. The main target species belong to the following families:

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

While many of the species important to the MAFF have a broad distribution, some species are endemic to Australia and, in some cases, are only found in one area, many of which occur on the Great Barrier Reef.

Management units for the harvest strategy

The management units for this harvest strategy are defined by the fishery areas outlined in the Fisheries (Commercial Fisheries) Regulation 2019:

- management area A is accessed through the A1 and A2 symbol fishery area
- management area B includes a number of special management areas
 - o Moreton Bay
 - o Sunshine Coast
 - o Keppels
 - o Whitsundays
 - o Cairns.

Summary of management information

A summary of the management arrangements for the MAFF are set out in Table 1 (overleaf). Fishers may access copies of fisheries legislation at <u>legislation.qld.gov.au</u> or visit <u>fisheries.qld.gov.au</u> for the latest information on fishing rules.

Table 1: Summary of MAFF management arrangements

Feature	Details	
Commercial access	Primary commercial fishing licence with an A1 and/or A2 fishery symbol	
Relevant fisheries	Fisheries Act 1994	
legislation	Fisheries (General) Regulation 2019	
	Fisheries (Commercial Fisheries) Regulation 2019	
	Fisheries Declaration 2019	
	Fisheries Quota Declaration 2019	
Other relevant legislation	<i>Great Barrier Reef Marine Park Act 1975</i> and Great Barrier Reef Marine Park Regulations 2019 (Cwlth)	
	Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)	
	Marine Parks Act 2004 (Qld)	
Working group	Marine aquarium fish and coral fisheries working group	
	Terms of reference and communiques are available at <u>fisheries.qld.gov.au</u>	
Gear	The following apparatus are permitted for use:	
	• commercial – hand collection, hand-held non-mechanical implements using underwater breathing apparatus	
	 recreational – hand collection only (excluding hookah/scuba) 	
	Refer to fisheries legislation for specific gear requirements and rules	
Main management	Commercial	
methods	Limited access	
	Effort control	
	Vessel and tender restrictions	
	Number of divers 'to take' restrictions	
Stock status	Stock status is assessed using the nationally agreed <u>Status of Australian Fish</u> <u>Stocks</u> (SAFS) classification framework – most aquarium fish species are listed as ' undefined '	
	*Note: The classification system used as part of the SAFS reporting is assessed against a 20% biomass sustainability criteria. Therefore, although a species may be classified as 'sustainable' in SAFS, this does not mean that the biomass is meeting the targets set out in the <i>Queensland Sustainable</i> <i>Fisheries Strategy: 2017–2027</i> .	
Accreditation under the	Part 13: Accredited (expires 2021)	
Environment Protection	Part 13A: Accredited (expires 2021)	
Conservation Act 1999	Visit <u>environment.gov.au</u>	

Fishery objectives

The objective of the harvest strategy is to manage the fishery in accordance with the objectives of the *Fisheries Act 1994* and the *Queensland Sustainable Fisheries Strategy: 2017–2027*.

Fishery objectives set out the direction and aspirations to achieve in the long term. The objective for this fishery is to:

• maintain marine aquarium fish harvesting effort at levels that are a low risk to ecological sustainability for target species.

In pursuing the primary objective, the harvest strategy aims to:

- effectively use spatial management to reduce the risk of localised concentrations of fishing effort
- minimise and mitigate any unacceptable ecological risks arising from fishing-related activities
- maximise economic performance of the commercial harvest sector.

Catch shares

This harvest strategy aims to maintain the existing catch shares between sectors. The resource allocation arrangements set out in Table 2 ensure that catch shares among sectors are maintained, where appropriate.

The traditional fishing rights of Aboriginal peoples and Torres Strait Islanders are protected under native title legislation and relate to harvest for domestic, communal and non-commercial purposes. Accordingly, traditional and customary fishing is recognised in Queensland and is not a defined allocation.

Aboriginal peoples and Torres Strait Islanders and their communities continue to express a desire to have more economic opportunities through fishing, particularly in their own sea country. The *Aboriginal and Torres Strait Islander commercial fishing development policy* provides for an Indigenous fishing permit to be issued, on a case-by-case basis and in accordance with section 54 of the Fisheries (General) Regulation 2019, to provide opportunities to take part in fishing-related business.

Table 2: Resource allocation arrangements for the MAFF

	Commercial fishing*	Recreational fishing	
Proportion of total harvest approx. 99%		1%	

* Commercial catch data is based logbook catch records.

Managing the performance of the fishery

This harvest strategy will manage the commercial catch at a species level and manage risks identified through ecological risk assessments (ERA). Appropriate performance indicators have been selected, where available, to describe fishery performance in relation to the fishery objectives. Catch data for marine aquarium fish species will be used to evaluate the status and level of risk of harvesting to marine aquarium fish populations.

Catch triggers provide a way for controlled increases in fishing mortality, providing that they are within historical catch levels. Annual catch levels are assessed against a reference period to detect changes in fishery behaviour that may represent an unacceptable risk to marine aquarium fish species. A reference period from 2003 to 2008 has been defined for this fishery. This reference period represents a stable period and more normal representative level of fishing operation in the MAFF. Fishing levels have reduced in more recent years due to changes in international demand for aquarium fish. However, this may change again in the coming years. As the level of exploitation increases above historical levels, species will be elevated to higher levels of monitoring, assessment and management.

ERAs are principally used to assess the level of risk from harvesting marine aquarium fish species. If the ecological risk to a species is increased, then species are elevated to a higher tier of monitoring and management actions may be undertaken to ensure the risk is reduced to an acceptable level. Industry and emerging science can also identify species that may be considered for monitoring and management at a higher tier. If fishing impacts are considered to generate an acceptable level of risk to the harvested marine aquarium fish species, then no management action would be required. However, if fishing impacts are considered to generate or high risk), then the marine aquarium fish species would be elevated to tier 1 and an appropriate management response developed to reduce the risk, where possible. In addition to the level of ecological risk, a species may also be considered a tier 1 species if it is classified as prohibited for recreational take.

Tier 1 species	
Scalloped hammerhead shark (Sphyrna lewini)	Wideband anemonefish (Amphiprion latezonatus)
Great hammerhead shark (Sphyrna mokaran)	Blackback anemonefish (Amphiprion melanopus)
Smooth hammerhead shark (Sphyrna zygaena)	Ocellaris clownfish (Amphiprion ocellaris)
Wedgefish (family Rhinidae)	Orange clownfish (Amphiprion percula)
Giant guitarfish (family Glaucostegidae)	Harlequin tuskfish (Choerodon fasciatus)
Shortfin mako shark (Isurus oxyrinchus)	Pineapplefish (Cleidopus gloriamaris)
Longfin mako shark (Isurus paucus)	Blue tang (Paracanthurus hepatus)
Barramundi cod (Chromileptes altivelis)	Scribbled angelfish (Chaetodontoplus duboulayi)
Humphead Maori wrasse (Cheilinus undulatus)	Queensland yellowtail angelfish (Chaetodontoplus)
Paddletail (Lutjanus gibbus)	Queensland groper (Epinephelus lanceolatus)
Potato rockcod (Epinephelus tukula)	Sawfish (family Pristidae)

Table 3: Marine aquarium fish species classified as Tier 1

Management of target species

1.0 Decision rules for all marine aquarium fish species

The decision rules have been designed to reduce the risk of localised depletion to MAFF species through assessment and management of intensive fishing practices. The decision rules below are used to identify the potential for localised depletion of any MAFF species and ensure that any associated management action is informed by a species-specific assessment of risk.

- 1.1 If the annual harvest within a single 6 nautical mile grid for any species is less than half the average harvest from the reference period (2003–2008), then no management action is required.
- 1.2 If the annual harvest within a single 6 nautical mile grid for any species is greater than half the average harvest from the reference period (2003–2008), a vulnerability assessment of the species will be undertaken to determine whether the harvest level is acceptable or unacceptable.

AND

1.3 If the risk is determined to be unacceptable, then management action will be implemented to reduce the risk of localised concentrations of effort (i.e. spatial closures or trip limit).

OR

1.4 If the risk is determined to be acceptable, then no management action is required.

2.0 Decision rules for tier 1 marine aquarium fish species

The following decision rules are to ensure that fishing does not result in unacceptable levels of fishing pressure on tier 1 species, including those identified to be at moderate and high ecological risks to harvest.

- 2.1 If the annual harvest of any tier 1 species is less than 1.5 times the average historical reference period (2003–2008), then no management action is required.
- 2.2 If the annual harvest of any tier 1 species is greater than 1.5 times the average historical reference period (2003–2008), management action must be in place for the following fishing season to restrict species catches (i.e. total allowable commercial catch (TACC), trip limits, spatial closures) to achieve rule 2.1.

3.0 Breakout rules for hammerhead shark species

3.1 If the Queensland total allowable catch limit (defined under the Commonwealth Non-Detriment Finding) is reached, the species becomes no-take in that management region consistent with commercial net and line fishing for the species.

Management of secondary and by-product species

4.0 Decision rules for tier 2 marine aquarium fish species

The secondary and by-product species in this fishery are classified as tier 2 species and do not have TAC limits. Some tier 1 and 2 species do not have TACCs in all. The harvest control rules below monitor effort shift to ensure there is no unacceptable levels of fishing pressure for tier 3 species or regions where tier 1 and 2 species are managed under a TACC.

- 4.1 If the annual harvest of any tier 2 species is less than three times the average historical reference period (2003–2008), then no management action is required.
- 4.2 If the annual harvest of any tier 2 species is greater than three times the average historical reference period (2003–2008), a review is to be undertaken to understand the reason for the increased harvest, assess the risks and ensure catch of a species does not increase more than 10% above the trigger. If rule 4.2 is triggered, management action must be in place for the following fishing season until a detailed review is completed (e.g. trip or catch limits, size limits or spatial/temporal closures), including whether the species should be elevated to tier 1. If the review identifies that a species is of increasing importance, the species may be considered for further risk assessment, monitoring or management action. If the review identifies sustainability is at risk, a risk assessment for this species is required within three years.
- 4.3 If a risk assessment or stock assessment becomes available, then the risk assessment or stock assessment will be used to inform management of the species.

Management of ecological risks from fishing

A foundation of sustainable fisheries management is managing the impact of fishing activities on non-target species and the broader marine ecosystem. ERAs identify and measure the ecological risks of fishing activity and identify issues that must be further managed under harvest strategies.

The MAFF operates within the Great Barrier Reef World Heritage Area, and as a result this harvest strategy also considers the potential for management action to be taken if fishing is identified as a high risk under a Great Barrier Reef Marine Park Authority (GBRMPA) Reef Health Incident Response Plan. The below decision rules are in place to minimise and mitigate high ecological risks arising from fishing-related activities.

- 5.1 If an ERA identifies fishing impacts that are considered to generate an acceptable level of risk to a species, then no management action is required.
- 5.2 If an ERA identifies fishing impacts that are considered to generate an unacceptable level of risk to any ecological component, a review is triggered to investigate the reason for the risk rating. Appropriate management action will be taken to reduce the risk to an acceptable level.
- 5.3 If a reef event is identified under the GBRMPA Reef Health Incident Response Plan, a review will be led by GBRMPA and additional management action for the species may be considered in order reduce the risk to an acceptable level.

The most recent ERA for the marine aquarium fishery was completed in 2013. Fisheries Queensland developed the *Ecological risk assessment guideline* to assess ecosystem impacts of fishing activities. ERAs will be undertaken in line with the guideline to reassess any current or new ecological risks that may arise in the fishery. ERAs can be undertaken more frequently if there are significant changes identified in fishery operations, management activities or controls that are likely to result in a change to previously assessed risk levels.

Monitoring social and economic performance

The *Queensland Sustainable Fisheries Strategy: 2017–27* outlines the target to set sustainable catch limits based on achieving maximum economic benefits of the resource, taken initially to correspond to around 60% of exploitable biomass. This is to support the most economically efficient use of the resource, improve the fishing experience for all sectors and promote a resilient system that can bounce back from other adverse environmental conditions (e.g. floods). This harvest strategy has been developed to maintain harvesting at levels that represent a low risk and are considered ecologically sustainable, noting that ideally Fisheries Queensland would like to move towards understanding biomass of the MAFF to inform future management.

The following objectives and performance indicators in Table 4 will be used to monitor the social and economic performance of this fishery. The management options outlined are intended to provide some guidance on the options that could reasonably be considered alongside the decision rules if fishery trends are of concern.

Objective	Performance indicators	Management actions	
Maximise economic performance of the commercial sector	 Potential indicators to monitor include: capacity utilisation catch per unit effort (average per day) costs, earnings and net financial and economic profit net economic returns, gross state product, gross value of production licence sale and lease price profit decomposition (using profit or lease price) to determine impacts of prices, costs and stock/catch rates on changes in profits 	Consider non-regulatory and regulatory options Adjust management as needed	
Monitor the broader social and economic benefits of the fishery to the community	 Potential indicators to monitor include: fisher satisfaction (with their fishing experience – commercial and recreational) Recreational fisher participation and economic information percentage of licences that are owned (rather than leased) Gini coefficient of owners (measure of concentration) Percentage of total costs/inputs purchased from local businesses/residents income generated (crew plus profit – gross value added) proportion of catch sold locally fish prices number of platforms / number of active licences / total capacity community satisfaction (with their fisheries and the way in which they are managed) 	Consider non-regulatory and regulatory options Adjust management as needed	
Maintain Wildlife Trade Operation (WTO) accreditation under the Environment Protection and Biodiversity Conservation Act 1999	Number of conditions met as required through WTO accreditation	Amend fisheries legislation or implement other measures as required to align with best practice and maintain accreditation	

Table 4: Social and economic indicators for the MAFF

Data collection, validation and assessment

Fishery-dependent data (self-reported)

Catch and effort data is obtained through commercial logbook returns and real-time landing reports. The catch and effort data required to determine the standardised commercial catch rate for key species is obtained from catch and effort logbook returns and vessel tracking data. The MAFF logbook is available at <u>business.qld.gov.au</u>.

Fishery-dependent data (independent validation)

All commercial fishing vessels are required to have vessel tracking systems installed and active on their vessels. Vessel tracking data is used to verify effort information reported in commercial fishing logbooks. As a quota-managed fishery, compulsory quota unload reports provide an accurate record of the catch. Queensland Boating and Fisheries Patrol undertake routine and intelligence-based at-sea and landing (unload) inspections to check compliance and validate reported information.

Scientific assessment of stock

No modelled stock assessment is currently available for the MAFF. It is anticipated that if biomass were determinable, it would be able to inform TACC-setting process more confidently at least every three years.

Compliance with CITES requirements

The Convention on International Trade in Endangered Species of Wild Fauna and Fauna (CITES) lists aquarium species as Appendix II species. This means they are not necessarily threatened with extinction, but they may become extinct, requiring trade to be closely controlled. International trade of Appendix II species may be authorised by the Australian Government granting an export permit or re-export certificate. Permits or certificates should only be granted if the relevant authorities are satisfied that certain conditions are met and the trade of species will not be detrimental to the survival of the species in the wild.

The MAFF is required to provide an annual report to the CITES Scientific Authority of Australia as part of annual reporting under the *Environment Protection and Biodiversity Conservation Act 1999* WTO accreditation.

Information and research priorities

Key information and research priorities have been identified in Table 5 to help meet the objectives of this harvest strategy. These will be reviewed and updated as required through the marine aquarium fish and coral fisheries working group.

Table 5: Information and research priorities for the MAFF

Project description	Explanation of need	Priority
Update industry code of practice for the harvest of tier 1 and 2 species	To increase stewardship, reduce localised depletion and enhance reproduction ability of some target species	Medium

Schedule of performance monitoring, assessment and review

Annual performance monitoring and assessment

The fishery's performance will be reviewed against this harvest strategy **annually**. This review will include convening the marine aquarium fish and coral fisheries working group in September/October to provide operational advice on the fishery's performance and any matters that may need addressing.

The primary performance measure is the ERA, which will be reviewed every three years. In the intervening years, other fishery data (e.g. catch and effort) will be reviewed annually.

While harvest strategies provide certainty and transparency in terms of management decisions in response to certain fishery information, there must also be flexibility to allow new information or changing circumstances to be appropriately considered. There may be instances in which a risk assessment may need to be available prior to, or delayed beyond, the scheduled date. Any change to the risk assessment schedule should be considered by the harvest strategy workshop and decided on by the chief executive based on the below conditions:

- If during the period between scheduled risk assessments the chief executive is concerned that a performance indicator (e.g. stock status, commercial catch and effort, total harvest) suggests the stock is not performing in a way that will ensure sustainability, the chief executive may decide that a risk assessment will be undertaken before the scheduled timeframe.
- If the chief executive is satisfied that (1) indicators for the stock suggest it is sustainable, and that there is a low ecological risk to the stock under the current management arrangements, or (2) if resourcing requirements prohibit the ability for an assessment to be delivered in the scheduled timeframe, the chief executive may decide that a scheduled risk assessment will be delayed.

	Year 1	Year 2	Year 3	Year 4	Year 5
Monitoring and assessment activity	Catch and effort monitoring	Catch and effort monitoring	Ecological risk assessment	Catch and effort monitoring	Catch and effort monitoring
Management activity	Review of catch and effort data Bring forward management decisions if needed	Review of catch and effort data Bring forward management decisions if needed	Review of tiered management of species	Review of catch and effort data Bring forward management decisions if needed	Review harvest strategy and reset reference points

Table 6: Anticipated performance monitoring schedule for the MAFF

Harvest strategy review

This harvest strategy will remain in place for a period of five years, after which time it will need to be fully reviewed in accordance with the *Fisheries Act 1994*.

The harvest strategy may be subject to further review and amendment as appropriate within the five-year period if any of the following circumstances arise:

- there is new information that substantially changes the status of a fishery, leading to improved estimates of indicators relative to reference points
- drivers external to management of the fishery increase the risk to fish stock/s
- a new recreational harvest estimate becomes available that suggests the defined sectorial catch shares may have been set incorrectly or may be unrepresentative
- it is clear the harvest strategy is not working effectively and the intent of the *Queensland harvest strategy policy* is not being met.

For more information on the processes for amending harvest strategies, refer to the <u>Queensland harvest</u> <u>strategy policy</u>.

Acronyms and definitions

Acronym/term	Definition
Biomass	Total weight or volume of a stock or component of a stock (e.g. spawning stock biomass would refer to all adult (reproductively mature) fish in a population)
Bycatch	 A species that is incidentally either: taken in a fishery and returned to the sea killed or injured as a result of interacting with fishing equipment in the fishery, but not taken Bycatch can include protected species
By-product	Any part of the catch that is kept or sold by the fisher, but is not the target species By-product makes some contribution to the value of the catch in a fishery but less than that of key commercial species
Catch-per-unit-effort	The number or weight of fish caught by a unit of fishing effort Can be used as an index of relative abundance or indicator of change in the fishery
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Fauna
Ecological risk assessment (ERA)	An assessment process that evaluates the relative risk posed by fishing on species, habitats and communities within a fishery
GBRMPA	Great Barrier Reef Marine Park Authority
MAFF	Marine aquarium fish fishery
SAFS	Status of Australian Fish Stocks
Total allowable catch	The harvest limit set as an output control on fishing for all fishing sectors
Total allowable commercial catch (TACC)	The harvest limit set for the commercial fishing sector usually achieved through setting TACC, but sometimes through input controls
wto	Wildlife Trade Operation