A decorative graphic at the top of the page features several stylized fish swimming in waves. The fish are rendered in a light blue, line-art style, and the waves are represented by fine, overlapping lines. The background is a gradient of blue, with a darker teal triangle in the top-left corner and a lighter blue triangle in the bottom-right corner.

Marine aquarium fish fishery
harvest strategy: 2021–2026

CONSULTATION DRAFT

Business Unit Owner Management & Reform

Endorsed by Deputy Director General (Fisheries & Forestry) in accordance with delegated powers under Part 2, Division 1 (Harvest Strategies) of the *Fisheries Act 1994*

Approved by Minister responsible for fisheries in accordance with section 16 of the *Fisheries Act 1994*

Revision history

Version no.	Approval date	Comments
1.0	September 2020	Draft harvest strategy for consultation

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What the harvest strategy is trying to achieve

This harvest strategy has been developed 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. This decision rules are risk-based and designed to ensure harvesting remains sustainable by monitoring of harvesting trends.

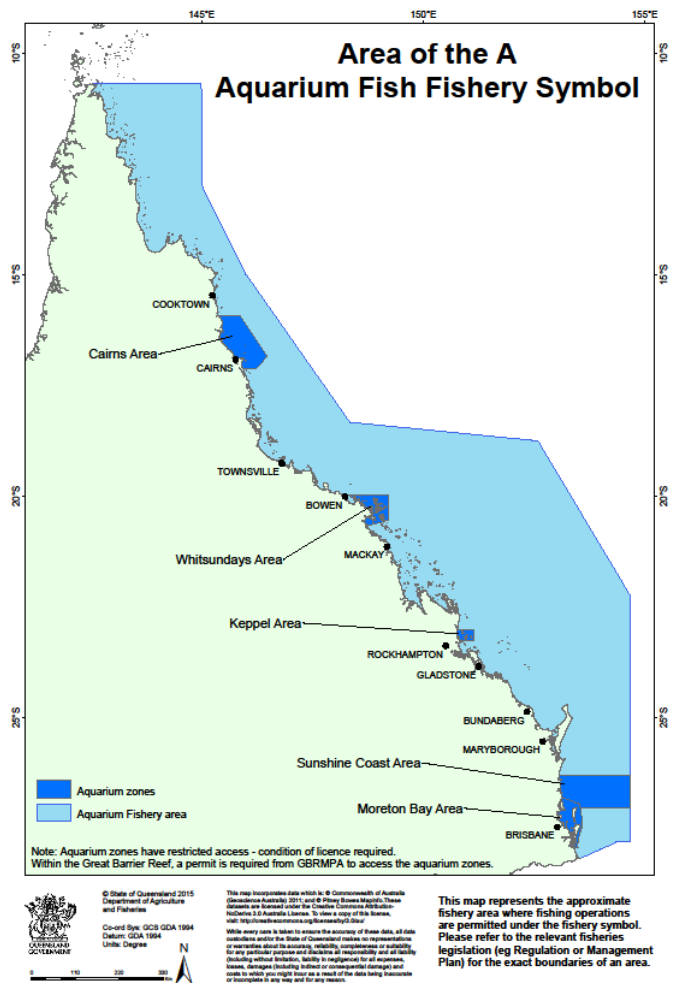
Fishery overview

The MAFF operates along the Queensland east coast from the tip of Cape York south to the Queensland – New South Wales border. MAFF is a small fishery which collects a wide variety of fish and invertebrates for the live aquarium trade, most of which is exported. It is a hand collection fishery operating primarily on the Great Barrier Reef (GBR) with licence holders conditioned 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' (SMAs) that can only be accessed by holders of an A1 symbol. Authority to access these areas is based on historic 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.



Fish 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 fish targeting belong to the following families:

- Pomacentridae – damselfish & 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 be found in one area, many of which occur on the GBR.

Management units for this harvest strategy

Defining the fishery to which a harvest strategy will apply is a critical step in determining its scope. The management units for this harvest strategy are:

1. Management Area A that is accessed through the A1 and A2 symbol fishery area
2. Management Area B that includes a number of SMA's, defined under the *Fisheries (commercial Fisheries) Regulation 2019*. For the purposes of the harvest strategy these SMA's are:
 - Moreton Bay
 - Sunshine Coast
 - Keppels
 - Whitsundays
 - Cairns

Fishery summary

A summary of the management arrangements for the MAFF are set out in Table 1 below. Fishers should consult the relevant fisheries legislation for the latest and detailed fishery rules or visit www.fisheries.qld.gov.au.

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 Legislation	<i>Fisheries Act 1994</i> <i>Fisheries (General) and (Commercial Fisheries) Regulations 2019</i> <i>Fisheries Declaration and Fisheries Quota Declaration 2019</i>
Other relevant legislation	<i>Great Barrier Reef Marine Park Act 1975 and Regulation 2019</i> <i>Environment Protection and Biodiversity Conservation Act 1999</i> <i>Marine Parks Act 2004</i>
Working Group	Marine Aquarium and Coral Fisheries Working Group Terms of Reference and meeting communiques are available online
Gear	The following apparatus are permitted for use: <i>Commercial</i> - Hand collection, hand-held non-mechanical implements using underwater breathing apparatus. <i>Recreational</i> – Hand collection only (excluding Hookah/SCUBA).
Main management methods	<i>Commercial</i> <ul style="list-style-type: none"> • Limited access • Effort control • Vessel & tender restrictions • Number of divers “to take” restrictions
Stock Status	Most aquarium fish species are listed as “undefined” by the Australian fish stocks (SAFS) report at www.fish.gov.au <small>*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 Sustainable Fisheries Strategy 2017-2027.</small>
Accreditation under the Environment Protection and Biodiversity Conservation Act 1999	Part 13: Accredited (expires 2021) Part 13A: Accredited (expires 2021) https://www.environment.gov.au/marine/fisheries/qld/marine-aquarium

Fishery objectives

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.

While:

- Effectively using spatial management to reduce the risk of localised concentrations of fishing effort;
- Minimising and mitigating high ecological risks arising from fishing related activities;
- Supporting the viability of the commercial harvest sector; and
- Monitoring the social and economic benefits of the fishery to the community.

Catch shares

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

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

Aboriginal Peoples and Torres Strait Islanders also desire more economic opportunities through fishing, particularly in their own sea country. In line with the Indigenous Commercial Fishing Development Policy, an Indigenous Fishing Permit, issued in accordance with section 54 of the *Fisheries (General) Regulation 2019*, may be provided on a case-by-case basis to provide opportunities for communities 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 performance of the fishery

This harvest strategy will manage the commercial catch at a species level and risks identified through an Ecological Risk Assessment (ERA). Suitable 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 2003-2008 has been defined for this fishery. This reference period represents a stable period and more normal representative level of fishing of operation for 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 an undesirable level of risk (moderate 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 as a Tier 1 species if it is classified as prohibited for recreational take.

Table 3. Marine aquarium fish species classified as Tier 1

TIER 1 species	
Scalloped Hammerhead Shark – <i>Sphyrna lewini</i>	Wideband anemonefish – <i>Amphiprion</i>
Great Hammerhead Shark – <i>Sphyrna mokaran</i>	Blackback anemonefish - <i>Amphiprion</i>
Smooth Hammerhead Shark – <i>Sphyrna zygaena</i>	Ocellaris clownfish - <i>Amphiprion ocellaris</i>
Wedgefish – Family <i>Rhinidae</i>	Orange clownfish – <i>Amphiprion percula</i>
Giant Guitarfish – Family <i>Glaucostegidae</i>	Harlequin tuskfish – <i>Choerodon fasciatus</i>
Shortfin Mako Shark – <i>Isurus oxyrinchus</i>	Pineapplefish – <i>Cleidopus gloriamaris</i>
Longfin Mako Shark – <i>Isurus paucus</i>	Blue tang – <i>Paracanthurus hepatus</i>
Barramundi cod – <i>Chromileptes altivelis</i>	Scribbled angelfish – <i>Chaetodontoplus</i>
Humphead Maori wrasse – <i>Cheilinus undulatus</i>	Queensland yellowtail angelfish –
Paddletail – <i>Lutjanus gibbus</i>	Queensland groper – <i>Epinephelus lanceolatus</i>
Potato rockcod – <i>Epinephelus tukula</i>	Sawfish – family <i>Pristidae</i>

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 below harvest strategy trigger is used to identify the potential for localised depletion of any MAFF species and ensures that any associated management action is informed by a species-specific assessment of risk.

- 1.1 If the annual harvest within a single 6nm 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 6nm 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 implement management 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 harvest control 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) a review will be undertaken to determine the likely circumstance that have caused the trigger. **AND**
 - 2.3 If the trigger is likely to continue to occur in the future (i.e. the circumstance giving rise to the trigger is not temporary in the fishery), the species catches will be restrained (e.g. using trip limits, spatial closures) at the average of the previous 3 years catch until a vulnerability assessment can be undertaken to determine if there is risk to the stock of ongoing similar catch levels where a further management response may be required. **OR**
 - 2.4 If the trigger is deemed temporary, no further management action required other than continued monitoring (for further triggers).
-

3.0 Decision rules for Tier 2 marine aquarium fish species

The following harvest control rules are to ensure that fishing does not result in unacceptable levels of fishing pressure on Tier 2 species (all non-Tier 1 species).

- 3.1 If the annual harvest of any Tier 2 species is less than 3 times the average historical reference period (2003 - 2008) then no management action is required.
 - 3.2 If the annual harvest of any Tier 2 species is greater than 3 times the average historical reference period (2003 - 2008) a vulnerability assessment of the species will be undertaken to determine whether the harvest level is acceptable or unacceptable. **AND**
 - 3.3 If the risk is determined to be unacceptable then implement management framework to reduce the risk (i.e. spatial closures, trip limit or elevate to Tier 1). **OR**
 - 3.4 If the risk is determined to be acceptable then no management action is required.
-

Minimise ecological risks from fishing

The 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 Action Plan. The below decision rules are in place to minimise and mitigate high ecological risks arising from fishing related activities.

- 4.1 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.
 - 4.2 If an ERA identifies fishing impacts that are considered to generate an acceptable level of risk (i.e. high risk) to species management action will be taken to reduce harvest pressure to an acceptable level of risk to the species (i.e. effort controls).
 - 4.3 If a reef event is identified under 'GBRMPA's 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's Ecological Risk Assessment Guideline is published online at

<https://www.daf.qld.gov.au/business-priorities/fisheries/sustainable-fisheries-strategy/ecological-risk-assessment-guidelines>.

Monitoring the social and economic performance

The Sustainable Fisheries Strategy 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 the harvesting at levels that represent a low risk and are considered ecologically sustainable, noting that ideally the MAFF would like to move towards understanding biomass to inform future management.

The following objectives are to support 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 if fishery trends are of concern.

Table 4: Social and economic indicators for the MAFF

Objective	Performance indicators	Management actions
Maximise economic performance of the commercial sector	<p>Potential indicators to monitor include:</p> <ul style="list-style-type: none"> • Capacity utilization • CPUE (average per day) • Costs, earnings and net financial and economic profit • Licence sale and lease price <p>Profit decomposition (using profit or lease price) to determine impacts of prices, costs and stock/catch rates on changes in profits</p>	<p>Consider non-regulatory and regulatory options. Adjust management as needed.</p>
Monitor the broader social and economic benefits of the fishery to the community	<p>Potential indicators to monitor include:</p> <ul style="list-style-type: none"> • Fisher satisfaction (with their fishing experience – commercial and recreational) • Percent of licences that are owned (rather than leased) • Gini coefficient of owners (measure of concentration) • Percent 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 licenses/total capacity <p>Community satisfaction (with their fisheries and the way in which they are managed)</p>	<p>Consider non-regulatory and regulatory options. Adjust management as needed.</p>

Monitoring and assessment

The catch and effort data required to inform harvesting of aquarium fish species is obtained through commercial logbook returns. The MAFF logbook is at <https://www.business.qld.gov.au/industries/farms-fishing-forestry/fisheries/monitoring-reporting/requirements/logbooks>

As the MAFF is an effort-managed fishery, only logbooks are required to provide an accurate record of the catch, noting that most MAFF harvesting occurs on the same trip as coral harvesting where real time reporting is required. All boats in the MAFF are required to have vessel tracking installed and operational on all primary and tender vessels to verify fishing effort reported in commercial fishing logbooks.

No modelled stock assessment is currently available for the MAFF.

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 updated as required.

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 & 2 species	To increase stewardship, reduce localised depletion and enhance reproduction ability of some target species	Medium

Schedule of performance assessment and review

The fishery's performance will be reviewed against this harvest strategy annually. This review will include convening the Coral and Aquarium Fishery Working Group in September/October to provide operational advice on the fishery's performance and any matters that may need addressing. Performance will be primarily measured using ERA along with regular review of catch and effort data. Table 6 summarises the key review and decision points for the MAFF.

Table 6: Anticipated performance schedule for the MAFF

	Year 1	Year 2	Year 3	Year 4	Year 5
Monitoring & 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 and bring forward management decisions if needed	Review of catch and effort data and bring forward management decisions if needed	Review of tiered management of species	Review of catch and effort data and bring forward management decisions if needed	Review harvest strategy and reset reference points

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*.

While harvest strategies provide certainty and transparency in terms of management decisions in response to fishery information, there needs to be flexibility to allow new information or changing circumstances to also be considered. Consequently, the harvest strategy may be subject to further review and amendment as appropriate within the five-year period if 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; or
- It is clear the harvest strategy is not working effectively and the intent of the Queensland Harvest Strategy Policy is not being met.

Further explanation and information on the processes for amending harvest strategies can be found in the Queensland Harvest Strategy Policy published at <https://www.daf.qld.gov.au/business-priorities/fisheries/sustainable-fisheries-strategy/harvest-strategy>.