



TONGA MARINE AQUARIUM FISHERY MANAGEMENT AND DEVELOPMENT PLAN 2017 - 2019



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SPC
Secretariat
of the Pacific
Community

Ministry for Primary Industries
Manatū Ahu Matua



FOREWORD

The Tonga Marine Aquarium Fishery Management and Development Plan 2017 – 2019 provides the formal guidelines for the management and development of the marine aquarium fishery in Tonga. More specifically, it sets out the main objectives, measures and requirements for the sustainable utilization of the fishery in the country's national waters. The goal of the Plan is to manage the development of the nation's sustainable Marine Aquarium fishery to provide economic benefits for people of Tonga as well as improving their livelihoods.

This Marine Aquarium Management and Development Plan also serves to communicate important information on the fishery and its management to fisheries sector stakeholders including the marine aquarium operators, government line ministries, Ministry of Fisheries and other stakeholders. The Plan has a lifespan of three years and it can be modified at any time without hindering the Minister's discretionary powers as set out in the Fisheries Management Act 2002. The Minister can, for reasons of conservation or for any other valid reasons consistent with the Act, modify any provision of the Plan in accordance with the powers granted pursuant to the Fisheries Management Act 2002. The Ministry of Fisheries is the responsible authority for the implementation of this Plan.

It is my pleasure to present this Plan to the Government, the people of Tonga and marine aquarium fishery stakeholders to be used for the sustainable utilization of marine aquarium fishery resources in the Kingdom of Tonga. Furthermore, I would like to thank the staff of the Ministry of Fisheries and stakeholders who put a lot of effort and time towards the preparation of this Plan, which led to its timely completion, and I look forward to working closely with you all to ensure the successful implementation of the Plan in the next three years.

APPROVAL OF THE TONGA MARINE AQUARIUM FISHERY MANAGEMENT AND DEVELOPMENT PLAN 2017- 2019

This Tonga Marine Aquarium Fishery Management and Development Plan 2017 to 2019 is produced be used in accordance with Part II, Section 7(1) and 7(5) of the Fisheries Management Act 2002.



Honourable Semisi Taelangi Fakaofo



Minister for Agriculture and Food, Forests and Fisheries

LIST OF ABBREVIATION AND ACRONYMS

CD	Cabinet Decision
CEO	Ministry of Fisheries Chief Executive Officer
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
IATA	International Airline Transport Association
MA	Marine Aquarium
MAMC	Marine Aquarium Management Committee
MOF	Ministry of Fisheries
NFC	National Fisheries Council
SCUBA	Self-Contained Underwater Breathing Apparatus
SPC	Pacific Community
SPREP	Secretariat of the Pacific Regional Environment Programme
TOP	Tongan pa'anga

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1 DEFINITIONS

Live Rock means an assemblage of living organisms attached to a hard substrate (including dead coral or rock usually calcareous in nature) as per Fisheries Management (Conservation) Regulations 2008

Marine Aquarium fish refers to hard coral, soft coral, small invertebrates and aquarium fish, as per Fisheries Management (Conservation) Regulations 2008

Minister means the Minister responsible for Fisheries

Secretary means the CEO of Ministry of Fisheries

2 INTRODUCTION

The Marine Aquarium Management Plan guides the management of Tonga's Marine Aquarium fish, identifying objectives for the fishery and strategies to achieving those.

The Marine Aquarium Fishery in Tonga has been developed over the last 25 years, providing both economic and social benefits in terms of trade and jobs for the country. Marine Aquarium fish include small ornamental (inedible) fish, corals, invertebrates and live rocks, occurring almost exclusively inshore and surrounding reefs¹.

Three characteristics that distinguish the Tongan Marine Aquarium Fishery from other components of the Tongan reef fish fisheries are that: the primary use of the product is for ornamental purposes rather than for food or medicinal purposes for example; it is a commercial fishery; and the product form is live rather than processed, frozen, dried, smoked, or otherwise preserved.

The fishery is small and licenses five operators in Tongatapu; exploitation levels of Marine Aquarium fish in Tonga have averaged approximately 190,000 pieces and TOP660, 000 in export volume and value over the last three years.

The Ministry of Fisheries is empowered to promote the conservation, management, sustainable utilisation and development of Marine Aquarium fish. The Marine Aquarium Fishery Management and Development Plan 2017 – 2019 (the Plan) is the second management plan for this fishery, and is based on the Marine Aquarium Fishery Management and Development Plan 2008. The Plan has been established through consultation and cooperation with stakeholders, including other government departments, as stipulated under section 7 of the Fisheries Management Act 2002 (the Act).

3 COMMENCEMENT

This Marine Aquarium Fishery Management and Development Plan 2017 to 2019 shall take effect one month after the endorsement by the Minister.

¹ The harvest and export of various Marine Aquarium resources have been banned over the life of the fishery; see Appendix A for further detail.

4 SCOPE AND APPLICATION

The Plan has been prepared in accordance with Part II, section 7 of the Fisheries Management Act 2002.

The Plan supplements, and does not in any way override, the provisions of the Act or regulations promulgated under the Act. All activities subject to the Plan shall be subject to the applicable provisions of all Acts and Regulations of Tonga:

- 1) The Plan applies to any wild caught fish, invertebrates, live corals and substrates (known collectively as Marine Aquarium fish) that are collected within Tonga fisheries waters, sold and / or exported live for the Marine Aquarium trade;
- 2) This Plan applies to all forms of collecting, aquaculture and facilities for holding live Marine Aquarium fish, including handling, packing, transport and shipping of these Marine Aquarium fish;
- 3) Appendices to this Plan form part of the Plan and shall be read together with the Plan;
- 4) The Plan is to be interpreted in accordance with Section 1 of this Plan, and Section 2 of the Act.

Where there is inconsistency between the Plan and the Act, the Act shall prevail.

A description of the Marine Aquarium Fishery is summarized in Appendix A.

5 GOAL

Sustainably managed and utilised Marine Aquarium fish, to create economic benefits, and improved livelihoods of Tongan people.

6 PURPOSE

The purpose of this plan is to establish an effective, beneficial and enforceable management framework for the Marine Aquarium fishery in Tonga.

7 AUTHORITIES

Consistent with the section 7(4) of the Act, a Marine Aquarium Management Committee (MAMC) is established under this Plan (Appendix B). The MAMC “shall be primarily responsible for the implementation and review of the fishery plan or otherwise monitor the performance of the fishery subject of the fishery plan or perform such other duties and responsibilities as are given it under the fishery plan consistent with this Act”.

The Plan also acknowledges the different stakeholders within this fishery and their respective roles in co-managing the fishery.

The Ministry of Fisheries role is to promote the conservation, management, sustainable utilisation and development of Marine Aquarium fish.

8 REVIEW

The progress of implementing the management, development, regulation and policies, and other matters related to and as provided in the Plan shall be reported in the Annual Report of the Ministry of Fisheries. This report will include reporting on major difficulties and departures from the Plan by the MAMC.

Pursuant to section 7(1) of the Act, the Secretary is responsible for the review the Plan. This includes organizing consultations with key stakeholders in the review of such plan.

A review shall take place at the mid-term (2019) and completion of this plan (mid 2020), or earlier as deemed necessary.

Pursuant to section 7(5), each review thereof shall be submitted to the Minister for approval.

9 OBJECTIVES, STRATEGIES AND INDICATORS

OBJECTIVE	STRATEGY	INDICATOR
1. Strengthened management measures in place guiding the sustainable utilisation of the Marine Aquarium fish	a. Implement and monitor management measures for harvesting, packing and exporting Marine Aquarium fish	i. Improved data management of harvest data ii. Analysis of harvest and export data on a quarterly basis
	b. Create and implement guidelines for Code of Practice ² for harvesting, packing and exporting of Marine Aquarium fish	iii. Code of practice is understood and used by all operators when undertaking harvesting, packing and / or exporting activities
	c. Effective participatory approach to fisheries management of the fishery by Marine Aquarium Management Committee (include Government, fishers and industry) with clearly defined roles to co-manage Marine Aquarium fish	iv. MOF to provide secretarial services to the MAMC 6 monthly v. Complete actions plan from minutes of the Marine Aquarium Management Committee
	d. Monitor and report on Marine Aquarium operator's compliance with management framework	vi. Compliance engagement sheet template for authorised officers to use during inspections. Review Compliance engagement sheet and observer form on annual basis
	e. Restrict utilisation of the Marine Aquarium fish by controlling the number of harvesting and export licences	vii. No more than five licences are issued at any one time
	f. Restrict the utilisation and exportation of live rock and	viii. Develop live rock and giant clam

² Appendix G: code of practice for packing & export of Tonga Marine Aquarium fish used by Ecological Reef Company Ltd. and has offered to be included in this plan

	giant clams to only cultured stock	aquaculture
	g. Conduct a resource assessment including non-detrimental findings for corals, to use the best available scientific data	ix. Conduct resource assessment by end of 2019 x. Completed non-detrimental findings by 2019
	h. Develop a registry consistent with Fisheries (Local Fishing) Regulations 2009 for registration of vessel operating in the marine aquarium fishery	xi. Registry operational by the end of 2017
	i. Explore and trial appropriate and affordable technology for monitoring aquarium fishery vessel operations	xii. Trial underway within 3 months after the plan is operational and completed within 15 months after the plan is operational
2. Economically viable Marine Aquarium Fishery	a. Conduct economic assessment (market research/ economic analysis / export analysis) of the Marine Aquarium fish across the three island groups, Tongatapu, Ha'apai and Vava'u	i. Economic assessment completed by end of 2019 ii. Analysis of export data on a quarterly basis iii. Conduct community consultation with Ha'apai and Vava'u island groups on potential Marine Aquarium fish harvesting opportunities
	b. Support packing facility for holding and packing of Marine Aquarium fish	iv. Increase export value by 20%, with different destinations by 2019 v. Packing facilities established for Marine Aquarium operators to use
3. Improved livelihoods of people in coastal communities	a. Ensure Tongans benefit through employment opportunities	i. Ministry of Fisheries promotes aquarium fishery development where it is economically viable ii. Increased level of employment of

		Tongans in each company either as divers, boatmen or process workers and involve in farming Marine Aquarium species
	b. Provide training opportunity for Marine Aquarium operators and all employees operating under that licence on using best practice for harvesting and packing of the Marine Aquarium fish	iii. The per cent of employees in the Marine Aquarium companies are trained to harvest and pack Marine Aquarium species
	c. Provide technical support and training for farming Marine Aquarium fish as an alternative for harvesting wild stock	iv. The per cent of employees trained in farming techniques v. The number of communities involved in farming of Marine Aquarium fish vi. Awareness and training for communities to learn how to grow the preferred species for the Marine Aquarium industry, using best practices
4. Raised awareness and understanding of the Marine Aquarium Fishery and its contribution to Tonga's productivity	a. Develop and maintain transparent and informed management decisions	i. Six monthly reporting to Marine Aquarium Management Committee and stakeholders ii. Public informed of the fishery

10 MANAGEMENT MEASURES

10.1 Marine Aquarium Resource Operator Requirements

Harvesting, processing and exporting

- a. No person or company shall harvest or export Marine Aquarium fish for commercial purposes without authorisation by the Ministry of Fisheries Chief Executive Officer (CEO), issued in the form of a licence. Licence terms and conditions (Appendix C) will be used to control the harvest, purchase, packaging and export of Marine Aquarium fish. Licence fees will apply (Appendix D);
- b. A licence to fish for Marine Aquarium fish shall be issued for a one year term, which shall be subject to annual reviews and payment of annual licence fee (Appendix D). This licence is not transferable. Licences will not be issued unless the required fees are paid. Appendix E is a step by step process to follow on licences and permits to fish and export Marine Aquarium fish;
- c. If a vessel is used during the harvesting of Marine Aquarium fish, that vessel must be licenced in accordance with the Act and the Fisheries (Local Fishing) Regulations 2009 (the Local Fishing Regulations);
- d. A Marine Aquarium Fish Log Sheet must be completed by the licensed operator and provided to Ministry of Fisheries 24 hours after the day the fishing occurred. If this form is not provided, export permits will not be issued;
- e. Any fish processing establishment used for Marine Aquarium fish must comply with Part 4 of the Fisheries Management (Processing and Export) Regulations 2008 (the Processing and Export Regulations);
- f. Licence holders will allow and assist any observer / authorised officer to carry out their duties including the inspection of any harvesting activities, holding, processing and packing facilities, consignments destined for export, reporting log forms, the taking of photographs and collection of specimens if and where necessary.

Limit on the number of licences

- g. The maximum number of Marine Aquarium operators in Tonga is limited to five current operators as per Cabinet decision No.399, 1997
- h. Tongatapu is to remain as the only permitted area for harvesting. The Ministry and interested parties will investigate the potential of harvesting opportunities in other island groups / islands.

Export Permit

- i. Upon submitting an Aquarium Export Log Sheet an Export Permit issued by the Ministry of Fisheries is required for each shipment of Marine Aquarium fish. The Aquarium Export Log Sheet must list all species and quantities, destination, and other information as requested by the Ministry of Fisheries and the importing country:
 - i. *Coral Export Permit*: A Coral Export Permit is to be obtained from the Ministry of Fisheries for each shipment of corals and must list all species and quantities, destination and other information as requested by the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES), the International Airline Transport Association (IATA) and the importing country; and
 - ii. *Giant Clam Export Permit*: A Giant Clam Export Permit is to be obtained from Ministry of Fisheries for each shipment of giant clams and must list all species and quantities, destination and other information as requested by CITES, the IATA and the importing country.
- j. Each shipment must comply with relevant International Airline Transport Association regulations and standards for the transport of live animals.

10.2 Prohibitions

- a. The harvest or export of wild live rock is prohibited as per Section 30 (d) of the Fisheries Management (Conservation) Regulations 2008.
- b. The harvest of cetaceans as per section 16 of the Fisheries (Conservation) Regulations 2008 (the Conservation Regulations), is prohibited. The export of these species is also prohibited;
- c. The harvest or export of bumphead parrot fish, humphead wrasse, giant grouper, sharks, rays, triton or turtles is prohibited;
- d. Collection of Marine Aquarium fish within or close to any registered tourist diving sites is prohibited, and a buffer zone of at least 100 metres must be observed;
- e. The collection of Marine Aquarium fish at night and the use of underwater lights are prohibited;
- f. The collection of Marine Aquarium fish using techniques that may harm or destroy the environment is prohibited, as per section 30 of the Conservation Regulations, e.g. crowbars, axes, any metal rod, or garden tools such as spades, dynamite;
- g. The use, storage and transport of explosives, noxious substances (including cyanide and naturally derived substances in any form) for the purpose of killing, stunning, stupefying, disabling or capturing Marine Aquarium fish, per section 17 of the Act is prohibited;
- h. The collection of Marine Aquarium fish is prohibited within Marine Protected

Areas (Hakaumama’o Reef; reefs surrounding Malinoa Island; reefs surrounding Mounuafe; Pangaimotu; Ha’atafu reefs), all fringing reefs of Tongatapu, Special Management Areas, and the Fanga tapu (see “Appendix H: Map of Prohibited Marine Aquarium Fishing Areas”);

- i. The collection of food fish, sea cucumber, and invertebrates is prohibited while engaging in the harvesting of Marine Aquarium fish.

10.3 Restrictions on Collection Methods and Areas

- a. If a Marine Aquarium operator wants to use Self-Contained Underwater Breathing Apparatus (SCUBA), a written authorisation from the Ministry of Fisheries CEO is required. Only certified divers employed by the operator, are permitted to use SCUBA, to fish for Marine Aquarium fish. Copies of dive certificates must be attached to the SCUBA request. Additional copies of dive certificates must held at company offices and made available to the Ministry on request. Operators must update the Ministry of any changes to their authorised SCUBA divers;
- b. Hand scoop nets and Aquarium fishery barrier nets are permitted. Aquarium fishery barrier nets must be less than 5 m long, 1.5 m high, and with stretched mesh size smaller than 30 mm;
- c. Marine Aquarium operators must seek permission from the relevant community to grow aquacultured product for the Aquarium Trade in Special Management Areas;
- d. The export of live rock shall only be permitted for artificially manufactured and seasoned live rock. An export permit and other relevant documentation issued by Ministry of Fisheries is required for lawful export;
- e. The export of farmed hard corals is permitted for specimens that were grown from a farmed brood stock colony (i.e. F2, a fragment obtained from a colony that itself was reared from a clipping of a wild-sourced coral) and obtained from registered aquaculture operations. An export permit and other relevant documentation issued by Ministry of Fisheries is required for lawful export;
- f. The export of giant clams is permitted for specimens that were grown from brood stock (i.e. grown-out spat obtained from brood-stock) from registered aquaculture operations. An export permit and other relevant documentation issued by Ministry of Fisheries is required for lawful export.

10.4 Catch limits per licensed operator

Marine Aquarium Resource	Total Allowable catch per licensed operator
Fish	100,000 individual fish per year
Invertebrates	30,000 pieces per year
Hard coral	150 pieces per week (must be less than 20cm in length)
Soft corals	5,000 pieces per year
Wild Live rock	0
Cultured hard coral	Unlimited
Cultures artificial live rock	Unlimited
Cultured Giant Clam	Unlimited

Any new species identified shall be made known to the Ministry of Fisheries promptly.

10.5 Monitoring and reporting requirements

All forms below are to be completed and provided to the Ministry of Fisheries.

Type of form:	Submitted by who:	By when:
Marine Aquarium Fish Log Sheet (as per s36; Conservation Regulations)	Licensed Operator	No later than 24 hours after fishing occurred
Aquarium Fish Export Log Sheet (as per s17; Processing and Export Regulations)	Licensed Operator	No later than 24 hours after the export has occurred

A packing list of the previous export must be submitted to the Ministry prior to the Ministry issuing an export permit for the next consignment.

11 PENALTIES

All operators, including all fishers, processors and exporters must comply with this management plan, relevant regulations and the Act.

Penalties as per the Act, Conservation Regulations, and Processing and Exporting Regulations will apply to any non-compliance.

12 APPENDICES:

Appendix A: Characterization of Tonga's Marine Aquarium Fishery

General

The Marine Aquarium Fishery in Tonga has been in operation for the last 25 years, providing economic and social benefits in terms of trade and jobs for the country. Marine Aquarium fish include small ornamental (inedible) fish, corals, invertebrates and live rocks, occurring almost exclusively in less than 40 meters depths in inshore and surrounding reefs habitats.

Three characteristics that distinguish the Tongan Marine Aquarium Fishery from other components of the Tongan reef fish fisheries are that: the primary use of the product is for ornamental purposes rather than for food or medicinal purposes for example; it is a commercial fishery; and the product form is live rather than processed, frozen, dried, smoked, or otherwise preserved.

The Marine Aquarium Fishery is currently restricted around the main island of Tongatapu with all species occurring almost exclusively inshore and surrounding reefs from depths of 0-25 meters.

The fishery licenses five operators in Tongatapu; exploitation levels of Marine Aquarium fish in Tonga have averaged approximately 190,000 pieces and TOP660,000 in export volume and value over the last three years.

Fleet composition and size

The fleet composition and size used in the Marine Aquarium Fishery comprised of open skiffs of less than 6 meters. Usually these carry about 2- 3 crew members including a boat captain and two divers/collectors.

Collection methods, storage and packaging

Two main collection methods for marine aquarium fish are snorkelling and diving using self-contained underwater breathing apparatus (SCUBA). Although a number of Marine Aquarium fish are collected using snorkelling, a large majority is collected using SCUBA.

For ornamental fish species, divers usually uses SCUBA, hand nets, barrier nets or traps and guide the fish using pokers into the nets or traps. For corals, live rocks and invertebrates, divers use SCUBA and collection is usually done by hand.

The collected Marine Aquarium products are transported and stored in a shore-based facility. The facility consists of a warehouse with various sizes of holding tanks supplied with continuous flowing aerated seawater.

Ornamental fish, live corals, live soft coral and invertebrates including giant clams are packed in plastic bags with sea water and air and bags are tied using rubber bands. These are then packed into Styrofoam boxes ready for export.

Target species and production

Marine Aquarium fish include small ornamental (inedible) fish, corals, invertebrates, live rocks, shell fish and soft corals. Figure A1 illustrates the annual production from 2006 to 2015

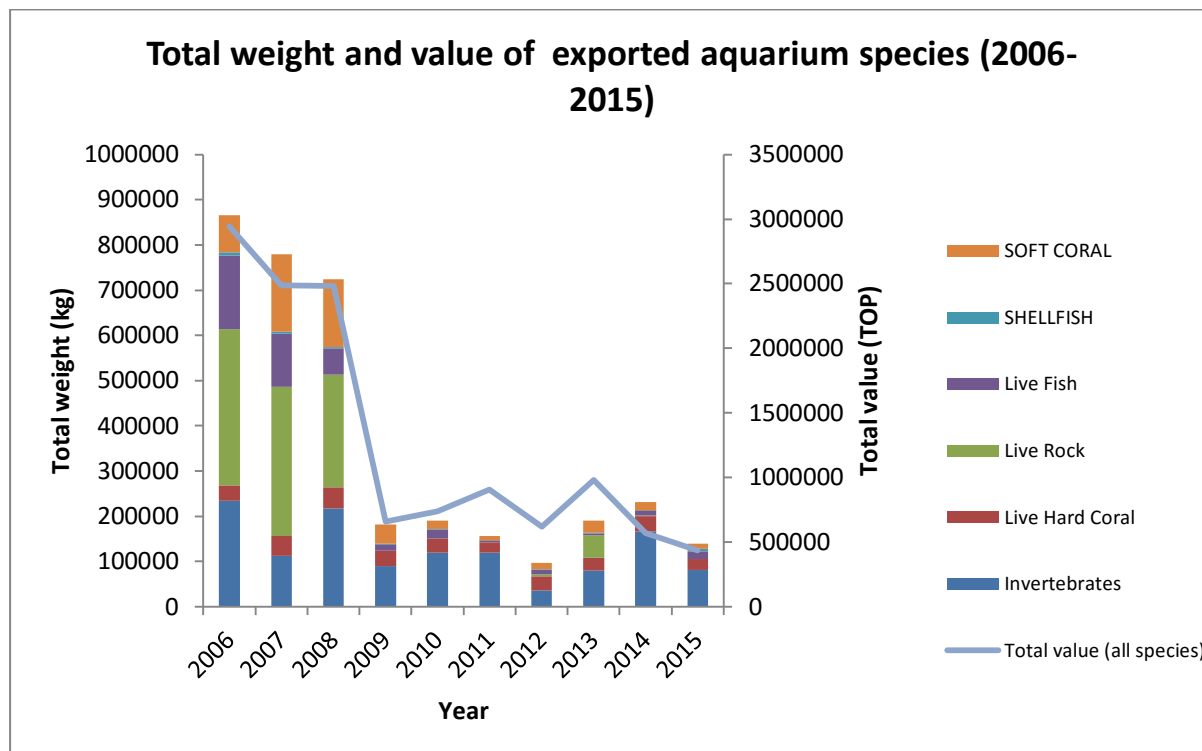


Figure A1: Total production by commodity (volume in weight and value in TOP) from 2006 to 2015

Live rock and invertebrates formed a significant component of Tonga's Marine Aquarium trade averaging 308,700kg and 187624 pieces respectively from 2006-2008 (Fig A2). The harvest and export of live rock was prohibited in late 2008, resulting in a dramatic decline in the trade in following years. From the period 2009 to 2015, invertebrates represent the bulk of the export volume comprising an annual average 55% followed by live hard corals (16%), soft coral (11%), live fish (7%) and shell fish (1%) (Fig A3). However over a brief period, 2012, 2013, and 2014; 4566kg, 49530kg and 1500kg respectively of live rock was traded (Fig A3).

At a more species level, from 2014 to 2016, invertebrates data became available and showed that the five most common exported species under the invertebrates are Nassarius snail (43.82%), assorted invertebrates (21.79%), hermit crab (11.98%), Ditrinus snail (5.59%), bubble anemone (5%). For live fish, the five most commonly exported groups of fish species from 2006 to 2016 are other live fish (36%), Damsel fish (19%), Wrasses (13%), Angel fish (12%) and Hawkfish (7%). For live hard coral, a total of 62 species are exported with *Monitipora* (8.8%), *Acropora* (8.1%), miscellaneous species (7.8%), *Euhpyllia* (5.5%) and *Lopophyllia* (53%) are the five most commonly exported species.

Tonga Marine Aquarium fish products are exported to many countries, with the majority going to USA, Britain, Asia (Japan, Hong Kong, Korea) and the Netherlands. The contribution composition in terms of value of the Marine Aquarium products is shown below (Fig. A3)

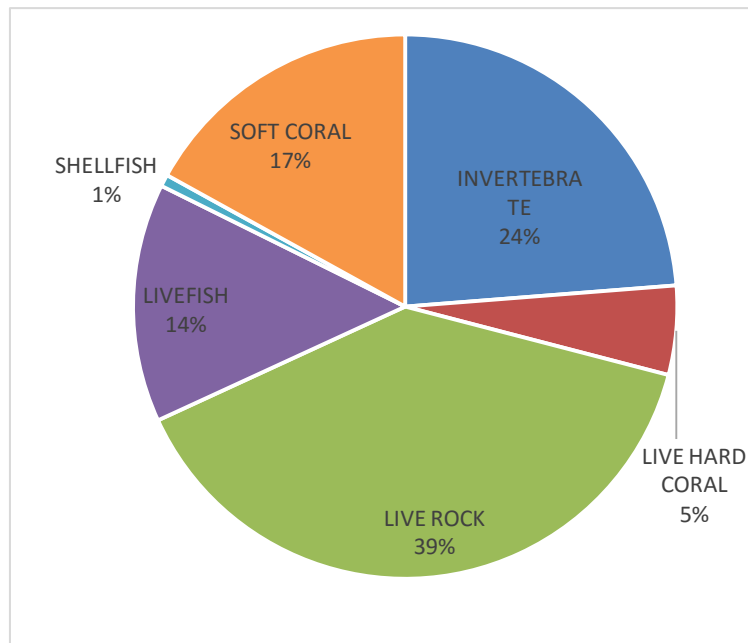


Figure A2: Composition (volume) of marine aquarium export products over the period 2006-2008

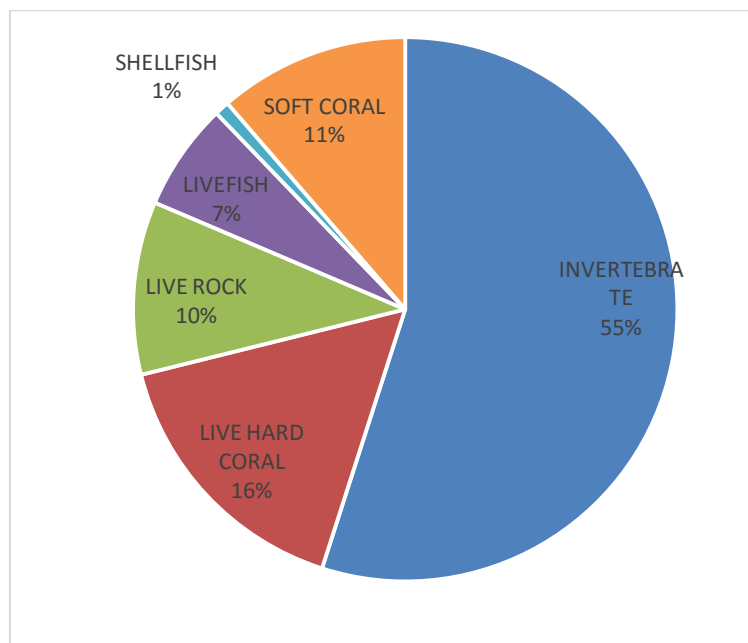


Figure A3: Composition (volume) of marine aquarium export products over the period 2009-2015

Monitoring, control and surveillance

The Marine Aquarium Fishery is controlled through licensing and permits. All Marine Aquarium operators must obtain a licence to operate in Tonga. Currently, the licence for the fishery is limited to five per year. The licence allows the operator to conduct fishing and collection for Marine Aquarium fish in and around Tongatapu.

Prior to export of any Marine Aquarium consignment, a Marine Aquarium fish operator must apply for an export permit indicating species, quantity and export destination.

As part of the licence condition, a Marine Aquarium operator must submit both catch/collection/location and export logs. This allows the Ministry of Fisheries to monitor the operations of the fishery.

Status of the Marine Aquarium Fishery resource

Since the Marine Aquarium fishery was established in Tonga, two underwater surveys have been conducted to determine stocks and status of the resources.

The first assessment in 1996 recorded 282 species of marine aquarium trade fish species. These species fall under five families and include Pomacentridae (damsel-fishes, angelfish, anemonefish), Acanthuridae (tang and unicornfish), Scaridae (parrotfish), Labridae (wrasses) and Chaetodontidae (butterflyfish). Butterflyfish accounted for about 85 per cent of the total fish density at sites assessed. Parrotfish comprised the greatest biomass followed by Pomacentridae, Acanthuridae, Kyphosidae (drummers) and Labridae, which together formed about 75 per cent of the total observed in this study. The overall density and biomass from the UVC data were 2.8 fish/m² and 118.9 g/m²³.

In 2005, a second underwater finfish assessment recorded a 135 Marine Aquarium fish species from 15 families. The most well represented families of fish in terms of number of species include Labridae (wrasse), Chaetodontidae (butterfly), Pomacentridae (damsel-fish and anemonefish) and Pomacanthidae (angelfish). For the whole survey Pomacentrids (damsel-fish and anemonefish) and Labridae (wrasse) had the highest mean density and with Cirrhitidae (hawkfish) and Zanclidae (Moorish idol) being one of the lowest⁴.

The 2005 survey also looked at bottom substrate and covers five categories. They included; soft bottom (sand, silt and muddy areas); rubbles and boulders (rubbly areas, boulders of up to 1m in size); Rocky bottom (rocks, slabs, and loose rocks over 1m in size); soft corals. Overall Rocky bottom is the predominant composition of reefs around Tongatapu. From the survey the estimated standing stock of live coral cover is about 40per cent, a notable significant decrease from 1996 which was 70per cent 1996⁵ and rubbles and boulders represent about 10%. Overall, it is believed that the stock can still be sustainable if a limit of

³ Matoto S., Ledua E., Mou-Tham G., Kulbicki M., and P. Dalzell (1996) The aquarium-fish fishery in Tongatapu, Tonga. Status and recommendations for management. South Pacific Commission.

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⁴ A Power Point Presentation on the Tongatapu Marine Aquarium Survey 2005

⁵ Matoto S., Ledua E., Mou-Tham G., Kulbicki M., and P. Dalzell (1996): The aquarium-fish fishery in Tongatapu, Tonga. Status and recommendations for management. South Pacific Commission 12 p

300 pieces of stony corals can be collected per week per operator and not more than 100 metric tons per year of live rock is collected.

However, it has been over a decade since the last survey was conducted. To ensure sustainability of resource and the fishery, it is imperative that regular surveys be conducted to ascertain the status of the resource.

Overview of significant event

During the establishment and development of the marine aquarium trade fishery in Tonga, there were key developments and decisions that contributed to shape the fishery over the past 25 years.

Year	Events
1988	Marine aquarium (MA) trade commenced, two operators harvesting and exporting marine aquarium resources with live hard corals as the main target resource
1993	Three operators joined the fishery, also targeting hard corals. Concerns raised regarding the removing of live hard corals from Tongatapu SPREP presented a report to Prime Minister's office providing a quota for fish and live rock. Fish- 100,000 fish per exporter and live rock was 100 t per exporter ⁶ Cabinet Decision (CD) 1853 in December banned exports of live hard corals of the order Scleractinia, Coecnothecalia, Athecata and Stolonifera. The CD also instructed Ministry of Fisheries to consider restrictions on live fish export. Consultation begun on the preparation of a management plan for this fishery
1995	MOF requested technical assistance of SPC for an aquarium fishery resources assessment, this assessment started in 1994
1996	In-water resource assessment survey continued, preliminary result were that resources are not seriously depleted and harvesting could resume, however impose quotas on live coral, live rock and fish ⁷ Two aquarium fishery operators closed business and were replaced by two new entrants, both new entrants were unable to sustain economically operations and subsequently closed business by the end of the year
1997	CD399 (March) revoked the ban on live coral harvest based on recommendation from the SPC lead assessment. A limit of five licences was permitted to operate at any time. Two companies were in operation and had licences.
2000	Two new operators entered the fishery but were unable to sustain viable operations. One of these operators targeted primarily aquarium live fish
2002	A second draft of the management plan was produced and made available to Ministry of environment and diver operators. A coral identification workshop was conducted by SPREP.
2005	Between 2003-2005 saw several new aquarium operators, many found it difficult to remain viable. By the end of 2005 there was a total of five operators (Island Marine Tropical, Walt Smith, Dateline Aquarium, South Pacific Paradise Export and Jay Hawk Inc.) Due to rise of SCUBA diving related injuries and deaths Government banned

⁶ Matoto S., Ledua E., Mou-Tham G., Kulbicki M., and P. Dalzell (1996): The aquarium-fish fishery in Tongatapu, Tonga. Status and recommendations for management. South Pacific Commission. 12p

⁷ Matoto S., Ledua E., Mou-Tham G., Kulbicki M., and P. Dalzell (1996) The aquarium-fish fishery in Tongatapu, Tonga. Status and recommendations for management. South Pacific Commission. 12p

	<p>the use of hookah and SCUBA gear for fishing, this posed problems for the aquarium companies. Licensed aquarium operators can obtain an exemption to the ban on the use of SCUBA from MoF</p> <p>Live rock was as an important revenue stream over the years. Operators requested to allow transfer of live rock quotas however this was not approved by MoF.</p>
2008	<p>A fourth draft of the management plan was sent to SPC for review/comments</p> <p>Due to increasing concerns over the harvest and export of live rock, Government banned the exploitation and trade of live rock in any area in Tongatapu</p> <p>The fourth draft Marine Aquarium Management Plan 2008 was endorsed by the Secretary and approved by the Minister.</p> <p>The Processing and Export Regulations 2008 was approved to assist the implementation of the Marine Aquarium Management Plan 2008</p> <p>The Fisheries Management Conservation Regulations 2008 was also approved in 2008 to implement Marine Aquarium Management Plan 2008</p>
2014	<p>Wabnitz from SPC and Nahacky (independent consultant) conduct a survey on Marine Aquarium trade and drafted a Best Practice for the Ornamental trade in Tonga to be use by Marine Aquarium operators in Tonga.</p>
2016	<p>Review of the 2008 Aquarium fishery plan. A draft was prepared and operators consulted in July. They provided suggestions, comments to the draft.</p>

Appendix B: Marine Aquarium Fisheries Management Committee

The Marine Aquarium Fisheries Management Committee established under section 7(4) of the Act, “shall be primarily responsible for the implementation and review of the fishery plan or otherwise monitor the performance of the fishery subject of the fishery plan or perform such other duties and responsibilities as are given it under the fishery plan consistent with this Act”.

The CEO for Ministry of Fisheries is the main government link and appointed Chairman of the MAMC. The MA Fisheries Management Committee would provide the required co-management link between the government, the community and the industry players in the Marine Aquarium industry.

The members of the MA Fisheries Management Committee consist of as a minimum:

- (a) the CEO for Ministry of Fisheries (Chairperson)
- (b) the Fisheries Legal Advisor
- (c) a representative from the following government offices
 - i. Department of Environment
 - ii. Customs Department
- (d) representatives from the Hahake, Hihifo District Officers
- (e) representative from Marine Aquarium Exporters Associations (MAEA)
- (f) three representatives from Marine Aquarium operators
- (g) representatives from the National Fisheries Council (NFC) and,
- (h) including others that may be co-opted as determined necessary by the CEO for Ministry of Fisheries. The Committee may meet at least twice in a calendar year.

Appendix C: Terms and Conditions

i. Terms and conditions of licence to fish for Marine Aquarium Fish

The Licence holder shall -

Kuo pau ki he taha ma'u laiseni ke ne –

- (a) notify the Secretary within 14 days of any change to his address;
fakaha ki he Sekelitali 'i loto 'i he 'aho 'e 14 ha fetongi 'a 'ene tu'asila;
- (b) ensure that only his employees fish for marine aquarium fish under this licence;
fakapapau'i ko 'ene kau ngaue pe 'oku ngaue toutai ika ke tauhi 'i he tauhi'anga ika mo'ui 'i he laiseni ko 'eni;
- (c) provide the CEO, in writing, with a list of all employees operating under this licence and all employees shall wear identification cards;
'oatu ki he Sekelitali, 'i ha tohi, ha lisi 'o e kau ngaue kotoa 'oku nau ngaue'aki 'a e laiseni ko 'eni pea kuo pau ki he kau ngaue kotoa ke nau tui ha ngaahi kaati fakailonga.
- (d) ensure observer is on port every time that employees of this licence fish for marine aquarium fish
fakapapau'i 'oku heka ma'u pe tokotaha taulama fakamafai 'i he taimi kotoa pe 'oku fakahoko ai ha toutai ika ke tauhi 'i he tauhi'anga ika mo'ui 'i he laiseni ko eni;
- (e) notify CEO three days before fishing days to allow enough time for the ministry to organize observer to join the operators in every fishing days.
fakahoko ki he Pule 'oe Potungaue Toutai 'i he 'aho 'e 3 ki mu'a pea fakahoko e toutai ika ke tauhi 'i he tauhi'anga ika mo'ui ke lava hano teuteu ha tokotaha taulama fakamafai kene kau atu kihe toutai 'i he taimi kotoa pe 'oku fakahoko ai e toutai ika ke tauhi 'i he tauhi'anga ika mo'ui;
- (f) not use any vessel to conduct any activity under this licence without a local fishing vessel licence;
'oua na'a ngaue'aki ha vaka ke fakahoko'aki ha ngaue 'i he laiseni 'oku 'ikai ke 'i ai laiseni vaka toutai fakalotofonua;
- (g) only fish in permitted Marine Aquarium fishing areas (Appendix I)
fakahoko pe toutai kihe ika tauhi he tauhi'anga ika mo'ui 'i he ngaahi 'elia 'oku ha 'i he mape 'oe ngaahi feitu'u 'oku ngofua ke fakahoko ai e toutai ika ke tauhi 'i he tauhi'anga ika mo'ui;
- (h) not receive any marine aquarium fish from any person unless that person is an employee of the licence holder;
'ikai ma'u ha ika ke tauhi 'i he tauhi'anga ika mo'ui mei ha taha tukukehe ka ko e tokotaha ko ia ko ha taha ngaue 'a e taha ma'u laiseni;
- (i) not use diving equipment that utilises surface supplied air (hookah equipment) to fish for any Marine Aquarium fish;
'oua na'a ngaue'aki ha naunau uku 'oku ngaue'aki ha 'ea 'i 'olunga 'i he fukahahi tahi (hookah equipment) ke toutai 'i ha ika ke tauhi 'i he tauhi'anga ika mo'ui;
- (j) not use self-contained under water breathing apparatus (SCUBA) equipment or any diving equipment that utilizes compressed gas to fish for hard and soft corals;
'oua na'a ngaue'aki ha me'angaue manava 'i he vai (SCUBA) pe ko ha naunau uku 'oku ngaue'aki 'a e 'ea kuo tanaki ke toutai 'i 'a e feo;
- (k) not fish more than 150 pieces of live hard coral per week;

'oua na'a toutai'i 'o lahi hake 'i he konga feo mo'ui 'e 150 'i he uike;

- (l) not fish live hard coral of the genera specified in Table 1 below that is over the maximum size of 20 centimetres in length.

'oua na'a toutai 'a e feo mo'ui 'i he fa'ahinga 'oku tu'utu'uni 'i he Tepile 1 'oku lahi hake 'a hono lahi 'i he 20 cm 'a hono loloa.

Table 1 / Tepile 1

No.	Genera	No.	Genera
1	Alvepora	7	Hydnophora
2	Barbattoia	8	Micromussa
3	Bubble coral	9	Oxypora
4	Button coral	10	Pectinia (spiny cup)
5	Diplostrea	11	Pleisiastrea
6	Elegant coral	12	Trachyphyllia

- (m) not fish wild live rock or wild giant clam;

'oua na'a toutai'i 'a e maka mo'ui na'e 'ikai ke faama'i pe koe vasuva meihe moana na'e 'ikai ke faama'i.

- (n) not fish more than 100,000 aquarium fish for the 12 month period of this licence;

'oua na'a toutai 'o lahi hake 'i he 100,000 'a e ika ke tauhi 'i he tauhi'anga ika mo'ui ki he vaha'a taimi koe mahina 'e 12 'o e laiseni ko 'eni; pea

- (o) not use destructive fishing techniques for harvesting marine aquarium fish or use or have in possession any destructive fishing gear (such as hammers, crowbars and poisons) at the point of harvesting or on any vessel used under this licence;

'oua na'a ngaue'aki ha founga toutai fakatu'utamaki ke toutai 'aki 'a e ika ke tauhi 'i he tauhi'anga ika mo'ui pe ngaue pe ma'u ha me'angaue toutai fakatu'utamaki ('o hange ko e hamala, sina pe ngaahi me'a fakakona) 'i he taimi toutai pe ko ha vaka 'oku ngaue'aki 'i he laiseni ko 'eni;

- (p) maintain accurate records on a daily basis on forms:

- i. Marine Aquarium Fish Log Sheet (form 2 of Sch 13 of Conservation Regulations)
- ii. Monthly Catch Log Form of Management Plan (**Appendix F**)
- iii. and any other information which the Secretary may require and

Tauhi e ngaahi lekooti 'i ha lipooti faka'aho

- iv. i. Tohi loka fakamatala ke lekooti e ika mo'ui. (Foomu 2 of Sch13 'oe tu'uni fakalao ki hono fakatolonga e me'a mo'ui mei tahi.
 - v. ii. Tohi loka lekooti fakamahina ki hono pule'i e e me'a mo'ui 'i tahi.
 - vi. iii. Pea moha ngaahi fakamatala kehe pe 'e te fie ma'u 'e he mei he pulengaue.
- (q) The licence holder shall ensure that any information provided to the Secretary, whether in a prescribed form or otherwise, is provided clearly, legibly, truthfully and accurately.

Kuo pau ke fakapapau'i 'e he taha ma'u laiseni ko e kotoa 'o e fakamatala 'oku 'oatu ki he Sekelitali, 'o tatau ai pep e 'i ha foomu kuo tu'utu'uni pe me'a kehe, 'oku mahino, lau ngofua, mo'oni pea tonu.

ii. Terms and conditions of aquarium fish processing establishment licence

Every licence holder shall—

Kuo pau ki he taha ma'u laiseni ke ne —

- (a) notify the Secretary within 14 days of any change to the registered company address;
fakaha ki he Sekelitali 'i loto 'i he 'aho 'e 14 ha liliu 'i he tu'asila 'a e kautaha kuo lesisita;
- (b) ensure all such records and the processing premises are open to regular inspection and investigation at any time by fisheries inspectors and authorised officers;
fakapapau'i ko e ngaahi lekooti kotoa ko ia pe mo e feitu'u ngaohi'anga 'oku 'ata ki hano toutou sivi'i mo fakatotolo'i 'i ha taimi pe 'e he kau 'Inisipekita 'a e toutai mo e kau 'ofisa kuo fakamafai
- © allow fisheries inspectors, authorised officers or other personnel to participate fully in any research or survey project inside the processing facility;
faka'ata 'a e kau faisivi 'a e toutai, kau 'Inisipekita 'a e Toutai, kau 'ofisa fakamafai pe ko ha to e taha ngaue kehe ke kau atu ki ha fekumi pe ngaue savea 'i loto 'i he fale ngaue ngaohi'anga;
- (d) ensure that all employees operating under this licence are sufficiently trained in processing and the handling of fish and fish product to enhance the quality;
fakapapau'i ko e kau ngaue kotoa pe 'oku nau ngaue'aki 'a e laiseni ko 'eni 'oku nau ma'u ha ako ngaue fe'unga 'i hono ngaohi mo ngaue ki he ika mo e ngaahi koloa ika ke fakautuutu 'a 'ene lelei;
- € ensure that the Marine Aquarium fish processed at such establishment shall not exceed the total quotas allowed to that operator, including those relating to species and quantity;
fakapapau'i ko e ika na'e ngaohi 'i he fale ngaohi'anga ika ko ia 'oku 'ikai ke lahi hake 'i he kuota na'e fakangofua ki he fale ngaohi'anga ko ia, 'o kau ai 'a e fa'ahinga mo e lahi 'o e ika
- (f) ensure that any information provided to the Secretary, whether in a prescribed form or otherwise, is provided clearly, legibly, truthfully and accurately.
fakapapau'i ko e fakamatala 'oku 'oatu ki he Sekelitali, 'o tatau aipe pe 'oku 'i ha foomu na'e tu'utu'uni pe 'ikai, 'oku mahino, ala lava 'o lau, mo'oni pea tonu.

Appendix D: Fees in Tonga Pa'anga (TOP)

APPLICATIONS AND LICENCES	NEW APPLICATION FEES (TOP\$)#	RENEWAL LICENCE FEES (TOP\$)##
Application for a licence to fish for marine aquarium fish – <i>for a new licence: Form 4 schedule 1 or to renew a licence: Form 6 Schedule 1 of Fisheries Management (Conservation) Regulations 2008</i>	\$15.00	\$11.50
Application to register a fish processing establishment - <i>Form 1 (from Fisheries management (Processing and Export) Regulation 2008)</i>	\$5.75	\$ -
Application for a fish processing establishment licence - <i>Form 3 (from Fisheries management (Processing and Export) Regulation 2008)</i>	\$57.50	\$11.50
Application for an aquarium fish export licence - <i>Form 9 (from Fisheries management (Processing and Export) Regulation 2008)</i>	\$57.50	\$11.50
REGISTRATION AND LICENCE		
Licence to fish for marine aquarium fish	\$2,300.00	\$2,300.00
Registration of fish processing establishment	\$11.50	\$ -
Fish processing establishment licence	\$115.00	\$115.00
Aquarium fish export licence	\$1,150.00	\$1,150.00
Registration of local fishing vessel (once only and not when renewed)	\$5.00 for the first 6 meters and \$2.00 for every additional meter after the first 6 meters	
Licence for local fishing vessel	<ul style="list-style-type: none"> a. Vessels up to 10 meters. \$200.00 for first 6 meters and every additional meter after the first 6 meters shall be \$5.00. b. Vessels 10.1 meters to 20 meters. \$500.00 for the first 6 meter and every additional meter after the first 6 meters shall be \$10.00 c. Vessels greater than 20.1 meters. \$800.00 for the first 6 meters and every additional meter after the first 6 meters shall be \$20.00 	

#: relate to new applicants to the fishery

##: relate to operators renewing their licence(s)

MARINE AQUARIUM RESOURCE	RESOURCE RENT
Soft coral	0.5% of total export value
Live hard coral	1% of total export value
Live fish	5% of total export value
Invertebrate	0.5% of total export value
Customs Tax	15% of total resource rent

Appendix E: The processes to follow on licenses to fish and export Marine Aquarium Fish

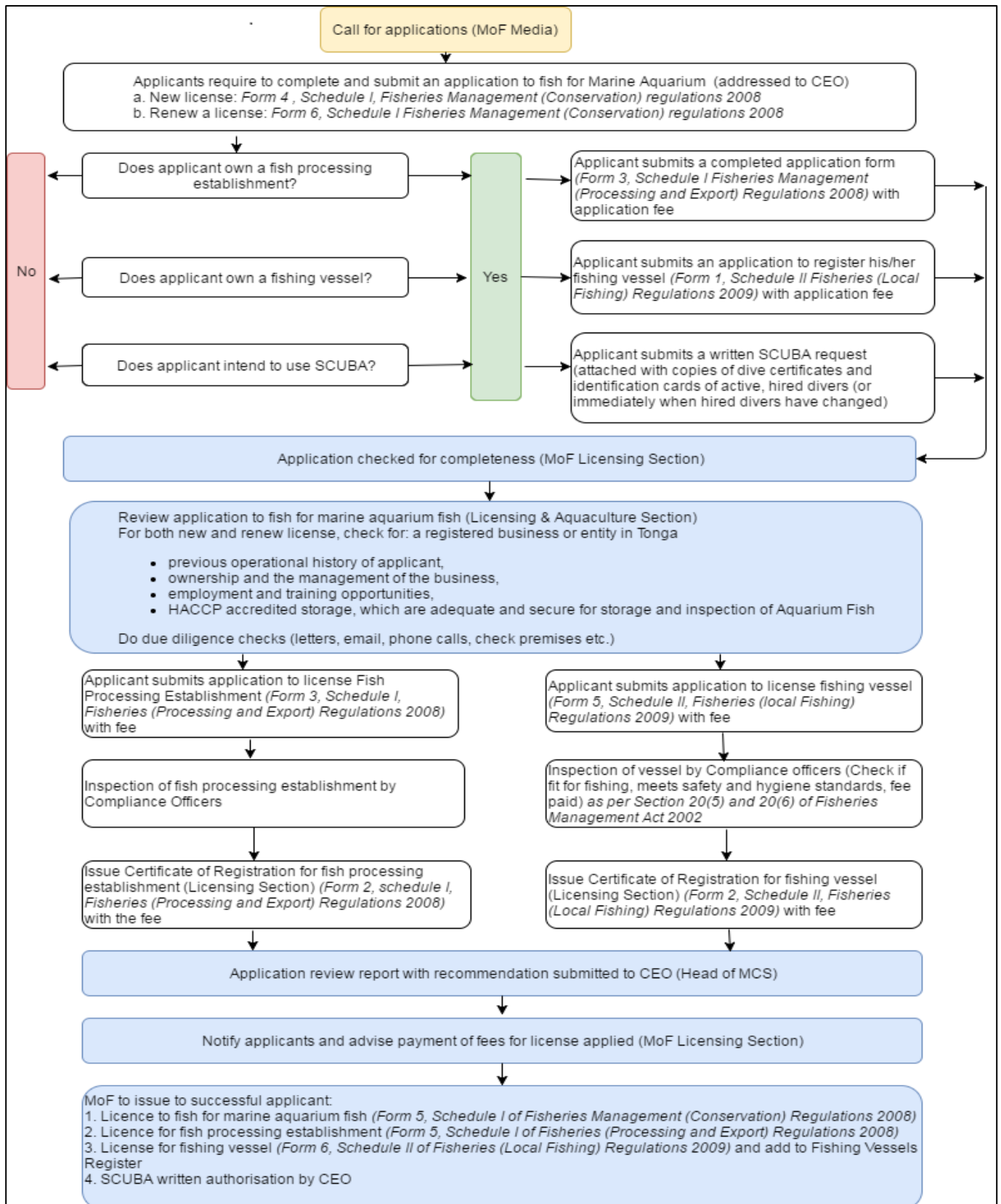
a. Tonga Marine Aquarium Fish licensing process

The flow chart below illustrates the process to follow for advertising, applying, reviewing and issuing Marine Aquarium fish licences. The process criteria have been set up so that as far as possible, Ministry of Fisheries may conduct a review of the application including due diligence checks to provide a recommendation to the CEO.

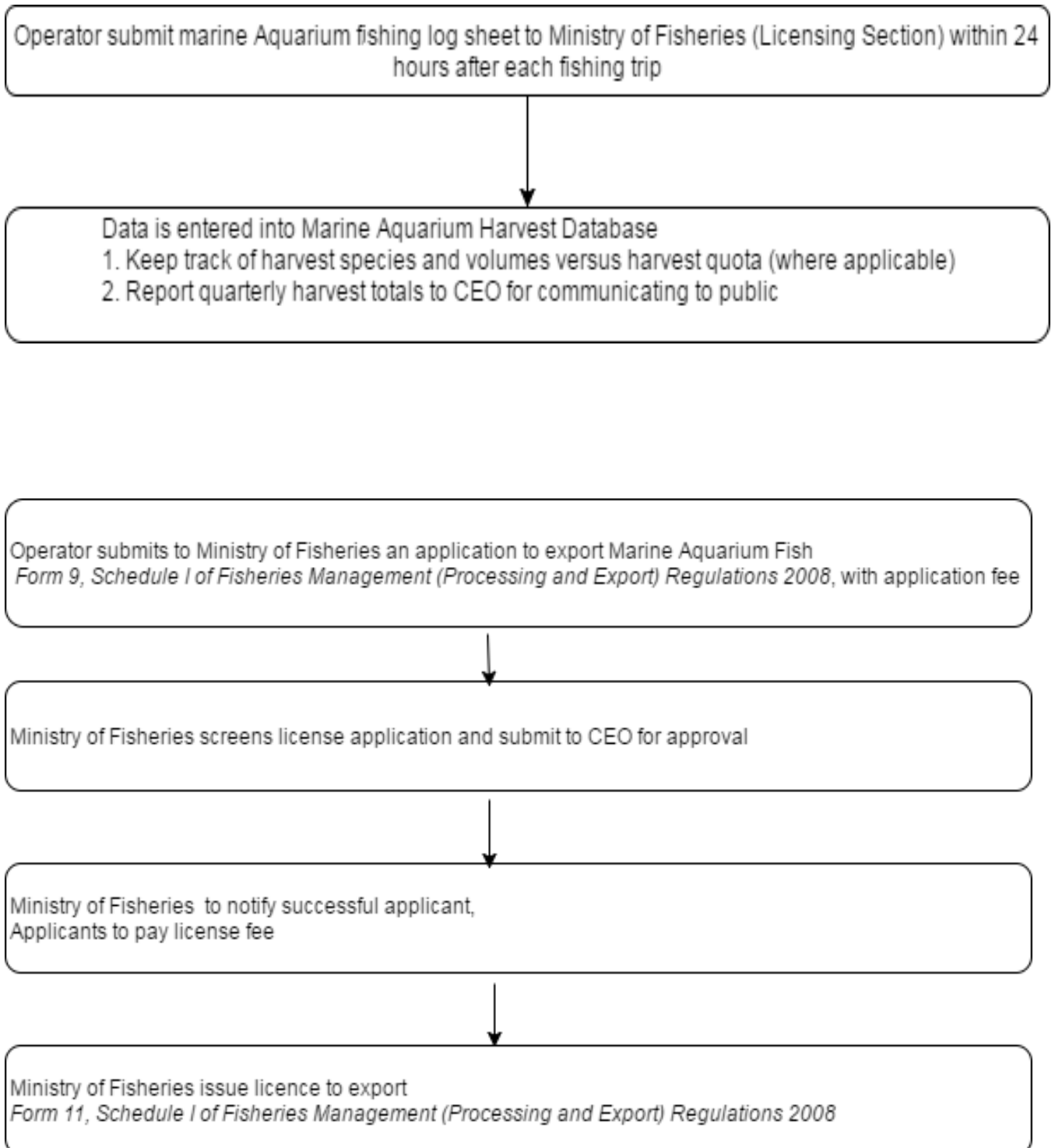
Licence to harvest aquarium fish

The Licence:

- Applicable to companies who intend to fish for Marine Aquarium fish for export
- Issued by the Ministry of Fisheries
- Cannot be issued until prescribed fees are paid in full
- Is for a term of one year and subject to renewal (with annual licence fees to be paid)
- Is non-transferable
- Has operating terms and conditions
- Can be terminated if operating conditions are not followed
- Should include applications to:
 - Register and license their fishing vessels
 - Register and license their fish processing establishments (this does not apply if Ministry of Fisheries facilities at Sopu are used)
 - Written authorization to use SCUBA (a SCUBA request is required during application (new/renewed licence) or immediately when hired divers have changed)

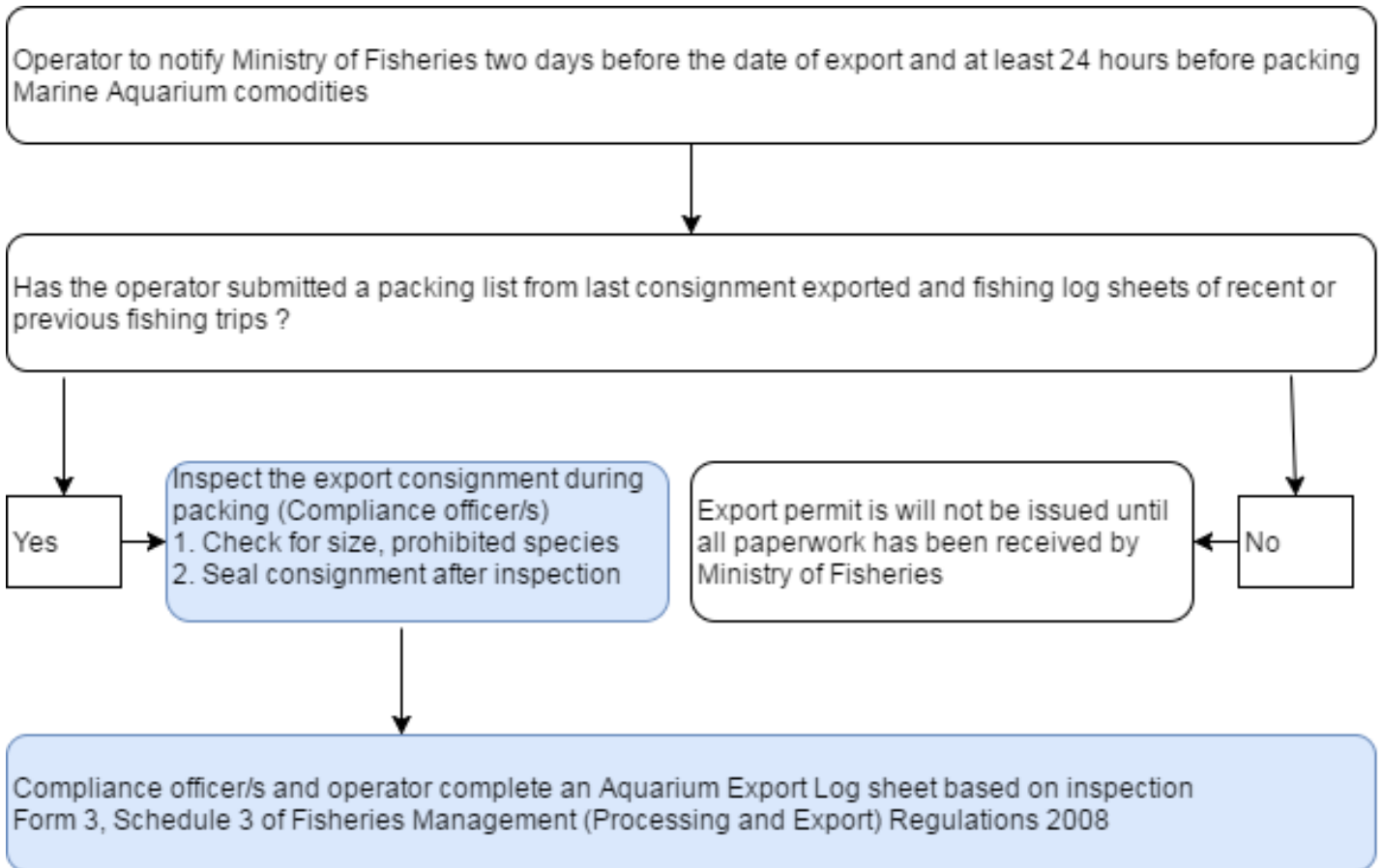


b. During harvesting Marine Aquarium Fish



c. To export Marine Aquarium Fish

d. Permit to export a consignment



Appendix F: Marine Aquarium Monthly Catch Log sheet

This form is to be completed and provided to the Ministry of Fisheries no later than one month after fishing has occurred.

Name of Company and Licence Operator:																
Fishing effort					Aquarium fisheries resources											
					Fin fish			Invertebrate			Soft coral			Hard coral		
Date	Hours spent collecting	Number of divers	Site of fishing*	Number of tanks if used SCUBA**	Family / species	Number caught	Number dead	Family / species	Number caught	Number dead	Family / species	Number caught	Number dead	Family / species	Number caught	Number dead

* specify the area of fishing (e.g. N/W Velitua);

** if no SCUBA is used, write 'NIL'

Appendix G: Code of practice for, packing and export of Tonga Marine Aquarium Fish

SHIPPING WATER

Shipping Water & Temperature:

- ✓ Keep Shipping Water contained cleaned and covered – rinse well before each use
 - ✓ If possible, filter water with filter bag, be sure the filter bag is clean
 - ✓ If fish vats are 21oC – 26.7oC (70oF to 80oF) shipping water should be 24.5oC (76oF)
 - ✓ If fish vats are above 26.8oC (80oF) shipping water should be 25.5oC (78oF)
- (HEAT OR COOL WATER AS NEEDED TO REACH CORRECT TEMPERATURE)*



Shipping Water Medication:

- ✓ 1 level spoon as provided of Nitrofurazone to 1L of freshwater. Shake well.
- ✓ ¼ cup of mixed solution in a 32 U.S. gallon bucket
- ✓ Alternatively 1mL of Nitrofurazone to 15L of shipping water

BOXES

Double layer box using your standard tall box. To make the support cross for top layer:

- ✓ Height of cross 12.5cm (5 in) or 50% internal height of box
- ✓ Cross should span diagonally from corner to corner
- ✓ Cross should be waxed cardboard or put plastic bage over each section of cross
- ✓ Platform on top of cross should fit snugly on all sides Labelling the box for export:
- ✓ Place “UP” arrow labels and “LIVE ANIMALS” label on box’s long sides
- ✓ Circle fist on “LIVE ANIMALS” label and write “LIVE TROPICAL FISH” at the bottom
- ✓ Label box with your company name / address and customer name / address
- ✓ Label box with species names of the fish inside and quantities of each



BAGS

- ✓ Place bags of a given size in individual containers for easy and quick access during packing
- ✓ Keep bag containers easily accessible for fish packer
- ✓ Put newspaper lining in all bags so that it goes completely around the bag
- ✓ Remove all air from bag before filling with oxygen
- ✓ Always keep bag upright
- ✓ Pack in a box as soon as possible

TRANSFER OF FISH FROM VAT & FISH BASKETS TO BAG

- ✓ Use soft small-meshed net to remove fish from basket
- ✓ Lift basket before netting the fish to prevent the fish from jumping, but leave enough



- water in the basket for the fish to swim. Do not have the fish dry in the basket
- ✓ Change water in container bringing fish to packing table every time you bring fish – or at least every 20 minutes
 - ✓ Keep Angels, and fish that fight, separately when bringing fish to packing table
 - ✓ Screen fish one last time before putting into bag
 - ✓ Do not ship fish that have been dropped on floor

HOLDING TIME FOR FISH

Fish size	Number of days prior to packing
Small (< 2in or < 5cm)	2 - 3 days
Medium (2 - 4in or 5 – 10cm)	3 - 4 days
Large (4 - 6in or 10 – 15cm)	4 - 5 days

Appendix H: Map of Prohibited Marine Aquarium Fishing Area

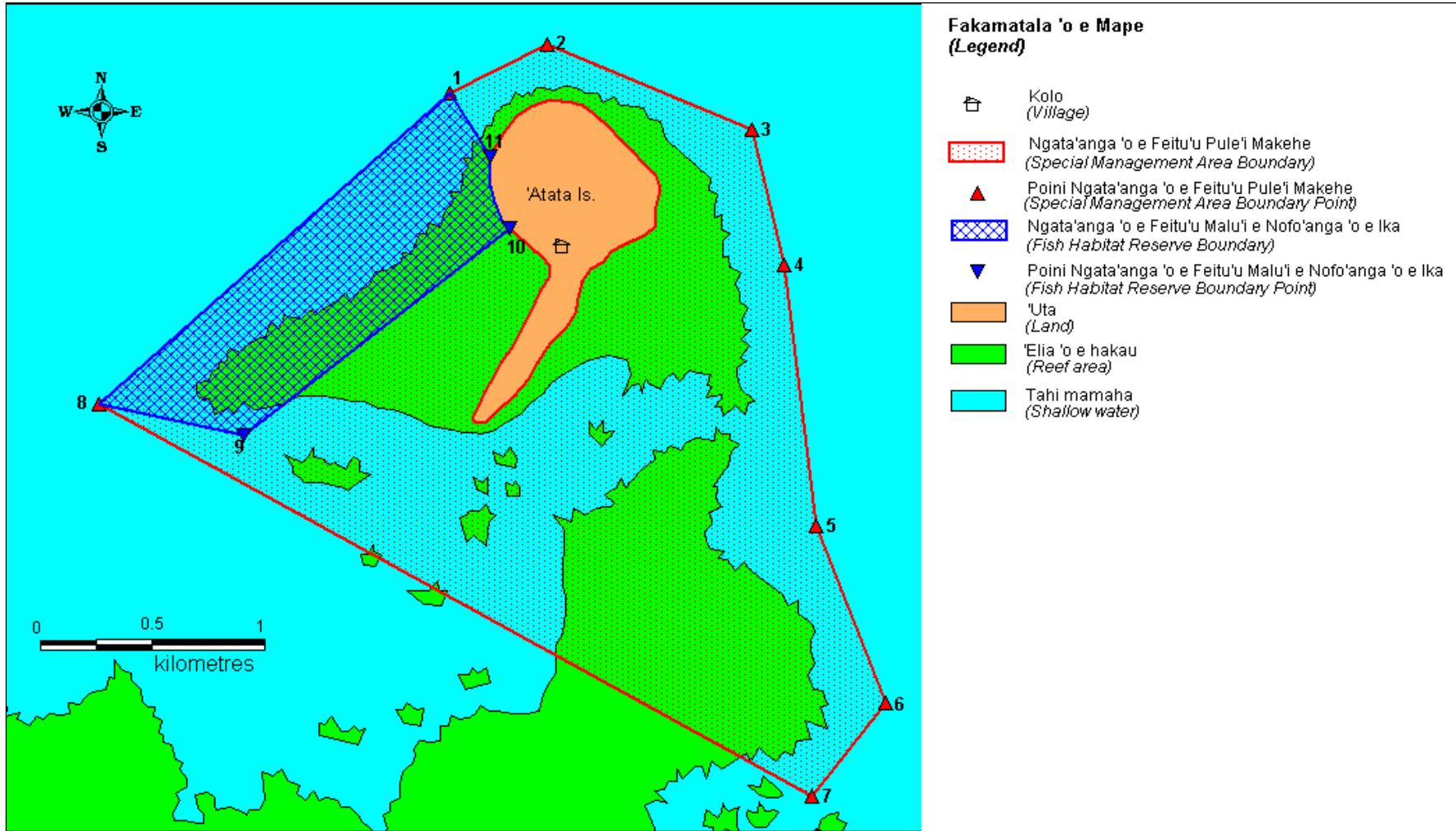
Coordinates and maps of special management areas and habitat reserve

Longitude and Latitude of 'Atata Special Management Area Boundary Points

Boundary point	Decimal Longitude	Decimal Latitude
1	175.258750°W	21.042050°S
2	175.254610°W	21.039910°S
3	175.245850°W	21.043640°S
4	175.244481°W	21.049626°S
5	175.243080°W	21.061140°S
6	175.240110°W	21.068930°S
7	175.243240°W	21.073050°S
8	175.273830°W	21.055750°S

Longitude and Latitude of 'Atata Fish Habitat Reserve Boundary Points

Boundary point	Decimal Longitude	Decimal Latitude
1	175.258750°W	21.042050°S
8	175.273830°W	21.055750°S
9	175.267600°W	21.057150°S
10	175.256193°W	21.048023°S
11	175.257033°W	21.044828°S

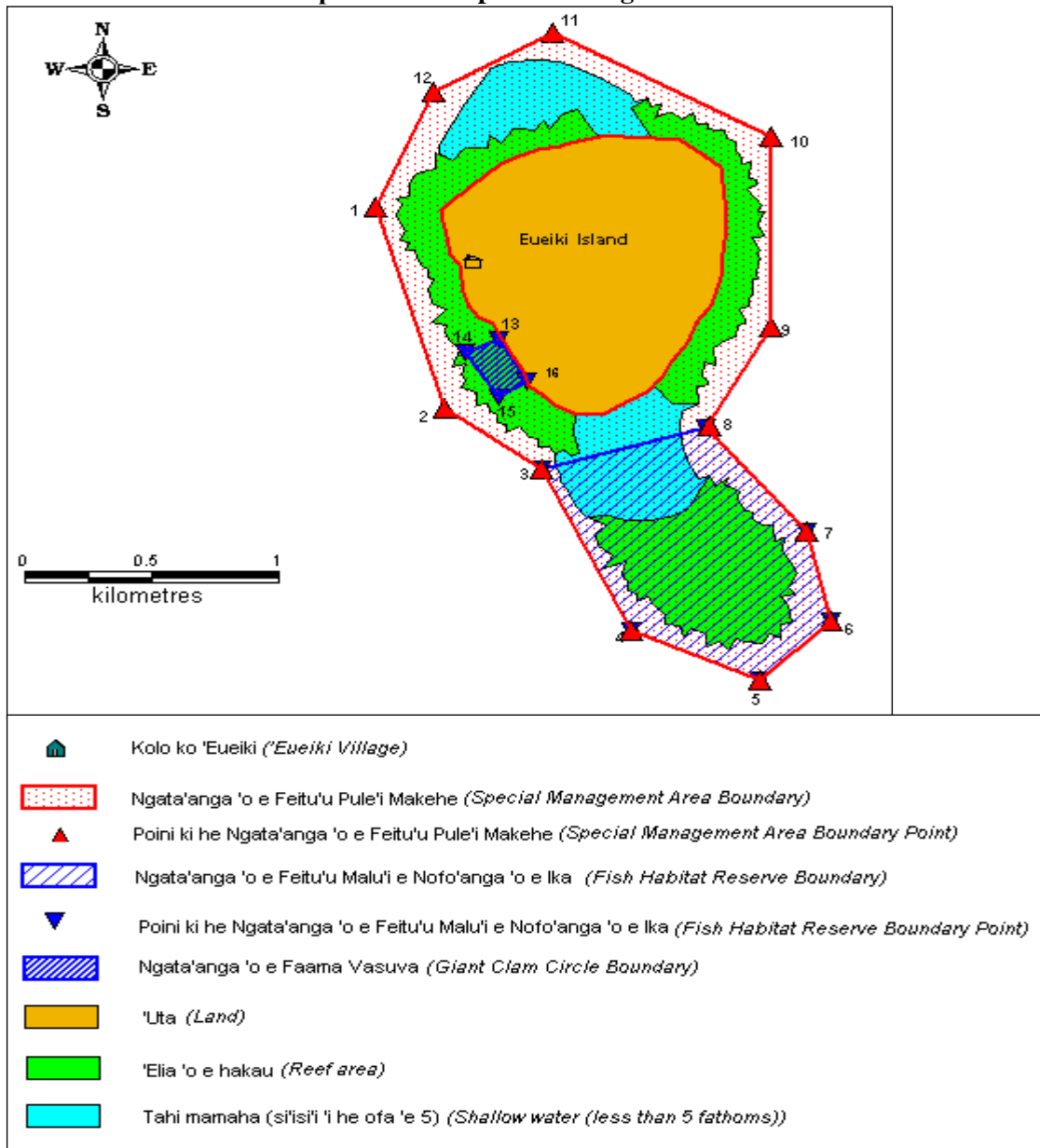


Map of 'Atata Special Management Area

Longitude and Latitude of 'Eueiki Special Management Area Boundary Points

Boundary Coordinates of 'Eueiki Special Management Area	
Latitude	Longitude
1 18°45'47.20"S	174° 1'14.88"W
2 18°45'46.40"S	174° 1'5.43"W
3 18°45'53.51"S	174° 0'52.80"W
4 18°46'6.01"S	174° 0'46.72"W
5 18°46'11.96"S	174° 0'41.85"W
6 18°46'18.25"S	174° 0'43.49"W
7 18°46'20.87"S	174° 0'51.08"W
8 18°46'15.17"S	174° 1'15.76"W
9 18°46'3.93"S	174° 1'25.44"W

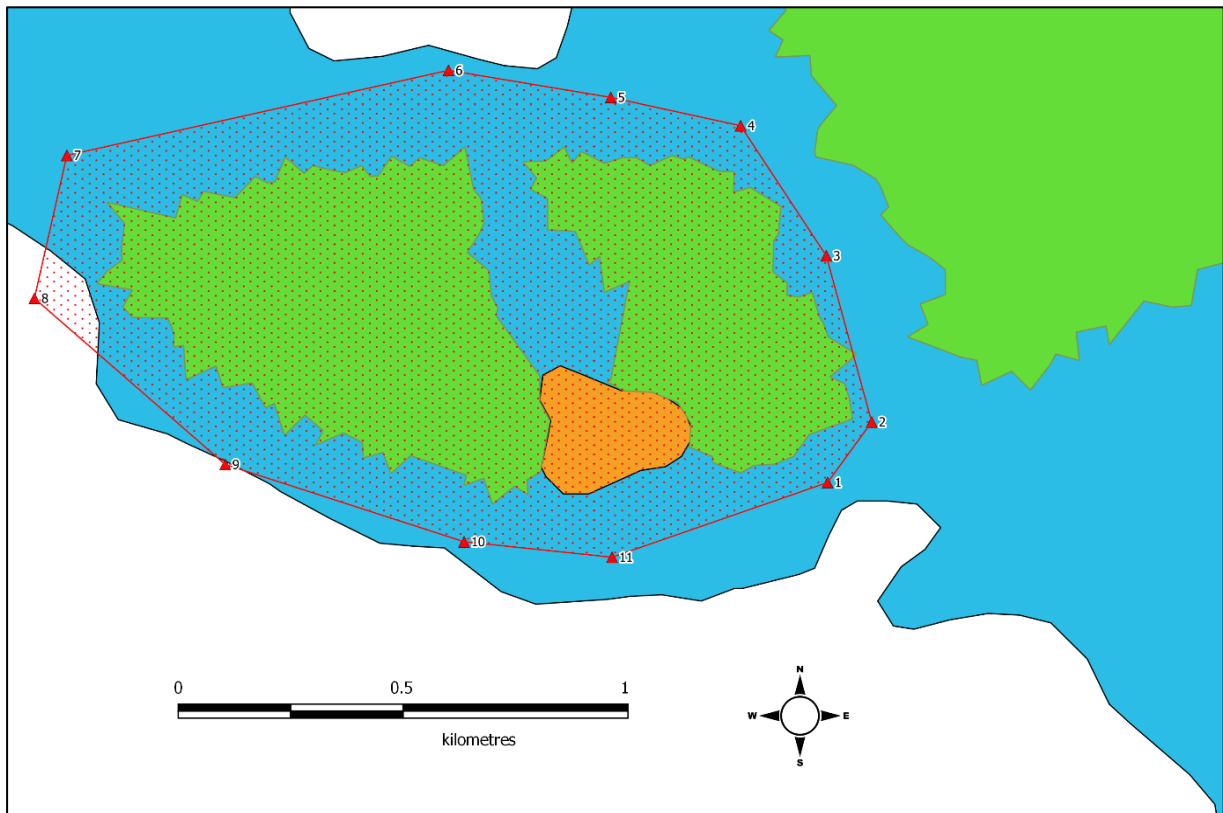
Map of 'Eueiki Special Management Area



Longitude and Latitude of Fafa Special Management Area Boundary Points

Point	Latitude	Longitude
1	21° 05' 20.2" S	175° 09' 14.2" W
2	21° 05' 15.5" S	175° 09' 10.8" W
3	21° 05' 02.6" S	175° 09' 14.3" W
4	21° 04' 52.5" S	175° 09' 20.9" W
5	21° 04' 50.3" S	175° 09' 30.9" W
6	21° 04' 48.2" S	175° 09' 43.4" W
7	21° 04' 54.8" S	175° 10' 12.8" W
8	21° 05' 05.9" S	175° 10' 15.3" W
9	21° 05' 18.8" S	175° 10' 00.6" W
10	21° 05' 24.8" S	175° 09' 42.2" W
11	21° 05' 26.0" S	175° 09' 30.8" W

Map of Fafa Special Management Area



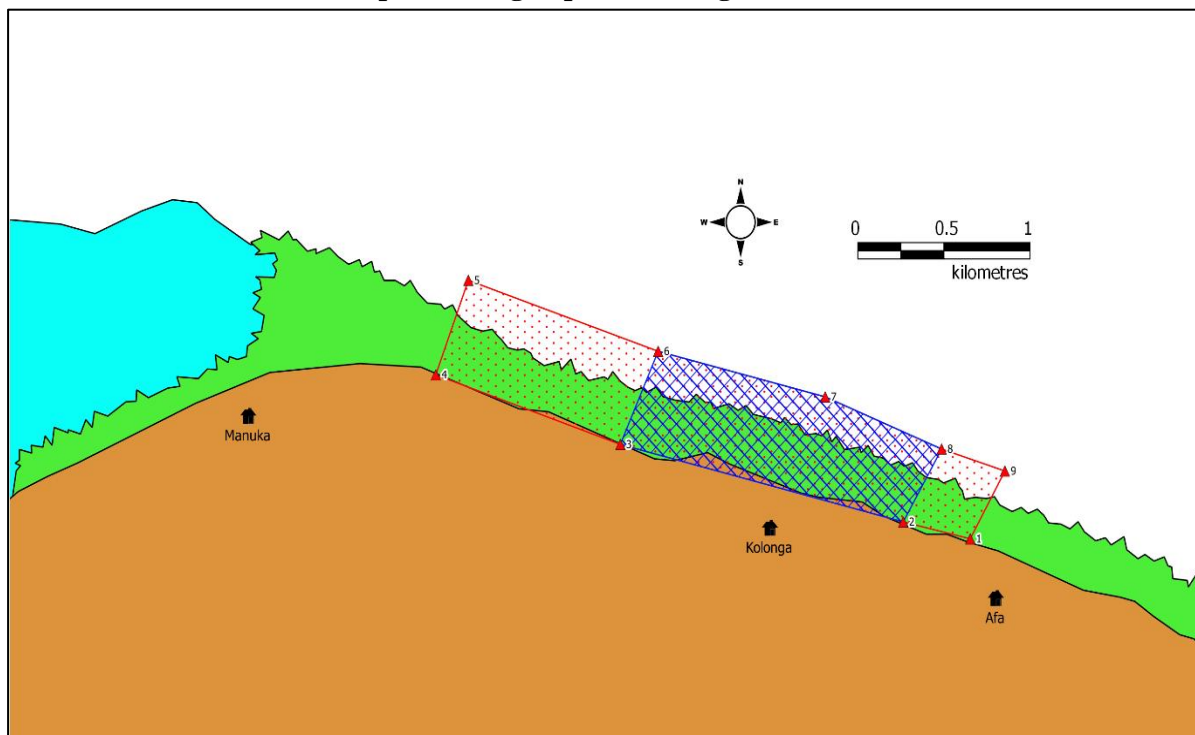
Longitude and Latitude of Kolonga Special Management Area Boundary Points

Point	Latitude	Longitude
1	21° 7'44.16"S	175° 3'33.13"W
2	21° 7'41.10"S	175° 3'46.64"W
3	21° 7'27.06"S	175° 4'43.64"W
4	21° 7'14.46"S	175° 5'20.83"W
5	21° 6'57.34"S	175° 5'14.27"W
6	21° 7'10.20"S	175° 4'36.02"W
7	21° 7'18.45"S	175° 4'2.36"W
8	21° 7'27.90"S	175° 3'38.90"W
9	21° 7'31.88"S	175° 3'26.15"W

Longitude and Latitude of Kolonga Fish Habitat Reserve Boundary Points

Point	Latitude	Longitude
2	21° 7'41.10"S	175° 3'46.64"W
3	21° 7'27.06"S	175° 4'43.64"W
6	21° 7'10.20"S	175° 4'36.02"W
7	21° 7'18.45"S	175° 4'2.36"W
8	21° 7'27.90"S	175° 3'38.90"W

Map of Kolonga Special Management Area



Appendix I: Marine aquarium harvesting zones

Mounu Island



Zone	Latitude	Longitude
Mounu 1	21° 7'52.11"S	175°11'21.20"W
Mounu 2	21° 7'32.40"S	175°11'30.33"W
Mounu 3	21° 7'25.06"S	175°11'11.53"W
Mounu 4	21° 7'42.85"S	175°11'2.18"W

Ualanga Uta



Zone	Latitude	Longitude
Ualanga Uta 1	21° 7'2.38"S	175°11'56.90"W
Ualanga Uta 2	21° 6'51.77"S	175°12'2.80"W
Ualanga Uta 3	21° 6'49.02"S	175°11'55.23"W
Ualanga Uta 4	21° 6'56.29"S	175°11'47.74"W

Ualanga Lalo



Zone	Latitude	Longitude
Ualanga Lalo 1	21° 6'17.32"S	175°11'15.77"W
Ualanga Lalo 2	21° 6'1.10"S	175°11'33.25"W
Ualanga Lalo 3	21° 5'53.07"S	175°11'16.59"W
Ualanga Lalo 4	21° 5'56.58"S	175°11'2.32"W
Ualanga Lalo 5	21° 6'8.41"S	175°10'54.70"W

Velitua, Onevai, Onevao



Zone	Latitude	Longitude
Velitua,Onevai,Onevao 1	21° 5'12.54"S	175° 9'5.78"W
Velitua,Onevai,Onevao 2	21° 3'52.79"S	175° 7'14.47"W
Velitua,Onevai,Onevao 3	21° 6'16.70"S	175° 7'10.16"W
Velitua,Onevai,Onevao 4	21° 5'54.45"S	175° 6'9.60"W
Velitua,Onevai,Onevao 5	21° 5'45.50"S	175° 4'25.45"W
Velitua,Onevai,Onevao 6	21° 4'46.78"S	175° 4'15.80"W
Velitua,Onevai,Onevao 7	21° 4'19.27"S	175° 6'1.75"W

Motutapu islet to Tau islet



Zone	Latitude	Longitude
Motutapu islet to Tau islet 1	21° 5'53.10"S	175° 2'39.39"W
Motutapu islet to Tau islet 2	21° 4'21.13"S	175° 2'36.63"W
Motutapu islet to Tau islet 3	21° 2'39.95"S	175° 1'3.25"W
Motutapu islet to Tau islet 4	21° 0'5.03"S	175° 0'48.12"W
Motutapu islet to Tau islet 5	21° 0'25.12"S	174°59'34.82"W
Motutapu islet to Tau islet 6	21° 3'30.59"S	174°59'29.90"W
Motutapu islet to Tau islet 7	21° 5'58.00"S	175° 1'9.45"W