

Marine Aquarium Council

**Mariculture and Aquaculture Management
International Performance Standard for the
Marine Aquarium Trade**

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I. Introduction

Coral reef ecosystems contain some of the richest biological diversity and habitats on Earth. Coral reefs support thousands of species of fish, invertebrates, algae, plankton, sea grasses, and other organisms. They have great commercial, recreational, cultural, and aesthetic value, serving as shoreline protection, areas of natural beauty, and sources of food, jobs, and pharmaceuticals. They are also important nursery habitats for some pelagic species. Reefs are the focus of a wide variety of activities, including education, research, recreation, tourism, and fishing.

Many coral reef ecosystems around the world are being degraded and severely threatened by human activities, including land-based pollution, over-fishing, destructive collection and fishing practices, reef mining, coastal development, vessel groundings, siltation, and climate change. The international trade in live coral, other reef invertebrates, reef fish, live rock, live sand and coral gravel for marine aquaria can, if not properly managed, contribute to the decline and degradation of coral reefs through destructive collection and fishing practices and overexploitation of resources. With proper management, these resources can be harvested in a sustainable manner, represent a source of income for under-developed areas, and provide an economic incentive for long-term protection.

Mariculture and aquaculture (i.e., the culturing of aquatic organisms such as fish, invertebrates, and aquatic plants, either in their natural environment or in artificial environments) are seen as ways by which some pressure may be taken away from certain coral reef ecosystems and their marine aquarium organisms that have been, or have the potential to be, overexploited by the marine aquarium trade. Some forms of mariculture provide additional habitats in which fish and other organisms can thrive. Commercial mariculture and aquaculture can create valuable employment in the countries of origin, and some industry operations and fishery management systems already demonstrate that responsible culturing of marine aquarium organisms is possible.

However, commercial culturing of marine ornamentals can also sometimes have negative environmental and social impacts. To date there has been no independent, objective system internationally available to verify whether a company is culturing marine ornamentals responsibly or not.

This Mariculture and Aquaculture Management (MAM) Standard is intended to close the gap by providing a means to ensure that marine aquarium organism culturing is performed to the best possible practices that meet internationally approved environmental and socioeconomic criteria (e.g., United Nations Department on Economic and Social Affairs, Division for Sustainable Development).

II. MAC Standard Development and Implementation

The Marine Aquarium Council (MAC) is an independent, not-for-profit, non-governmental international organization. The mission of MAC is to conserve coral reefs and other marine ecosystems by creating standards and certification for those engaged in the culturing, collection and care of ornamental marine life from reef to aquarium.

MAC Standards are international performance standards for the international trade in marine aquarium organisms prepared under the direction of the MAC Standards and Certification Advisory Committee (SCAC). They are subject to a broad and inclusive stakeholder review and consultation process within and outside the marine aquarium sector.

The MAC Standards are used for third-party certification of the marine aquarium trade. MAC Accredited certifiers undertake the assessment of an organization to the appropriate portion of the relevant standard.

This Mariculture and Aquaculture Management (MAM) Standard covers the activities of the marine aquarium organism culturing-sector, including:

- The placement and use of cages, racks, cultured live rock, coral propagation, grow-out ponds and culturing facilities;
- The general culturing activities from broodstock/post-larvae receipt through to grow-out to market size.
- The packaging and transport of cultured marine aquarium organisms from the culturing facility.

The requirements in this international standard are applicable to the culturing of marine aquarium organisms in the marine environment, and in land-based “stand-alone” operations. This includes land-based operations dedicated primarily to the culturing of marine ornamental organisms, and “in facility” operations that are primarily dedicated to wholesale, retail, research and education, personal enjoyment, etc, where culturing and propagation for commercial purposes also occurs.

The MAC Secretariat, a small Experts Group, the MAC Board of Directors and an approximately 60-member international, multi-stakeholder MAM Standards Advisory Group (SAG) prepared the MAM Standard through several rounds of review and revision.

In order to meet the immediate need for certification, the Marine Aquarium Council works with stakeholders to develop the MAC Standards and their implementation in phases. The first phase is the "Development Phase," which involves the initial implementation of a MAC Standard as the basis for refining and improving it.

The “Development Phase” acknowledges that accurate data associated with the marine aquarium trade (especially related to marine aquarium organism abundance on the coral reef, the volume and kinds of organisms, and their survival in trade) are limited. It therefore allows for adaptive management through the interpretation of the Standard as more data are gathered about the industry and the growth, impact, and issues surrounding the trade.

During the "Development Phase," the MAC SCAC can recommend interpretations and revisions to the Standard, which would be passed to the MAC Board of Directors for review and authorization, as appropriate. The “Development Phase” enables “lessons learned” to be documented, and the MAC Standards and Certification system to be adjusted and improved before moving to an established phase of activities.

The MAC Board will terminate the Development Phase upon the publication of the revised MAC Standards and Certification Program documentation. All stakeholders have the right to submit comments at any time during the 5 year period before the next review. Any comments with respect to the MAM Standard, or any other MAC Standard, should be sent via email to standards@aquariumcouncil.org.

III. Scope

The MAC MAM Standard addresses the mariculture and aquaculture management, propagation, collection, and culturing of marine aquarium organisms, including cultured live rock, for the marine aquarium trade.

Aquaculture and mariculture activities are divided in the MAM Standard as follows, with **mariculture of marine species** taken as “culturing in a marine environment” and **aquaculture of marine species** as “culturing in a land-based environment.”

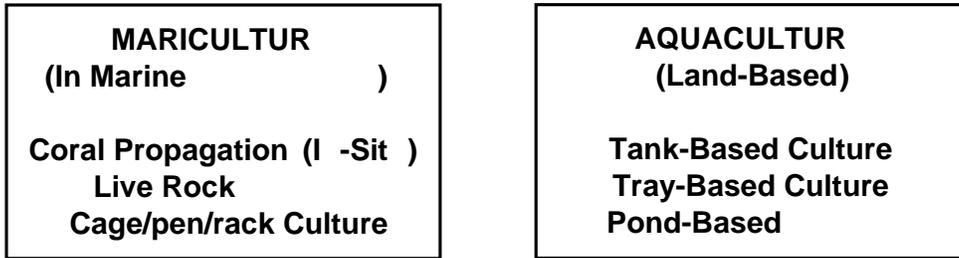


Figure 1 – MAC MAM Standard Production Methods

The MAC MAM Standard should also be read in conjunction with the MAC Ecosystem and Fishery Management (EFM) and Collection, Fishing and Holding (CFH) Standards and HHT standards. The relationship between these standards and the MAC MAM Standard is as follows:

Activity Undertaken Applicable MAC Standard	The Management of The Collection Area of Wild Fish, Invertebrates and Corals, Post-larvae and Broodstock Marine Aquarium Organisms.	The Management and placement of Sea Cages/Tables, Cultured Live Rock and Coral Propagation in the Marine environment.	The Collection and Holding of Wild Fish, Invertebrates and Corals, and Broodstock Marine Aquarium Organisms	General Requirements for Marine Aquarium Organism Culturing
EFM – Ecosystem and Fishery management	<ul style="list-style-type: none"> - Management Principles - Collection Area Management Plan (CAMP) - Components Of a CAMP - Effectiveness Of a CAMP - Communication 			
CFH – Collection, Fishing and Holding			<ul style="list-style-type: none"> - Order Instruction Requirements - Ability to meet CAMP Requirements - Marine Aquarium Organism Collection and Fishing - Collection and Fishing Management - Holding, Handling and Husbandry (HHT) Requirements 	
MAM –Mariculture And Aquaculture Management		<ul style="list-style-type: none"> - Mariculture Area Management Principles - Mariculture area Management Plan (MAMP) - Components of a MAMP - Environmental Impact (EIA) and Risk Assessment - Ability to meet MAMP Requirements - Coral propagation - Cultured live rock - Sea Cage/Table Siting and Grow Out - Organism Identification and Mortality Monitoring 		<ul style="list-style-type: none"> - Broodstock and Post Larvae - Hatchery Operations - Nursery Operations - Land-Based Grow Out - Culturing Management - Handling and Control of Cultured Organisms and Live Rock - Contract and Orders - Documentation - Personnel - Traceability of Certified Marine Aquarium Organisms - Holding, Handling, Husbandry and Transport (HHT) Management - Record Keeping - Identification, Dispatch and Packing of Marine Aquarium Organisms

Figure 2 - Relationship between the MAC MAM Standard and MAC EFM and CFH Standards

The detailed activities of culturing in a facility or stand-alone operations as described by the MAM Standard are as follows:

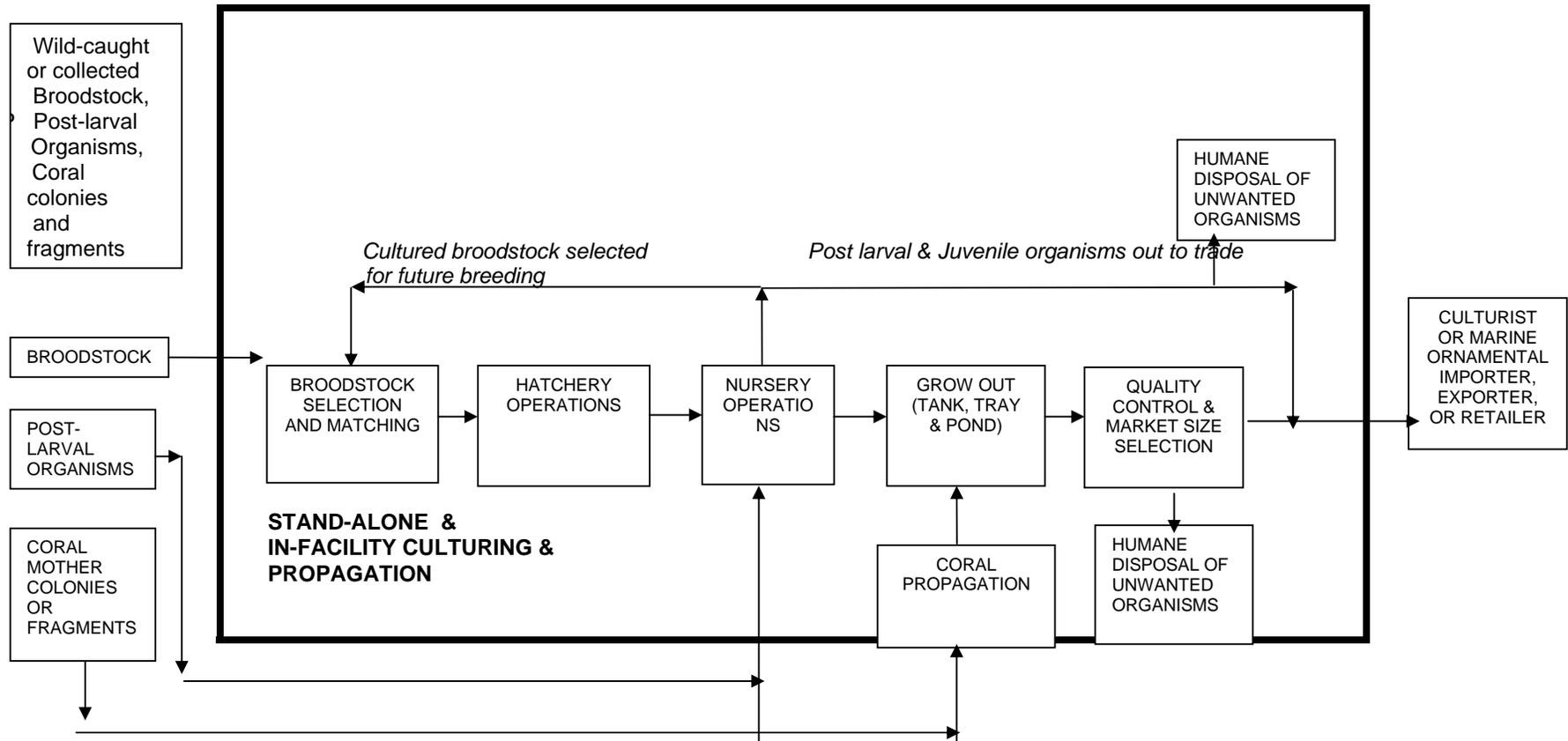


Figure 3 - MAM Standard Culturing Processes

IV. Requirements for Mariculture and Aquaculture Management Certification

1.0 PURPOSE

To ensure that the mariculture and aquaculture management systems used by culturing organizations are based upon best practices that ensure that organisms are maintained in optimal health throughout the complete culturing process and that potential environmental and social impacts are mitigated.

2.0 MARICULTURE

2.1. Mariculture Area Management Principles

- a) All commercial activities within the mariculture area support sustainability and the conservation of biological diversity;
- b) Basic principles of environmental management and ecosystem management are applied within the mariculture area;
- c) All activities are undertaken in a planned and organized manner, and in accordance with a mariculture area management plan;
- d) The placement and removal of coral fragments, cultured live rock, cages, etc. shall be undertaken so as to minimize negative environmental impacts of the mariculture area;
- e) Every reasonable means shall be taken to scale down the reliance on wild-collected stock over time;
- f) Exotic species shall not be kept in cages or in open culture.

2.2 Mariculture Area Management Plan

2.2.1 Those managing the mariculture area shall produce and implement a Mariculture Area Management Plan (MAMP) consistent with the above management principles.

For community-based mariculture, NGO or government assistance/oversight may be required until such time as local management processes are established and fully functional.

2.2.2 The MAMP shall be consistent with any other authorized local or regional management plans that encompass the area.

For sites under customary/traditional ownership, the activity must be in conjunction with a community-based resource management plan.

2.3 Components of a MAMP

The MAMP shall include the following significant components:

- a) geographical boundaries of the area including the delineation of coral propagation areas, cultured live rock placement areas, location of cages, pens, racks or other physical facilities in the marine environment, and other relevant and/or associated activities, as appropriate, ownership and political boundaries of the area,
- b) identification and listing of all stakeholders relevant to the area,
- c) projected annual volume of maricultured organisms to be produced,
- d) history of the use of the area for the mariculture of marine aquarium organisms,
- e) listing of significant organisms in the area, including natural coral resources, besides those being cultured,
- f) listing of significant activities in area besides the culturing of marine

ornamentals,

- g) a process for monitoring the area, including the detection and reporting to the appropriate legal authorities, the use of destructive culturing practices,
- h) a process for ensuring that unsuitable species are not cultured. (list still to be added)
- i) a process for insuring that the cultured organisms are native to the area and could not result in the introduction of a non-indigenous species, exotics or varieties.

2.4 Ability to Meet Mariculture Area Management Plan Requirements

2.4.1 *Compliance with Relevant National and Local Laws and Regulations*

Culturists shall comply with relevant national and local laws and regulations with respect to access to, and culturing within, the certified collection, propagation and placement area.

2.4.2 *Compliance with MAMP*

Culturists shall comply with the requirements of the MAMP produced by those managing the mariculture area.

2.4.3 *Compliance with Government and Community Management Plans*

Culturists shall comply with the requirements of any management plans produced by the appropriate legal and/or customary authority that encompass the mariculture area.

2.4.4 *Compliance with MAC EFM and CFH standards*

Culturists shall insure that broodstock, post-larvae, mother colonies and coral fragments come from sources compliant with EFM and CFH Standards.

2.5 Environmental Impact and Risk Assessment

An environmental impact and risk assessment shall be undertaken for each mariculture area to ensure that *in-situ* coral propagation, cultured live rock placement and cage placement minimizes damage to habitats and interference with the amenity of other coastal resource users. For new ventures, the EIA should be carried out before mariculture commences.

3.0

CORAL PROPAGATION

- a) All whole colonies taken from the wild, or fragments taken from them, will be considered wild caught mother colonies for the purposes of the export, no matter how long the coral is grown.
- b) After being cultured **for at least 12 months** as “mother” colonies, the fragments are ready for pruning. These fragments will be pruned from new growth of the mother colony (or fragments thereof) to produce first generation coral fragments that are considered at that point to be cultured coral seed
- c) Cultured (first generation) coral seed must be grown for a minimum of six months for the resulting coral colonies to be considered second generation farmed corals.
- d) Second generation (and higher) farmed corals shall be considered as **maricultured, aquacultured or farmed.**
- e) All coral fragments from verified second- and third-generation farmed corals shall be considered to be farmed corals.
- f) The relative times needed for culture for various species of farmed corals shall be verified by skeletal overgrowth of tags, bases, and lines, as appropriate.
- g) Second generation (and higher) farmed corals shall be grown on an identifiable substrate that is easily distinguishable from those used as mother colonies (or fragments thereof), and for first generation corals.

h) For verification, each genetic line of farmed corals (those descending from a single mother colony) shall be given a clone name, an associated detailed phenotypic description, and a label, so that each coral is traceable to its original mother colony.

4.0 CULTURED LIVE ROCK

a) Cultured live rock shall not contain any natural coral rock or any toxic substance as an ingredient. However, aragonite or coralline limestone from the land can be used.

b) Live rock shall be cultured for a minimum of 12 months before being made available for retail sale.

c) Product sold to the market should have at least 50% coverage of coralline algae.

d) Live rock that has been maricultured (i.e., cultured *in-situ* in the ocean) or aquacultured in such away as to pose a risk of subsequent alien invasive species introduction, shall be cured for a minimum of 14 days prior to dispatch.

5.0 CAGE AND NET /PEN/RACK/TABLE PLACEMENT AND GROW OUT

a) Cages/pens/racks and other physical structures shall be sited to minimize damage to habitats and interference with the amenity of other coastal resource users.

b) Cages/pens/racks/tables are not to be placed directly over, or upstream of, living coral reef habitat.

c) Protocols shall be developed to address the site selection, anchoring, light, current and nutrient changes associated with cage and net-pen operations.

d) The farming operation should not result in an increase in water column parameters (nitrogen or phytoplankton, particularly when supplementary feeds are used) in the surrounding waters, and should not increase sedimentation rates directly beneath the farm.

e) Currents should be sufficient to maintain dissolved oxygen levels within the pen.

f) Lighting can be used only for worker safety around the cages, and not to increase growth performance.

g) Cages and net pens shall be designed and managed to prevent escape of cultured animals and shall not be used for exotic or **non-indigenous** species.

h). Hybrids and selectively bred organisms are not allowed in net-pens.

i) Coral tables can be built in two tiers, those above being light-loving species sheltering those that grow better at lower light levels. There should be enough space between the tiers to allow for growth. This maximizes space and allows species that are otherwise cultured at greater depths to be cultured in shallower water, allowing them to be reached and maintained without the use of scuba gear.

j) Coral tables should not be placed over wild living coral, as this prevents wild coral growing through the table and encrusting on the table, making it difficult to maintain or move.

k) If shellfish spats (larvae) are collected and reared on spat collectors, changing density shall be done at sufficient age for manipulation and shellfish removals.

6.0 OTHER MARICULTURE REQUIREMENTS

6.1 Organism Identification and Mortality Monitoring

a) All fish, coral and other invertebrates, and cultured live rock shall be screened at the culturing area according to established quality criteria.

b) Mortality and rejected organisms identified during holding shall be recorded by species batch collection area and collector in a logbook or similar document, immediately prior to dispatch. Each culture facility should demonstrate a trend in decreasing levels of dead and rejected organisms.

c) The following information shall be recorded by the culturist for each species batch; culturist ID, Marine Organism ID (i.e., MOID or equivalent), CITES permit number

(where applicable) number of organisms or weight/volume of cultured live rock, post-larvae, and collection/propagation period.

6.2 Humane Organism Disposal

- a) When required cultured organisms shall be destroyed in a humane manner in accordance with appropriate national, provincial, state and local regulations.
- b) Animals may not be disposed of for reasons including age, size, abundance, or lack of market value.

6.3 Mariculture Site Maintenance

- a) Sites must be maintained in a tidy and uniformly laid out appearance. The outward appearance of the site shall reflect the aesthetic standards of the community.
- b) Cages/pens/ racks/tables or other structures in the marine environment shall be built and maintained in such a way that they minimize visual impacts and effects on the environment in close proximity, and in accordance with the EIA.
- c) Cages/pens/racks/tables and other structures in the marine environment (e.g., coral tables) must not obstruct vessel traffic in the area, and must be clearly identified with a buoy or other suitable marker, and must comply with national, provincial, state and local regulations as applicable.
- d) If possible, GPI coordinates should be established for each site location and registered with the authorities.
- e) An adequate surveillance/guarding system should be installed in areas where there is a risk of buoys or livestock being stolen, or of the site attracting unwanted attention.

6.4 Natural Disaster Emergency Plan

- a) All mariculture areas shall have an emergency plan in place that ensures that appropriate action is taken to move or destroy those organisms, and move or secure cages /pens/racks or other structures in the marine environment during a severe natural event such as a major storm, flood or tsunami.
- b) The development of a natural disaster plan should be anticipated as part of the EIA.

7.0 AQUACULTURE

Sustainable aquaculture of marine organisms should not contribute to significant greenhouse gas or toxic chemical release and should conform to relevant international conventions, including the Convention on Biological Diversity.

7.1 Broodstock, Post-larvae, Coral Fragments, etc.

7.1.1 *Receipt of Broodstock, Post-larvae, Coral Fragments, etc.*

- a) Purchased broodstock, post-larvae, coral fragments, etc. shall, where possible, come from a MAC Certified collection area or MAC Certified culturing facility. Post-larvae shall be checked to ensure the purity and correct identification of the specimens, and the absence of non-target species.
- b) Wild-caught post-larvae shall be placed in isolation within a quarantine system for a minimum of 14 days.
- c) Purchased post-larvae shall not be released from quarantine unless they have been free of obvious signs of disease for a minimum of 3 days.
- d) Dead on arrival (DOA) of purchased broodstock and post-larvae shall be recorded per batch at the species level upon receipt of each consignment.
- e) Sub-standard delivery performance shall be reported to the supplier. The supplier must identify and undertake corrective action to resolve the problem, record the corrective action taken and communicate this to their customer.

7.1.2 *Acclimatization of Broodstock and Post-larvae*

- a) Newly-arrived livestock, broodstock and post-larvae shall be clearly marked, isolated, acclimatized, and rested until normal healthy behavior has been re-established.
- b) DOA shall be recorded at the species level upon receipt of each consignment. All consignments for exportation and transfers between facilities with a DOA level above 1% are no longer considered MAC Certified .
- c) Newly-arrived purchased marine aquarium organisms shall be separated from previously held stock, clearly marked, acclimatized, and rested, using a separate water circulation system until normal healthy behavior has been re-established.
- d) DAA shall be recorded at the species level at all stages from acclimatization to dispatch. Each batch of species arrived from exportation and transfers between facilities with a DAA level above 1% shall no longer be considered MAC Certified.
- e) Consignments that have been decertified because of a DOA level above 1% may be recertified if, after being held for a period of 3 days, there is no further mortality.
- f) For post-larvae newly captured and arrived at the first time in a facility, all consignments with a DAA level above 10% per batch of species are no longer considered MAC Certified.

7.1.3 *Long-term Care of Broodstock*

Broodstock shall be managed for their long-term care with adequate tank, cage, or pond size and proper diet provided.

7.1.4 *Basic Materials and Stock Origin/Breeding*

- a) Dependence on any wild-caught broodstock, coral fragments, etc. shall be documented.
- b) Where possible, locally- caught/collected broodstock, coral fragments, etc. shall be used instead of imported or translocated broodstock, coral fragments, etc.
- c) Stock for reseeding shall be kept separate from selectively bred stock lines.
- d) Records of any selective breeding program (stock origin, crosses, etc.) shall be kept for a minimum of 2 years in an accessible form.
- e) The reappearance of any disease outbreak at a mariculture site shall be documented, reported and controlled using appropriate techniques.
- f) To take pressure off species that are overexploited by the marine aquarium trade, overseas culture should focus on the most commonly overexploited species, and not only on organisms that can be cultured with ease in the country of origin.
- g) Selection of species in trade should take into consideration the potential longer-term economic impacts of overproduction of certain species, in both the exporter and buyer countries.

7.1.5 *Transgenic or Genetically Modified Organisms*

Use of transgenic or genetically modified organisms is prohibited.

7.1.6 *Hybrids*

- a) Species hybridization is permitted, but must be well documented.
- b) No hybrids may, for any reason, be released into the wild.
- c). Hybrids and selectively bred organisms are not allowed in net-pens.

7.2 Hatchery Operations

7.2.1 *Egg Handling*

- a) An estimate of fertility shall be calculated per fertilized batch.
- b) The success of breeding programs shall be monitored as a percentage of viable

batches, against what is considered average viability per species.

- c) Dead eggs shall be removed as appropriate to reduce the risk of fungal or disease outbreaks.
- d) Breeding programs should show a trend of increasing viability over time.

7.2.2 *Origin of, and Escape Prevention for Non-indigenous Live Feeds*

Where required and in accordance with appropriate local, provincial, state, and national legislation:

- a) Mechanisms shall be in place to prevent escape of non-indigenous live feeds, including non-indigenous “strains” of live feed organisms. Risks of escapes should be established during the EIA.
- b) Chlorine bags/tablets shall be readily available for use in the case of escapes into effluent ditches/drains.
- c) Effluent shall be monitored to ensure there is no release of non-indigenous species.

7.2.3 *Larval Rearing*

- a) Larval rearing areas and procedures shall be in place to maximize larval growth and survival in accordance with known best practices for the species cultured.
- b) Water quality shall be maintained within the tolerances of the species cultured. Water quality parameters shall be sampled, recorded and documented in accordance with known best practices for the species cultured.
- c) Larval rearing areas shall be designed and operated to prevent escape of cultured species.
- d) Antibiotics and bacteria control agents shall not be used routinely (or prophylactically) for larval rearing. The use of antibiotics and bacteria control agents in rearing shall be used only in response to a documented and properly diagnosed disease outbreak.
- e) Use of antibiotics, bacteria control agents, probiotics and other chemicals shall be in accordance with appropriate national, provincial, state and local regulations and prescribed by a veterinary doctor where available, or by a qualified fish health professional.

7.3 Nursery Operations

7.3.1 *Cultch (Setting Substrate)*

- a) Cultch shall not be made from non-food grade materials or materials that have previously contained toxic or harmful materials or vehicle tires.
- b) The use of disinfectants on cultch prior to their use shall be consistent with known published best practices.

7.3.2 *Photoperiod Manipulation*

Hatchery operations may alter photoperiods to encourage species into liberating gametes, as long as this activity is short-lived and not detrimental to the health of the broodstock. All photoperiod manipulations shall be recorded.

7.4 Land Based Grow Out

7.4.1 *Tank Siting and design*

- a) Following a positive risk assessment, tanks shall be sited to provide treatment options to minimize nutrient loads (and other pollutants, including antibiotics and bacterial control agents in effluent water prior to its release to natural receiving waters.
- b) Tanks shall be designed, placed and managed so as to minimize possible escape of **exotic** organisms in the event of a natural disaster.

7.4.2 *Trays-Coral and Shellfish Density*

- a) Coral and shellfish density levels per tray must reflect due considerations of the optimal health of the marine aquarium cultured organisms.
- b) Corals shall be attached to their trays in such a way so as to maximize their health, and to prevent them from tipping over.

7.4.3 *Ponds - Siting and design*

- a) Ponds shall not be sited within mangroves or in potentially acid sulphate soil areas.
- b) Ponds shall be sited to provide treatment options to minimize nutrient loads in effluent water prior to its release to natural receiving waters.
- c) Pond systems shall be designed and managed to prevent escape of cultured animals.
- d) Ponds shall be designed so that they drain down completely to enable complete dry-out for routine management and should a disease outbreak occur.
- e) Where seepage from culturing facilities is likely to cause saltwater intrusion into the freshwater table, pond liners shall be used.
- f) Pond water shall be treated prior to release into natural watercourses.
- g) Land ownership of natural watercourses adjacent to ponds should be considered.

7.5 Culturing Management

7.5.1 *Live Feeds*

- a) Wherever possible, live feed shall come from a sustainably managed resource
- b) Production of live feeds shall be undertaken in accordance with national, state, provincial and local regulations, including requirements involving translocation of exotic species or strains of live feed organisms, and provisions to prevent escape.
- c) Live feeds provided shall be of optimal quality for the species being cultured. Where necessary, nutritional supplementation of live feed organisms shall be included to increase levels of polyunsaturated fatty acids, vitamins and other nutritional components, and to promote full coloration.

7.5.2 *Effluent Management*

- a) Culturing shall be practiced in ways that minimize the environmental impacts of waste. Environmental impact assessments shall be undertaken to demonstrate that such methods are being used.
- b) Environmental monitoring shall be undertaken as appropriate to demonstrate that methods identified in the Environmental Impact Assessment are effective.
- c) All effluents will be released according to local rules and regulations. No water will be dumped into the municipal sewers except when specifically allowed.

7.5.3 *Sediment Management*

- a) Effluent from aquaculture facilities shall pass through a treatment process (e.g., settling ponds, physical filtration system, etc.) to remove settleable and suspended solids prior to release of the effluent into natural receiving waters.
- b) Sediment shall be dried out for a recommended time period, or chlorinated and removed and disposed of in an environmentally responsible way, before ponds are refilled.

7.5.4 *Biochemical Oxygen Demand (BOD) and Nutrient Management*

Effluent from aquaculture facilities shall pass through a treatment process to reduce levels of BOD and waste nutrients prior to its release to natural receiving waters, in accordance with the national/local regulations and recommendations of the EIA.

7.5.5 *Pathogens and Parasites in Effluent*

Effluent shall have non-detectable levels of pathogens and parasites. Routine monitoring of effluent levels is advised.

7.5.6 *Stock Escape Prevention*

All effluent channels shall be double screened to prevent organisms from escaping. Flooding barriers shall be used as appropriate. Culture facilities containing exotic species must not have a potential seawater connection with subtropical or tropical seas, including potential storm surge.

7.5.7 *Noise, Light and Odor Pollution*

Noise, light and odor pollution arising from culturing activities shall be minimized.

7.5.8 *Nutrition and Feeding*

Use of transgenic or genetically modified ingredients in formulated diets and transgenic or genetically modified live feeds is prohibited.

7.5.9 *Introduction of Exotic/Non-Indigenous Species*

a) Exotic species shall not be kept in cages or in open culture.

b) Any introduction of exotic species shall be undertaken in accordance with relevant licensing and local, state, provincial and national legislation as well as in accordance with international 'Best Practice' documentation (e.g., CBD, ICES Code of Practice on the Introductions and Transfers of Marine Organisms 1994; FAO / NACA Asia Regional Technical Guidelines on Health Management for the Responsible Movement of Live Aquatic Animals, IUCN Guidelines for Re-Introductions).

7.5.10 *Storage and Disposal of Farm Supplies*

Farm supplies shall be kept under lock and key, and be catalogued to ensure safe consumption, protection from theft, and prevention of contamination. All farm supplies shall be disposed of in a fashion that is both legal and responsible and in accordance with local, provincial, state, and national guidelines.

7.5.11 *Drug and Chemical Use and Management*

a) The use of hazardous chemical inputs and drugs shall be consistent with known best practices and in accordance with relevant local, state, provincial and national legislation.

b) The safe, effective, and minimal use of therapeutants, hormones and drugs, antibiotics, and other disease control chemicals shall be ensured. Records shall be kept of all therapeutants, hormones, drugs, antibiotics, and chemicals used.

c) Treatment of diseases should be carried out only after diagnosis and treatment recommendations by a qualified fish health professional.

d) Known carcinogens shall not be used under any circumstances.

7.5.12 *Marine Organism Health and Welfare*

a) A high standard of health and welfare management of marine aquarium cultured organisms shall be promoted by minimizing stress, reducing the incidence of disease, and respecting the natural behavioural needs of those organisms.

b) Stocking densities shall be such as to maintain water quality, organism growth, and survival rates.

c) Fish and invertebrates shall be monitored regularly for signs of disease. Records of disease outbreaks, including treatment, recovery and/or disposal of organisms, shall be maintained and kept.

d) Farms shall ensure that fish and invertebrates sold are free of visual and external signs of disease, and of known pathogens of concern.

7.5.13 *Mutilation*

- a) Marine aquarium cultured organisms must not be subject to any kind of mutilation with the exception of the cutting of the byssus when harvesting bivalves if done without damaging internal organs. Also excepted is the fragmentation of coral colonies for propagation purposes.
- b) Small tags may be used for stock identification. Larger tags can be used on corals, but are preferably attached to the supporting base

7.5.14 *Incidental Mortality*

- a) Mortality due to occasional pathology or fish “jumping out of a tank” must be recorded as dead after arrival (DAA), and, if it occurs on a consistent basis, corrective and preventive action shall be taken.
- b) Mortality as a result of predation and cannibalism shall induce specific corrective and preventive actions to reduce these events; these shall be notified.

7.5.15 *Pest Control*

- a) Pest control practices must target specific animals with minimal impact upon the environment, and be undertaken in accordance with appropriate national, provincial, state and local regulations.
- b) Pest control devices shall be permanently secured at all times to ensure they do not present undue risk of injury to wildlife.

7.5.16 *Humane Organism Disposal*

When required cultured organisms shall be destroyed in a humane manner in accordance with appropriate national, provincial, state and local regulations.

7.5.17 *Culturing Facilities Maintenance*

Sites must be maintained in a tidy and uniformly laid-out appearance. The outward appearance of the site shall reflect the aesthetic standards of the community.

7.5.18 *Natural Disaster Emergency Plan*

All facilities shall have an emergency plan in place that ensures that appropriate action is taken to move or destroy organisms during a severe natural event such as a major storm, flood, high surf or tsunami at a predetermined trigger point of flood level, storm force warning, tsunami warning, high surf warning, etc.

8.0 GENERAL REQUIREMENTS

8.1 Contract and Order Documentation

- a) Culturing facilities shall clearly describe how they identify and review their buyer order instructions.
- b) Customers’ orders shall be reviewed before a commitment is made to supply the marine aquarium organisms specified. This review shall ensure that customer’s instructions are clearly defined and unambiguous. This review shall also be undertaken when customer amends or changes their order instructions.
- c) Culturing facilities shall review their ability to meet their customer’s order instructions, and shall not overproduce stock.
- d) Culturing facilities shall implement effective liaison with their customer and shall define communication requirements relating to the handling of customer enquiries and orders.

8.2 Personnel

8.2.1 *Assignment and Training of Personnel*

- a) All individuals working within a culturing facility shall be selected and assigned to each activity based upon their training and experience.
- b) Culturing facilities shall determine the training needs of their personnel and provide

training to address those needs.

c) For community-based mariculture of organisms within customary ownership areas, training should be provided by a qualified NGO or the company working with the community.

8.2.2 *Work Instructions*

Culturing facilities shall maintain current information and instructions that are necessary to achieve the handling and transportation of marine aquarium organisms to the buyer's order instructions.

8.2.3 *Compliance with Workplace Laws*

a) Collectors and culturists shall ensure compliance with the acceptable health and safety factors of the work environment that meet with local and national workplace laws and regulations.

b) The minimum age of culturists shall be 16 years of age, or the minimum age stipulated by local labor laws which ever is the highest.

c) Culturists shall demonstrate that they are aware of and comply with the health and safety criteria associated with their collection, placement and propagation activities and in particular with respect to scuba diving and the use of hookah (if applicable).

8.3 Traceability of Certified Marine Aquarium Organisms

8.3.1 *Documentation*

Culturing facilities shall operate and maintain a documentation system for assuring that marine aquarium organisms being sold and listed as MAC Certified come from a MAC Certified collection area and supplier.

8.3.2 *Certified Status*

a) Culturing facilities shall operate a system for ensuring that when MAC Certified marine aquarium organisms are received and shipped they are clearly identified as being MAC Certified.

b) MAC Certified marine aquarium organisms shall remain easily identifiable as MAC Certified throughout all stages of fish, invertebrate and live rock culture, and/or coral propagation, handling, transportation, and acclimatization.

8.3.3 *Co-mingling and Maximization of Holding*

a) Where space is limited and other segregation methods have been exhausted, MAC Certified marine aquarium organisms may be mixed with uncertified organisms or MAC Certified organisms of a different species if the other species are significantly visually different from the MAC Certified species being added.

b) If organisms are co-mingled, the holding tank, cage/pen/rack, tray, or pond shall be clearly labeled for all species, and clearly indicate which species are MAC Certified. An additional label shall state, "Not all species within this tank, cage/pen/rack, tray or pond are MAC Certified."

8.3.4 *Traceability Pre- and Post-Acclimatization*

Certification traceability shall be maintained throughout and after the acclimatization process.

8.3.5 *Identification Control*

Culturing facilities shall operate a secure system for the identification of MAC Certified marine aquarium organisms that ensures that only its own MAC Certified marine aquarium organisms are labeled with the MAC Certified label.

8.3.6 *Control of MAC Certified Label Pack*

The organization shall accept legal responsibility for ensuring that the MAC Certified

Label Pack(s) issued to it is not used by any unauthorized users, or for unauthorized uses.

8.4 Holding, Handling, Husbandry, and Transport Management

- a) Marine aquarium organisms shall be kept in facilities and containers that are adequate to maintain or improve the health of the organisms.
- b) Water quality and temperature shall be maintained at the levels required to maintain optimal health of the marine aquarium organisms.
- c) Culturing facilities shall manage marine aquarium organism handling, packing, and transport by having clearly understood work standards and instructions, suitable equipment, and safe working practices and working environment.
- d) Culturing facilities shall ensure that inspection and testing are undertaken where required to maintain optimal health of the marine aquarium organisms.
- e) Culturing facilities shall produce instructions for, and assign trained staff to, activities to ensure that they do not adversely affect the health of the marine aquarium organisms.
- f) Culturing facilities will keep a record of shipping mortality for stock originating from the operation, and must be able to document that no two consecutive shipments are graded "poor".

8.5 Record Keeping

8.5.1 *Receipt and Dispatch Records*

Culturing facilities shall maintain appropriate records of all incoming marine aquarium organisms, acclimatization, and outgoing marine aquarium organisms.

8.5.2 *Mortality Records*

DOA and DAA records shall be maintained for all marine aquarium organisms.

8.5.3 *Traceability Records*

Records shall be sufficient to allow an independent assessor to trace back from any given outgoing MAC Certified marine aquarium organisms to in house bred or incoming MAC Certified marine aquarium organisms.

8.5.4 *Record Retention*

Records shall be maintained for a minimum of two years.

8.5.5 *Control of Nonconformity*

Culturing facilities shall provide for identifying, recording, and reviewing the nature of problems and complaints.

8.6 Identification, Dispatch and Packing of Marine Aquarium Organisms

8.6.1 *Labeling*

MAC Certified marine aquarium organisms shall be labeled or otherwise be identifiable in a manner that does not become detached during storage, handling, or transport.

8.6.2 *Invoicing*

Culturing facilities shall operate a system that allows any marine aquarium organism sold as MAC Certified to be linked to the specific sales invoice issued by the organization.

8.6.3 *Control of Certified Sales*

Culturing facilities shall operate a system to ensure that all sales invoices issued for MAC Certified marine aquarium organisms include a description of the organisms, the quantity of the organisms, the declared shipping time, and the company's MAC Certificate Registration Code and expiration date.

8.6.4 *Dispatch*

All marine aquarium organisms shall be shipped in containers suitable for the journey to ensure optimal health. Special regard shall be paid to the temperature conditions and shipping time.

8.6.5 *Make Weights*

"Make weights" shipments shall not be made unless documented as previously agreed to by the buyer.

8.6.6 *Declared Shipping Time*

a) Culturing facilities shall estimate the amount of shipping time each consignment will take to arrive at its final destination and pack the marine aquarium organisms appropriate to the declared shipping time.

b) Culturing facilities shall design and implement packing systems that maintain the optimal health of the marine aquarium organisms and **zero DOA** under normal circumstances within the declared shipping time.

c) Culturing facilities shall declare and record for each consignment the maximum allowable declared shipping time suitable to maintain optimal health of the marine aquarium organisms and zero DOA under normal circumstances.

V. Definitions

MAC has, where possible, provided a definition for terms used in MAC Standards documents. Each definition below is meant to provide an overarching description of the term being defined. Where possible, we have tried to use terminology and definitions that have wide international acceptance and use.

Where possible, the definitions below were taken from the following sources:

- Convention on Biological Diversity (CBD)
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)
- UN Environment Program's Global Biodiversity Assessment (GBA)
- UN Food and Agriculture Organization (FAO)

- (1) The term "*acclimatization*" means to slowly adapt an organism from the water quality parameters it was shipped in to conditions for optimal health and normal healthy behavior of the organism, with special emphasis on pH, temperature, and salinity levels.
- (2) The term "*accreditation*" means a procedure by which an authoritative body gives formal recognition that a body or person is competent to carry out specific tasks.
- (3) The term "*aquaculture*" means the farming of aquatic organisms including fish, molluscs, crustaceans, corals and other invertebrates, and aquatic plants with some sort of intervention in the rearing process to enhance production, such as regular stocking, feeding, protection from predators, etc. Farming also implies individual or corporate ownership of the stock being cultivated. (FAO)
- (4) The term "*biological diversity*" means the variety and variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species, and of ecosystems. Diversity indices are measures of richness (the number of species in a system) and, to some extent, evenness (variances of species' local abundance). They are, therefore, indifferent to species substitutions, which may, however, reflect ecosystem stresses (such as those due to high fishing intensity). (FAO)
- (5) The term "*BOD*" refers to biological oxygen demand, a rough measure used to indicate levels of pollution. Water with a low BOD is relatively pure, while a high BOD indicates a high concentration of biodegradable organic matter present in a sample of water

- (6) The term “cage” means any moored cage structure, including floating cages or fixed net pen structures.
- (7) The term “certification” means the procedure by which a third party gives written assurance (certificate of conformity) that a product, process, or service conforms to requirements specified.
- (8) The term “certification traceability” means the documentation and other evidence by which a certified organism can be traced back from each certified customer to each certified supplier through the chain of custody all the way to the certified collection area from which it was collected.
- (9) The term “certifier or certification organization” means a third-party independent organization that assesses, on a commercial basis, other organizations or individuals for their compliance to the MAC Standards. Competence to do so is accredited by the Marine Aquarium Council.
- (10) The term “chain of custody” means the sequence of commercial operations or people responsible for the collection and trade in marine aquarium organisms. This begins with the collectors and extends to the retailer-sale and to the end customer. For the retailer to be able to offer certified marine aquarium organisms, all components of the chain of custody handling the organisms must be certified.
- (11) The phrase “collection and fishing” means the removal of live marine fish and corals and other marine invertebrates and plants from their natural environment for commercial purposes for use in aquariums as live organisms.
- (12) The term “collection area” means the geographical area of reef or other natural marine ecosystem or the geographical area defined by natural, political, social and/or ownership boundaries from which the marine aquarium organisms are collected or fished. For certification purposes, the collection area defines the physical space covered by the Collection Area Management Plan.
- (13) The term “Collection Area Management Plan” means a document or collection of documents, usually prepared by those managing the fishery, the purpose of which is to ensure the collection area is managed according to the principles of the MAC Standards.
- (14) The term “collector” means an individual engaged in the activity of removing marine aquarium organisms from their natural habitat for commercial purposes.
- (15) The term “co-mingled” means certified and uncertified marine aquarium organisms are mixed so that the origin of the organisms cannot be traced to a certified supplier and collection area.
- (16) The term “conservation” means:
 - (a) the judicious use and management of nature and natural resources for the benefit of human society and for ethical reasons. (GBA)
 - (b) the management of human use of the biosphere so that it may yield the greatest sustainable benefit to current generations while maintaining its potential to meet the needs and aspirations of future generations. Thus conservation is positive, embracing preservation, maintenance, sustainable utilization, restoration, and enhancement of the natural environment. (CBD)
- (17) The term “conservation of biological diversity” means the management of human interactions with genes, species, and ecosystems so as to provide the maximum benefit to the present generation while maintaining their potential to meet the needs and aspirations of future generations; it encompasses elements of saving, studying, and using. (CBD)

- (18) The term "*coral*" means any living or dead specimens, parts, or derivatives or any organisms containing specimens, parts, or derivatives of any organisms of the following taxonomic groups belonging to the phylum Cnidaria:
- (a) all species of black corals (Antipatharia), stony corals (Scleractinia), soft corals (Alcyonacea), thorny corals (Gorgonacea/Scleraxonia and Holaxonia) , organ pipe corals (Stolonifera), and blue coral (Coenothecalia/Helioporacea) of the class Anthozoa; and
 - (b) all species of the fire corals (Milleporina) and lace corals (Stylasterina) of the class Hydrozoa.
- (19) The term "*coral reef*" means any reef, shoal, or other natural feature composed in part of the solid skeletal structures in which corals are major framework constituents.
- (20) The term "*coral reef ecosystem*" means the interacting complex of organisms and nonliving variables associated with coral reefs and their habitats, including sea grass beds, sand flats, mangroves, and algal plains, that function as an ecological unit in nature.
- (21) The term "*coral reef organisms*" means:
- (a) any plant or animal (including algae, sea grasses, invertebrates, and vertebrates, but excluding mammals, reptiles, and birds) that live in, on, or in association with coral reefs and are directly dependent on the coral reef ecosystem for feeding, reproduction, or growth; and
 - (b) live rock.
- (22) The term "*cured*" means the process whereby live rock is cleaned (usually several times with a high-pressure hose) to remove all organisms (e.g. sponges) that are likely to die during holding and transit and then foul the water. The rock may be kept in the dark and sprayed with water rather than immersing it.
- (23) The term "*curio coral*" means coral collected and sold without intent to supply the organism as live.
- (24) The term "*customer*" means all purchasers of marine aquarium organisms at any stage of chain of custody, e.g., middleman/woman, exporter, importer, transshipper, retailer, consumer.
- (25) The term "*DAA*" means "Dead After Arrival," i.e., from acclimatization through the holding period until the organism is packed for onward shipping. For organisms such as colonial invertebrates, algae and live rock, "dead" means the entire organism or rock mass is no longer living or, if partially alive, is not likely to be able to be restored to optimal health following a reasonable period of good faith efforts by those responsible for acclimatization.
- (26) The term "*declared shipping time*" means the maximum period of time an organism can maintain optimal health in a closed container for shipping and is measured from the time the packing of a consignment is finished until that same consignment is opened for acclimatization. The supplier, e.g., exporter, must determine this time, pack the shipment accordingly and inform the receiver of this time.
- (27) The term "*destructive collection and fishing practices*" means the collection and fishing of live marine aquarium organisms through methods that are environmentally destructive or harmful, including but not limited to practices such as the use of poison/toxins, other deleterious materials, and explosives; reef dredging; and physical damage to non-target organisms, especially corals or other sessile invertebrates.
- (28) The term "*DOA*" means "Dead On Arrival," i.e., upon receipt and opening of the shipping container, at the beginning of the acclimatization period. This can extend to include a period of up to 24 hours after the opening of the shipping container. For organisms such as colonial invertebrates, algae, and live rock, "dead" means the entire organism or rock mass is no longer

living or, if partially alive, is not likely to be able to be restored to optimal health following a reasonable period of good faith efforts by the receiver.

- (29) The term “*documentation system*” means the collection of written policy statements, procedures, work instructions and records that make up the formal objective evidence to show that an organization or individual complies with the requirements of the MAC Standards.
- (30) The term “*ecosystem*” means:
- (a) a dynamic complex of plant, animal, fungal, and micro-organism communities and their associated non-living environment interacting as a functional unit; and/or
 - (b) the organisms living in a given environment, such as a tropical forest, a coral reef or a lake, and the physical part of the environment that impinges on them. (Adapted from CBD and GBA)
- (31) The term “*ecosystem integrity*” means the ability to support and maintain a balanced, integrated, adaptive biological community having a species composition, biological diversity, and functional organization comparable to that of natural habitat in the region. (FAO)
- (32) The term “*ecosystem management*” means management taking due account of all living organisms and their environment in the management area. In practice, this means management ensuring sustainability of target, dependant, and associated species. (Adapted from FAO)
- (33) The term “*environmental management*” means management and control of the environment and natural resources systems in such a way so as to ensure the sustainability of development efforts over a long-term basis. (FAO)
- (34) The term “*exotic*” means a species outside of its historical range. Exotic species in Mariculture are those species being grown in an area where they do not naturally occur.
- (35) The term “*exporter*” means any customer of marine aquarium organisms from the collector or other supplier, whether an individual (e.g., middleman/woman), company or other business entity, who exports all or some of those organisms to another country or state (e.g., from Hawaii).
- (36) The term “*fisher*” is a gender-neutral name for a person (male or female) participating in the catching, taking, or harvesting of fish or other aquatic organisms.
- (37) The term “*fishery*” means:
- (a) the sum (or range) of all fishing activities on a given resource. It may also refer to the activities of a single type or style of fishing. The fishery can be artisanal and/or industrial, commercial, subsistence, and recreational and can be annual or seasonal; and
 - (b) the activity of catching marine organisms from one or more stocks that can be treated as a unit for purposes of conservation and management and that are identified on the basis of geographic, scientific, technical, recreational, social, or economic characteristics and/or method of catch.
- (38) The term “*fishery management*” means the integrated process of information gathering, analysis, planning, decision-making, allocation of resources, and formulation and enforcement of fishery regulations by which the fishery management authority controls the present and future behavior of interested parties in the fisheries in order to ensure the continued productivity and well being of the living resources. (FAO)
- (39) The term “*grow-out*” means in aquaculture, the stage at which young fish have grown to market size.

- (40) The term "*habitat*" means the place or type of site where an organism or population naturally occurs. (CBD)
- (41) The term "*harvest*" means to capture, catch, or collect marine aquarium organisms from their natural environment for commercial purposes.
- (42) The term "*hookah*" means an air supply system that consists of a portable compressor that pumps air to the diver through a hose to a demand regulator. An alternative system may consist of an onboard tank of compressed air that is delivered to the diver through a rubber hose. The diver's teeth regulate the intake by biting down on the hose, or by using a regulator attached to the hose.
- (43) The term "*importer*" means a customer of marine aquarium organisms from an exporter or other supplier (whether an individual, company or other business entity) who pays for those organisms to be brought into another country or state (e.g., from the Philippines into Germany; from Hawaii into California).
- (44) The term "*live rock*" means any hard substrate that is attached to and supports any organisms identified in subparagraph (a) of the definition of "coral reef organisms."
- (45) The term "*MAC Accredited Certifier*" means formal recognition by the Marine Aquarium Council that a body is competent to carry out certification to the MAC Standards.
- (46) The term "*MAC Certified Industry Operator*" means an individual or organization that has been successfully assessed by a MAC Accredited Certifier as being in compliance with the requirements of the MAC Standards.
- (47) The term "*MAC Certified Marine Aquarium Organism*" means a marine aquarium organism that has been passed entirely through a chain of MAC Certified Industry Operators from "reef to retail."
- (48) The term "*MAC Certified Label*" means the registered trademark of the Marine Aquarium Council. The MAC Label is licensed to organizations after they have successfully been assessed to the MAC Standards.
- (49) The term "*MAC Certified Label Pack*" means a document that contains the rules and conditions of use of the MAC Label and includes artwork samples in paper and electronic formats.
- (50) The term MAC Standards and Certification Advisory Committee, or SCAC, means the committee and sub-committees established and designated by the MAC Board of Directors to have authority for the international standards-setting activities of the Marine Aquarium Council.
- (51) The term "*make weight*" means an addition of organisms to a shipment that was not included in the original order instructions.
- (52) The term "*managed towards sustainability*" means managed in ways so as to obtain sustainability of the resource being used and the biological diversity of the ecosystem(s) being impacted by the use of that resource.
- (53) The term "*mariculture*" means the cultivation of marine organisms by exploiting their natural environment.
- (54) The term "*Mariculture Area Management Plan*" or MAMP, means a document or collection of documents, usually prepared by those managing the area used for mariculture, the purpose of which is to ensure that area is managed according to the principles of the MAC MAM Standard.
- (55) The term "*marine aquarium organism(s)*" means any marine fish, coral and other marine invertebrate, or plant removed from its natural environment for commercial purposes for use in an aquarium as a live organism.

- (56) The term "*monitoring*" means:
- (a) the intermittent (regular or irregular) surveillance to ascertain the extent of compliance with a predetermined standard or degree of deviation from an expected norm (CBD and GBA); and
 - (b) the collection of information for the purpose of assessing progress and success of an area-use plan. Monitoring is used to assess performance of a management plan or compliance scheme in order to revise it or to gather experience for future plans. (Adapted from FAO)
- (57) The term "*optimal health*" means the condition of well being for marine aquarium organisms expected from implementing the MAC Standards and Best Practice Guidance in Collection, Fishing, and Holding and in Handling, Husbandry, and Transport that does not result in reduced survivability of the organism or mortality of greater than 1% DOA and 1% DAA.
- (58) The term "*order instructions*" means the number and type of certified marine aquarium organisms requested by the customer, the order date, and the requested delivery date including whatever other conditions agreed upon and documented by both parties in the order.
- (59) The term "*planned and organized manner*" means collection and fishing activities are consistent with the Collection Area Management Plan and make the plan operational.
- (60) The term "*post-larvae*" or "post-larval" means animals that have changed from the larval form to the very first stages of their juvenile form, just at the end of metamorphosis.
- (61) The term "*precautionary approach*" means a set of agreed cost-effective measures and actions, including future courses of action that ensures prudent foresight and reduces or avoids risk to the resource, the environment, and the people, to the extent possible, taking into account existing uncertainties and the potential consequences of being wrong. (FAO)
- (62) The term "*reef mining*" means the large-scale removal of living reef corals and fossilized limestone from the coral reef ecosystem for use as building materials, lime production, aggregate, or other construction purposes.
- (63) The term "*Ranching*" refers to culture that is grow-out/dependent on wild resources rather than a closed life cycle.
- (64) The term "*retailer*" means any company, individual, or hobbyist group that buys from an importer and/or transshipper or directly imports marine aquarium organisms for the supply, use, or benefit of the final consumer.
- (65) The term "*significant organisms*" means species whose status provides information on the overall condition of the ecosystem and of other species in that ecosystem. They reflect the quality and changes in environmental conditions as well as aspects of community composition. (CBD and GBA)
- (66) The term "*spat*" refers to bivalve mollusc larvae (e.g. of oysters, scallops, clams) that are planktonic and float in the water column until they find a suitable substrate on which to settle and grow. There they grow from being microscopic to a few mm long.
- (67) The term "*spat collector*" refers to a fine mesh or other settling material (e.g. cedar leaves, scallop shells, nylon mesh,) that is hung or tied in bunches to lines or nets, or inserted into fine mesh nets. Spat enter the nets, and/or settle on the spat collector, and begin to grow.
- (68) The term "*species*" means:
- (a) a group of organisms capable of interbreeding freely with each other but not with members of other species (CBD); and

- (b) a group of animals or plants that have common characteristics, are able to breed together to produce fertile (capable of reproducing) offspring, and maintain their separateness from other groups. (FAO)
- (69) The term "*species batch*" refers to the unit of traceability that carries a MAC Label and MAC Certification identity number. The "*species batch*" includes all MAC Certified marine aquarium organisms of the same species from the same supplier and source country contained within a shipment and or shipments when mixed together in a traceable way in a facility. A consignment, i.e. shipment or delivery, of organisms from a supplier (e.g. collector, exporter, importer) to a buyer (e.g. exporter, importer, retailer) will usually consist of several species batches.
- (70) The term "*stakeholders*" means an individual or group of individuals, whether at an institutional or personal level, who has an interest or claim that has the potential of being impacted by or having an impact on a given activity. This interest or claim can be stated or implied and direct or indirect. Stakeholders and stakeholder groups can be at the household, community, local, regional, national, or international levels. (Adapted from FAO)
- (71) The term "*stocking*" means the practice of putting artificially reared young fish into a sea, lake or river. These are subsequently caught, preferably at a larger size. (FAO)
- (72) The term "*supplier*" means all providers of marine aquarium organisms at any stage of the chain of custody, e.g., collector, fisher, middleman/woman, exporter, importer, and transshipper.
- (73) The term "*sustainable use*" means the use of components of biological diversity in a way and at a rate that does not lead to the long-term decline of biological diversity, thereby maintaining the potential of the components to meet the needs and aspirations of present and future generations. (CBD)
- (74) The term "*third party*" means a person or body that is recognized as being independent of the parties involved, as concerns the issue in question.
- (75) The term "*third party certification*" means a procedure by which an independent third party gives written assurance that a product, process, or service conforms to requirements specified.
- (76) The term "*those responsible for managing the fishery*" means:
- (a) the government authority with the mandate, responsibility, and capacity to develop a management plan and/or actively manage the aquarium fishery or collection area where the fishery takes place; or
 - (b) the individuals, groups, or commercial entities with the necessary authorization or permission from the appropriate authority (e.g., government, community, and/or owner) to conduct the marine aquarium fishery in the collection area if the appropriate government authority does not exist; does not have the appropriate mandate, responsibility, and capacity; or has not yet produced a management plan consistent with the MAC Standards.
- (77) The term "*transgenic or genetically modified organisms (GMOs)*" means animals or plants containing genetic material from more than one species.
- (78) The term "*transshipper*" means any importer of marine aquarium organisms who has contracted access to (but does not operate) a wholesale facility capable of holding and acclimatizing imported organisms, and whose primary role is to receive shipments and prepare them for immediate re-transport to other wholesale or retail operations ensuring that they will still arrive within the declared shipping time.
- (79) The term "*unit of traceability*" is defined as a batch of organisms of the same species (or the appropriate and feasible level of taxonomic detail).

- (80) The term "*unsuitable species*" means species that have been determined by the MAC Committee on Unsuitable Species to be inappropriate for the trade in marine ornamentals.

VI. Bibliography

The concepts contained within the following standards and publications have been considered in the development of this document.

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ISO 14024:1999, Environmental labels and declarations - Type I environmental labelling - Principles and procedures

ISO 19011:2002, Guidelines for quality and/or environmental management systems auditing

ISO/IEC 17020:1998, General criteria for the operation of various types of bodies performing inspection

ISO/IEC 17024:2003, Conformity assessment — General requirements for bodies operating certification of persons

ISO/IEC Guide 62:1996, General requirements for bodies operating assessment and certification/ registration of quality systems

ISO/IEC Guide 65:1996, General requirements for bodies operating product certification systems

ISO/IEC Guide 66:1999, General requirements for bodies operating assessment and certification/ registration of environmental management systems (EMS)