CONSULTATION PAPER
DRAFT 1

Monitoring of International Trade in Ornamental Fish

Prepared for

European Commission
Directorate General E - Environment
ENV.E.2. – Development and Environment

Prepared by

United Nations Environment Programme
World Conservation Monitoring Centre

ABOUT UNEP WORLD CONSERVATION MONITORING CENTRE

The UNEP World Conservation Monitoring Centre is the biodiversity assessment and policy implementation arm of the United Nations Environment Programme (UNEP), the world's foremost intergovernmental environmental organisation. UNEP-WCMC aims to help decision-makers recognise the value of biodiversity to people everywhere, and to apply this knowledge to all that they do. The Centre's challenge is to transform complex data into policy-relevant information, to build tools and systems for analysis and integration, and to support the needs of nations and the international community as they engage in joint programmes of action.

UNEP-WCMC provides objective, scientifically rigorous products and services that include ecosystem assessments, support for implementation of environmental agreements, regional and global biodiversity information, research on threats and impacts, and development of future scenarios for the living world.

The first draft of this document was produced with contributions from the Marine Aquarium Council (MAC), which drafted the section on MAC certification; and the IUCN Freshwater Biodiversity Assessment Unit. Both organisations provided a review and general input to the document.

Prepared for European Commission Directorate General E – Environment ENV.E.2. – Development and Environment

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EXECUTIVE SUMMARY

[TO BE COMPILED UPON COMPLETION OF THE CONSULTATION PROCESS]

* COMMENTS ON THE CONSULTATION DOCUMENT MUST BE RECEIVED BY **20 JULY 2008** AND SHOULD BE SENT TO ORNAMENTALFISHTRADE@UNEP-WCMC.ORG
* AFTER THIS DATE CONSULTATION WILL ONLY BE OPEN TO COMMENT **ON CHANGES** MADE DURING THE FIRST ROUND OF CONSULTATION.
* FOR DETAILS OF THE CONSULTATIVE PROCESS PLEASE REFER TO THE METHOD, BELOW.

1. CONTEXT

The trade in live aquatic ornamental animals for the aquarium trade is a global multi-million dollar industry, which can provide strong economic incentives for habitat conservation. However, little is known about the scale of the international trade in many species, and there are concerns that trade in some species might not be sustainable, given factors such as their biology, distribution, conservation status and ability to survive in captivity.

In 2000, the Global Marine Aquarium Database (GMAD) was established by UNEP-WCMC, in collaboration with the Marine Aquarium Council (MAC) and with members of various aquarium trade associations. Many industry members (wholesale exporters and importers) provided data to enable monitoring of the trade in marine ornamentals, including information on the species in trade, volumes traded, and source and destination countries. While this initiative provided an important step for the monitoring of this trade, it has lacked an institutionalised, systematic reporting process and a regular source of funding to sustain it.

Following several discussions, the Scientific Review Group (SRG) of the EU Wildlife Trade Regulation recommended that a number of species should be listed in Annex D of Council Regulation 338/97. This recommendation has not yet come into effect[1]. Meanwhile, some traders have expressed concern about these potential listings, suggesting that perhaps the value of their voluntary monitoring efforts may have been overlooked, and that the Annex D listings would lead to increased administrative burden on the import of specimens into the EU.

In addition to GMAD, a number of mechanisms exist which aim to gather information concerning the trade in these organisms. These include customs and veterinary border controls, and sustainability-certification schemes. There has been, however, lack of clarity about how useful these sources of trade data can be for the assessment of taxon-specific international trade.

Moreover, to date, certification and monitoring efforts have been focused on the marine component of the ornamental trade, with less emphasis on the freshwater sector. Although much of the freshwater trade involves captive-bred specimens, substantial volumes of wild-caught fish are also traded. Little is known about the scale and nature of much of this trade.

In order to clarify some of these issues, and to bring on board the various opinions of the different stakeholders, at its 38th meeting the SRG indicated its support for a consultation process to be conducted on monitoring of international trade in ornamental fish.

[1] Following CITES CoP14 it is likely that *Pterapogon kauderni* will be listed in Annex D in 2008

2. INTRODUCTION

This report is the first draft of a Consultation Paper to be made publicly available for consultation, and circulated to major stakeholders in the international trade in aquatic ornamentals, including importers, exporters, trade regulators, NGOs *etc.* Summaries of comments received will be incorporated into subsequent versions, with the intention of reflecting as clearly as possible the views of all contributors.

Readers are invited to provide their comments about the present document (hereafter referred to as the Consultation Paper), which is as such intended as the vehicle of the consultation process.

The Consultation Paper was produced by UNEP-WCMC with input from IUCN Freshwater Biodiversity Assessment Unit, the Marine Aquarium Council (MAC) and the Scientific Review Group of the EU Wildlife Trade Regulations (SRG).

3. OBJECTIVE AND SCOPE

This consultation is conducted with three objectives, namely to:

a) consider the existing governmental mechanisms that gather data concerning the international trade in ornamental fish, and assess their ability to provide information appropriate for the monitoring of this trade at the species level;

b) consider the extent to which non-governmental mechanisms, such as certification schemes or voluntary databases provide a mechanism to monitor and ensure the sustainability of the international trade in aquatic ornamentals at a global scale;

c) produce recommendations for the best method of monitoring international trade in ornamental fish.

The document and the consultation process are focused on the international trade in ornamental fish entering the EU. Trade in corals, which is already monitored through CITES, as well as trade in other invertebrates and plants, are not generally discussed.

4. METHOD

The consultation process will consist of three 'consultative rounds'. The 'first consultative round' aims to gather comments and contributions on the general content of, and on the list of issues and monitoring tools identified in, the first draft (Draft 1) of the Consultation Paper.

The second draft (Draft 2) of the document will seek to incorporate a summary of the feedback and data received from the first consultative round, as well as to provide a series of provisional conclusions on the topics discussed. Changes made since the first draft will be in bold text to enable readers to identify them easily. The second draft will be circulated for comments in a 'second consultative round', for which comments should only be on the bold text (i.e. changes made since the first draft).

The third draft (Draft 3) will aim to incorporate a summary of comments received from the second round. It is not the purpose of this draft to add any further substantive issues, which should have already been incorporated in the second draft. The third draft of the document will be circulated on a 'third consultative round', to give stakeholders the opportunity to contribute any final feedback, particularly if there were any clarifications needed concerning the extent or the accuracy with which contributions and opinions were summarised and on the conclusions made.

At all stages in the drafting process, the drafting team will endeavor to summarise all substantive contributions in a clear, succint and representative manner. However, contributions will generally not be transcribed verbatim.

The Discussion section aims to identify the most relevant issues concerning the remit of this paper, and to present a set of ideas under each issue, about which contributors can provide further information. The content in the discussion in Draft 1 of the Consultation Paper is based on the information available from previous sections, as well as on MAC's experience in the topics under discussion.

Contributors are requested to read the entire document at least once before formulating their comments, as issues that may come to mind at one point in the text may have already been addressed further on. Providing pertinent and succinct feedback will enable the drafting team to capture and represent contributions accurately in subsequent versions of the document.

While a significant effort has been made to produce a well documented and well discussed paper, the current draft does not claim to be exhaustive in the range and depth of issues it intends to cover. Instead, the document is expected to grow and evolve as feedback is received. Contributors are emphatically encouraged to provide literature references or data supporting their contributions whenever possible. Contributors are also requested to include the line number(s) relevant to each comment.

To make your contribution, please send comments on Draft 1 by email to ornamentalfishtrade@unep-wcmc.org by **20 July 2008** at the latest. The process includes three consultative rounds. All dates for the consultation process are given in Table 4.1.

TABLE 4.1. TIMELINE FOR THE CONSULTATION PROCESS

Date	Action
13 June 2008	Draft 1 circulated to contributors
20 July 2008	Deadline for feedback on Draft 1
22 August 2008	Draft 2 completed and circulated
14 September 2008	Deadline for feedback on Draft 2
03 October 2008	Draft 3 completed and circulated
19 October 2008	Deadline for feedback on Draft 3
10 November 2008	Final document completed

5. INTERNATIONAL TRADE MONITORING

This section considers the various existing mechanisms that gather data concerning the international trade in ornamental fish. Particular attention is given to the way in which data are collected through certification processes and through legislative regulation, and whether information is collected in such a way that it can be used to monitor this trade at the species level.

5.1 CERTIFICATION AND MONITORING

Certification is a procedure to ensure that a product, process or service conforms to specified requirements. There are three principal ways in which certification can be developed and applied:

- First Party certification is based upon a self-declaration by the producer that it meets the requirements of a certain standard. There is no independent oversight agency for first party certification and therefore it is normally deemed to be of limited value.

- Second Party certification is based upon an assessment that the producer meets the requirements of a standard that was set by a group of consumers, by government or by a non-governmental organization. Unlike first-party certification, the producers do not define the standards nor do they assess their compliance themselves. However, the standards may be less than objective and comprehensive as they are often subject to the interests of the group that both sets them and assesses compliance.
- Third Party certification is based upon standards created by a multi-stakeholder process. Compliance with the standards is voluntary and is assessed by an accredited, independent third party that has no vested interest in the standards, certification, product or any particular stakeholder group. The International Organization for Standardization (ISO) defines third party certification as the highest order for proof of compliance.

5.1.1 Marine Certification

At the time of writing, only one global certification process for marine ornamentals was known – that established and implemented by the Marine Aquarium Council (MAC). The following section introduces MAC and the MAC Certification scheme. Most of the material in Sections 5.1.1 to 5.1.2.1 inclusive was provided by the Marine Aquarium Council, unless otherwise stated.

5.1.2 The Marine Aquarium Council and Certification

The Marine Aquarium Council (MAC), established in 1996, is an international, multi-stakeholder, not-for-profit organization that brings together conservation organizations, fishers, the aquarium industry, public aquaria, aquarists and government agencies to ensure the marine aquarium trade is responsible and sustainable. MAC's mission is to conserve coral reefs and other marine ecosystems by creating standards and certification for those engaged in the collection and care of ornamental marine life from reef to aquarium.

In 2002, MAC launched a certification scheme following multi-stakeholder consultations which included participation in the standard-setting process. The multi-stakeholder Standards Advisory Group in the first developmental phase included about 80 members, with representation from Asia, the Pacific, North America and Europe. The different interests were represented by industry in supply and demand countries, consumers, conservation organizations, science, governmental agencies and trade associations.

MAC Certification is a third-party certification. It accredits independent third-party certification companies. These MAC Accredited certifiers assess companies for their initial compliance with the MAC Standards, and they conduct scheduled and unscheduled surveillance visits to monitor continued adherence to the Standards.

MAC Certification covers both practices (industry operators, facilities and collection areas) and products (aquarium organisms). Industry operators at any link of the chain of custody from reef to retail (collectors, culturists and breeders, exporters, importers, retailers) can seek to become MAC Certified by being evaluated for compliance with the appropriate MAC Standard.

Four Standards apply along the Certified Chain of Custody:

- The Ecosystem and Fishery Management (EFM) international Standard: ensures the collection area is managed as a responsible fishery and includes resource assessment and monitoring, a Collection Area Management Plan (CAMP) and organism replenishment/'no-take' areas.
- The Collection, Fishing and Holding (CFH) international Standard: makes sure that the harvesting of fish, coral and other coral reef organisms are conducted responsibly and maintain the health of the collection area (e.g. using no destructive fishing practices; ensuring that handling prior to export, holding, packaging and transport maintain optimal health of the harvested organisms).
- The Handling, Husbandry and Transport (HHT) international Standard: certifies that (i) the handling of marine life during export, import and retail maintain the organisms'

153 optimal health; (ii) uncertified organisms are segregated; and (iii) MAC Certified organisms
154 have passed exclusively from one MAC Certified industry operator to another.

155 • The Mariculture and Aquaculture Management (MAM) international Standard: launched
156 in 2006, this Standard addresses the propagation, collection, and culturing of marine
157 aquarium organisms, and specifies requirements for all stages from broodstock/post-
158 larvae collection through to grow-out for market, packaging and transport of cultured
159 marine ornamentals.

160 MAC Certified products must be harvested from a certified collection area or bred and cultured by
161 a certified Mari- or Aquaculture facility and pass from one certified operation to another. Along
162 this chain of custody certain quality criteria (e.g. mortality allowances) apply to products to
163 maintain their certification.

164 MAC Certification and the corresponding MAC Certified Label enable the end consumer to
165 identify those businesses that apply best practices in handling, husbandry and transport of
166 organisms, operating in appropriate facilities and with trained staff. MAC Certified Organisms can
167 be identified by the MAC Certified Label on their holding tank and boxes in which they are kept
168 and shipped. Thus, when a fish is labelled as MAC-certified it means that it was collected in a MAC
169 Certified Collection area (EFM Standard) by a MAC Certified Collector (CFH Standard) and then
170 passed from one certified trader to another (HHT Standard). Another possibility is that the fish
171 comes from a MAC Certified aquaculture/mariculture facility (MAM Standard) and is traded by
172 MAC Certified operators (HHT Standard). The fish itself is not certified for compliance with any
173 standard, but results as the product of implementing the standards throughout the different links
174 of the chain of custody.

175 MAC defines "*mariculture*" as the cultivation of marine organisms by exploiting their natural
176 environment, whereas "*aquaculture*" is the farming of aquatic organisms including fish, molluscs,
177 crustaceans, corals and other invertebrates, and aquatic plants with some sort of intervention in the
178 rearing process to enhance production, such as regular stocking, feeding, protection from
179 predators, etc. Farming also implies individual or corporate ownership of the stock being
180 cultivated.

181 Each of the four MAC standards has its own set of requirements, which need to be complied with
182 by any industry operator seeking to be certified. MAC certification requires the industry to support
183 the monitoring and documentation of the trade as well as the conservation and management of the
184 reefs, through the way it does business.

185 As of mid-2007, 63 industry operators were MAC Certified, see Table 5.1.

186 TABLE 5.1. NUMBER OF MAC CERTIFIED OPERATORS, BY CATEGORY AND COUNTRY (2008)

Collection Areas	Collector's Groups	Exporters	Culturists/Breeders	Importers	Retailers
				Canada: 1	
Fiji: 5	Fiji: 5	Fiji: 1			
				France: 4	France: 2
				Germany: 1	
Indonesia: 3	Indonesia: 3	Indonesia: 6			
				Netherlands: 2	
Philippines: 9	Philippines: 8	Philippines: 10			Philippines: 1
		Singapore: 1		Singapore: 1	Singapore: 1
			UK: 1	UK: 3	UK: 1
			USA: 2	US: 4	USA: 4

187 The MAC Certification scheme has requirements, mechanisms and processes for collecting and
188 analysing information on the status of marine ornamental resources, including the status of the
189 ecosystem and the of impact of human activities. This information was not previously collected and
190 is expected to ensure that the sustainability of marine ornamental operations to be assessed more

objectively. MAC Core Standards provide the means to integrate this information into the requirements for industry operations, creating the possibility to improve continually the sustainability of the marine aquarium trade through adaptive management.

5.1.2.1 Evaluation and Capacity Building

MAC has developed a Monitoring & Evaluation (M&E) system and team for the impact and outcomes of MAC Certification. This team collects and reports relevant data at the species level, quantity, mortality rates, reject rates and price (see Organism Receipt Sheet (ORS) form in Figure 5.1). Data are recorded by collectors and traders, who the pass the data to their respective contacts in MAC (e.g. community organizer). The M&E team is then responsible for collating this information into an internal MAC database. The Marine Aquarium Market Transformation Initiative (MAMTI) and M&E reports provide a project "score card" that tracks a number of project output and outcome indicators.

Figure 5.1. Organism Receipt Sheet form used by MAC

ORGANISM RECEIPT SHEET & SHIPMENT EVALUATION		**Supplier:**		**Delivery Date:**					
(related to invoice no.:)									
				Receipt Details					
Species (Common and/or Scientific Name)	**MAC Certification Status**	**Size (S,M,L,XL)**	**Ordered**	**Received**	**Invoiced**	**DOA**	**in suboptimal condition + Reason(s)***	**Misidentified** (please correct ID)	**Comments**

The Marine Aquarium Market Transformation Initiative (MAMTI) is a joint project of MAC, the Conservation and Community Investment Forum (CCIF) and Reef Check in the Philippines and Indonesia, sponsored by the International Finance Corporation (IFC). The project has concentrated on the implementation of MAC Certification at the collection area and collector level. The main tasks were training programmes (collection, post-harvest handling, basic ecology, business skills) and reef surveys that can "pave the way" to certification for areas that have not yet certified. The project started in October 2004 and is funded until 2009. The main goal is the certification of a number of collection areas and certification of collectors that supply the marine aquarium industry.

In 2006, the MAMTI project of MAC covered 14 collection areas in seven provinces, in 10 municipalities and districts encompassing 22,947 hectares of reef areas in the Philippines and Indonesia. The MAMTI project covers only Indonesia and the Philippines, but there are also certified collection areas in Fiji. The project monitors many more areas in the Philippines and Indonesia than are certified. These are the areas the project is working in, but where certification is not yet achieved. Seven hundred and eighteen (718) collectors and traders (483 in the Philippines and 235 in Indonesia) have been trained in non-destructive collection methods and given assistance in preparing for a third party assessment for MAC Certification.

MAC assists industry operators interested in Certification of their activities by providing guidance documents as well as training and capacity building (mainly in developing supply countries). Local conditions and national differences are taken into account. For example, the capacity building needs for Certification and compliance for the Ecosystem and Fishery Management Standard vary from country to country depending on the different rules and regulations in coral reef area management. In Fiji, the approach has been customized to indicate how traditional reef management is compliant with the requirement for Collection Area Management. In the Philippines, the capacity building was customized to take into account the Local Government Unit jurisdiction over the near-shore marine area; it aimed to integrate the collection area management plan in the overall coastal management plan of the municipality. In Indonesia, MAC has focused on

gaining the interest and participation of the Local Government Units to educate them on the management of marine resources and to provide a model for the implementation of the EFM Standard.

Discussion on the challenges relating to monitoring trade through certification, including the MAC scheme, are summarised in Section 6.2.

5.1.2.2 THE GLOBAL MARINE AQUARIUM DATABASE (GMAD)

To support the certification process, UNEP-WCMC, MAC and members of various aquarium trade associations began collaboration in 2000, to address the need for better information on the international trade in marine aquarium species and created the Global Marine Aquarium Database (GMAD). Companies keep records, for their own files, of their sales, either on their own electronic databases or, more commonly, as paper copies of their invoices. Although the way in which companies register their trading records varies, all records show species name, quantity, date and usually origin and/or destination. Hence, company sales records can be an excellent source of data on marine aquarium species in trade, and the only source for species not recorded through any other process. A number of these companies provided UNEP-WCMC with access to their sales records. Trade data were obtained from wholesale exporters and importers of marine aquarium organisms, most often through copies of trade invoices; integrated and standardized into quantitative, species-specific information; and placed in the public domain. Fifty-eight companies, approximately one-fifth of the wholesalers in business, and four government management authorities provided data to GMAD between 2000-2003.

In August 2003 the dataset contained 102,928 trade records concerning 7.7 million imported and 9.4 million exported animals, covering a total of 2,393 species of fish, corals and invertebrates, and spanning the years 1988 to 2003. These data have permitted the most accurate quantitative estimates to date of the size of the global trade in marine ornamental fish and corals, and the production of the first ever estimates for invertebrates other than corals -- a previously overlooked section of the industry. However, the data were only collected for those countries/regions in which MAC is active. Moreover, no data have been entered into GMAD since 2003.

Discussion on the opportunities and constraints relating to GMAD are summarised in Section 6.2.

5.1.3 FRESHWATER CERTIFICATION

There is no body or process equivalent to MAC in the freshwater sector. However, a number of local and national initiatives have been developed with the aim of certifying the trade in freshwater ornamentals or establishing mechanisms to promote a sustainable trade e.g. in Brazil, Cameroon and Guyana.

The Zoological Society of London is working with Sociedade Civil Mamirauá, to develop a pilot project in the Mamirauá and Amaná Sustainable Development Reserves (MSDR) in Brazil, which aims to establish best practice guidelines that can be adopted for a certification system within this and other Amazonian regions, providing a mechanism for improved control of the trade in ornamental fish and a sustainable ornamental fish trade. It is hoped that the introduction of such a trade will result in direct economic benefits to the rural community, which along with the establishment of a sustainable system is intended to ensure the long-term protection of fish diversity within the reserve.

In Guyana, an organisation called Iwokrama is working in partnership with the North Rupununi District Development Board (NRDDB) on a sustainable, community-based aquarium fisheries business in the Rupununi wetlands. The project is designed to generate revenue for indigenous communities and benefits from the area's extraordinarily high fish diversity. Management protocols to ensure local ecological and social sustainability have been implemented. On a regional level, Iwokrama hopes to influence South America's aquarium trade by introducing a certified 'green equity' trade, resulting in regulation of the presently unregulated industry.

In Brazil, an initiative called Project Piaba was established which aimed to promote an economically viable fishery for the riverine communities of the middle Rio Negro, and an

ecologically sustainable resource for a 'green' aquarium industry (Chao & Prang, 1997). This project is conducting research on the diversity, abundance and distribution of ornamental species with a view to: establishing fishery management strategies; identifying ways in which fish husbandry techniques and captive breeding could be improved; providing environmental education; creating community-based fisheries management strategies; and liaising with the regulatory bodies in Brazil to provide advice on monitoring and inspection of stocks, fisheries management and export policy (Chao & Prang, 1997).

Ornamental Fish International (OFI) is involved in plans to develop a labelling system for South American fish in cooperation with The United Nations Conference on Trade and Development (UNCTAD), TRAFFIC South America and Organización del Tratado de Cooperación Amazónica (OTCA). OFI also took initiatives towards to a Code of Conduct for collectors, breeders, exporters and importers, which is under discussion among the membership.

5.2 MONITORING THROUGH WILDLIFE TRADE LEGISLATION

5.2.1 INTERNATIONAL

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) is a legally binding international agreement between national governments. It acts as a regulatory instrument which aims to ensure that international trade in specimens of wild animals and plants does not threaten their survival. As of May 2008, 173 countries were party to the Convention. The species covered by CITES are listed in three Appendices depending on the level of regulation needed to ensure international trade does not threaten them. Appendix I includes species threatened with extinction. Appendix II includes species not necessarily threatened with extinction, but in which trade must be controlled to avoid utilization incompatible with their survival. Appendix III contains species for which at least one country has asked other CITES Parties for assistance in controlling the trade.

The trade in CITES-listed species is regulated so that all imports, exports and re-exports of CITES-listed species must be authorized through a licensing system. Each Party to the Convention must designate one or more Management Authorities in charge of administering that licensing system and one or more Scientific Authorities to advise them on the effects of trade on the status of the species. Before a permit may be granted, the Scientific Authority must make a "non-detriment finding" or a conclusion that the export of specimens of a particular species will not impact negatively on the survival of that species in the wild. In this way, it is intended that trade will only be permitted if there is evidence that it is sustainable.

International trade in any species listed in the Appendices to CITES, involving parties to the Convention must be accompanied by a CITES permit or certificate of origin issued by a national CITES Management Authority. Parties to CITES are then obliged to produce annual reports specifying the quantity of trade that has taken place in each listed species, the country of export/origin/destination, source of the specimens and purpose of trade. These data are compiled in the CITES trade database which is managed by UNEP-WCMC on behalf of the CITES Secretariat.

Annual reports should be submitted in accordance to agreed standards (http://www.cites.org/eng/notif/2006/E030wAnnex.pdf). Additionally taxonomic references have been adopted by CITES to ensure that the same nomenclature is applied by all countries in their annual reports and permits.

To date very few ornamental fish species have been listed on CITES.

Marine ornamental fish species listed in CITES Appendix II include the seahorses *Hippocampus* spp., listed in Appendix II in 2004 *Pristis microdon* was listed in Appendix II (for the exclusive purpose of allowing international trade in live animals to appropriate and acceptable aquaria for primarily conservation purposes) at the 14th meeting of the Conference of the Parties to CITES (CoP 14) in June 2007 (Anon, 2007a). A proposal to list the Bangaii Cardinal fish (*Pteragon kauderni*) in CITES Appendix II was discussed at CITES CoP 14 but was subsequently withdrawn (Anon, 2007b).

Few species of freshwater fish have been listed in the Appendices to CITES to date, and even fewer freshwater ornamental species. Hence species-level trade data on a global scale are not generally available for this group. Ornamental freshwater fish species which have been listed include the Silver Arowana *Scleropages formosus*, the Cui-ui *Chasmistes cujus,* Seven-line Barb or Giant River Carp *Probarbus jullieni* and the Pangasid catfish *Pangasianodon gigas* which are listed in CITES Appendix I. All sturgeon species (Acipenseriformes spp.) are listed in CITES Appendix II, except *Acipenser brevirostrum* and *Acipenser sturio* which are listed in Appendix I. The Arapaima *Arapaima gigas*, African Blind Barb Fish *Caecobarbus geertsi* and the Australian lungfish *Neoceratodus forsteri* are also listed in CITES Appendix II.

The opportunities and constraints of the use of CITES for monitoring the aquatic ornamental trade are summarised in Sections 6.1 and 6.3.

5.2.2 Regional

5.2.2.1 European Union

The European Single Market and the absence of systematic border controls within the European Union (EU) mean that the provisions of CITES have to be implemented in a uniform way in all 27 EU Member States. This has been acheived through the European Wildlife Trade Regulations, in particular Council Regulation 338/97 and Council Regulation 865/2006, which together implement CITES and go beyond it. Council Regulation 338/97 lists species in four annexes: Annexes A B, and C which broadly correspond with CITES Appendices I, II and III respectively but also contain some non-CITES species, and Annex D for species that are imported into the European Union at such levels as to warrant monitoring. An import permit is required for species listed in Annexes A and B, differing from CITES which only requires an import permit to be issued for Appendix I specimens. The European Union can establish import suspensions where the Scientific Authority is concerned that the trade might have a negative impact on the status of the species in the wild.

Annex D of Council Regulation 338/97 is intended to be a tool which allows for the monitoring of non-CITES species that are imported into the European Union in relatively high numbers. An import notification (rather than an import permit as required for Annexes A and B) is required for imports of species listed in Annex D upon entry to the EU. Criteria for listing species in Annex D agreed by the SRG read as follows:

a) there is evidence of demand for it in the EU market and

b) it might be threatened by trade due its unfavourable or unknown conservation status, distributional, ecological or reproductive potential and

c) reliable trade data are not available from any other source.

Discussion on the opportunities and constraints relating to the use of Annex D of the EU Wildlife Regulation for monitoring trade are summarised in Section 6.1.

5.2.3 National

The vast majority of the 173 Parties to CITES have national legislation that implements the Convention and/or that specifies the conditions for trading in wildlife according to national priorities (e.g. commercial exploitation of threatened native species may be prohibited). Many countries, including the Bahamas, Brazil, and certain states in the US limit the number of fish or the number of species that can be taken from the wild (Tlusty, 2002).

Legislation regulating the trade in ornamental species can pertain to various ministries including environment, trade, fisheries, water etc. Some countries may collect information at the species level in taxa that are not listed in CITES. However, many countries do not. A comprehensive review of national legislation was beyond the scope of this paper.

5.3 CUSTOMS LEGISLATION AND MONITORING

5.3.1 INTERNATIONAL

The World Customs Organization (WCO) is an intergovernmental organisation with competency regarding the development of global Customs Standards, the simplification and harmonization of Customs procedures, the security and facilitation of the trade supply chain, trade facilitation, and Sustainable Customs capacity-building initiatives. It currently represents 173 Customs administrations on all continents. Currently, WCO Members are responsible for processing more than 98% of all international trade[2].

The Harmonized Commodity Description and Coding System provides a common basis for the classification of goods and the collection of Customs duties. It comprises about 5,000 commodity groups, each identified by a six digit code, arranged in a legal and logical structure and is supported by well-defined rules to achieve uniform classification. The coding system includes code "0301.10 - Ornamental fish". While countries can further develop this code to distinguish between categories of ornamental fish, many countries do not (particularly when they charge the same excise duty on all ornamental fish), so data is commonly collected only at this level.

Thus, all WCO member countries involved in importing and exporting ornamental species record trade through Customs data.

5.3.2 REGIONAL

Customs procedures are often applied consistently in particular regions through trade agreements and common tariff systems. Some of the main agreements are summarised below. Others include the Central American Customs System and the Common Customs Law of the Cooperation Council for the Arab States of the Gulf.

5.3.2.1 EUROPEAN UNION

The Customs codes that are applied by the 27 Member States of the European Union for ornamental fish are listed in Part two, Section I, Chapter 3 of Commission Regulation 1214/2007 which amended Annex I to Council Regulation 2658/87 on the tariff and statistical nomenclature and on the Common Customs Tariff[3]. These are: "0301.10 is the code for Ornamental fish", which is further broken down into 0301.10.10 the code for Ornamental fish – freshwater, and 0301.10.90, which is the code for Ornamental fish – saltwater[4].

5.3.2.2 SOUTH AMERICA

The Southern Common Market (Mercosur), a Regional Trade Agreement (RTA) between Brazil, Argentina, Uruguay and Paraguay, applies the codes: "0301.10 - Ornamental fish"; "0301.10.10 – Arawana *Osteoglossum bicirrhosum;* and "0301.10.90 - Ornamental fish - other".

The member Countries of the Cartagena Agreement, namely Bolivia, Colombia, Ecuador, Peru, and Venezuela (Decision 580, effective 4 May 2004) do not distinguish between marine and freshwater species of ornamental fish (see International Customs Tariffs Bureau). However, the tariff code specifies that Member Countries may include national subheadings for the classification of goods in more detail than that laid down in this nomenclature.

5.3.2.3 AFRICA

Countries which are part of the West African Economic and Monetary Union (WAEMU) involving the countries Benin, Burkina Faso, Côte d'Ivoire, Guinea Bissau, Mali, Niger, Senegal and Togo do not distinguish between marine and freshwater species of ornamental fish.

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[2] http://www.wcoomd.org/home_about_us_our_profile.htm
[3] http://www.bitd.org/Search.aspx
[4] COMMISSION REGULATION (EC) No 1214/2007
http://eur-lex.europa.eu/LexUriServ/site/en/oj/2007/l_286/l_28620071031en00010894.pdf

5.3.3 NATIONAL

Many countries use the higher level tariff code "0301.10 - Ornamental fish", some have additional sub-codes for particular species or groups. However, while many countries may record marine and freshwater trade separately, most countries do not collect data on aquatic ornamentals at a species level with the exception of species of particular national interest.

Countries using the higher level tariff code "0301.10 - Ornamental fish" which do not distinguish between marine and freshwater species of ornamental fish (see International Customs Tariffs Bureau) include: Algeria, Australia, Bolivia, Canada, Democratic Republic of the Congo, China, Chile, Colombia, Costa Rica, Cuba, Egypt, Guatemala, Iceland, India, Japan, Lebanon, Madagascar, Malta (prior accession to the EU), Mauritius, Mexico, New Zealand, Nicaragua, Norway, Pakistan, the Philippines, Saudi Arabia, Switzerland, the United States of America, South Africa.

Some countries record more detailed levels of ornamental fish trade. Morocco uses "0301.10 for Ornamental fish", which is further broken down into 0301.10.10, the code for Ornamental fish - freshwater and 0301.10.90, the code for Ornamental fish – saltwater. Rwanda applies the codes: "0301.10.10 Ornamental fish – Breeding animals; and "0301.10.90 - Ornamental fish - other". Fish are not excisable according to legislation in Singapore according to the Customs Tariff of 09/06/2004[5]. In Singapore, different customs codes are used for recording freshwater and marine ornamental fish species. For freshwater species the code is: "Fish, freshwater, live, ornamental, 03011030" and although the same code is used fish may be recorded as barb, angel or betta within this category. For marine species the code is "Fish, marine live, ornamental- 03011020" which may also be recorded as butterfly, clown or damsel within this category[6].

Indonesia and Viet Nam use the codes: "0301.10 - Ornamental fish"; "0301.10.10 - Ornamental fish – Fish Fry", "0301.10.20 - Ornamental fish – Other, marine fish", "0301.10.30 - Ornamental fish – Other, freshwater fish".

The U.S. Fish and Wildlife Service (USFWS) compile data on the international trade of live, ornamental aquatic species through their Law Enforcement Management Information System (LEMIS). These data are taken from Customs shipment declaration forms (Form 3-177), which are completed for each shipment that arrives or exits a given U.S. port of entry. Information about ornamental species is recorded on these forms through three general "species groups": (1) non-CITES invertebrates (designated as NONV), (2) other live invertebrates contained in tropical fish and other shipments (designated as OLIN), and (3) all live tropical fish including goldfish (designated as TROP) (Adams *et al.*, 2001).

According to Adams *et al.* (2001), individual species names in each shipment are not databased by USFWS, although they do appear on the Form 3-177, resulting in difficulties in distinguishing between marine and freshwater species through the existing datasets. As from the 15th of May 2004, all importers and exporters must separate marine tropical fish from freshwater tropical fish on different lines of the declaration form (Form 3-177). Declarations that combine freshwater and marine tropical fish as one line item will be rejected for correction[7].

5.3.4 CUSTOMS TRADE DATABASES

There are a number of statistical databases which provide information on trade in ornamental fish based on the Customs codes described above or on the associated tariffs.

These include:

- The United Nations Commodity Trade Statistics Database (COMTRADE) which contains detailed imports and exports statistics reported by statistical authorities of close to 200 countries or areas. It concerns annual trade data from 1962 to the most recent year and is thought to be the most comprehensive trade database available. As of September 2007, it contained more than one billion records.

[5] http://www.bitd.org/Download.aspx?ID=292
[6] Singapore Customs http://www.customs.gov.sg/NR/rdonlyres/9DD35ABD-7D3D-44F1-8350-A06F5D39710C/0/AZ.pdf
[7] http://www.fws.gov/le/PubBulletins/PBSeahorsesTropicalFish.htm

- The United Nations Conference on Trade and Development (UNCTAD) Trade Analysis Information System (TRAINS) that contains information on Imports, Tariffs, Para-Tariffs and Non-Tariff Measures for 119 countries. The data are available at the most detailed commodity level of the national tariffs (i.e., at the tariff line level) and are recorded according to three internationally recognized trade and tariff classifications.
- The World Trade Organization (WTO) Integrated Data Base (IDB) that contain Imports by Commodity and Partner Country and MFN Applied Tariffs for over 80 countries at the most detailed commodity level of the national tariffs; and, the Consolidated Tariff Schedule Database (CTS) that contains WTO Bound Tariffs, Initial Negotiating Rights (INR) and other indicators. The CTS is the official source for Bound Tariffs, which are the concessions made by countries during a negotiation (e.g., the Uruguay Round of Multilateral Trade Negotiations). The data are recorded according to two internationally recognized trade and tariff classifications.
- FISHSTAT Plus[8] is a web-downloadable software for fishery statistical time series at global level. It provides time series data on aquaculture production, total capture production, trade and production of fishery products.
- EU Export Helpdesk statistics[9] is an online service, provided by the European Commission, to facilitate market access for developing countries to the European Union. It provides trade data (exports and imports) for the EU and its individual Member States, both collectively and individually as well as intra-EU trade. Data are available for the years 2000-2006. The data are recorded using the TARIC (Integrated Tariff of the European Communities) code system.
- National statistics are available for a number of countries, some of which can be accessed online.

A discussion of the opportunities and constraints of using the available trade statistics mentioned above for monitoring the aquatic ornamental trade are summarised in Section 6.1.

5.4 VETERINARY LEGISLATION

In addition to Customs regulations, veterinary and health regulations apply in most countries with regards the import of all live animals. Veterinary requirements can provide a method of monitoring the trade although the purpose is usually solely the control of exotic diseases and species introductions in importing countries.

Most countries now have national legislation relating to veterinary requirements that must be met in order to import live animals. In all but six of 20 countries and regions[10] surveyed by Whittington & Chong (2007), a health certificate was required to import freshwater fish. A fish inspection was required in 14, but fish were quarantined in only eight. Veterinary and health regulations can involve physical checks of shipments, health certificates or permits, prior notification of arrival (Olivier, 2001).

5.4.1 REGIONAL

In September 2006, the European Commission published a Decision 'laying down the animal health conditions and certification requirements for imports of fish for ornamental purpose' (2006/656/EC). The aim of the decision was to prevent any potential introduction of disease which could have a significant impact on farmed and wild fish stocks in Community waters. The Decision has been implemented from the 1st April 2007 through national legislation of Member States.

In Decision 2006/656/EC, cold water ornamental fish are defined as any ornamental fish which are susceptible to one or more of the following diseases: epizootic haematopoietic necrosis (EHN), infectious salmon anaemia (ISA), viral haemorrhagic septicaemia (VHS), infectious haematopoietic

[8] http://www.fao.org/fishery/topic/16073
[9] http://exporthelp.europa.eu/ Accessed on 09/08/2007
[10] including Europe, Hong Kong (China), Taiwan (China)

necrosis (IHN), spring viraemia of carp (SVC), bacterial kidney disease (BKD), infectious pancreatic necrosis (IPN), Koi herpes virus (KHV) and infection with *Gyrodactylus salaris*. Tropical ornamental fish are defined in the Decision as all those not included under the 'cold water' definition. The distinction between the two categories is related to the susceptibility of an ornamental fish to diseases as listed by World Organisation for Animal Health (OIE). Therefore, any ornamental fish which is not listed as susceptible to any disease can be treated as a 'tropical ornamental fish' (independently of whether it originates from a 'tropical' region) provided it is from a country which is a member of the World Organisation for Animal Health (OIE).

The certificates for imports of cold-water and tropical ornamental fish into the European Community required through Decision 2006/656/EC require the data concerning the country of origin and destination, the scientific name of the species, and the quantity of specimens imported. Data collected in this way between 01/05/2007 and 23/07/2007 has been made available electronically. However, the electronic dataset did not include species-level information, even though data on the origin and destination country and the number of fish imported were recorded. It is hoped that species-level data will be captured in the future. However, it is not clear how rigorously this will be implemented and how it will be stored and managed.

Further discussion on the opportunities and constraints of monitoring the aquatic ornamental trade through veterinary legislation are summarised in Section 6.1.

6. DISCUSSION

The ornamental marine and freshwater industries are different in many respects, ranging from the habitats from which specimens are extracted, to the costs and level of specialisation required by hobbyists for maintaining each type of aquarium. However, the measures that may be put in place to ensure their sustainability, and some of the mechanisms already in place to regulate and monitor this trade (such as veterinary controls and customs reporting practice) are, in many respects, common to both industries. For this reason, both sectors are considered in tandem in this discussion, highlighting issues pertaining exclusively to one or to the other only when this is appropriate.

6.1 STRENGTHS AND WEAKNESSES OF THE GOVERNMENTAL INSTRUMENTS AVAILABLE TO MONITOR TRADE IN AQUATIC ORNAMENTALS

i) Customs and FAO statistics

In countries where most or all of the ornamental species collected are for export, customs export data could provide an indication of catch. At present, however, there are many issues associated with trade data collection, including differences in reporting values, reporting by weight rather than number of fish, misclassification in the food-fish category, and exclusion of small shipments, for instance. International trade in the sector is frequently underreported and estimations using available data may include a large degree of uncertainty containing incorrect statistics with different unit values (Olivier, 2001).

Moreover, when trade is recorded in volume or weight, many countries include in this the water and packaging the fish are transported in, and frequently do not distinguish between marine and freshwater species (Wilhelmsson *et al.,* 2002).

Customs data on international trade usually do not include information at the species level. Moreover, where species level information is collected other problems fish are often only known by common names, and where scientific names are used they can be out of date or mistaken (Moreau & Coomes, 2007). There are however, occasional exceptions, such as data collection for *Osteoglossum bicirrhosum* through the tariff system of the Southern Common Market (Mercosur).

One advantage of Customs statistics is that they have been collected over a relatively long time period, and will presumably be collected for some time to come. This allows better detection of trends and patterns of trade. However, FAO international trade statistics rely on data reports submitted by member countries (Olivier, 2001). In many cases, trade may not be reported or may be underreported. Moreau & Coomes (2007) observed that approximately 41% of trade from Peru to the US was undeclared at export. They remarked that as shipments of ornamental fish in Peru are not routinely checked, exporters admitted to mis-declaring with the purpose of exporting restricted species, and to under-declaring with the purpose of tax evasion. Monteiro-Neto *et al.* (2003) also noted that intentional under-reporting of the trade can take place with the purpose of reducing tax duties or to remain below allowed quotas.

ii) Veterinary controls

As noted above, in 2006 the European Commission published Decision (2006/656/EC) laying down the animal health conditions and certification requirements for imports of fish for ornamental purpose. Member States should therefore only authorise imports of ornamental species as listed in Decisions 2003/858/EC and 2006/656/EC.

The certificates required for imports of cold-water and tropical ornamental fish into the European Community should record the country of origin and destination, the scientific name of the species and the quantity. However, data captured electronically so far (between 01/05/2007 and 23/07/2007) did not include information on the name of the species traded. It is not clear whether a standard list of accepted names will be used in the future to ensure data consistency, and whether such information will be databased and maintained. The data are submitted using paper forms which need to be entered into a computer manually if they are to be used for analysis. Moreover, the reporting forms do not distinguish between specimens extracted from the wild and those originating from captive-breeding operations. It should also be noted that the Decision does not cover so far the import of ornamental invertebrates.

iii) CITES listing

CITES, with 172 signatory Parties, is the foremost intergovernmental mechanism for the regulation and monitoring of trade in species that are threatened by international trade. While species of hard coral have been listed in the CITES Appendices since the 1980s, the Convention's involvement in the trade in ornamental fish is fairly recent, and a number of marine taxa traded by the ornamental industry, such as sea horses, have recently been included in the CITES Appendices. The Convention has had a much more limited involvement to date on the trade in freshwater ornamentals, with only a small number of these species listed in its Appendices.

Data are collected through CITES only for those species listed in the Appendices of the Convention. Exports from the 172 CITES Parties are reported at the species level annually, forming the basis of a comprehensive dataset in listed species. However, as only a limited number of aquatic ornamental species are listed in the Appendices, data coverage in terms of species is limited.

It has been argued that trade restrictions such as listing of a species in CITES Appendix I can shift the trade to look-alike or substitute species, thus transferring the pressure to other taxa, and displacing market opportunities of local traders (see Section 6.4 for further discussion on impacts on livelihoods). The listing of the Asian Arowana (*Scleropages formosus*) in CITES Appendix I, for instance, was followed by an increase in trade in Silver Arowana (*Osteoglossum bicirrhosum*), a South-American species (Tello & Cánepa, 1991 cited in Moreau & Coomes, 2006).

iv) Annex D of the EU Wildlife Trade Regulation

Annex D of Commission Regulation (EC) No. 338/97 serves as a trade monitoring tool that allows early detection of levels of trade into the European Union of possible conservation concern. Species are listed in Annex D if they are imported into the Community in such numbers as to warrant monitoring.

Species listed on Annex D require an import notification, to be completed by the importer upon entry into the European Union. The import notification form is found in Commission Regulation 865/2006. It requires that data is collected on the species name, quantity, country of origin, exporter

(where different from the country of origin) and importer. While it does not specifically require information on whether the specimens were extracted from the wild or originated in captive-breeding operations, in practice this information is often reported in the annual reports of EU Member States. Failure to provide a notification is one of the criminal offences which Member States are required to create under Council Regulation 338/97. However, the awareness of customs officials and the degree of enforcement on Annex D requirements by all Member States is unclear.

In principle, all imports of Annex D species should be recorded, but in practice it appears likely that some gaps in the data may occur. For instance, a comparison of the data gathered for *Hippocampus* spp. by the GMAD and by Annex D up to 2003 showed that there have been some data gaps in the data collected for the Annex. However, while both datasets presented similar overall trends in trade, Annex D was shown to be a relatively comprehensive monitoring tool which provided significantly higher number of specimens in trade than GMAD. As noted above, however, GMAD is designed to provide global coverage of all species, and as such, it continues to be a unique resource concerning the assessment of the volumes and trends of trade in ornamental taxa.

In 2004, the Scientific Review Group for wildlife trade (SRG) recommended the inclusion of 14 marine ornamental species in Annex D of Council Regulation 338/97[11]. Trade data used for the assessment of those species by the SRG was obtained from GMAD.

Some traders disagreed with the SRG recommendation on the basis that voluntary efforts were already being made to monitor the trade and it has further been suggested that the administrative burden placed on traders by listing species on Annex D could act as a disincentive to voluntary contribution of trade data to GMAD. It has also been argued that the data required from traders for compliance with Annex D listings of ornamental fish is also required by veterinary authorities, which may lead to duplication of the reporting effort by traders.

The EU Wildlife Trade Regulation is limited to EU trade, the market on which this consultation process is focussed.

6.2 STRENGTHS AND WEAKNESSES OF THE NON-GOVERNMENTAL INSTRUMENTS AVAILABLE TO MONITOR TRADE IN AQUATIC ORNAMENTALS

i) The Global Marine Aquarium Database

In April 2000, MAC and UNEP-WCMC commenced collaboration with members of marine ornamental trade associations to establish the Global Marine Aquarium Database (GMAD). The database was designed to gather, integrate, standardise and mobilise information on the trade of individual species. To this end, UNEP-WCMC liaised with wholesale import and export companies from around the world. As these companies link the supply and retail ends of the business, they proved to be key in the collection of quantitative data about the aquarium trade.

GMAD was the first, and to date the only, global database on this trade at the species level. Its creation enabled the production of the first global and the first EU-wide assessments of levels and trends of this trade. Information was provided by the traders on a voluntary basis, as there is no institutional process in place that obligates reporting, nor a standard reporting method for GMAD. Thus, data gathering, collation, standardisation and integration proved to be a labour-intensive exercise, which required visits to wholesale companies to collect and process data mostly from invoices. Additionally, data was entered into GMAD only for those countries in which MAC was running their certification scheme, and so many exporting and importing countries were excluded.

A comparison of the data collected for *Hippocampus* spp. through Annex D (of EU wildlife trade regulations) and in GMAD indicated that, overall, Annex D captured higher levels of data, although for some countries, GMAD data may have been more comprehensive.

[11] http://ec.europa.eu/environment/cites/pdf/srg/31_summary_srg.pdf

Funding for GMAD ended in 2004, and since then it has not been possible to continue maintaining this resource. Its continuation would require regular funding and the establishment of an obligatory reporting process that sought to ensure comprehensiveness and accuracy of the data, and to make the process of data collation effective and efficient.

No equivalent system has been established to monitor the trade in freshwater ornamentals.

ii) Monitoring through a certification scheme.

There is currently no international monitoring nor certification scheme for the trade in freshwater ornamental species comparable to that established by the Marine Aquarium Council (MAC) for the certification of the marine aquarium trade. Experience in this regard, therefore, emerges principally from the certification efforts put in place by MAC.

To date, there has commonly been a lack of information concerning the industry, as recognized at the World Conference on Ornamental Fish in 1999, with regard to the status of natural populations harvested for the industry, ornamental aquaculture production, and the number and species exported (Bartley, 2000). Catch and effort need to be monitored regularly and species under exploitation assessed on a country-by-country basis and reef-by-reef basis (Wood, 2001a; Wood, 2001b).

Monitoring at source is often difficult in key countries of origin such as Indonesia or the Philippines where there are thousands of collectors operating over large areas, and where hundreds of exporting companies and middlemen exist particularly due to lack of organization and resources (Wood, 2001a).

Under a certification scheme, sustainability of extraction may often be more effectively monitored by assessing the condition of the habitat and of the stock from which specimens are extracted, rather than by counting the number of specimens extracted. Monitoring number of specimens extracted at source can often be impractical as collection is conducted by often illiterate collectors, with limited resources to record catch and trade data on a species level.

Moreover, species in trade are given a variety of local names and although training in proper species identification using Latin names is part of the training provided by MAC, experience so far indicates that the chance of backsliding as soon as MAC leaves the field is very high. It is not only at the collection level that MAC faces these difficulties. Many misunderstandings also occur in the communication between exporters and importers. With the existing diversity of vernacular names for species in trade, it is always necessary that somebody 'translates' the names reported before data can be entered into a database in a standard way. This person has to be paid and there will usually be no funds available in developing countries.

MAC faces a significant challenge in its work in countries in which the specimens traded originate, as implementation of the MAC Certification Scheme and compliance with MAC Standards requires a change of behaviour. MAC performs awareness-raising regarding environmental issues as well as training and capacity building.

The main Monitoring and Evaluation (M&E) challenge for MAC involves ensuring that local resource managers and certified traders appreciate the importance of documenting catch and shipment records. Local resource managers are not accustomed to keeping records or overseeing this process, as this is generally done by traders who do not share these data. The process of overseeing record keeping therefore has so far remained largely dependent on community organizers and the outreach officers in the supply and market countries, working with the Certified Industry Group. Moreover, when available, data are often only in hard copy form and need to be collected and then computerized by MAC community organizers.

A significant challenge in Indonesia, for instance, is the unwillingness of exporters to share information which is considered commercially sensitive. Moreover, some exporters do not consistently provide information on number of animals dead on arrival (DOA) and fish reject rates, nor on reasons for rejects, and those that do often do not follow the format that can be used by MAC's M&E system. Even when an internal quality feedback system (between exporter and collectors) is in place, many of the exporters do not seem to recognise the importance of data

collection and information aggregation at the regional and national level. Education is necessary to make exporters understand their role in the establishment of a sustainable future for the marine aquarium trade through actions such as the collection and provision of trade data to manage resources and the trade appropriately.

MAC intends to make further improvements in the M&E database by incorporating shipment data at the importer level. The M&E database program has already been updated to incorporate these data, but no data have yet been provided voluntarily by MAC-Certified importers who receive MAC-Certified supply. Again, only education on the value of monitoring and evaluation may overcome resistance in this respect.

"Leakage" (the selling of MAC-Certified fish to exporters that are not MAC-Certified) is also a problem. All four MAC-Certified collection areas in the Philippines and Indonesia recorded higher catch numbers compared to the number traded, these unrecorded traded organisms may have been sold to exporters that are not MAC-Certified. This is often mostly due to limited absorbing capacity of the MAC-Certified buyers for the limited species variety deriving from one collection area. To be economically viable in their business and to sustain their livelihoods, collectors then need to sell the excess of available organisms to non-certified buyers.

Currently, MAC works mainly in the Philippines, Indonesia and Fiji as these are the main exporters and it is in these countries where a number of issues (cyanide fishing, etc.) were apparent. The main impediment to progress in other countries is lack of funding, hence the focus of MAC activities on these two countries.

Considerable time and funding would be required for each exporting country to market a national certification and labelling program. Without intensive outreach work, awareness of and interest in the MAC Certification scheme is limited. Additionally, certification of collection areas and of collectors is harder to achieve than in developed countries where management plans and regulations are already in place and enforced, and where collectors have access to education and knowledge.

6.3 Effectiveness of the various instruments as international trade monitoring mechanisms

The focus of this consultation process is to consider whether the various existing mechanisms that gather data concerning the international trade in ornamental fish can adequately provide information appropriate for the monitoring of this trade at the species level. Thus, important considerations in this regard include the units reported (e.g. whether the trade is reported by weight or by number of specimens), the taxonomic level at which the data are collected, the geographic coverage provided by the data, the taxonomic coverage (i.e. whether data are collected for all species or just listed species), sectors monitored (i.e. marine and/or fresh water); and implementation regime (i.e. voluntary or compulsory). A summary of the characteristics of the data collected through those instruments concerned with international trade in aquatic ornamentals is provided in Table 6.1.

i) The Global Marine Aquarium Database

Data have been collected at the species level in GMAD for all species traded by participating companies. However, although coverage is global, it is limited to those countries in which MAC is active (and indeed to those companies participating in the certification scheme) and hence major geographic gaps in the data are apparent. As well as the implementation challenges experienced by MAC (Section 6.2), a significant limitation to the success of monitoring through certification is the need to secure long-term reliable funding. This has proved to be a key obstacle in the past. It should also be remarked that MAC is concerned with trade in marine ornamentals, and the scope of GMAD has therefore also been limited to that group of species. To date, there is no equivalent system in place in the freshwater sector.

ii) Customs and FAO statistics

Data collected through the Customs reporting process is undertaken at a global scale, with data usually submitted by both importers and exporters. However, data are collected at at a very general level such as 'ornamental fish' or 'ornamental fish – marine' and trade is often reported by weight or by value. Hence data collected in this way fails to provide a mechanism to monitor the species and number of specimens in the ornamental aquatic trade.

iii) Veterinary controls

Many countries collect data on the imports and exports of live animals and plants for veterinary purposes. As noted earlier (Section 5.4), a Decision has recently come into force in the EU concerning imports of fish for ornamental purposes. Although data made available in electronic form so far have been at a very general level (i.e. freshwater ornamentals and marine ornamental fish), the data reporting form (paper) specifies that data should be collected at the species level, and information on the number of specimens in trade should be recorded. For this reason, it seems that this instrument potentially provides a mechanism for the monitoring of trade in ornamental fish, equivalent to the monitoring facility provided by Annex D of Commission Regulation (EC) No. 338/97. However, a number of issues should first need to be resolved in particular with regards to how data will be collected at the species level, and how this information will be standardised; and whether it will be databased.

iv) CITES listing

Data on CITES-listed species are reported by both exporting and importing countries. As CITES is legally binding and has a global reach, it provides the most comprehensive and detailed data set available. Reporting is limited to species listed in the CITES Appendices.

v) Annex D of the EU Wildlife Trade Regulation

Annex D is legally binding and provides a comprehensive dataset of trade in listed species entering the EU. It does not confer any restrictions on trade and incurs minimal administrative burden as import and export permits are not required. As with CITES listing, the data collected are for species of conservation concern.

TABLE 6.1 SUMMARY OF CHARACTERISTICS OF DATA COLLECTED THROUGH FIVE INSTRUMENTS REGARDING TRADE IN AQUATIC ORNAMENTALS

	Taxonomic level reported	Unit reported	Taxonomic Coverage	Geographic Coverage – importers	Geographic Coverage- Exporters	Sector	Implementation regime
GMAD	Species	Number of specimens	All species	Global – though limited to a few countries	Global – though limited to a few countries	Marine	Voluntary
Customs data	None/mixed	Mixed: weight, volume, number of items, etc.	All ornamental fish	Global	Global	Marine and Freshwater	Normally compulsory through national legislation
EU Veterinary data	Possibly species?	Number of specimens	All ornamental fish	EU	Global	Marine and Freshwater	Compulsory
CITES	Species	Number of specimens	Listed species only	Global	Global	Marine and Freshwater - listed species only	Compulsory for listed species
Annex D	Species	Number of specimens	Listed species only	EU	Global	Marine and Freshwater - listed species only	Compulsory for listed species

6.4 POSSIBLE IMPACTS ON LIVELIHOODS FROM THE MONITORING OF INTERNATIONAL TRADE

It is widely believed that the trade in wild-caught freshwater and marine aquarium species, if managed sustainably, can present a valuable opportunity for income generation and support to livelihoods, while at the same time providing an alternative to environmentally destructive activities (Junk, 1984; Chao & Prang, 1997; Ng & Tan, 1997; Brummet, 2005; Calado, 2006; Moreau & Coomes, 2007).

CITES Resolution Conf. 8.3(Rev. 13) recognises that that commercial trade may be beneficial to the conservation of species and ecosystems and/or to the development of local people when carried out at levels that are not detrimental to the survival of the species in question; and recognises also that implementation of CITES-listing decisions should take into account potential impacts on the livelihoods of the poor.

Dawes (2007) commented that the aquarium industry is not necessarily against regulation of trade in ornamental species particularly when a species survival is threatened in the wild and there is evidence to show that this is the case. However, there appears to be concer in the trading sector that listing species in CITES Appendix II may result in trade suspensions, particularly into the European Community using the EU Wildlife Trade Regulation, which could affect negatively the livelihood of traders. In turn, trade restrictions may force traders to shift efforts to alternative, less threatened taxa. Watson & Moreau (2006) suggested that international regulations may have negative effects and highlighted that the impact of CITES-listings on the livelihoods of collectors is unknown. For CITES Appendix I and II species, frequently there are fees charged to traders for the issuance of export and import permits and associated administration.

7. CONCLUSIONS AND RECOMMENDATIONS

[to be produced for the second consultative draft]

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