

**CONSULTATION PAPER
FINAL DOCUMENT**

**Monitoring of International Trade in
Ornamental Fish**

Prepared for



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

Prepared by



UNEP WCMC

**United Nations Environment Programme
World Conservation Monitoring Centre**

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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.

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EXECUTIVE SUMMARY

The consultation process on the Monitoring of International Trade in Ornamental Fish was initiated on 13 June 2008 and closed for comment on 19 October 2008. It has taken the form of a Consultation Paper, alongside a document providing background information. The aim of the process was to assess the ability of governmental and non-governmental mechanisms to provide information appropriate for the monitoring of this trade at the species level and to produce recommendations with regards to suitable methods. The document and the consultation process focused on the international trade in ornamental fish entering the European Union.

Three consecutive drafts of the Consultation Paper were circulated for feedback to 58 individuals and organisations, and all documents were made publicly available on the website¹ of the United Nations Environment Programme World Conservation Monitoring Centre (UNEP-WCMC). Responses were received from academic experts, the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) authorities, trade associations, conservation organisations, hobbyists, and the Directorate General for Health and Consumer Affairs (DG-SANCO). In total, 15 participants provided input, including five combined responses from organisations such as Ornamental Fish International, the European Pet Organisation, Ecocean and the Zoological Society of London.

Six monitoring mechanisms were considered in detail, namely statistics collected by: Customs and The Food and Agriculture Organization of the United Nations (FAO); European Community (EC) veterinary controls²; CITES listing; Annex D of the European Union Wildlife Trade Regulation³; The Global Marine Aquarium Database (GMAD); and certification. Table 1. shows the key characteristics of each of these mechanisms.

The debate arising from the Consultation indicated the following:

Some consultees felt that due to the threats currently facing coral reefs, increased monitoring is necessary and desirable. Others agreed that current data are insufficient.

Some consultees suggested that monitoring international trade was less effective than on-the-ground conservation because it does not consider mortality prior to export, collection methods, or domestic use, and it does not include stock and habitat assessments. Some consultees emphasised the importance that monitoring should be targeted to species of conservation concern.

Although it was not contested that Annex D was a relatively comprehensive monitoring tool for species imported into the EC, several concerns were raised with regards to Annex D listing. The concerns included that it is focused only on trade into the EU, and that it does not consider domestic use and post-capture mortality. Concerns from industry representatives included a perceived lack of justification for this monitoring measure, a lack of consultation with range States, a lack of confidence in the SRG process, the administrative burden, duplication of effort with veterinary controls and the inclusion of captive-bred specimens.

Industry representatives from Ornamental Fish International (OFI) and the European Pet Organisation (EPO) expressed support for trade monitoring via the data captured by veterinary controls. The forms used by EC veterinary controls⁴ request species-level information and are already completed as a matter of course by importers. The support for monitoring by this mechanism was in a large part because it would minimise any additional administrative burden for the industry. However, a number

¹ <http://www.unep-wcmc.org/species/OrnamentalFishTrade.aspx>

² Decision 2006/656/EC

³ Council Regulation 338/97

⁴ <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:271:0071:0080:EN:PDF>

of practical issues would need to be resolved before this option could monitor trade at the species level. At present, although species names are recorded on hard copy forms, they are not collected or managed electronically. Furthermore, captive-bred specimens are not distinguished from wild-caught specimens.

Some of the concerns raised about Annex D appear to be based on mistaken assumptions, for example: that it will lead to the closure of the European market and that permits are required. There was also a complaint about a lack of clarity about the criteria for inclusion of species in Annex D. One respondent commented that species were listed in Annex D solely because they are traded in significant numbers, to which another replied that species can be listed due to other criteria and that species traded in low numbers can also be assessed.

Certification received support in principle from a range of consultees, but the complexity of the issue was widely recognised. This included issues such as the sustainability of the business, whether consumers would pay a premium for certified fish, economic incentives and industry motivation. There was agreement that a successful certification scheme which is capable of monitoring international trade is a long way off. Several respondents pointed out examples of poor implementation in certification schemes, while one respondent highlighted the success of Project Piaba as a positive example of certification.

Several respondents were concerned about the impact of trade monitoring on wild populations and livelihoods in range states. However, there was disagreement over the expected effects that monitoring would have. There was concern from some respondents that the administrative costs associated with monitoring would be passed on to poor collectors; others felt that economic extinction from unmonitored and unrestricted collection was a greater threat to the livelihoods of collectors.

Various other suggestions concerning aspects of the trade which are outside the scope of the consultation were also debated. These included:

One respondent suggested that ornamental invertebrates should also be monitored; however, another felt that this would need to be justified.

One consultee suggested that breeding in Europe should be encouraged; however another suggested that this would ruin livelihoods in range states, e.g. in South America. Furthermore, other consultees pointed out that such a shift from local use can devalue the resource, and leave the habitat vulnerable to damaging alternative uses.

The important characteristics of each of the mechanisms are compared in Table 1 and presented as follows:

1. Whether monitoring is targeted at species of conservation concern.
2. Whether species name is collected, so that target species can be monitored.
3. Whether species-level data are collected and stored electronically.
4. Whether source of specimens is recorded to distinguish whether individuals are wild or captive bred.
5. Whether the mechanism is compulsory or voluntary.
6. Whether the mechanism is self-sustaining, so that the monitoring can continue in the long-term.
7. Global extent of coverage.
8. Permit fee.
9. Whether data are collected using an agreed list of accepted scientific names.
10. Consideration of mortality prior to export.

While each mechanism has its benefits, there are also limitations which rule out most of the mechanisms. Although they are very longstanding, Customs and FAO statistics have been found to be inconsistently reported in terms of units, and lack the species and source

information required to serve a useful conservation purpose. CITES has many desirable characteristics, and is generally an effective and targeted tool for monitoring trade in species that meet the CITES criteria for listing. However, the monitoring enabled by CITES requires the trader to obtain a permit for the transaction. Certification is the only mechanism which takes into account mortality prior to export; however, for the purpose of international trade monitoring they are expensive; they provide only partial coverage, limited to a selection of areas in some countries; some have a poor track record; and they depend upon consumer awareness to support the schemes. Data in GMAD were collected on a voluntary basis only, and it is not currently operational as it does not have a continued source of funding.

Annex D listing and EC veterinary controls fulfil most of the necessary criteria to effectively monitor EU imports of ornamental fish and appear to be the only practical options for monitoring international trade in ornamental fish; they collect species name, are enforceable and are self-sustaining. Both mechanisms focus on trade to the EU rather than globally. However, they do not currently require information on source of the specimens in trade. Furthermore, veterinary controls do not currently gather the species information electronically, although there are reported to be plans do so in the future.

It is apparent that there is no ideal mechanism and that any decision made is likely to be subject to criticism from some sectors. Veterinary controls are favoured by the industry because the information which is already provided on veterinary certificates could be used to monitor the trade. The problems with collecting and managing species information electronically for veterinary controls and for recording the source of the specimens are practical issues which would need to be addressed.

The evidence presented in this report and the feedback received from consultees suggest that currently, the only instrument that can provide comprehensive, species-level data on international trade in species of conservation concern is Annex D of the Wildlife Trade Regulations. However, industry operators have expressed a willingness to work in partnership with the regulatory bodies and are keen for veterinary controls to be investigated further as a mechanism for monitoring international trade in ornamental fish.

TABLE 1. SUMMARY OF THE CHARACTERISTICS OF MECHANISMS FOR MONITORING INTERNATIONAL TRADE IN ORNAMENTAL FISH.

Mechanism	Customs and FAO statistics	CITES listing	GMAD	Certification	EC Veterinary controls	Annex D of the EC Wildlife Trade Regulation
Species name normally collected	No	Yes	Yes	Depends on scheme	Yes	Yes
Species-level data recorded electronically	Yes	Yes	Yes	Depends on scheme	No	Yes
Distinguishes wild and captive bred	No	3) a No	No	Yes	No	No
Enforceable	Yes	Yes	No	No	Yes	Yes
Species coverage	All	Listed species only	Marine	Depends on scheme	All	Listed species only
Self-sustaining	Yes	Yes	No	No	Yes	Yes
Geographic coverage	Global	Global	Potentially global	Where active	EU	EU
Permit fee	No	Yes	No	No	No	No
Agreed list of scientific names for use on permits	Not applicable	Yes	Yes	No	No	Yes
Considers mortality prior to export	No	No	No	Yes	No	No
Other comments	Has been collected for a long time, allowing detection of trends. Inconsistent reporting values Small shipments sometimes excluded.	Species need to meet CITES criteria for listing.	Not currently operational.	Requires an economic incentive.	No additional administrative burden for traders.	Possible duplication of effort with veterinary controls.

2

THE CONSULTATION IS NOW CLOSED.

1 1 CONTEXT

2 The trade in live aquatic ornamental animals for the aquarium trade is a global multi-million dollar
3 industry, which can provide economic incentives for habitat conservation. However, little is known
4 about the scale of the international trade in many species, and there are concerns that trade in some
5 species might not be sustainable, given factors such as their biology, distribution, conservation
6 status and ability to survive in captivity (see background information⁵).

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

14 Following several discussions, the Scientific Review Group (SRG) of the EU Wildlife Trade
15 Regulation recommended that a number of species should be listed in Annex D of Council
16 Regulation 338/97. This recommendation has not yet come into effect⁶. Meanwhile, some traders
17 have expressed concern about these potential listings, suggesting that the value of their voluntary
18 monitoring efforts may have been overlooked, and that the Annex D listings would lead to
19 increased administrative burden on the import of specimens into the EU.

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

24 Moreover, to date, certification and monitoring efforts have been focused on the marine component
25 of the ornamental trade, with less emphasis on the freshwater sector. Although much of the
26 freshwater trade involves captive-bred specimens (Andrews, 1990; Olivier, 2001; Tlustý, 2002),
27 substantial volumes of wild-caught fish are also traded. Little is known about the scale and nature
28 of much of this trade.

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

32

⁵<http://www.unep-wcmc.org/species/OrnamentalFishTrade.aspx>

⁶ Following CITES CoP14 *Pterapogon kauderni* was listed in Annex D on 3/8/2008

33 *Contributions from consultees*

34 [5:] Marine invertebrates could also be included, as trade in invertebrates is in some ways less
35 known than fish but of significant importance.

36 [7:] As for fish species, the trade in marine ornamental invertebrates compared to the total resource
37 and compared to the use made of it by other sectors is often *de minimus*.

38 [7:] Nowhere is there a clear rationale for how species subject to greater scrutiny might be selected –
39 we must emphasize that “it might be nice to know” is not and never can be sufficient justification.
40 Resources are limited and must be deployed to best conservation effect, not on a whim (I am not
41 suggesting respondent 5 did this).

42 [11a:] Considering the title of the Paper, invertebrates are beyond the scope of this document.

43 [7:] Lines 17-19 do not reflect our concerns. I suggest “Meanwhile some traders have expressed
44 concern “ be reworded as “Some sectors have a deep seated mistrust of the methodology and hence
45 validity of the SRG as currently established”.

46 [7:] I think it is incorrect to say “little” is known about the scale or nature of the trade. Much is
47 known but perhaps not as much or in as much detail as the SRG might like to see.

48 [7:] The voluntary nature of GMAD has been overlooked. There is a long-held fundamental lack of
49 confidence in the decision making process of and the conclusions drawn by the SRG. A more
50 transparent inclusive approach to decision making is required to enable the greatest conservation
51 benefit for the least, or at least a proportionate, cost.

52 [5:] “There is a long-held fundamental lack of confidence in the decision making process of and the
53 conclusions drawn by the SRG” seems to be a sweeping statement – is there evidence to back it?

54 [7:] During 2007, 3200 consignments (pers. com. Tristram Bradfield, Heathrow Border Inspection
55 Post) of ornamental fish landed at Heathrow (LHR). LHR is responsible for 70% of UK imports
56 (Customs data) by value, in turn the UK is responsible for 25% of EU imports (Eurostat). Therefore
57 it is not unreasonable to assume there are in the region of 20,000 consignments of ornamental fish
58 imported into the EU annually. It is probably a reasonable assumption that an average of 50 species
59 is present in each consignment-thus over 1 million records would need to be created, recorded,
60 collated filed and reported. Even if all this could be done electronically there is the potential for an
61 enormous cost for both trade and administrators. {Editors’ note: This comment seems to refer to a
62 scenario in which trade in all ornamental fish species were monitored}. [7:] Since the criteria for Annex D
63 are neither clear nor precise we had to assume the worst case – that it might be “nice to know”
64 about all species. Any eventual conclusion should carry a health warning that a RIA should be
65 undertaken.

66

2 INTRODUCTION

67 This report is the final document of a Consultation Paper based on three drafts which have been
68 circulated to major stakeholders in the international trade in aquatic ornamentals, including
69 importers, exporters, trade regulators, NGOs *etc.* Summaries of comments were incorporated with
70 the intention of reflecting as clearly as possible the views of all contributors.

71 Draft 1 of The Consultation Paper was produced by UNEP-WCMC with input from IUCN
72 Freshwater Biodiversity Assessment Unit, the Marine Aquarium Council (MAC) and the Scientific
73 Review Group of the EU Wildlife Trade Regulations (SRG). Drafts 2 and 3 incorporated feedback
74 received from consultees. The current, final version incorporates all the comments which have been
75 received and includes an Executive Summary outlining the major points made in the debate.

76 3 OBJECTIVE AND SCOPE

77 This consultation is conducted with three objectives, namely to:

- 78 a) consider the existing governmental mechanisms that gather data concerning the
79 international trade in ornamental fish, and assess their ability to provide information
80 appropriate for the monitoring of this trade at the species level;
- 81 b) consider the extent to which non-governmental mechanisms, such as certification schemes
82 or voluntary databases provide a mechanism to monitor the international trade in aquatic
83 ornamentals at a global scale;
- 84 c) produce recommendations for the best method of monitoring international trade in
85 ornamental fish.

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

89 [6&7:] The document seems to be based on the principle that it is desirable to improve and/or
90 increase monitoring of the international trade in ornamental fish and yet there is no explicit case
91 made for increased monitoring. The revised draft should state the objectives that increased or
92 improved monitoring is meant to achieve. Without this, it is very difficult to assess the relevance or
93 potential effectiveness of any proposed measures, let alone what the longer term objective might be
94 (conservation, trade, livelihoods, etc).

95 [5:] Increased monitoring is desirable and necessary at a time when there is widespread concern
96 about the rate at which coral reefs are being lost or degraded and the knock-on effect this has on
97 availability of resources. Wilkinson (2004) concluded that 20% of reefs have been effectively
98 destroyed and show no prospects of recovery. A further 24% are considered to be under imminent
99 risk of collapse and 26% under longer-term threat. This leaves only 30% of reefs at low risk, and
100 even these are not immune from the effects of global climate change. The main threats to coral reefs
101 are from climate change, destructive fishing, declining water quality and degradation of coastal
102 habitats. But whatever the cause of the loss of, or damage to, reefs, it means that reef resources will
103 be increasingly scarce and vulnerable to over-harvesting. Thus there are strong arguments for
104 monitoring collection of fish for the aquarium trade. The seriousness of the situation is illustrated
105 by a recently published Red List analysis that placed one third of reef-building corals at elevated
106 risk of extinction (Carpenter *et al.*, 2008).

107 [6:] The revised report still does not make an explicit case for increased monitoring of the
108 ornamental fish trade. Any benefits are at best implicit and most are inferred rather than defined. It
109 is by no means certain that monitoring will bring any conservation benefits and gathering of data
110 without a clear idea of what that data represents or how it can be analysed and interpreted is
111 bound to lead to the generation of information which is at best difficult to interpret. The intended
112 conservation benefits should first be defined and then the data needed to achieve these benefits
113 should be identified and a data collection and analysis system designed around this need. The
114 world is littered with the remains of databases which collected a great deal of information without
115 any clear idea how that data would be used. Consideration should be given to how much
116 information could be extracted from data which is currently gathered before any move is made to
117 extend data collection.

118 [6:] The justification for increased monitoring is still unclear. What is proposed has some elements
119 of displacement activity about it; doing something easy but trivial to avoid addressing the more
120 serious and difficult issues relating to the potential loss of coral reef biodiversity. It might make
121 people feel as if they are doing something, but little concrete may result. At worst, monitoring may
122 simply provide a better platform from which to observe the loss of coral reef biodiversity. I do not
123 think that monitoring in isolation is really going to do much to conserve coral reefs.

124 4 METHOD

125 The consultation process consisted of three ‘consultative rounds’. The ‘first consultative round’
126 aimed to gather comments and contributions on the general content of, and on the list of issues and
127 monitoring tools identified in the first draft (Draft 1) of the Consultation Paper.

128 The second draft (Draft 2) of the document sought to incorporate a summary of the feedback and
129 data received from the first consultative round, as well as to provide a series of provisional
130 conclusions on the topics discussed. Changes made since the first draft were in bold text to enable
131 readers to identify them easily. The second draft was circulated for comments in a ‘second
132 consultative round’, for which comments were to be on the bold text (i.e. changes made since the
133 first draft).

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

140 At all stages in the drafting process, the drafting team endeavored to summarise all substantive
141 contributions in a clear, succinct and representative manner. However, contributions were generally
142 not transcribed verbatim.

143 The Discussion section aimed to identify the most relevant issues concerning the remit of this
144 paper, and to present a set of ideas under each issue, about which contributors can provide further
145 information.

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

150 While a significant effort has been made to produce a well documented and well discussed paper,
151 Draft 1 in particular did not claim to be exhaustive in the range and depth of issues it intended to
152 cover. Instead, the document was expected to grow and evolve as feedback is received.
153 Contributors were emphatically encouraged to provide literature references or data supporting
154 their contributions whenever possible. Contributors were also requested to include the line
155 number(s) relevant to each comment.

156 All dates for the consultation process are given in Table 4.1. The consultation process has now
157 closed.

158

159 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

160 5 INTERNATIONAL TRADE MONITORING

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

165 5.1 CERTIFICATION AND MONITORING

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

- 168 • First Party certification is based upon a self-declaration by the producer that it meets the
 169 requirements of a certain standard. There is no independent oversight agency for first party
 170 certification and therefore it is normally deemed to be of limited value.
- 171 • Second Party certification is based upon an assessment that the producer meets the
 172 requirements of a standard that was set by a group of consumers, by government or by a
 173 non-governmental organization. Unlike first-party certification, the producers do not
 174 define the standards nor do they assess their compliance themselves. However, the
 175 standards may be less than objective and comprehensive as they are often subject to the
 176 interests of the group that both sets them and assesses compliance.
- 177 • Third Party certification is based upon standards created by a multi-stakeholder process.
 178 Compliance with the standards is voluntary and is assessed by an accredited, independent
 179 third party that has no vested interest in the standards, certification, product or any
 180 particular stakeholder group. The International Organization for Standardization (ISO)
 181 defines third party certification as the highest order for proof of compliance.

182 5.1.1 MARINE CERTIFICATION

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

187 5.1.2 THE MARINE AQUARIUM COUNCIL AND CERTIFICATION

188 The Marine Aquarium Council (MAC), established in 1996, is an international, multi-stakeholder,
 189 not-for-profit organization that brings together conservation organizations, fishers, the aquarium
 190 industry, public aquaria, aquarists and government agencies to ensure the marine aquarium trade

191 is responsible and sustainable. MAC's mission is to conserve coral reefs and other marine
 192 ecosystems by creating standards and certification for those engaged in the collection and care of
 193 ornamental marine life from reef to aquarium.

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

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

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

208 Four Standards apply along the Certified Chain of Custody:

- 209 • The Ecosystem and Fishery Management (EFM) international Standard: ensures the
 210 collection area is managed as a responsible fishery and includes resource assessment and
 211 monitoring, a Collection Area Management Plan (CAMP) and organism
 212 replenishment/'no-take' areas.
- 213 • The Collection, Fishing and Holding (CFH) international Standard: makes sure that the
 214 harvesting of fish, coral and other coral reef organisms are conducted responsibly and
 215 maintain the health of the collection area (e.g. using no destructive fishing practices;
 216 ensuring that handling prior to export, holding, packaging and transport maintain optimal
 217 health of the harvested organisms).
- 218 • The Handling, Husbandry and Transport (HHT) international Standard: certifies that (i)
 219 the handling of marine life during export, import and retail maintain the organisms'
 220 optimal health; (ii) uncertified organisms are segregated; and (iii) MAC Certified organisms
 221 have passed exclusively from one MAC Certified industry operator to another.
- 222 • The Mariculture and Aquaculture Management (MAM) international Standard: launched
 223 in 2006, this Standard addresses the propagation, collection, and culturing of marine
 224 aquarium organisms, and specifies requirements for all stages from broodstock/post-
 225 larvae collection through to grow-out for market, packaging and transport of cultured
 226 marine ornamentals.

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

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

242 MAC defines “mariculture” as the cultivation of marine organisms by exploiting their natural
 243 environment, whereas “aquaculture” is the farming of aquatic organisms including fish, molluscs,
 244 crustaceans, corals and other invertebrates, and aquatic plants with some sort of intervention in the
 245 rearing process to enhance production, such as regular stocking, feeding, protection from
 246 predators, etc. Farming also implies individual or corporate ownership of the stock being
 247 cultivated.

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

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

253 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

254 The MAC Certification scheme has requirements, mechanisms and processes for collecting and
 255 analysing information on the status of marine ornamental resources, including the status of the
 256 ecosystem and the of impact of human activities. This information was not previously collected and
 257 is expected to ensure that the sustainability of marine ornamental operations to be assessed more
 258 objectively. MAC Core Standards provide the means to integrate this information into the
 259 requirements for industry operations, creating the possibility to improve continually the
 260 sustainability of the marine aquarium trade through adaptive management.

261 *Contributions from consultees*


262 [4:] The MAMTI standard has never been applied and no post-larvae experts have been consulted
 263 about it

264 [11:] MAC has gone through a major transformation in the last months and the text needs an
 265 update to the present situation. The basic idea of MAC still stands, but experience in the last decade
 266 has shown that the way forward needs a major adaptation toward more simplified mechanisms.
 267 For the moment the MAC system would absolutely not work in the majority of the freshwater
 268 businesses.

269 5.1.2.1 EVALUATION AND CAPACITY BUILDING

270 MAC developed a Monitoring & Evaluation (M&E) system and team for the impact and outcomes
 271 of MAC Certification. This team collected and reported relevant data at the species level, quantity,
 272 mortality rates, reject rates and price (see Organism Receipt Sheet (ORS) form in Figure 5.1). Data
 273 are recorded by collectors and traders, who the pass the data to their respective contacts in MAC
 274 (e.g. community organizer). This information was then collated into an internal MAC database. The
 275 Marine Aquarium Market Transformation Initiative (MAMTI) and M&E reports provided a project
 276 “score card” that tracks a number of project output and outcome indicators.

277 FIGURE 5.1. ORGANISM RECEIPT SHEET FORM USED BY MAC



ORGANISM RECEIPT SHEET & SHIPMENT EVALUATION (related to invoice no.:		Supplier:	Delivery Date:						
				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

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

286 In 2006, the MAMTI project of MAC covered 14 collection areas in seven provinces, in 10
 287 municipalities and districts encompassing 22,947 hectares of reef areas in the Philippines and
 288 Indonesia. The MAMTI project covered only Indonesia and the Philippines, but there were also
 289 certified collection areas in Fiji. The project monitored many more areas in the Philippines and
 290 Indonesia than were certified. These were the areas the project was working in, but where
 291 certification had not yet been achieved. Seven hundred and eighteen (718) collectors and traders
 292 (483 in the Philippines and 235 in Indonesia) have been trained in non-destructive collection
 293 methods and given assistance in preparing for a third party assessment for MAC Certification.

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

296 *Contributions from consultees*

297 [5:] If available, the MAC database could, in theory, be a useful source of data.

298 *{Editors' note: MAC has offered to provide an update on their work. This was not received before circulation*
 299 *of this document. This information will be made available when received.}*

300 5.1.2.2 THE GLOBAL MARINE AQUARIUM DATABASE (GMAD)

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

315 In August 2003 the dataset contained 102,928 trade records concerning 7.7 million imported and 9.4
 316 million exported animals, covering a total of 2,393 species of fish, corals and invertebrates, and
 317 spanning the years 1988 to 2003⁷. These data have permitted the most accurate quantitative
 318 estimates to date of the size of the global trade in marine ornamental fish and corals, and the
 319 production of the first ever estimates for invertebrates other than corals - a previously overlooked
 320 section of the industry. However, the data were only collected for those countries/regions in which
 321 MAC is active. Moreover, no data have been entered into GMAD since 2003.

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

323 *Contributions from consultees*

324 [5:] GMAD represented only a small percentage of the total trade.

325 5.1.3 FRESHWATER CERTIFICATION

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

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

338 In Guyana, an organisation called Iwokrama was formed in partnership with the North Rupununi
 339 District Development Board (NRDDB) to create a sustainable, community-based aquarium fisheries
 340 business in the Rupununi wetlands. The project was designed to generate revenue for indigenous
 341 communities from the area's extraordinarily high fish diversity. Management protocols to ensure
 342 local ecological and social sustainability were implemented. On a regional level, Iwokrama hoped
 343 to influence South America's aquarium trade by introducing a certified 'green equity' trade,
 344 resulting in regulation of the presently unregulated industry. The project has since ended (see the
 345 first comment by [6], below).

346 In Brazil, an initiative called Project Piaba was established which aimed to promote an
 347 economically viable fishery for the riverine communities of the middle Rio Negro, and an
 348 ecologically sustainable resource for a 'green' aquarium industry (Chao & Prang, 1997). This project
 349 is conducting research on the diversity, abundance and distribution of ornamental species with a
 350 view to: establishing fishery management strategies; identifying ways in which fish husbandry
 351 techniques and captive breeding could be improved; providing environmental education; creating
 352 community-based fisheries management strategies; and liaising with the regulatory bodies in Brazil
 353 to provide advice on monitoring and inspection of stocks, fisheries management and export policy
 354 (Chao & Prang, 1997).

355 Ornamental Fish International (OFI) is involved in plans to develop a labelling system for South
 356 American fish in cooperation with The United Nations Conference on Trade and Development
 357 (UNCTAD), TRAFFIC South America and Organización del Tratado de Cooperación Amazónica
 358 (OTCA).

359 [12:] In Cameroon, the WorldFish Center is working with fishing communities and exporters
 360 provide training in proper capture, handling and holding (resulting in a net change in survival
 361 during shipping from <20% to >90%), which has contributed importantly to the profitability and
 362 sustainability of the trade. Studies of the abundance and distribution of ornamental species and the

⁷ Import and export data cannot be pooled as some of the contributing exporters traded with some of the contributing exporters. Therefore import and export data should be treated separately.

363 costs and practices associated with various stages of the local value chain, enabled by having a
 364 good relationship with the main stakeholders, facilitated the generation of sustainable business
 365 plans, although financial assets to implement these are currently available only to wealthier
 366 investors.

367 *Contributions from consultees*

368 [6:] Having worked on the Iwokrama/NRDDDB project I can provide some information, although
 369 this is not a statement on behalf of either organisation. The aim was to produce “green” ecolabelled
 370 ornamental fishes from the Rupununi River. Most of the effort went into establishing monitoring of
 371 populations and catch/effort and insufficient went into creating a stable and sustainable business.
 372 When the project ended in March 2005, the collectors in N Rupununi were ill-equipped to handle
 373 the business and, coupled with a very unstable business environment in Guyana and high waters
 374 in the Rupununi, very little collecting or exporting took place in the next two years. A few
 375 shipments have taken place subsequently, but these have not relied on the “green” label and were
 376 made by NRDDDB directly to the exporters, not through Iwokrama. One of the important lessons to
 377 come out of this (and some other ornamental fish projects) is that it is not possible to create
 378 sustainable ornamental fish trade without a sustainable business at the core.

379 [11:] Certification is an interesting idea that has much support from within the industry, but
 380 examples like this show that it is not a straightforward task.

381 [6:] The report correctly points out that first party certification is of limited value. First party
 382 certification was what Iwokrama originally proposed; the idea was to promote “green” fish from
 383 Guyana on the basis of the work done in NRDDDB. The data collection records from the collectors
 384 would have been available to an external auditor should second party certification have been
 385 required. Unfortunately, as the project concentrated on measuring offtake and catch per unit effort
 386 and did not engage with the trade until the very end of the project, the idea did not take off. If
 387 the setting of standards by Iwokrama were to be considered an external influence, there may be
 388 grounds for considering this to be second party certification after project completion.

389 [11:] The OFI Code of Conduct was adopted at the annual meeting of May 2008 and will be
 390 formally implemented in the coming year. {*Editors’ note: the OFI code of conduct covers animal welfare,*
 391 *biosafety and fair trade*}.

392 [7:] OATA also has a Code of Conduct.

393 [14:] Freshwater fish are more vulnerable due to the number of endemics being traded and small
 394 population sizes of some wild caught species. As the wild-caught marine trade is bigger globally it
 395 seems to get more management attention. Freshwater species can often be more important in
 396 domestic trade in developing countries where management of domestic trade is poor or non-
 397 existent.

398 **5.2 MONITORING THROUGH WILDLIFE TRADE LEGISLATION**

399 **5.2.1 INTERNATIONAL**

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

410 The trade in CITES-listed species is regulated so that all imports, exports and re-exports of CITES-
 411 listed species must be authorized through a licensing system. Each Party to the Convention must

412 designate one or more Management Authorities in charge of administering that licensing system
 413 and one or more Scientific Authorities to advise them on the effects of trade on the status of the
 414 species. Before a permit may be granted, the Scientific Authority must make a “non-detriment
 415 finding” or a conclusion that the export of specimens of a particular species will not impact
 416 negatively on the survival of that species in the wild. In this way, it is intended that trade will only
 417 be permitted if there is evidence that it is sustainable.

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

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

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

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

435 Few species of freshwater fish have been listed in the Appendices to CITES to date, and even fewer
 436 freshwater ornamental species. Hence species-level trade data on a global scale are not generally
 437 available for this group. Ornamental freshwater fish species which have been listed include the
 438 Asian Arowana *Scleropages formosus*, the Cui-ui *Chasmistes cujus*, Seven-line Barb or Giant River
 439 Carp *Probarbus jullieni* and the Pangasid catfish *Pangasianodon gigas* which are listed in CITES
 440 Appendix I. Although only representing a small part of the ornamentals trade, other CITES-listed
 441 marine and freshwater species that are kept in public aquariums include (Koldewey & Jones, 2008;
 442 CITES Appendix in parentheses): Whale shark (*Rhincodon typus*; II); Great white shark (*Carcharodon*
 443 *carcharias*; II); Sawfish (Pristidae spp.; I) except *Pristis microdon* (II); Acipenseriformes spp. (II) except
 444 Shortnose sturgeon (*Acipenser brevirostrum*; I) and Sturgeon (*Acipenser sturio*; I); Arapaima (*Arapaima*
 445 *gigas*; II); Congo blind barb (*Caecobarbus geertsii*; II); European eel (*Anguilla anguilla*; II); Seahorses
 446 (*Hippocampus* spp.; II); Humphead wrasse (*Cheilinus undulatus*; II); Totoaba (*Totoaba macdonaldi*; I)
 447 and Australian lungfish (*Neoceratodus forsteri*; II).

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

450 *Contributions from consultees*

451 [7:] The proposal to list Banggai Cardinal fish on Appendix II was subject to criticism concerning
 452 various aspects of the research and was withdrawn due to a lack of support from the range State.
 453 The proposal to list the species on Annex D in spite of these criticisms has increased industry
 454 reservations concerning the SRG.

455 5.2.2 REGIONAL

456 5.2.2.1 EUROPEAN UNION

457 The European Single Market and the absence of systematic border controls within the European
 458 Union (EU) mean that the provisions of CITES have to be implemented in a uniform way in all 27
 459 EU Member States. This has been achieved through the European Wildlife Trade Regulations, in
 460 particular Council Regulation 338/97 and Council Regulation 865/2006, which together implement

461 CITES and go beyond it. Council Regulation 338/97 lists species in four annexes: Annexes A B, and
 462 C which broadly correspond with CITES Appendices I, II and III respectively but also contain some
 463 non-CITES species, and Annex D for species that are imported into the European Union at such
 464 levels as to warrant monitoring. An import permit is required for species listed in Annexes A and
 465 B, differing from CITES which only requires an import permit to be issued for Appendix I
 466 specimens. The European Union can establish import suspensions where the Scientific Authority is
 467 concerned that the trade might have a negative impact on the status of the species in the wild.

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

- 473 a) there is evidence of demand for it in the EU market and
- 474 b) it might be threatened by trade due its unfavourable or unknown conservation status,
 475 distributional, ecological or reproductive potential and
- 476 c) reliable trade data are not available from any other source.

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

479 *Contributions from consultees*

480 [7:] There is concern that closing the EU market will reduce the value of fish and reduce returns
 481 from the harvest, rather than ensure a sustainable harvest.

482 5.2.3 NATIONAL

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

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

492 5.3 CUSTOMS LEGISLATION AND MONITORING

493 5.3.1 INTERNATIONAL

494 The World Customs Organization (WCO) is an intergovernmental organisation with competency
 495 regarding the development of global Customs Standards, the simplification and harmonization of
 496 Customs procedures, the security and facilitation of the trade supply chain, trade facilitation, and
 497 Sustainable Customs capacity-building initiatives. It currently represents 173 Customs
 498 administrations on all continents. Currently, WCO Members are responsible for processing more
 499 than 98% of all international trade⁸.

500 The Harmonized Commodity Description and Coding System provides a common basis for the
 501 classification of goods and the collection of Customs duties. It comprises about 5,000 commodity
 502 groups, each identified by a six digit code, arranged in a legal and logical structure and is
 503 supported by well-defined rules to achieve uniform classification. The coding system includes code
 504 "0301.10 - Ornamental fish". While countries can further develop this code to distinguish between

⁸ http://www.wcoomd.org/home_about_us_our_profile.htm

505 categories of ornamental fish, many countries do not (particularly when they charge the same
506 excise duty on all ornamental fish), so data is commonly collected only at this level.

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

509 5.3.2 REGIONAL

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

514 5.3.2.1 EUROPEAN UNION

515 The Customs codes that are applied by the 27 Member States of the European Union for
516 ornamental fish are listed in Part two, Section I, Chapter 3 of Commission Regulation 1214/2007
517 which amended Annex I to Council Regulation 2658/87 on the tariff and statistical nomenclature
518 and on the Common Customs Tariff⁹. These are: “0301.10 is the code for Ornamental fish”, which is
519 further broken down into 0301.10.10 the code for Ornamental fish – freshwater, and 0301.10.90,
520 which is the code for Ornamental fish – saltwater¹⁰.

521 5.3.2.2 SOUTH AMERICA

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

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

530 5.3.2.3 AFRICA

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

534 5.3.3 NATIONAL

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

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

546 Some countries record more detailed levels of ornamental fish trade. Morocco uses “0301.10 for
547 Ornamental fish”, which is further broken down into 0301.10.10, the code for Ornamental fish -

⁹ <http://www.bitd.org/Search.aspx>

¹⁰ COMMISSION REGULATION (EC) No 1214/2007

http://eur-lex.europa.eu/LexUriServ/site/en/oj/2007/l_286/l_28620071031en00010894.pdf

548 freshwater and 0301.10.90, the code for Ornamental fish – saltwater. Rwanda applies the codes:
 549 “0301.10.10 Ornamental fish – Breeding animals; and “0301.10.90 - Ornamental fish - other”. Fish
 550 are not excisable according to legislation in Singapore according to the Customs Tariff of
 551 09/06/2004¹¹. In Singapore, different customs codes are used for recording freshwater and marine
 552 ornamental fish species. For freshwater species the code is: “Fish, freshwater, live, ornamental,
 553 03011030” and although the same code is used fish may be recorded as barb, angel or betta within
 554 this category. For marine species the code is “Fish, marine live, ornamental- 03011020” which may
 555 also be recorded as butterfly, clown or damsel within this category¹².

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

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

567 According to Adams *et al.* (2001), individual species names in each shipment are not databased by
 568 USFWS, although they do appear on the Form 3-177, resulting in difficulties in distinguishing
 569 between marine and freshwater species through the existing datasets. As from the 15th of May 2004,
 570 all importers and exporters must separate marine tropical fish from freshwater tropical fish on
 571 different lines of the declaration form (Form 3-177). Declarations that combine freshwater and
 572 marine tropical fish as one line item will be rejected for correction¹³.

573 5.3.4 CUSTOMS TRADE DATABASES

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

576 These include:

- 577 • The United Nations Commodity Trade Statistics Database (COMTRADE) which contains
 578 detailed imports and exports statistics reported by statistical authorities of close to 200
 579 countries or areas. It concerns annual trade data from 1962 to the most recent year and is
 580 thought to be the most comprehensive trade database available. As of September 2007, it
 581 contained more than one billion records.
- 582 • The United Nations Conference on Trade and Development (UNCTAD) Trade Analysis
 583 Information System (TRAIS) that contains information on Imports, Tariffs, Para-Tariffs
 584 and Non-Tariff Measures for 119 countries. The data are available at the most detailed
 585 commodity level of the national tariffs (i.e., at the tariff line level) and are recorded
 586 according to three internationally recognized trade and tariff classifications.
- 587 • The World Trade Organization (WTO) Integrated Data Base (IDB) that contain Imports by
 588 Commodity and Partner Country and MFN Applied Tariffs for over 80 countries at the
 589 most detailed commodity level of the national tariffs; and, the Consolidated Tariff Schedule
 590 Database (CTS) that contains WTO Bound Tariffs, Initial Negotiating Rights (INR) and
 591 other indicators. The CTS is the official source for Bound Tariffs, which are the concessions
 592 made by countries during a negotiation (e.g., the Uruguay Round of Multilateral Trade
 593 Negotiations). The data are recorded according to two internationally recognized trade and
 594 tariff classifications.

¹¹ <http://www.bitd.org/Download.aspx?ID=292>

¹² Singapore Customs <http://www.customs.gov.sg/NR/rdonlyres/9DD35ABD-7D3D-44F1-8350-A06F5D39710C/0/AZ.pdf>

¹³ <http://www.fws.gov/le/PubBulletins/PBSeahorsesTropicalFish.htm>

- 595 • FISHSTAT Plus¹⁴ is a web-downloadable software for fishery statistical time series at global
596 level. It provides time series data on aquaculture production, total capture production,
597 trade and production of fishery products.
- 598 • EU Export Helpdesk statistics¹⁵ is an online service, provided by the European
599 Commission, to facilitate market access for developing countries to the European Union. It
600 provides trade data (exports and imports) for the EU and its individual Member States,
601 both collectively and individually as well as intra-EU trade. Data are available for the years
602 2000-2006. The data are recorded using the TARIC (Integrated Tariff of the European
603 Communities) code system.
- 604 • National statistics are available for a number of countries, some of which can be accessed
605 online.

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

608 5.4 VETERINARY LEGISLATION

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

613 Most countries now have national legislation relating to veterinary requirements that must be met
614 in order to import live animals. In all but six of 20 countries and regions¹⁶ surveyed by Whittington
615 & Chong (2007), a health certificate was required to import freshwater fish. A fish inspection was
616 required in 14, but fish were quarantined in only eight. Veterinary and health regulations can
617 involve physical checks of shipments, health certificates or permits, prior notification of arrival
618 (Olivier, 2001).

619 5.4.1 REGIONAL

620 In September 2006, the European Commission published a Decision 'laying down the animal health
621 conditions and certification requirements for imports of fish for ornamental purpose'
622 (2006/656/EC). The aim of the decision was to prevent any potential introduction of disease which
623 could have a significant impact on farmed and wild fish stocks in Community waters. The Decision
624 has been enforced from the 1st April 2007 by Member States.

625 In Decision 2006/656/EC, cold water ornamental fish are defined as any ornamental fish which are
626 susceptible to one or more of the following diseases: epizootic haematopoietic necrosis (EHN),
627 infectious salmon anaemia (ISA), viral haemorrhagic septicaemia (VHS), infectious haematopoietic
628 necrosis (IHN), spring viraemia of carp (SVC), bacterial kidney disease (BKD), infectious pancreatic
629 necrosis (IPN), Koi herpes virus (KHV) and infection with *Gyrodactylus salaris*. Tropical ornamental
630 fish are defined in the Decision as all those not included under the 'cold water' definition. The
631 distinction between the two categories is related to the susceptibility of an ornamental fish to
632 diseases as listed by the relevant Community legislation in accordance with the list of the World
633 Organisation for Animal Health (OIE). Therefore, any ornamental fish which is not listed as
634 susceptible to any disease can be treated as a 'tropical ornamental fish' (independently of whether it
635 originates from a 'tropical' region) and it may be exported to the Community provided it is sourced
636 from a country which is a member of the World Organisation for Animal Health (OIE).

637 The certificates for imports of cold-water and tropical ornamental fish into the European
638 Community required through Decision 2006/656/EC require the data concerning the country of
639 origin and destination, the scientific name of the species, and the quantity of specimens imported.

¹⁴ <http://www.fao.org/fishery/topic/16073>

¹⁵ <http://exporthelp.europa.eu/> Accessed on 09/08/2007

¹⁶ Requiring a health certificate: Australia, Brazil, Bahrain, Europe (some members), China (People's Republic; Taiwan), Iceland, Indonesia, Mauritius, Malaysia, New Zealand, Philippines, Poland, Singapore. Not requiring a health certificate: Canada, China (Hong Kong), Japan, Mexico, Thailand, United States of America.

640 Data collected in this way between 01/05/2007 and 23/07/2007 has been made available
641 electronically. However, the electronic dataset did not include species-level information, even
642 though data on the origin and destination country and the number of fish imported were recorded.

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

645 *Contributions from consultees*

646 [13:] In the future, species-level data will be captured, as species will be sorted in categories in
647 accordance with their susceptibility to diseases of Community concern. These certificates will be
648 repealed and replaced by the end of 2008. The main amendments to the current certificates will be
649 in scope, as they will cover ornamental mollusc and ornamental crustaceans and with regard to
650 ornamental fish, new animal health requirements related to Epizootic Ulcerative Syndrome (EUS).

651 6 DISCUSSION

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

659 6.1 STRENGTHS AND WEAKNESSES OF THE GOVERNMENTAL 660 INSTRUMENTS AVAILABLE TO MONITOR TRADE IN AQUATIC 661 ORNAMENTALS

662 i) Customs and FAO statistics

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

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

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

679 One advantage of Customs statistics is that they have been collected over a relatively long time
680 period, and will presumably be collected for some time to come. This allows better detection of
681 trends and patterns of trade. However, FAO international trade statistics rely on data reports
682 submitted by member countries (Olivier, 2001). In many cases, trade may not be reported or may be
683 underreported. Moreau & Coomes (2007) observed that approximately 41% of trade from Peru to
684 the US was undeclared at export. They remarked that as shipments of ornamental fish in Peru are
685 not routinely checked, exporters admitted to mis-declaring with the purpose of exporting restricted

686 species, and to under-declaring with the purpose of tax evasion. Monteiro-Neto *et al.* (2003) also
687 noted that intentional under-reporting of the trade can take place with the purpose of reducing tax
688 duties or to remain below allowed quotas.

689 *Contributions from consultees*

690 [14:] Calculations based at the point of export will be underestimates as they do not consider
691 mortality during collections, holding and transfer to the point of export. [5:] A very valid point.
692 Monitoring needs to be done as close to the point of collection as possible in order to provide
693 reasonably accurate data on numbers of specimens/species extracted.

694 [2:] Comparison of customs import data from the United States with CITES import data for five key
695 taxa showed widely divergent values among the two databases for similar products (Blundell &
696 Mascia, 2005). The authors conclude that these discrepancies indicate high uncertainty in the
697 reporting of wildlife data. Problems included the observation that some CITES import records did
698 not specify the units and CITES did not report trade in derivatives of products (i.e. powder from
699 ginseng) (Blundell & Mascia, 2005). A similar comparison of EU customs data and CITES data
700 would be beneficial to see if the problems are limited to the US or are more widespread.

701 ii) Veterinary controls

702 As noted above, in 2006 the European Commission published Decision (2006/656/EC) laying
703 down the animal health conditions and certification requirements for imports of fish for
704 ornamental purpose. Member States should therefore only authorise imports of ornamental fish
705 complying with the animal health conditions set out in the above mentioned Decision.

706 The certificates required for imports of cold-water and tropical ornamental fish into the European
707 Community should record the country of origin and destination, the scientific name of the species
708 and the quantity. However, data captured electronically so far (between 01/05/2007 and
709 23/07/2007) did not include information on the name of the species traded. It is not clear whether a
710 standard list of accepted names will be used in the future to ensure data consistency, and whether
711 such information will be databased and maintained. The data are submitted using paper forms
712 which need to be entered into a computer manually if they are to be used for analysis. Moreover,
713 unlike those for CITES, the reporting forms do not distinguish between specimens extracted from
714 the wild and those originating from captive-breeding operations. It should also be noted that the
715 Decision does not cover so far the import of ornamental invertebrates. {*Editors' note: SANCO has*
716 *indicated that in the future, species-level data will be captured, and ornamental molluscs and ornamental*
717 *crustaceans will be included. See Section 5.4.1.*}

718 *Contributions from consultees*

719 [11:] The present health certificates have separate documents for tropical fish and coldwater fish. In
720 both certificates, the animals imported are usually listed in the separate packing list or in the
721 invoice. Shrimps and mollusks imported in the same shipment are usually listed in one of these
722 certificates and are thus included in the total number of specimens. Indeed the Certificate is
723 originally for fishes, but Border Inspection Posts in most countries accept it. Per 1 August new
724 certificates will be implemented in which all fish, mollusks and crustaceans for ornamental purpose
725 will be covered by a single certificate. The legislation does not distinguish captive bred and wild
726 specimens.

727 [11:] Currently there is no standard list of accepted names. OFI has proposed to the European
728 Commission (Traces) to work out such a list and will bring this up once more.

729 [15:] One of the objectives of the World Organisation for Animal Health (OIE) is to safeguard world
730 trade by publishing health standards for international trade in animals and animal products. The
731 normative publications of the OIE relevant to aquatic animals are the *Aquatic Animal Health Code*
732 and the *Manual of Diagnostic Tests for Aquatic Animals*. These standards provide for Member
733 Countries and Territories to protect against the introduction of diseases and pathogens, without
734 setting up unjustified sanitary barriers. OIE standards are recognized by the World Trade
735 Organization as reference international sanitary rules.

736 [15:] The OIE *Aquatic Animal Health Code* provides standards for safe international trade in aquatic
 737 animals (fish, molluscs, crustaceans and amphibians) and their products. These safeguards take the
 738 form of health measures to be used by the veterinary services or other competent authorities of
 739 importing and exporting countries in establishing health regulation for the safe importation of
 740 animals and animal products including ornamental fish. It is very important for any country
 741 wishing to be part of international ornamental fish markets to be a Member of the OIE.

742 iii) CITES listing

743 CITES, with 173 signatory Parties, is the foremost intergovernmental mechanism for the regulation
 744 and monitoring of trade in species that are threatened by international trade. While species of hard
 745 coral have been listed in the CITES Appendices since the 1980s, the Convention's involvement in
 746 the trade in ornamental fish is fairly recent, and a number of marine taxa traded by the ornamental
 747 industry, such as seahorses, have recently been included in the CITES Appendices. The Convention
 748 has had a much more limited involvement to date on the trade in freshwater ornamentals, with
 749 only a small number of these species listed in its Appendices.

750 Data are collected through CITES only for those species listed in the Appendices of the Convention.
 751 Exports from the 173 CITES Parties are reported at the species level annually, forming the basis of a
 752 comprehensive dataset in listed species. However, as only a limited number of aquatic ornamental
 753 species are listed in the Appendices, data coverage in terms of species is limited.

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

760 *Contributions from consultees*

761 [2:] It has been argued that CITES “uplisting” of species from one Appendix to the next can lead to
 762 an increase in commercial value and thus increase their collections from the wild, during the time
 763 between uplisting and the final ban in trade (Rivalan *et al.*, 2007). Listing species in Appendix I may
 764 also lead to illegal trading (Rivalan *et al.*, 2007). If the listing process is impeded for whatever
 765 reason, it can have grave impacts on the populations of the species. This issue should be addressed
 766 or at least considered before wholesale listings of marine/freshwater species are proposed. [11a:]
 767 Considering the very few ornamental fish species listed by CITES and the very low volume of trade
 768 in these species, this is hardly an issue.

769 iv) Annex D of the EU Wildlife Trade Regulation

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

774 Species listed on Annex D require an import notification, to be completed by the importer upon
 775 entry into the European Union. The import notification form is found in Commission Regulation
 776 865/2006. It requires that data is collected on the species name, quantity, country of origin, exporter
 777 (where different from the country of origin) and importer. While it does not specifically require
 778 information on whether the specimens were extracted from the wild or originated in captive-
 779 breeding operations, in practice this information is often reported in the annual reports of EU
 780 Member States. Failure to provide a notification is one of the criminal offences which Member
 781 States are required to create under Council Regulation 338/97. However, the awareness of customs
 782 officials and the degree of enforcement on Annex D requirements by all Member States is unclear.

783 In principle, all imports of Annex D species should be recorded, but in practice it appears likely
 784 that some gaps in the data may occur. For instance, a comparison of the data gathered for
 785 *Hippocampus* spp. by the GMAD and by Annex D up to 2003 showed that there have been some
 786 data gaps in the data collected for the Annex. However, while both datasets presented similar

787 overall trends in trade, Annex D was shown to be a relatively comprehensive monitoring tool
 788 which provided significantly higher number of specimens in trade than GMAD. As noted above,
 789 however, GMAD is designed to provide global coverage of all species, and as such, it continues to
 790 be a unique resource concerning the assessment of the volumes and trends of trade in ornamental
 791 taxa.

792 In 2004, the Scientific Review Group for wildlife trade (SRG) recommended the inclusion of 14
 793 marine ornamental species in Annex D of Council Regulation 338/97¹⁷. Trade data used for the
 794 assessment of those species by the SRG was obtained from GMAD.

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

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

803 *Contributions from consultees*

804 [4:] We agree with the fact that Annex D “could act as a disincentive to voluntary contribution of
 805 trade data” and “that the data required from traders for compliance with Annex D listings of
 806 ornamental fish is also required by veterinary authorities, which may lead to duplication of the
 807 reporting effort by traders”. The more traders have to fill different papers the harder it will be to
 808 gather data from them.

809 [11:] Low awareness among customs officials may be a result of over-complexity of regulations.

810 [11:] One of the main problems with the proposed Annex D listing is that the sole argument put
 811 forward is the significant number of the fish imported, which was extracted from the GMAD. Not
 812 only is this the strongest disincentive for voluntary D-listing you can imagine, but also it should be
 813 clear that there is no direct link with quantities in trade and a threatened conservation status. If
 814 there was a link, it would be likely to be the opposite one: threatened fish are not available in big
 815 quantities. Several of the proposed species are available in large parts of the world in big quantities.
 816 A few ten-thousands of specimens may be high for CITES authorities in Europe, but for most reefs
 817 it is an extremely small portion of the population of this fish. {Editors’ note: Annex D criteria are
 818 included in Section 5.2.2.1}.

819 [5:] It is not true that the sole argument put forward for the proposed Annex D listing is the
 820 significant number of fish imported. A species can be listed on Annex D if it might be threatened by
 821 trade due to its ‘unfavourable or unknown conservation status, distributional, ecological or
 822 reproductive potential’. All species would be assessed and listing would NOT necessarily follow
 823 just because the species was traded in high numbers – other criteria are equally important, and
 824 species traded in low numbers can also be assessed

825 **6.2 STRENGTHS AND WEAKNESSES OF THE NON-GOVERNMENTAL** 826 **INSTRUMENTS AVAILABLE TO MONITOR TRADE IN AQUATIC** 827 **ORNAMENTALS**

828 i) The Global Marine Aquarium Database

829 In April 2000, MAC and UNEP-WCMC commenced collaboration with members of marine
 830 ornamental trade associations to establish the Global Marine Aquarium Database (GMAD). The
 831 database was designed to gather, integrate, standardise and mobilise information on the trade of
 832 individual species. To this end, UNEP-WCMC liaised with wholesale import and export companies

¹⁷ http://ec.europa.eu/environment/cites/pdf/srg/31_summary_srg.pdf

833 from around the world. As these companies link the supply and retail ends of the business, they
834 proved to be key in the collection of quantitative data about the aquarium trade.

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

843 Comparison of data collected for *Hippocampus* spp. through Annex D (of EU wildlife trade
844 regulations) and in GMAD shows that, overall, Annex D captured significantly greater volumes of
845 trade than GMAD, although for a small number of countries, GMAD captured greater volumes of
846 trade than Annex D.

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

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

852 *Contributions from consultees*

853 [11:] GMAD is based on information from only a very limited number of operators. Then, of course,
854 it is very logical that any conclusions drawn from these data are not very trustworthy.

855 [14:] GMAD under-reports numbers collected as the reporting is at point of export and does not
856 consider mortality prior to export.

857 [14:] In spite of the limitations, GMAD has been a very valuable tool and its re-establishment would
858 be an excellent contribution to monitoring the trade. Inclusion of freshwater species would also be
859 useful. Incorporating GMAD into an existing organisation or framework is needed so that it does
860 not depend upon continued project funding.

861 ii) Monitoring through a certification scheme.

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

866 To date, there has commonly been a lack of information concerning the industry, as recognized at
867 the World Conference on Ornamental Fish in 1999, with regard to the status of natural populations
868 harvested for the industry, ornamental aquaculture production, and the number and species
869 exported (Bartley, 2000). Catch and effort need to be monitored regularly and species under
870 exploitation assessed on a country-by-country basis and reef-by-reef basis (Wood, 2001a; Wood,
871 2001b).

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

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

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

889 MAC faces a significant challenge in its work in countries in which the specimens traded originate,
890 as implementation of the MAC Certification Scheme and compliance with MAC Standards requires
891 a change of behaviour. MAC performs awareness-raising regarding environmental issues as well as
892 training and capacity building. The main Monitoring and Evaluation (M&E) challenge for MAC
893 involves ensuring that local resource managers and certified traders appreciate the importance of
894 documenting catch and shipment records. Local resource managers are not accustomed to keeping
895 records or overseeing this process, as this is generally done by traders who do not share these data.
896 The process of overseeing record keeping therefore has so far remained largely dependent on
897 community organizers and the outreach officers in the supply and market countries, working with
898 the Certified Industry Group. Moreover, when available, data are often only in hard copy form and
899 need to be collected and then computerized by MAC community organizers.

900 A significant challenge in Indonesia, for instance, is the unwillingness of exporters to share
901 information which is considered commercially sensitive. Moreover, some exporters do not
902 consistently provide information on number of animals dead on arrival (DOA) and fish reject rates,
903 nor on reasons for rejects, and those that do often do not follow the format that can be used by
904 MAC’s M&E system.

905 Even when an internal quality feedback system (between exporter and collectors) is in place, many
906 of the exporters do not seem to recognise the importance of data collection and information
907 aggregation at the regional and national level. Actions such as the collection and provision of trade
908 data, while not in themselves ensuring sustainability, can be used to inform choices to manage
909 resources and the trade appropriately.

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

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

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

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

932

933 *Contributions from consultees*

934 [7:] Exchange of information among participants in the scheme will allow exporters to fully
935 materialise their role in enhancing the sustainability of the marine aquarium trade.

936 [1:] Unwillingness to share commercially sensitive information is also a problem in Hawaii.
937 Working closer with state/provincial fisheries agencies and garnering greater legislative support
938 from national governments to pass laws requiring exporters to disclose their records would help
939 tremendously. This draconian approach may not be welcomed in many countries, but nearshore
940 fishery resources in the US are considered a “public good” managed by the states for the people, so
941 that could be used to justify the reason why exporters must concede their records. [7:] Since this is a
942 report for the EU are comments on what the exporting countries might do relevant?

943 [11:] The importance of data collection is there only for scientists, anti-trade NGO’s and perhaps
944 governments. What is the incentive for companies to document all data? Due to the economical
945 situation of most collectors and exporters, their interest is only short term and only few look to the
946 long term. For these few, however, there is hardly any incentive as it does cost more money, but
947 they cannot get a better price. [5:] This is an introspective and short-term view. The incentive for
948 companies to assist with documentation is that it is essential if they are to be sure of a long-term,
949 sustainable trade. A comparison can be made with food fisheries, where the companies concerned
950 were saying the same thing 10 years ago, but are now embracing the notion that they are
951 accountable and have a responsibility to ensure that their trade is sustainable.

952 [6:] In the UK, much of the fishery product is sourced from non-certified fisheries which are
953 nonetheless sustainable (e.g. the Icelandic cod fishery). Supermarkets do this by using their own
954 resources to review fishery data and ensure that the product is sustainable. In addition, they may
955 apply extra conditions such as low-impact fishing methods to reduce by-catch and/or
956 environmental impact. It is difficult to define this as first, second or third party certification and the
957 process is largely internal to those involved in the supply chain, rather than being open to external
958 inspection or verification. What supermarkets are really after is assuring fishery product supplies
959 in the long term (generally a 10-15 year horizon) and while they are quite happy to take certified
960 products, this is not an absolute requirement. They do seek to address the conservation concerns
961 relating to wild fisheries, but these too do not necessarily rely on certification. It should not be
962 assumed that all markets will react the same way to issues of sustainability and certification. For
963 example, the UK supermarkets will not touch trawled, tropical shrimp/prawn due to issues of by-
964 catch and habitat destruction and instead use farmed, tropical shrimp/prawn. By contrast,
965 Norwegian supermarkets will not touch farmed shrimp/prawn due to issues relating to mangrove
966 destruction and prefer to buy trawled product. It is also worth making the point that sustainability
967 is only one issue taken into consideration and that other issues relating to corporate social
968 responsibility (e.g. carbon footprint, workers’ rights, workers’ pay, etc) may be given higher
969 weighting.

970 [1:] The discrepancies between catch and traded numbers could also be from fishers taking larger
971 or blemished fish that are recorded as catch but are either returned to the ocean or discarded by
972 exporters. These “returned to ocean” and/or discarded fish should also be monitored.

973 [1:] A solid reporting system doesn’t preclude the need for concurrently undertaking stock and
974 habitat assessments, but the latter shouldn’t be used as a surrogate for the former.

975 [5:] Leakage may also be due to fish which have died.

976 [7:] It is not appropriate for MAC to dictate who may sell what to whom.

977 [1:] It would seem there needs to be a direct benefit for everyone in the supply chain for a
978 certification scheme to work successfully. The hypothesis that people will replace the destructive
979 activity with a non-destructive alternative assumes that the returns are at least as high as for the
980 original activity. Aquarium certification schemes will continue to be challenged by economics, not
981 behaviour change.

982 [12:] It is true that the common names are often confused, but my experience with ornamental
983 fishing communities is that they know very well what they are catching and with some guidance

984 could attach correct Latin names to their harvest. However, there are no real incentives to do this; as
985 with most of the private sector, compliance with status monitoring and/or regulating trade will
986 depend upon incentives, whether endangered species or ecosystems are involved or not.

987 [7:] The trade in marine ornamentals compared to the total resource and compared to the use made
988 of it by other sectors is often minimal. The ecosystem is chaotic and there is very little data on the
989 natural variability in populations, especially fecund pelagic spawners.

990 [2:] Other experience may be gained by examining the ecolabeling schemes by the Marine
991 Stewardship Council (MSC) for marine food fishes, which primarily indicates that consumers must
992 have some concern for sustainability of the species before they will choose to buy an ecolabeled
993 product, and that some financial benefit must flow to the producers of the product (Kaiser &
994 Edwards-Jones, 2006). The authors also note that many of the successful MSC certified fisheries
995 have co-operative management, and they suggest a tiered ranking for certification standard (Kaiser
996 & Edwards-Jones, 2006). Currently, a limited number of fisheries have the ability to participate and
997 thus, their conservation benefit is limited.

998 [6:] The following is not a statement on behalf of MSC. The conclusions of Kaiser and Edwards-
999 Jones (2006) are broadly correct although MSC has now moved on to adapt their certification to be
1000 able to cope with data-deficient fisheries in developing countries. Lessons from this may (in a few
1001 years) provide some useful lessons for ecolabelling of ornamental fishes. It is worth noting that
1002 MSC arose out of a dialogue between WWF and Unilever, rather than as a response to consumer
1003 demands expressed through multiple retailers. Even now, evidence for the demand for MSC-
1004 certified fish being driven by consumer demand is weak. For multiple retailers, the incentives are to
1005 ensure supplies into the long term by securing product from sustainable fisheries and some
1006 retailers are now shifting to 100% ecolabelled (although not necessarily 100% MSC-certified)
1007 seafood. Partly due to food safety concerns, but also due to the need for securing supplies from
1008 sustainable sources, multiple retailers have also shortened supply chains and may now deal
1009 directly with catchers. How this could apply to the ornamental fish trade is not clear, although a
1010 greater connection between producers and markets is very desirable if for no other reason than to
1011 encourage collect to order rather than speculative collecting.

1012 [6:] There is little evidence of economic incentives for producers to become involved in supplying
1013 ecolabelled products. Unless consumers can be shown to actually pay (as opposed to expressing
1014 willingness to pay) more for certified products, producers may avoid such schemes which would
1015 otherwise raise costs for no benefit. Even if producers were to receive higher prices initially, there is
1016 no indication that a “green” bonus would continue to accrue. As Kaiser and Edwards-Jones (2006)
1017 point out, while ecolabelled product may get a price premium initially, increasing supply tends to
1018 force prices down while the costs of ecolabelling remain the same, thus reducing profitability for
1019 producers. Unless this trap can be avoided, the logical move by producers would be to not become
1020 involved in ecolabelling. Examination of the literature on the economics of ecolabelling suggests
1021 that additional returns to producers are at best uncertain, and in some cases, non-existent.

1022 [1:] It would make sense to evaluate the impacts of the freshwater fish farms and look into their
1023 practices to ensure sustainability. For the remaining fish collected from freshwater, commissioning
1024 a thorough environmental threats and socioeconomic analysis to determine the impacts and
1025 economic benefits should be considered. Aggressively investing in a freshwater certification
1026 scheme might not be the best use of resources.

1027 [14:] To validate trade figures, monitoring should occur at as many trade levels as possible, e.g.
1028 collectors, buyers, exporters and importers. [7:] At what cost? We have seen the cost of stricter
1029 domestic measures in EU. If that idea is expanded down the supply chain will the fish be saleable
1030 at the higher price in the market? No trade no benefits for anyone! Any suggestion along these lines
1031 should be costed and determined proportionate to identified conservation gains.

1032 [1:] Altruism is not going to encourage people to participate in a certification scheme, especially in
1033 the developing world where people are barely making ends meet but also in developed countries.
1034 If the certification makes economic sense, every fisher and their associates will partake. Intensive
1035 outreach and education programmes are expensive and their impacts are fleeting.

1036 [14:] Unless we have a thorough and practical system in place, spending lots of money on
 1037 certification may be an inappropriate use of resources. We certainly need to learn from attempts to
 1038 certify in both marine and freshwater elements of the aquarium trade. Undoubtedly, they are
 1039 challenging to implement but the increasing movement towards this being effective and
 1040 economically viable e.g. Forestry Stewardship Council, Marine Stewardship Council should
 1041 provide valuable lessons on how this can be achieved in the aquarium trade. In spite of its
 1042 problems, MAC has made progress in a number of areas and rather than reinventing the wheel
 1043 with a new scheme, it seems more appropriate that stakeholders work with MAC to address
 1044 previous issues and develop a scheme that works.

1045 [1:] Although things in developed countries are better, they are not perfect. For example, Hawaii
 1046 does not have a management plan in place for its aquarium fishery, and it's the State's most
 1047 lucrative nearshore fishery. The Big Island of Hawaii closed 33% of its coastline to prevent complete
 1048 exploitation of aquarium fish in 1999, and is in the process for shifting the fishery to a limited entry
 1049 plan and developing a no-take list for certain species, but there is no comprehensive management
 1050 plan in place – it's still managed on an ad hoc basis. There are many inefficiencies leading to
 1051 mortality and waste associated with the exporter side of the industry in Hawaii. There is no reason
 1052 why a certification process wouldn't work there if it made economical sense or was required by the
 1053 state (a top-down approach is going to be more effective in the US).

1054 {Suggested new heading} [1:]

1055 iii) [1:] Industry Self-Monitoring.

1056 [1:] There are a number of self monitoring schemes already in place and it would be great to assess
 1057 their efficacy and transferability, and utilize them. One idea is to empower industry stakeholders
 1058 (including aquarists) to enforce their own industry by developing an anonymous text messaging
 1059 system using mobile phone technology to report illegal or questionable practices. Mobile phones
 1060 are widely used in the Philippines, Indonesia and Hawaii. A bottom-up, self-monitoring
 1061 mechanism linked to a third party organization will greatly increase the monitoring bandwidth.

1062 **6.3 EFFECTIVENESS OF THE VARIOUS INSTRUMENTS AS INTERNATIONAL** 1063 **TRADE MONITORING MECHANISMS**

1064 The focus of this consultation process is to consider whether the various existing mechanisms that
 1065 gather data concerning the international trade in ornamental fish can adequately provide
 1066 information appropriate for the monitoring of this trade at the species level. Thus, important
 1067 considerations in this regard include the units reported (e.g. whether the trade is reported by
 1068 weight or by number of specimens), the taxonomic level at which the data are collected, the
 1069 geographic coverage provided by the data, the taxonomic coverage (i.e. whether data are collected
 1070 for all species or just listed species), sectors monitored (i.e. marine and/or fresh water); and
 1071 implementation regime (i.e. voluntary or compulsory). A summary of the characteristics of the data
 1072 collected through those instruments concerned with international trade in aquatic ornamentals is
 1073 provided in Table 6.1.

1074 i) The Global Marine Aquarium Database

1075 Data have been collected at the species level in GMAD for all species traded by participating
 1076 companies. However, although coverage is global, it is limited to those countries in which MAC is
 1077 active (and indeed to those companies participating in the certification scheme) and hence major
 1078 geographic gaps in the data are apparent. As well as the implementation challenges experienced by
 1079 MAC (Section 6.2), a significant limitation to the success of monitoring through certification is the
 1080 need to secure long-term reliable funding. This has proved to be a key obstacle in the past. It should
 1081 also be remarked that MAC is concerned with trade in marine ornamentals, and the scope of
 1082 GMAD has therefore also been limited to that group of species. To date, there is no equivalent
 1083 system in place in the freshwater sector.

1084

1085 *Contributions from consultees*

1086 [3:] Being voluntary, it will never gather all trade. The high standards of excellence to meet the
 1087 standards mean that by definition, it excludes the totality. The GMAD database depends on
 1088 external funds and there is no obligation to anyone to maintain it. This is highly risky, as has been
 1089 proved by the lack of operation since 2003.

1090 ii) Customs and FAO statistics

1091 Data collected through the Customs reporting process is undertaken at a global scale, with data
 1092 usually submitted by both importers and exporters. However, data are collected at a very general
 1093 level such as 'ornamental fish' or 'ornamental fish – marine' and trade is often reported by weight
 1094 or by value. Hence data collected in this way fails to provide a mechanism to monitor the species
 1095 and number of specimens in the ornamental aquatic trade.

1096 *Contributions from consultees*

1097 [1:] FAO statistics are based on the information provided by national statistical bureaus. Not all
 1098 importers are required to provide their import figures. Ploeg (2007) noted that, in the Netherlands,
 1099 errors are made in the data provided, and imports travelling via surrounding countries are often
 1100 not registered. Additionally, import values are sometimes reported including freight, and
 1101 sometimes excluding freight. This situation is likely to be the case in other countries.

1102 iii) Veterinary controls

1103 Many countries collect data on the imports and exports of live animals for veterinary purposes. As
 1104 noted earlier (Section 5.4), a Decision has recently come into force in the EU concerning imports of
 1105 fish for ornamental purposes. Although data made available in electronic form so far have been at a
 1106 very general level (i.e. freshwater ornamentals and marine ornamental fish), the data reporting
 1107 form (paper) specifies that, among other information, data should be collected at the species level,
 1108 and information on the number of specimens in trade should be recorded. For this reason, it seems
 1109 that this instrument potentially provides a mechanism for the monitoring of trade in ornamental
 1110 fish, equivalent to the monitoring facility provided by Annex D of Commission Regulation (EC)
 1111 No. 338/97. However, a number of issues should first need to be resolved in particular with
 1112 regards to how data will be collected at the species level, and how this information will be
 1113 standardised; and whether it will be databased.

1114 *Contributions from consultees*

1115 [2:] Gerson *et al.* (2008) have suggested the use of taxonomic serial numbers (TSN) that could be
 1116 added to compliment the traditional Customs Harmonized System (HS) reporting. The TSN is
 1117 attributed to each kingdom + scientific name + authority + rank, and is persistent. Currently the
 1118 TSN is used in the Integrated Taxonomic Information System (ITIS), an online database for
 1119 taxonomic information in the United States, Canada, Mexico and worldwide coverage for CITES-
 1120 listed species (Gerson *et al.*, 2008). The collection of detailed species information using this method
 1121 could help reconcile customs data with CITES and other wildlife trade databases; however, it
 1122 would require extensive training for both traders and customs officers.

1123 iv) CITES listing

1124 Data on CITES-listed species are reported by both exporting and importing countries. As CITES is
 1125 legally binding and has a global reach, it provides the most comprehensive and detailed data set
 1126 available. Reporting is limited to species listed in the CITES Appendices.

1127 *Contributions from consultees*

1128 [14:] Even for species that are listed in CITES Appendices, there are limitations in the data and
 1129 variations in quality of data according to reporting country.

1130 v) Annex D of the EU Wildlife Trade Regulation

1131 Annex D is legally binding and provides a comprehensive dataset of trade in listed species entering
 1132 the EU. It does not confer any restrictions on trade and incurs minimal administrative burden

1133 relative to CITES listing, as import and export permits are not required. As with CITES listing, the
1134 data collected are for species of conservation concern.

1135 *Contributions from consultees*

1136 [7:] The cost of preparing the declaration is small but measurable. The consequences of even an
1137 innocent mistake have in the past been confiscation. For Annex D to be used a full and clear public
1138 explanation of the scientific information and reasoning should be required. To add a species to a list
1139 which creates a criminal offence should not be taken lightly nor be on the basis of an opinion that is
1140 not readily open to public scrutiny.

1141 TABLE 6.1 SUMMARY OF CHARACTERISTICS OF DATA COLLECTED THROUGH FIVE INSTRUMENTS
1142 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
EC 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

1143 6.4 POSSIBLE IMPACTS ON LIVELIHOODS FROM THE MONITORING OF 1144 INTERNATIONAL TRADE

1145 It is widely believed that the trade in wild-caught freshwater and marine aquarium species, if
1146 managed sustainably, can present a valuable opportunity for income generation and support to
1147 livelihoods, while at the same time providing an alternative to environmentally destructive
1148 activities (Junk, 1984; Chao & Prang, 1997; Ng & Tan, 1997; Brummet, 2005; Calado, 2006; Moreau &
1149 Coomes, 2007).

1150 CITES Resolution Conf. 8.3 (Rev. 13) recognises that that commercial trade may be beneficial to the
1151 conservation of species and ecosystems and/or to the development of local people when carried
1152 out at levels that are not detrimental to the survival of the species in question; and recognises also
1153 that implementation of CITES-listing decisions should take into account potential impacts on the
1154 livelihoods of the poor.

1155 Dawes (2007) commented that the aquarium industry is not necessarily against regulation of trade
1156 in ornamental species particularly when a species survival is threatened in the wild and there is
1157 evidence to show that this is the case. However, there appears to be concern in the trading sector
1158 that listing species in CITES Appendix II may result in trade suspensions, particularly into the
1159 European Community using the EU Wildlife Trade Regulation, which could affect negatively the
1160 livelihood of traders. In turn, trade restrictions may force traders to shift efforts to alternative, less
1161 threatened taxa. Watson & Moreau (2006) suggested that international regulations may have
1162 negative effects and highlighted that the impact of CITES-listings on the livelihoods of collectors is

1163 unknown. For CITES Appendix I and II species, frequently there are fees charged to traders for the
1164 issuance of export and import permits and associated administration.

1165 *Contributions from consultees*

1166 [1:] The shifting pattern resulting from trade restrictions is quite common in conservation and is the
1167 reason why rigorous monitoring programs should be implemented in conjunction with adaptive
1168 management strategies to adjust to for any possible shifts in catch composition and community
1169 structure.

1170 [1:] Dulvy *et al.* (2003), argued that a species will become economically extinct prior to going
1171 biologically extinct due to the low profitability of harvesting from low-density populations.
1172 Therefore, it is in the best interest of the aquarium industry to embrace trade regulations.

1173 [7:] The industry welcomes proportionate regulation, provided that it is enforced against those who
1174 deliberately break the law rather than make administrative errors.

1175 [7:] The costs of permits vary around the EU. However in the UK we have a clear view of the real
1176 costs of stricter domestic measures. In total the cost to government is almost £1 million pa with a
1177 cost to industry of the same amount (ie on top of the permit charges etc)-in total this cost is
1178 equivalent to almost 80% of the CITES Secretariat budget (based on documents from Animal
1179 Health) {*Editors' note: This seems to refer to the cost of issuing CITES permits in the UK for all CITES-*
1180 *listed species*}. Can commensurate “on the ground” conservation benefits be identified? Or do such
1181 costs just divert trade to other major markets-by providing more specimens to a smaller market is
1182 there a risk of lower prices and hence lower returns to the collector or producer and hence a
1183 livelihood issue? Are we likely to set up a monitoring scheme the outcome of which is to skew
1184 markets such that foreseeable perverse impacts are the outcome?

1185 [6:] The Convention on Biological Diversity (CBD) makes explicit reference to the rights of
1186 indigenous peoples to utilise the biodiversity around them. Any moves relating to monitoring or
1187 certification should be compatible with CBD and should ensure the continued ability of people in
1188 range states to benefit from income from ornamental fish diversity.

1189 [6:] While the income from ornamental fish harvesting may appear low, it is of great local
1190 importance for the collectors who live in remote areas, being one of the very few opportunities for
1191 cash income. Collectors are also the group least able to cope with any decrease in income or
1192 increase in costs. Trade intermediaries may pass on the costs of increased monitoring or
1193 certification to the collectors, most likely through discounting prices paid for fish. It may be argued
1194 that this could be compensated to some extent by higher prices for certified fish, but there is little
1195 evidence that this happens; indeed, there is limited evidence that consumers are willing to pay
1196 more for any certified products. There is some limited evidence that MAC-certified fish may fetch
1197 higher prices due to their better health, but this may simply be absorbed by the increased costs of
1198 chain of custody.

1199 [12:] European consumers care most about conservation of the resource and have the financial
1200 flexibility to act on their concern.

1201 [7:] Keeping of ornamental fish is an optional pastime; the price the market is prepared to pay is not
1202 elastic. Before any monitoring is undertaken the impacts in terms of the market (and industries)
1203 reactions to additional costs must be considered. Ill advised or unwarranted monitoring will
1204 increase costs and distort markets with very real possibilities of perverse impacts eg tipping the
1205 economic balance between sustainable wild collection and ex situ production. Information about
1206 the potential for these predictable outcomes must be considered and when they occur the
1207 responsibility overtly acknowledged by those who take the decisions.

1208 [7:] Tlustý (2002) reported that there a few key cases where a switch to aquacultural production
1209 should be made with great caution, or avoided altogether. This is the case for Cardinal tetra
1210 (*Paracheirodon axelrodi*), where the economic benefit of the wild harvest prevents agricultural
1211 development which would otherwise destroy the flooded forest ecosystem. An increase in ex situ
1212 production therefore poses a risk to wild populations of the species.

1213 [6:] Any initiative which restricts the trade in wild-caught ornamental fishes from developing
 1214 countries will impact on those least able to develop alternative livelihoods. The knock-on effects of
 1215 this need to be considered. Evidence from the cardinal tetra fishery on the Rio Negro suggests that
 1216 when the fishery is restricted (as happened during a severe drought which meant the fishery could
 1217 not be accessed) the collectors turn to alternative forms of income which are far less sustainable and
 1218 which have a far greater impact on the relatively intact rainforest. In the worst case scenario,
 1219 restricting or making the trade in wild-caught ornamental fishes non-viable could simply divert the
 1220 trade to the Far East where most freshwater ornamentals are produced. This would result in
 1221 income being diverted from poor people in remote areas of low-income countries to businessmen in
 1222 middle-income countries. It would also lead to economic loss as there is currently no effective
 1223 mechanism for ensuring that range states can get benefit from ornamental fishes farmed in other
 1224 countries.

1225 {Suggested new section [9:]}

1226 6.5 POSSIBLE IMPACTS ON LIVELIHOODS FROM NOT MONITORING OF 1227 INTERNATIONAL TRADE

1228 [9:] It is widely known that the worlds coral reefs are now under serious threat. ICRAN reported¹⁸
 1229 that "Over a decade ago scientists reported that some 10% of coral reefs had already been
 1230 destroyed or degraded beyond likelihood of recovery." and "Monitoring results from around the
 1231 world in 1998 and 1999 indicated that less than 30% of coral reefs have completely healthy
 1232 communities of corals, fish and other species".

1233 [9:] The global marine aquarium trade are collecting their products from an ever declining source.
 1234 CITES are adding an increasing number of marine species to the protected list, preventing further
 1235 trade in these animals and reducing the opportunity of income generation for both developing and
 1236 developed countries. By introducing regulation that independently monitors the collection of
 1237 marine animals, not only could the trade ensure its future but it could also become the protector
 1238 and maintainer of coral reefs. With the current pace of destruction of the worlds reefs and the
 1239 increase in marine animals under threat, there is great risk of governments restricting access to
 1240 coral reefs, making it impossible for the trade to survive.

1241 [7:] The ornamental fish sector is tiny compared to almost every other user group.

1242 [11a:] Only some marine species were listed on CITES appendices in the last few years. {Editors'
 1243 note: see Section 5.2.1 for details of species.}

1244 7 CONCLUDING REMARKS FROM CONSULTEES

1245 *Contributions from consultees*

1246 i) General

1247 [14:] Establishing a comprehensive system for monitoring the trade in both marine and freshwater
 1248 species is highly desirable, but will require extensive modification of existing systems. The method
 1249 of recording (paper/electronic) and subsequent availability of data to stakeholders are important
 1250 considerations. A system that has a degree of accuracy is particularly important, considering
 1251 current issues of only reporting at one point in the chain and the variation across systems,
 1252 organisations and countries.

1253 [11:] In general this document described very well the concerns of the industry itself. We have
 1254 hardly any reliable sources of statistical information on our industry that it is digitally available. On
 1255 the other hand it also exemplifies the huge fear of our industry that more and more different bodies
 1256 want to have information about this industry. For veterinary issues we need to provide information

¹⁸ <http://www.icran.org/peoplereefs-tenquestions.html>

1257 in imports of susceptible species, for CITES we need to declare imports, or in the EU respectively A,
 1258 B, C and D listed species, for customs we need to declare import values, statistical bureaus demand
 1259 information, Traces in now introduces in the community. How do we ensure that proper
 1260 information is made available in such a way that it can be utilized by all who need it without giving
 1261 the industry a heavy administrative burden?

1262 [6:] Before this proposal is taken much further, a wider consultation with the trade at all levels is
 1263 required, which should include government and trade bodies in exporting countries. It is quite
 1264 possible that existing market mechanisms could bring about major improvements in sustainable
 1265 harvest of ornamental fishes and bring a higher level of benefits to collectors in remote areas.

1266 [6:] The consultation document provides little evidence of consultation with the governments of
 1267 range States, notably those which supply important quantities of wild-caught, ornamental fishes. A
 1268 top-down system imposed by developed countries has little chance of gathering support from the
 1269 main exporting countries, most of which are already tied up with increased costs of compliance
 1270 with other issues such as EU fish health legislation and the OIE. Any requirement for more detailed
 1271 reporting or compulsory certification may impose costs and duties on developing country
 1272 governments which they may find impossible to comply with due to lack of resources and/or
 1273 trained personnel.

1274 [5:] Consultation with range States is certainly needed. It may be that countries already have some
 1275 mechanisms for recording collection of ornamental species that they could enhance. An advantage
 1276 of working directly with the export countries is that they will generate data of direct use for
 1277 resource management.

1278 [7:] If it is accepted, for the sake of this process only, that some additional monitoring is justified
 1279 then it must be targeted. If the purpose is conservation then what benefit is achieved by incurring
 1280 costs (both in industry and in government) by knowing how many fancy goldfish are imported to
 1281 the EU from China, koi carp from Japan or captive-reared zebra danios from Singapore? If none can
 1282 be clearly and publicly identified and justified then additional monitoring should not be
 1283 considered. “It would be nice to know” is not a sufficient justification. Additional monitoring
 1284 should only be undertaken to the extent necessary to address identifiable conservation concerns.

1285 [4:] We suggest the implementation of only one form (plus CITES one if needed) mentioning all
 1286 data required for customs, veterinary legislation, GMAD... This form could be based on the health
 1287 certificate annex IV decision 2006/656/EC specifying freshwater/saltwater and cultured/non
 1288 cultured ornamental fish through the tariff codes and secondly all the individuals by species traded
 1289 with this code. Veterinary certification would be done as required on current annex IV. This
 1290 certificate could be filled and transmitted online so that all the data (fish species and number of
 1291 individuals) would be electronically available for customs, trade monitoring organisations and
 1292 traders themselves.

1293 [1:] Nothing can substitute actual catch numbers. Furthermore, the capacity to undertake rigorous
 1294 and systematic habitat and stock assessments in the developing world is lacking, so the data
 1295 generated from those endeavors may not accurately represent the standing stock or habitat
 1296 integrity. Developing a standardized catch reporting system completed when the fish are sold to
 1297 the exporter would prove more beneficial, and it would resolve the species nomenclature issue. A
 1298 simple yet effective electronic system for reporting fish similar to how commercially harvested fish
 1299 in Alaska are reported could be developed for aquarium species. Of course, someone would have
 1300 to absorb the initial costs for such a system but it is quite effective and doesn't require high literacy
 1301 rates.

1302 [5:] “Nothing can substitute actual catch numbers” is an extremely important and relevant point.
 1303 The remit of the paper is to find mechanisms for monitoring international trade, but this disregards
 1304 domestic use and loss of fish due to post-capture mortality. In terms of conservation and
 1305 sustainability it is vital to understand the whole picture – thus the importance of gathering range
 1306 State fishery data.

1307 [11a:] We also feel that it would be great to have actual catch numbers, however, at what cost? We
 1308 are not dealing with large scale operations but very often with individual collectors or small

1309 collectives. A large part of the discussion in this draft is on marine fish, but marine fish in actual
 1310 numbers are only a very small percentage of the total number of fish collected from the wild. Most
 1311 of the collectors are active in remote areas in the Amazon, Africa or Indonesia, far away from the
 1312 coasts or cities. Furthermore, these fishermen also collect the same fish species for food, and often
 1313 at the same time in one collection trip. I do not see that these people will ever keep records during
 1314 the collection trips on what they actually catch and I do not see a governmental agency in these
 1315 countries gather and check such data. Would we be able to do so ourselves in Europe, on species
 1316 level and quantity level? The large errors in the import value data from our own statistical agencies
 1317 already show that we are not able to do it properly in Europe ourselves.

1318 [6:] Even in the best regulated fisheries, offtake is only estimated from catch reports. Similarly,
 1319 stock assessment is only based on estimates. Good data on catch and stock do not guarantee
 1320 sustainable fisheries as the case of the EU Common Fisheries Policy and N Sea cod fisheries
 1321 illustrate only too well. In most developing country fisheries, even the commercial fisheries have to
 1322 rely on limited stock and catch data for management purposes. The vast majority of fisheries in
 1323 developing countries are data deficient which poses all manner of management limitations. To try
 1324 to make an accurate estimation of offtake from highly dispersed ornamental fisheries would
 1325 require a huge effort, beyond anything which most governments could afford, let alone have the
 1326 resources to carry out. At best, proxy measures such as the numbers of fishes delivered to exporters
 1327 or first buyers may be the best that can be achieved although such information needs to be treated
 1328 with great caution due to improvements in handling. For example, Project Piaba has brought about
 1329 considerable improvements in handling of the cardinal tetra fishery, reducing mortality to only
 1330 about 2-3% compared to over 50% when the fishery opened up in the 1960s.

1331 [10:] Systems to monitor and control the trade in ornamental fish may come directly from the
 1332 government or through trade and amateur organisations, supervised by the government. The latter
 1333 would be preferable, since more parties would be involved. [11a:] We do not agree with respect to
 1334 amateur organisations. They lack the knowledge, not the capacity.

1335 [10:] There are several weaknesses in monitoring the fish trade: a lack of experts to identify species
 1336 and subspecies; animal welfare and transport, which has already improved greatly; diseases;
 1337 willingness of exporting countries; finding an compromise between the varied interested parties;
 1338 exhaustion at the point of origin.

1339 [10:] Breeding of fish in the EU should be encouraged and breeding firms in SE Asia and South
 1340 America should be better controlled, with more involvement from the local governments. And a
 1341 support system to amateurs and “attestation of ability” for amateurs and pet shops such as the
 1342 scheme run by BBAT in Belgium.

1343 [11a:] There is hardly any export of captive bred fish from South America. Breeding in Europe
 1344 would ruin the livelihoods of many thousands of fishermen and middlemen in many countries.[2:]
 1345 Captive breeding in the EU may also eliminate incentive for the preservation of habitats in which
 1346 ornamental species are found.

1347 [7:] Encouraging ex situ over in situ production takes no account of Access to Genetic Resources
 1348 and Benefit Sharing (ABS) discussions. Pet shops already are licenced in the UK and required to
 1349 implement training. The key issue in the UK is patchy implementation by local authorities not the
 1350 legal basis.

1351 [6:] In situ captive breeding may help to conserve resources, but this is not guaranteed. Activities
 1352 such as coral ranching can maintain access to the resource for local communities and may even
 1353 improve incomes. However, what tends to happen is that production will shift away from areas
 1354 where the biodiversity exists and to areas nearest to the point of export. Concurrently, there tends
 1355 to be a shift away from relatively poor, rural collectors to urban, relatively wealthy enterprises
 1356 which can afford the infrastructure necessary to breed a wide range of ornamental fishes. This in
 1357 turn leads to a relocation of benefits and thus a devaluing of the resource which can have a strong,
 1358 negative impact on how the resource is used. Worse still is relocation to capital-intensive, high-tech
 1359 producers in developed countries where none of the benefits will accrue to developing countries. If
 1360 this were to be coupled with a restriction in trade which reduced or prevented the trade in wild-

1361 caught organisms from developing countries, it would be viewed as a highly retrograde measure.
 1362 Such a move would not be compatible with EU objectives on development and would do nothing
 1363 at all towards achieving the Millennium Development Goals.

1364 [14:] It is also important to monitor freshwater trade. For example, freshwater species are imported
 1365 and traded heavily in Sri Lanka as many species are cheaper and easier to maintain than marine
 1366 species (and may be the same in other developing countries). Monitoring of domestic trade is
 1367 therefore more important for freshwater species. Marine species are almost exclusively for use in
 1368 developed countries.

1369 [12:] A key difference between freshwater and marine species is the level of endemism, with a
 1370 greater percentage of freshwater species being found in only a single locality. Some of our most
 1371 important export species, members of the genus *Aphyosemion*, exhibit particularly high levels of
 1372 endemism and technically qualify for endangered species status by the IUCN Species Survival
 1373 Commission because of limited and/or highly fragmented distribution. By far the greatest threats
 1374 to these species come from expanding agriculture, deforestation, dam construction and mining.
 1375 With no value as foodfish, the only people who care about these species are the fishers who catch
 1376 them for the ornamental trade and it would be extremely counter-productive to put these people
 1377 out of business. MAC's EFM standard is the key to resolving this conundrum and the current
 1378 practice of engaging local NGOs and concerned citizens is a reasonable means of enforcing the
 1379 EFM. Providing support at this level, closer to the problem, will work much better than additional
 1380 top-down mechanisms operated by governments and international agencies. [11a:] Fish of the
 1381 genus *Aphyosemion* originate largely from captive breeding in Europe, not from the wild.

1382 [1:] Trust funds that mature over time and provide an annual return are increasingly popular to
 1383 supplement fundraising needs for conservation projects. This model should be explored for NGOs
 1384 requiring long term financial support to cover operating expenses.

1385 ii) The Global Marine Aquarium Database

1386 [6:] International trade statistics are unreliable and examination of any set of stats reveals
 1387 inconsistencies and inaccuracies. Given the limited ability of many government agencies to monitor
 1388 trade, it is difficult to be optimistic about any significant improvement in the short term. The
 1389 difficulty of improving statistical data is well illustrated by GMAD which proved to be difficult to
 1390 operate in practice, notably in dealing with large numbers of paper records, and in the fact that it
 1391 ceased as soon as funding was withdrawn. Major improvements in developing country statistics
 1392 will require substantial funding and it is questionable as to whether this spending represents good
 1393 value for money. It may be better to restrict monitoring to species where a risk from trade has
 1394 already been identified, such as those placed on the various CITES appendices.

1395 iii) Customs/FAO

1396 [4:] Customs legislation can provide a good method of monitoring the trade. Firstly, eight digit
 1397 tariff codes should have the same meaning in all countries, for example 0301.10.10 for freshwater
 1398 ornamental fish and 0301.10.90 for saltwater ornamental fish.

1399 New codes to further distinguish cultured and non-cultured fish as for example:

- 1400 - 0301.10.10 for wild freshwater ornamental fish
- 1401 - 0301.10.11 for cultured freshwater ornamental fish
- 1402 - 0301.10.90 for wild saltwater ornamental fish
- 1403 - 0301.10.91 for cultured saltwater ornamental fish.

1404 [7:] From discussions I have witnessed in other fora is this suggestion practical? It seems Customs
 1405 coders are in lumping not a splitting mode.

1406 [4:] The meaning of "cultured" would follow Mariculture and Aquaculture Management (MAM)
 1407 international MAC Standard, that is "from broodstock / post-larvae collection through to grow-
 1408 out" with a scientific definition of post-larvae such as the last pelagic larval stage of marine coastal
 1409 fishes.

1410 [4:] Furthermore, a "cultured fish" certification should be implemented and different from the
 1411 existing MAC focused on the wild capture. Producers would have to be certified to be allowed to
 1412 declare their fish as "cultured fish" with the appropriate tariff code. Customs must ask the exporter
 1413 ID.

1414 [4:] Then, different import taxes between cultured and non cultured fish codes can be apply with
 1415 smallest taxes for cultured which will be good incentive for people to develop
 1416 aquaculture/mariculture. [7:] Don't agree.

1417 iv) Veterinary controls

1418 [11:] The EU health certification system, in combination with a workable Traces connection, could
 1419 be a possibility to obtain all needed information in a digital way. OFI is in discussion with DG
 1420 SANCO to develop Traces in such a way that species and quantities can be entered more easily, in
 1421 batches. A uniform application of names in a must in this respect and OFI is open for direct
 1422 cooperation to establish and maintain such a list. Photos for identification purpose are present in
 1423 our membership and also the ichthyological knowledge (there are several graduated ichthyologists
 1424 among the membership of OFI).

1425 [8:] Maybe there is a possibility in following the import of ornamental fish in the EU on a species
 1426 level via the TRACES-system. At the moment we have a harmonised sanitary document
 1427 (2006/656/EU) which mentions the species and the number of imported fish. Until now this
 1428 certification has been done on paper, and it is not yet practical to gather this information in a
 1429 database. However in the future electronic certification should be introduced in the EU, and this
 1430 could then be coupled to a TRACES report. If this form of certification would become a general
 1431 procedure (or be made obligatory), everything that would enter the EU legally would be known on
 1432 a species level.

1433 [12:] The relative successes and costs of implementation favour the use of structures associated
 1434 with the EU's Annex D or the national veterinary services in importing countries to monitor trade
 1435 at the species level. Assuming that there is a desire to avoid duplication of effort, I would further
 1436 suggest that of these two, the veterinary services would be the most easily upgraded to identify fish
 1437 to species level (vets being biologists) and that their widely accepted role in policing the transfer of
 1438 invasive alien species and disease transfer mean that their operations will be relatively immune to
 1439 administrative restructuring and budget de-allocations. They are also well placed at receiving
 1440 points, and their role is well understood both by exporters and importers. The vet at Charles de
 1441 Gaul airport contacted me to see if I could do something about the terrible condition in which fish
 1442 from Cameroon were arriving in France, which initiated the program of work by the WorldFish
 1443 Center in Cameroon.

1444 v) CITES listing

1445 [14:] CITES is often weak on implementation, especially in documenting and managing wild
 1446 collection (numbers, mortality, methods, etc.). There is some control at the export end but loopholes
 1447 exist which differ among countries. Also, trends in trade may not represent population fluctuation
 1448 at the local level. Where exported numbers remain the same, wild populations may have decreased,
 1449 but supply is maintained by increased collection effort. An individual record represents a shipment
 1450 and may refer to many individuals. Data may contain duplication if individual countries did not
 1451 record their data in the same manner (UNEP-WCMC, 2004) and many of the species names used
 1452 are inaccurate, with species recorded as wild-caught far from their known distribution (Green &
 1453 Hendry, 1999). However, CITES can be useful for monitoring trends in the trade for listed species.

1454 vi) Annex D of the EU Wildlife Trade Regulation

1455 [11:] Annex D listing is not supported by the industry. All information is already provided in the
 1456 attachment of the health certificate and thus should be available to the SRG. It would be good if it
 1457 were possible to discuss arguments for Annex D listing with the SRG. Present mechanisms of
 1458 decision taking prevent this.

1459 [7:] Any proposals concerning monitoring from the SRG should be:

- 1460 • made public (including the information upon which decisions were based);
- 1461 • subject to stakeholder review;
- 1462 • subject to scrutiny concerning proportionality and targeting by management authorities;
- 1463 • assessed for costs and intended conservation benefits and that these conservation benefits
- 1464 are identified, justified and reported to stakeholders annually; and
- 1465 • the least restrictive to trade necessary to meet the stated objectives.

1466 [6:] Working with developing country governments, the most common complaint I get is about EU
 1467 regulations. These are perceived as being imposed by the EC without consultation and are often
 1468 seen as not being driven by genuine trade, health or safety concerns but as nothing more than non-
 1469 tariff barriers to trade designed to protect EU producers. Regardless of the whether these
 1470 perceptions are correct or not, an important issue needs to be considered. Why is the EC seeking to
 1471 impose new trade conditions on developing countries in a top-down manner? There is little
 1472 evidence of consultation with developing country stakeholders in this process apart from any
 1473 which may come through OFI. Why should the EC seek to impose conditions on Third Countries
 1474 for the (presumed) benefit of conserving their biodiversity without involving them in the process
 1475 from the outset? It feels as if the underlying principle is that conservation is something that needs
 1476 to be imposed by developed country “experts” on developing countries. Much could be learned by
 1477 comparison with the Convention on Biological Diversity and what is perceived as a top-down
 1478 approach to the implementation of Protected Areas without adequate consultation with indigenous
 1479 peoples (see for example article in Samudra March 2008 reporting the CBD meeting in Rome,
 1480 February 2008

1481 http://www.icsf.net/icsf2006/uploads/publications/samudra/pdf/english/issue_49/art03.pdf).
 1482 An alternative and more sceptical interpretation might be that this process is being driven by a
 1483 desire to end the trade in exotic animals and that conservation monitoring is simply one way to
 1484 achieve this. It might well be that the money which would have to be spent on increased
 1485 monitoring would be better spent on the ground in encouraging protection of the resource and
 1486 sustainable harvest.

1487 [6:] The money spent on increased monitoring would be better spent on the ground in addressing
 1488 the urgent issues relating to widespread loss of coral reefs and their biodiversity (e.g. deforestation
 1489 and run-off, coral mining, climate change, coastal development). A better way to assure the long
 1490 term, sustainable use of coral reef biodiversity for the benefit of coastal communities in range states
 1491 would be to encourage measures to improve stewardship of reef resources and sustainable
 1492 livelihoods. A people-centred approach rather than a top-down, biodiversity-centred approach
 1493 may well serve conservation concerns far better in the long term by empowering and enabling
 1494 people who derive livelihoods from coral reefs to develop a truly sustainable approach to resource
 1495 management and use.

1496 vii) Monitoring through a certification scheme

1497 [11:] The role of MAC is important as a basic idea, however, the percentage of fish entering Europe
 1498 from a certified chain of custody is extremely limited, almost negligible. The current MAC system
 1499 cannot be used for the even the entire Marine industry, and certainly not entire industry.

1500 [6:] Second party certification may have some benefits for developing countries and could be
 1501 developed either by trade organisations, government agencies or NGOs. It may be the least cost
 1502 method for developing credible certification, a consideration which would be very important in
 1503 most countries exporting wild-caught ornamental fishes.

1504 [6:] Third party certification is expensive and there is little evidence that the costs can be recovered
 1505 either by the trade or by the certifying body through higher prices paid by consumers or by
 1506 licensing. Taking the Marine Stewardship Council as an example, income from licensing is not
 1507 predicted to reach even 40% of income for a number of years meaning additional funds are
 1508 essential to maintain MSC operations. It is not possible to get equivalent data from the MAC
 1509 website, but from what limited information is available, it is clear that MAC relies very heavily on
 1510 donor funds, even for its base operations. The financial information from the MAMTI project

1511 indicates that substantial donor inputs are required to enable the project to take place. There are
 1512 some examples of lower cost, third party certification (e.g. Friends of the Sea), but these have
 1513 limited credibility and may not be much better than second party certification. It is reasonable to
 1514 conclude that no certification scheme is financial viable in its early years and even long-term
 1515 viability is questionable.

1516 [6:] Regardless of how certification is carried out, there is very little evidence that there is
 1517 significant consumer demand for certified ornamental fish. Even in Germany which may be
 1518 regarded as having a high “green” awareness, MAC has had to carry out awareness-raising
 1519 seminars for aquarists and there is not one MAC-certified retailer in Germany according to Table
 1520 5.1. The push for certification in the ornamental fish trade appears to be supply-driven, rather than
 1521 demand-driven. There have been a number of ecolabelling initiatives for freshwater fishes in the
 1522 past few years, most of which have gone nowhere, simply because they were developed on the
 1523 assumption that certification was a “good thing” per se, rather than assessing market demand and
 1524 developing a system to meet that demand. The arguments for certification seem very weak at the
 1525 moment. It is worth stressing that any certification system would involve costs for the industry at
 1526 all levels and that prolonged consultation would be needed to develop a system which would have
 1527 even regional, let alone global support from the industry.

1528 8 CONCLUSIONS

1529 *This section has been prepared by the editorial team.*

1530 This consultation exercise has been conducted with the purpose of considering the various
 1531 mechanisms available to monitor the international trade in aquatic ornamentals fish and to
 1532 provide recommendations about the best available mechanism(s) for monitoring the trade at
 1533 species level. Six have been identified and discussed here, namely: the monitoring activities put
 1534 in place by certification schemes (e.g. MAC), GMAD, the statistics generated by Customs and
 1535 FAO, CITES, veterinary controls, and Annex D of the EU Wildlife Trade Regulations.

1536 Examination of non-governmental instruments indicates that while certification schemes are
 1537 recognised as a desirable ideal, for the purpose of international trade monitoring they are
 1538 expensive; they provide only partial coverage, limited to a selection of areas in some countries;
 1539 some have a poor track record; and there is little evidence of consumer awareness to support
 1540 the schemes. GMAD, which was initiated by the private sector and MAC, in the context of
 1541 certification, ran successfully for a number of years. However, it is reliant on continuing
 1542 funding, which it does not currently receive. Moreover, being voluntary, it is not
 1543 comprehensive enough for monitoring trade for conservation purposes.

1544 Concerning the governmental mechanisms examined, the data generated by Customs and FAO
 1545 have been found to be inconsistently reported in terms of units, and lack the species
 1546 information required to serve a useful conservation purpose. CITES is generally an effective
 1547 and targeted tool for monitoring trade of species that meet the CITES criteria for listing.
 1548 However, the monitoring enabled by CITES requires the trader to obtain a permit for the
 1549 transaction and there is often a monetary cost to the trader for the issuance of the necessary
 1550 permits. Furthermore, CITES-listing can restrict trade.

1551 Although EC veterinary regulations are not targeted to species of conservation concern, the
 1552 forms used by EC veterinary controls request species-level information and are already
 1553 completed as a matter of course by importers. In practice, however, species names are not
 1554 captured or aggregated in a standardised and accessible manner. If, in the future, species
 1555 information were to be captured in this manner, veterinary controls may offer a viable trade
 1556 monitoring method for conservation purposes.

1557 Annex D appears to be an effective tool for trade monitoring for conservation purposes.
 1558 Notably, Annex D allows monitoring to be targeted to species of conservation concern. Trade in
 1559 species listed in Annex D is not restricted, and as the Annex does not require the issuance of a

1560 permit, it avoids the associated monetary costs. The consultation process has confirmed that
 1561 there is concern among the trading sector about the administrative costs of reporting, the
 1562 potential duplication of effort with reporting for veterinary controls, and the compulsory
 1563 nature of the Annex.

1564 The evidence presented in this report and the feedback received from consultees suggest that
 1565 currently, the only instrument that can provide comprehensive, species-level data on
 1566 international trade in species of conservation concern is Annex D of the Wildlife Trade
 1567 Regulations. However, industry operators have expressed a willingness to work in partnership
 1568 with the regulatory bodies and are keen for EC veterinary controls to be investigated further as
 1569 a mechanism for monitoring international trade in ornamental fish.

1570 *Contributions from consultees*

1571 [5:] The conclusions reached by the editorial team are valid. An additional point about
 1572 Certification schemes is that they are not in any case necessarily dedicated to collecting detailed
 1573 data on numbers/species traded. Certainly at the moment they don't seem to have provided
 1574 any that is publicly available.

1575 [14:] The whole point of CITES is to ensure a sustainable trade. For a species to be listed under
 1576 CITES in the first place requires sufficient evidence that there is a need for this level of
 1577 management internationally and that the international trade is having a negative effect. It is,
 1578 therefore, inevitable, that CITES listing will restrict trade in some cases. This should be for the
 1579 benefit of listed species.

1580 [5:] CITES listing is an impractical suggestion because there is no way that any/all of the
 1581 species on the trade list would meet the criteria for listing in CITES.

1582 [7:] Your conclusion on the effectiveness of Annex D is I believe incorrect. To be truly effective
 1583 its use must be targeted and proportionate. The suggestions made for Annex D listings of
 1584 marine ornamentals at SRG 31
 1585 (http://ec.europa.eu/environment/cites/pdf/srg/31_summary_srg.pdf) were based on
 1586 consideration of a UNEP WCMC document "Review of ornamental species –December 2004".
 1587 We are at a loss to see how given the evidence provided species identified as pan-oceanic,
 1588 common, with a rapid doubling time and hardy in aquaria could be deemed in need of
 1589 additional monitoring.

1590 [5:] Annex D does provide a mechanism for recording international trade but in terms of
 1591 conservation (which is what the monitoring is needed for) will not necessarily provide the
 1592 information required. It is a step in the right direction, but is focused only on trade into the EU
 1593 and also gives a incomplete picture because the data collected will not take into account
 1594 domestic use and post-capture mortalities (which can be substantial). It would be more
 1595 productive and useful to work with range states to develop mechanisms for monitoring catch.
 1596 [2:] This is a valid point. Any approach limited to monitoring only through EU mechanisms,
 1597 such as Annex D or Veterinary data may serve useful for monitoring EU trade. However, it
 1598 will provide incomplete data on the conservation status of ornamental species in the wild,
 1599 which should be the purpose of monitoring. If EU trade numbers go up or down for a
 1600 particular species, will it mean anything? A decline in imports into the EU could be supplanted
 1601 by an increase in imports into other countries, for a particular species. Without catch or stock
 1602 monitoring within the country of origin, the overall effect on the conservation status of a
 1603 species will be nil.

1604 [11a:] As all the requested information is already present in the health certificates, we would
 1605 prefer this sources of information above the Annex D-listing, which is a huge administrative
 1606 burden for importers.

1607 [14:] Two references that may be useful are:
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 1609 analysis of source, price, guarantee and ecolabeling attributes. MSc Thesis, University of
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1612 fish: a discrete choice analysis of ecolableling and selected product attributes. *SPC Live Reef Fish*
1613 *Information Bulletin* 15: 19-22.
- 1614

1615 9 LIST OF CONSULTEES

1616 *Identifier code*

- 1617 [1:] Brian Tissot & Todd Stevenson, Washington State University, Vancouver, Canada.
- 1618 [2:] Cynthia Gerstner, Columbia College, Chicago, USA.
- 1619 [3:] Carlos Ibero, ATECMA Environmental Consultants, Madrid, Spain.
- 1620 [4:] A combined response from Ecocean, St Clément de Rivière, France.
- 1621 [5:] Elizabeth Wood, the Marine Conservation Society, Eversley, UK.
- 1622 [6:] Ian Watson, Watson Fish Consulting, Chatham, UK.
- 1623 [7:] Keith Davenport, Ornamental Aquatic Trade Association, Westbury, UK.
- 1624 [8:] Mr Graus, Federal Food Agency of Belgium.
- 1625 [9:] Mark Taber, Reefs UK
- 1626 [10:] Marc Thellissen, Belgische Bond Voor Aquarium-en Terrariumhouders, Neeroeteren,
1627 Belgium.
- 1628 [11:] A combined response from Ornamental Fish International, Maarssen, The Netherlands.
- 1629 [11a:] A combined response from Ornamental Fish International, Maarssen, The Netherlands and
1630 the European Pet Organization (EPO).
- 1631 [12:] Randall Brummett, WorldFish, Humid Forest Centre, Yaounde, Cameroon.
- 1632 [13:] A combined response from DG SANCO, Directorate General for Health and
1633 Consumer Affairs of the European Union.
- 1634 [14:] A combined response from the Zoological Society of London, London, UK and Project
1635 Seahorse.
- 1636 [15:] Bernard Vallat, the World Organisation for Animal Health (OIE), Paris, France.
- 1637

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