FISH VETERINARY SOCIETY
Specialist Division of the BVA

Ornamental fish trade review document for the British Veterinary Association Council and Non-Traditional Companion Animal Working Group

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SUMMMARY

- The Fish Veterinary Society (FVS) has significant concerns regarding the BVA's proposed position statement on non-traditional companion animals (NTCAs) banning the importation of wild-caught ornamental fish for the pet trade.

- It is a complex subject, and a One Health approach is required to consider all the important health, welfare, conservation and socio-economic factors that are involved globally within this industry. The trade is already heavily regulated from source to consumer by local governments and authorities, and a ban proposed by BVA will have no positive benefit on animal welfare or local communities in developing countries.

- Those supporting a ban have not produced any compelling scientific evidence to justify such action and appear to base their opinion on out-dated practices: modern methods of capture involve careful hand-netting without the use of chemicals such as cyanide (which is universally banned) and with due care for the environment.

- The industry continues to be proactive in raising animal welfare standards throughout with professional codes of conduct, and by supporting local communities with conservation and sustainability in source countries. Captive breeding programs have been developed and supported where possible and practical, with the aim of reducing the numbers of fish taken from the wild.

- FVS have found no evidence that fish held in captivity are in suboptimal welfare conditions. All five freedoms can be met, and Operational Welfare Indicators show no adverse effects from captivity. Fish from a captive origin are offered a life worth living.

- FVS is concerned that long-term damage will be done to the reputation of the veterinary profession and in extension that of the BVA by a poorly judged decision to support a ban.

- FVS and its supporters remain opposed to a blanket ban on the importation of wild-caught ornamental fish and will not support the BVA should it decide to include this proposal in its position statement on NTCAs.

To the BVA NTCA working group members and the BVA Council,

As you are aware, the Fish Veterinary Society (FVS) has disputed the current proposal to ban all wild-caught ornamental fish imports to the UK at the British Veterinary Association (BVA) Council meeting on 20 April 2022. During this meeting the British Veterinary Zoo Society (BVZS), Daniella Dos Santos (BVA past president), and the Policy Committee all argued in favour of a ban. As such, the remaining council members were unable to make an informed decision on the matter. The FVS offered to provide more evidence to support our position and have asked the BVZS and others to engage with us on their main concerns which were provided by their council, to which only the BVZS replied. We are still open to engage with the other parties, but we believe that the BVZS's comments capture most of the current concerns.

The FVS recognize that fish can feel pain and are sentient. The welfare of sentient animals is of a very high priority not only for the individual animal, but also the species as a whole, and as a specialist division of BVA we take this very seriously. Although fish are to be included into the existing legislation, this does not mean that fish are the same as the other animal classes, and there are often significant variations between the different orders, families, genera and species. Due to their varying biology, environments, specialist adaptations and breeding strategies their best interest may be served differently. The views and recommendations in the following document are based on these beliefs and are supported by the evidence that has been cited. This document is in addition to the information already provided, which is cited in Appendices 1-5.

FVS's engagement with other parties and those affected

The BVZS replied to us with the information about their divided opinion on the subject stating that their members' views are split into the following groups:

- *wild capture is ethically and morally wrong*
- *we don't think regulation can work, so we need to ban wild capture in order to avoid bad practices*
- *we think better regulation of wild capture is needed*

We will provide evidence to show that there is good scientific reasoning for the continuation of wild capture of ornamental fish. A well-managed small-scale artisanal fishery can offer a sustainable approach, not only from an ecological point view but also one that offers high-value for low-volume management of resources whilst still having at the center of its values important aspects of education and animal welfare.

As further explanation of the second and third points above, the following parameters were proposed by the BVZS to give more guidance to what they considered was needed:

- *Sustainability can be assured and there is no harm on stocks*
- *Fish are hand caught in small numbers*
- *There is no significant damage to the surrounding environment*
- *There is a clear demonstrable benefit for the preservation of habitats and therefore a conservation benefit, by a particular fishery*
- *Fish are housed in a way that fits with best practices, ensuring sufficient food, water quality, space* etc*.*
- *There is support for the development of captive breeding operations for fish, marine fish in particular*

Finally, the BVZS has concerns on how the above regulations would be implemented in the real world.

In the UK, ornamental fish are by far the most populous pet, and it is estimated that more than 100 million fish share our homes and garden ponds. It is estimated that over 4 million homes in the UK own pet fish (14% of the population). Many families and people around the world learn about animal life, the value of animal welfare and nurturing another animal through their first aquarium. It is an important part of the pet sector and one that drew many of us veterinarians into this trade. The same is true for conservationists, scientists and researchers.

Live ornamental fish fall into two main categories, freshwater and marine fish. The vast majority of freshwater fish (>90%) is captive-bred and technological advances in this sector have greatly reduced the percentage of fish taken from wild sources. Although lower in terms of percentage, these still represent a large number of fish collected, and provide a sustainable and ecological source of income for small-scale artisanal fisheries located in South America, Africa and Southeast Asia.

Captive breeding programs for marine fish were started in the UK in the 1990s by companies such as Tropical Marine Centre (TMC). In more recent years, these efforts have been replicated by others in the industry such as ORA, Quality Marine, De Jong Marine Life and Biota as well as various universities. These initiatives continue to expand across the world. For the UK, these now represent (in value) 13.2% of marine fish traded and 29.6% of invertebrates traded. In total, captive-bred marine fish and invertebrates represent around 23% of the total trade value. There are still challenges in the commercial captive breeding of various species, some of which may never be solved simply because there is not a high enough demand to warrant such a financial investment. More so, diverting income from developing nations to developed nations (hatcheries are usually based near the final market eg. EU and US) is often in clear contradiction with the Nagoya Protocol and could be interpreted as an act of biopiracy. This has been demonstrated in freshwater fish where most of the breeding programs occur near developed regions which can quickly absorb this demand. In turn, this has resulted in a reduction and even loss of various fisheries across South America such as in Brazil and Colombia.

As for the remainder of the market, the type of fishery used, and supply chain involved should be acknowledged. There are basically two types of supply chains when it comes to wild caught animals namely, long supply chains and short supply chains. These are differentiated by the number of participants in the chain, which ultimately leads to better control over practices used and a greater understanding of quality and animal welfare.

Short supply chains are entirely known by the importer and all aspects of the chain are assessed, and continuously monitored and evaluated. The UK trade and its main importers prioritize these as their main source of supply. They are primarily located in small distant locations with small family businesses that both catch and export the fish and are located in countries such as Maldives, Fiji, Australia, Madagascar, US (Hawaii and Florida). Together with captive-bred fish, short supply chains represent almost 80% of the trade.

Long supply chains are typically made up of fishermen, middlemen, agents and various exporters. These are mainly based in countries such as the Philippines and Indonesia which are extensive and subsequently must cover large areas of the country. It is still possible to have good control over the collecting processes used and ensure a high standard of animal welfare, but it requires a greater degree of effort. As an example of this, TMC employs specialized staff in the exporting country who inspect and select any fish sent to UK every week ensuring they are collected locally and with appropriate methods compliant with the company's strict code of conduct.

There are currently around 1800–2000 species of marine animals present in the trade worldwide. Of these, only 700–900 are fish while the remainder are invertebrates, such as corals and crustaceans.

There is some variation in these numbers depending on whether this includes temperate species primarily required for public aquaria, or simply for the aquatic hobbyists. Over 70% of the volume of trade is focused on approximately 100 different species while the remainder are traded in relatively small numbers.

The Fish Veterinary Society has also engaged with TMC. They have been Europe's leading supplier of marine fish and invertebrates into the UK and the EU since the 1970s. It is estimated they represent over 70% of all imports of marine fish into the UK and 20-25% of Europe's imports (including the UK pre-Brexit). There are other importers of fish in the UK, and these are either pet shops, or public aquaria that import directly or through a consolidating agent. Public aquaria also tend to work with European wholesalers such as De Jong Marine Life or others that offer a specialized service providing large fish and display specimens.

TMC and the Ornamental Aquatic Trade Association (OATA) have supplied both internal and external documents that show the level of their engagement and what legislation, codes, auditing and permits are already in place. The freshwater fish industry has not been individually approached. The majority of UK importers for both freshwater and marine fish (by volume) are members of OATA, who are represented in this reply. Eighty percent of the aquatic trade is in freshwater fish and 90% of these are captive bred, the remaining 10% are wild caught. On this, OATA stated that there are not that many UK importers and the majority of those will visit exporter sites to ensure that good working practices are followed. Some importing businesses have very long-term relationships with exporters and as an example, one of their newest suppliers have had a 15-year relationship with their exporter. These are well established, and the importers have been using their relationship with the exporters to improve the *status quo*, to drive improvements in welfare standards, sustainable sourcing and promote conservation in source countries.

FVS response to the BVZS concerns

Wild capture is ethically and morally wrong

Although ethics and morals are very personal, we feel that it is important to show that there should be a basis to those points of view and that this should be based on science and evidence. We feel that most of the views held by BVZS members are mainly based on historical facts and not recent practices. Within the ornamental fish industry, current activities have been established through codes of good practice[1,2], together with thorough internal and independent external audits by the importing companies. In some countries, there will also be local legal enforcement and guarantees of the source and sustainability of the animals captured[3]. Other views expressed appear to be based on emotion, with no tangible supporting evidence. Although noble, anthropomorphic feelings towards fish can be very misguided and counterproductive. Other countries which historically are associated with collecting methods condemned by the aquatic industry have implemented strong enforceable legislation to control these events, not only in the ornamental sector but also in food fishing.

In contrast, is it ethically and morally right to stop wild-caught fisheries and to remove the livelihoods from these communities? We have previously stated that there are significant socio-economic

[1] OATA (2015) Code of Conduct. (online) available at https://ornamentalfish.org/wp-content/uploads/2015/10/CODE-OF-CONDUCT-FINAL-OCT-2015.pdf (accessed July 2022)

[2] OFI (no date) *The OFI Charter*. (online) available at https://ofish.org/OFI-Charter (accessed July 2022)

[3] PIJAC (2021) Revised Final Environmental Impact Statement: issuance of commercial aquarium permits and commercial marine licenses for the West Hawai'i Regional Fishery Management Area. *Report of Pet Industry Joint Advisory Council* (online) available at https://files.hawaii.gov/dbedt/erp/EA_EIS_Library/2021-06-08-HA-Revised-FEIS-Hawaii-Island-Commercial-Aquarium-Permits.pdf

benefits from wild capture, but these were quickly dismissed because BVA would not consider economic factors to be important. Although we think this is a very naïve view, we feel that there are significant conservation benefits. CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora) have extensive experience in the monitoring and enforcement of restrictions on the trade in wildlife. It is widely accepted that to achieve success in any environmental program it must be based on finding synergies between people and nature. Without these, local habitats are left to exploitation or abandonment by local communities, resulting in the complete destruction of what was originally intended to be protected. Conservation is a result of balance and synergy between what may be seen as two opposing forces. This is the basis of One Health, an integrated, unifying approach that aims to sustainably balance and optimize the health of people, animals and ecosystems[4].

Sustainability has been at the center of attention since 2015 when the United Nations defined 17 Sustainable Development Goals to be achieved by 2030, and of these, number 14 relates to *Life Below Water*[5]. It is quite clear that the United Nations' understanding of sustainability lies not only on ending overfishing and implementation of marine conservation areas, but also lies in the much-needed economic effects, such as support for small-scale fisheries (targets 14.4 and 14.9).

There has been considerable work done on coral reef conservation[6,7,8]. These projects not only included study of the corals but also the higher life forms that live on those reefs. This can be compared to flagship mammalian species such as the giant panda and rhinos where all other species living in the same habitat benefit indirectly from the conservation efforts of those individual species. Ornamental fishermen will directly engage in restoration activities such as the deployment of artificial reef structures on degraded reefs as seen in Bali[9]. Indirectly, conservation is promoted through providing a low-impact livelihood alternative to other local damaging income streams (e.g. coral mining [for limestone extraction and construction purposes], trawl fishing, logging, mining) and also through stewardship by fishing communities that value the biodiverse habitats they utilize. Furthermore, the current NTCA policy focuses on vertebrates, but by doing so it is already outdated in the current thinking within aquatics. In addition to corals that are a part of the hobby and trade, there is also a growing number of crustaceans that would be not captured in the policy[10,11]. There is

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[4] Stentiford GD (2022) One Health Aquaculture – a personal perspective. *Bulletin of the European Association of Fish Pathologists* **41**, 188-191. https://eafpbulletin.scholasticahq.com/article/35858-one-health-aquaculture-a-personal-perspective

[5] Globalgoals.org (no date) *Life below water*. (online) available at https://www.globalgoals.org/goals/14-life-below-water/ (accessed July 2022)

[6] Anderson P and Pomeroy R (2021) *Analysis of Florida Marine Life Regulations for the marine aquarium trade*. (document can be supplied on request)

[7] TMC (2021) *Indonesian coral mariculture meeting with Joint Nature Conservation Committee*. Report by Tropical Marine Centre, Chorleywood (document can be supplied on request)

[8] MMAF (2022) *Conservation and management of coral species*. Presentation by Ministry of Marine Affairs and Fisheries, Republic of Indonesia at joint Cefas workshop, Jakarta, 11 Jan 2022 (document can be supplied on request)

[9] OATA (2021) Fishing for facts: an introduction to the UK ornamental fish trade. Annex 5: ecological and societal benefits. (online) available at https://ornamentalfish.org/wp-content/uploads/Fishing-for-facts-report-ONLINE-SPREADS.pdf

[10] Albalat A, Zacarias S, Coates CJ, Neil DM and Planellas SR (2022) Welfare in farmed decapod crustaceans, with particular reference to *Penaeus vannamei*. *Frontiers in Marine Science* **9**:886024. https://doi.org/10.3389/fmars.2022.886024

[11] Birch J, Burn C, Schnell A, Browning H and Crump A (2021) Review of the evidence of sentience in cephalopod molluscs and decapod crustaceans. https://www.lse.ac.uk/news/news-

an impression that this current policy is being pushed through by grouping fish together with a ban on wild caught birds, reptiles and amphibians in order to keep political statements tidy.

As stated earlier, we have seen no significant compelling evidence, either by ourselves or others, that would support a ban. We have repeatedly demonstrated with a considerable body of evidence, that there are no real or significant welfare, sustainability or moral issues within the trade in wild-caught ornamental fish. Where there have been historical issues, we have shown that there is now a well-structured, well-organized and well-motivated industry in the UK that will take full responsibility and accountability for the animals they import. For example, all OATA members in the UK sign up to a code of conduct that includes high welfare standards for captive-bred and wild-caught fish. If there are remaining concerns, there are systems in place to address them adequately through permits from the countries of origin[12]. In 1998, the Marine Aquarium Council[13] was established and was a worldwide, industry-led initiative to address issues that they saw within the industry. Although it ceased to exist in 2008 due to funding issues, many of the issues identified in 1999 have been addressed successfully 23 years later. Since then, other initiatives have been created with good work by various trade associations, co-operative supply chain monitoring such as Sedex, and various local co-operations between various governments, including the UK. These regularly feature in joint conferences and discussions on the trade with a view to promote and further divulge new developed good practices. A good example of this has been the relationship between the UK and Indonesia and other areas such as Australia, led by the Centre for Environment Fisheries and Aquaculture Science (CEFAS) and the Joint Nature Conservation Committee (JNCC), the UK's CITES Scientific Authority.

Regulation

There is a fundamental misunderstanding within the BVA of the current *status quo* of wild ornamental fisheries. Regulation of fisheries already exists in source countries: how they operate will vary from country to country, but local management of ornamental fisheries does exist and in most cases is very comprehensive. The use of Marine Protection Areas (MPAs), quotas, closed seasons, size limits, equipment limitations and other management measures are quite widespread for ornamental fisheries[12]. In addition, for the few marine ornamental fish species listed on CITES, parties are obliged to have a management strategy in place for these listed species. CITES COP19 will also be considering a work programme to examine conservation and management of marine ornamental fish species in November 2022[14]. It is worth noting that CITES is only one tool in the management of ornamental fisheries and that existing fisheries management measures are key to ensure that stocks are fished sustainably. The Indonesian government preferred this when Banggai cardinalfish (*Pterapogon kauderni*) were being considered for listing. This was summarised as: '*Despite the difficulties in*

assets/pdfs/2021/sentience-in-cephalopod-molluscs-and-decapod-crustaceans-final-report-november-2021.pdf

[12] PIJAC (2021) Revised Final Environmental Impact Statement: issuance of commercial aquarium permits and commercial marine licenses for the West Hawai'i Regional Fishery Management Area. *Report of Pet Industry Joint Advisory Council* (online) available at https://files.hawaii.gov/dbedt/erp/EA_EIS_Library/2021-06-08-HA-Revised-FEIS-Hawaii-Island-Commercial-Aquarium-Permits.pdf

[13] Holthus P (1999) The Marine Aquarium Council, certifying quality and sustainability in the marine aquarium industry. *SPC Live Reef Fish Information Bulletin* **5**, 34-35. https://spccfpstore1.blob.core.windows.net/digitallibrary-docs/files/dd/dd754ffee07580ea8b4a95eb55bb3366.pdf?sv=2015-12-11&sr=b&sig=6jTgBzTBYidZ2zT4w36H1BPFoYLmbXHYKPauFxWp5wo%3D&se=2022-11-26T16%3A25%3A39Z&sp=r&rscc=public%2C%20max-age%3D864000%2C%20max-stale%3D86400&rsct=application%2Fpdf&rscd=inline%3B%20filename%3D%22LRF5_34_Holthus.pdf%22

[14] CITES (2019) Conservation management of and the trade in marine ornamental fishes. CoP18 Doc. 94 (online) available at https://cites.org/sites/default/files/eng/cop/18/doc/E-CoP18-094.pdf (accessed July 2022)

managing the coral reef wildlife trade, some examples of successful management demonstrate that sustainable reform of the trade is possible. Some programs in exporting countries, such as Florida's moratorium on corals, Hawaii's FRAs, and the Maldives' and Tonga's no-take zones and tiered quota systems, represent steps towards reforming the trade. Similarly, legislation in importing countries, such as the EU's Wildlife Trade Regulation and Australia's ''whitelist'' can also improve the trade's environmental sustainability by proactively restricting and monitoring imports when there are concerns about the conservation status, disease risk, or invasiveness of certain species. In contrast to the US's reactionary approach to managing the trade, the precautionary approach adopted by the EU and Australia allows importing countries more control and oversight. Examples of regulation and management in the EU and Australia highlight promising ways for importing countries to proactively steer the trade towards sustainability. Different combinations of these management and regulation strategies, in conjunction with emerging data-poor fisheries management approaches, aquaculture, and the other underutilized management tools identified here, offer considerable promise for the future'[15]. This highlights two things. Firstly, that the situation is continually improving and that the historical problems are no longer an issue, and we are eight years on from when that was stated. Secondly, the EU is proactively changing the situation and a ban would only be a setback in that progress and incredibly damaging to an industry which is at the centre of finding solutions such as captive breeding, education, research, etc..

Sustainability can be assured and there is no harm on stocks

It is not possible to generalise on this topic as it is very dependent on the species and the country of origin. Of the 700-900 marine species and 2000+ freshwater species of fish that are imported, there are only a handful that have been described as endangered[16]. Over the years when this has been the case, the aquarium industry has always been responsible and operate its own control on what is imported following guidance from local legislators and based on their own experience. Where possible, breeding programs have been set up. This has been very successful in freshwater species (>90% of supply), and to a lesser degree in marine species (23% of value). A good example of such an initiative is the management and conservation initiatives of the Banggai cardinalfish in Indonesia[17], an issue that is central to the work done by CITES: UK wholesalers only trade in captive-bred Banggai cardinalfish which are now bred locally in the Far East. Having identified this species as endemic and geographically restricted to a single location, it was important to identify the technology required for captive breeding that would allow commercial trade of this species again.

Fish are hand caught in small numbers

Legislation in most countries includes specification of the equipment used to catch fish. Hand netting is very common in fresh and marine ornamental fishing, however all equipment used in ornamental fishing bears no resemblance to that used in commercial fishing such as trawling or boom netting. Therefore, '*small numbers*' is a relative term, and if seen in relation to the overall population this would indeed be the case, as in sustainable fisheries. Permits, quota, closed seasons *etc* are all

[15] Dee LE, Horii SS and Thornhill DJ (2014) Conservation and management of ornamental coral reef wildlife: Successes, shortcomings, and future directions. *Biological Conservation* **169**, 225-237. doi: 10.1016/j.biocon.2013.11.025

[16] IUCN (no date) The IUCN Red List of Threatened Species (online) available at https://www.iucnredlist.org (accessed July 2022)

[17] Moore A and Ndobe S (2013) The Banggai cardinalfish: An overview of management and conservation initiatives. *Galaxea, Journal of Coral Reef Studies* **15** (Supplement), 238-242. https://www.jstage.jst.go.jp/article/galaxea/15/Supplement/15_238/_pdf/-char/ja

included in the management programs of the countries and regions of origin. Marine Fish are caught to order, usually by individuals or in small groups (vs by weight for food fisheries). As only 100 species, which are well monitored, make up 70 % of import and the other 30% is made up from 600+ species it is highly likely that take for the wild is well below maximum sustainable yield. No evidence was found of exceeding capacity by the ornamental. Work remains by OATAs evidence programme and the CITES marine ornamentals work stream to monitor this.

There is no significant damage to the surrounding environment

Ornamental fishing utilises low-impact techniques to minimise damage to the fish and also the environment. It is worth noting that many of the habitats utilised for ornamental fisheries can also be subject to other anthropogenic impacts that cause far greater damage to biodiversity and the ecosystem, such as coral mining, trawl fishing, dam installation, mining for heavy metals, logging, cattle ranching, agricultural pollution *etc*. The presence of ornamental fisheries gives local people an alternative income and provides an incentive for them to act as stewards of the local habitats and protect them from bad practises. The equipment used for the capture of ornamental fish is regulated and has minimal impact on fish and the environment. The use of chemicals such as cyanide and explosives to catch fish are also banned and have been for many years. Ultimately, there is no market value in fish that are stressed, damaged and unhealthy, and this drives higher standards, encouraging the use of low impact hand netting techniques and traps.

A good example of the positive impacts of a fishery was witnessed by one of TMC's suppliers where they saw a significant increase in fish population in general, one year after setting up their small business. This was a direct result of being able to divert the fishers' main source of income from food fishing using destructive methods such as dynamite bombing, to now collecting small numbers of fish for the same income: fishers get paid 10-50x more for a single live fish compared to that paid for food fish by weight. Not using destructive techniques to collect food from the reef resulted in a much higher ecological solution which has proven to be sustainable in some of TMC's supply lines for over five decades.

There is a clear demonstrable benefit for the preservation of habitats and therefore a conservation benefit, by a particular fishery

These benefits have been described extensively in publications associated with Project Piaba, which has been going for well over three decades (literature refs. 1-59). More can be read on these benefits in the '*Literature review: the benefits of wild caught ornamental aquatic organisms'*[18]. Although coral species are not within the scope of the NTCA working group, there is a clear overlap with coral conservation and that of marine fish. '*Conservation and management of coral species*'[19] discusses the Indonesian coral project and its benefits and highlights the impact that the loss of an ornamental fishery has on the environment. During this workshop on coral farming led by CEFAS, Indonesian coral farmers who were subject to a ban stated that they took up alternative work such as coral mining, while the ban was in place.

[18] Watson I and Roberts D (2015) Literature Review: the benefits of wild caught ornamental aquatic organisms. *Report by Durrell Institute of Conservation and Ecology to the Ornamental Aquatic Trade Association*. https://ornamentalfish.org/wp-content/uploads/Literature-Review-The-Benefits-of-Wild-Caught-Ornamental-Aquatic-Organisms.pdf

[19] MMAF (2022) *Conservation and management of coral species*. Presentation by Ministry of Marine Affairs and Fisheries, Republic of Indonesia at joint Cefas workshop, Jakarta, 11 Jan 2022 (document can be supplied on request)

Fish are housed in a way that fits with best practices, ensuring sufficient food, water quality, space etc

This represents a fundamental misunderstanding of the supply chain. Fish are not "housed" at source but are captured in the wild then temporarily held at centres in preparation for shipment (examples of such facilities and management can be seen online[20,21,22]). The latter is required to treat the fish for parasites if present and fed before being purged for transport since excretion of metabolic wastes will compromise water quality during transport. This is all regulated under International Air Transport Association (IATA) standards and local legislation with strict regards to biosecurity and animal welfare. These are well-recognised procedures and the biological needs for transportation of the fish are well understood and taken into account. This is measurable, amongst more sophisticated indicators, in the low mortality rates which are commonly less the 1% on arrival[23,24] with a similar rate in the retail setting[25]. This is on a par with captive-bred fish, and although there is room for improvement, as in all livestock industries, there is much that can be learned to improve transportation in other animals.

There is support for the development of captive breeding operations for fish, marine fish in particular

Captive breeding has been discussed earlier and was suggested as a full replacement for wild-caught stocks. Although this was not supported by FVS (see Appendix 5), it is certainly one option, but it is only realistic in specific situations. Realistically, captive breeding is only a solution for the most popular species and there must be enough demand to justify the initial investment in time and money. The switch from wild-capture to captive-breeding is not always the best method for conserving wild populations, particularly when the most significant threats remain after the removal of live-capture fishing. There are significant socio-economic and conservation benefits to the local fishery communities and if they revert back to more destructive methods of making a living, the opposite will be achieved as witnessed with seahorses[26]. In 2004, seahorses were listed on CITES Appendix II and as such only allowed trade from most countries if captive-bred. Today, the numbers of seahorses in the trade have remained the same as in 2004 but sourced from captive breeding. Although this may be seen as a success, seahorses are still endangered and face the same threats as before. The original collection fisheries have sought out other sources of income and replaced the high value, low volume collection for the low value, high volume trade in Chinese medicine. This was originally the greatest threat to these animals, which has subsequently increased and has now been driven underground, with no control over sustainability. Dead seahorses can be caught through damaging bottom trawl methods, harming the local environments as opposed to live fishing which aims to minimise this. The ornamental industry is highly visible and allows for auditing and a better understanding of other potentially harmful practices. Separate to this, the industry now trades in various species that are not local to the countries breeding them, resulting in potential biopiracy as stated earlier. The industry is

[20] YouTube (2021a) *Wild caught: aquarium fish trade of the Amazon - Part 1*. (online) available at https://www.youtube.com/watch?v=FCP-IMw4zso (accessed July 2022)
[21] YouTube (2021b) *Wild caught: aquarium fish trade of the Amazon - Part 2*. (online) available at https://www.youtube.com/watch?v=WjNfep_ISdc (accessed July 2022)
[22] YouTube (2015) *From the Ocean to Your Aquarium, Saltwater Marine Fish Hand Collecting, Pacific Blue Hippo Tang Dory*. (online) available at https://www.youtube.com/watch?v=A15CDsGkY3Q (accessed July 2022)
[23] Quest R and City of London Corporation (2019) 'Personal Communication'.
[24] Scott A and Fish Health Inspectorate (2019) 'Personal Communication'.
[25] Wood LE, Guilder J, Brennan ML, Birland NJ, Taleti V, Stinton N, Taylor NG and Thrush MA (2022) Biosecurity and the ornamental fish trade: a stakeholder perspective in England. *Journal of Fish Biology* **100**, 352-365. doi: 10.1111/jfb.14928
[26] TMC (no date) Seahorse trade review. *Report by Tropical Marine Centre, Chorleywood* (document can be supplied on request)

committed to supporting local communities and has actively collaborated with governments worldwide on various actions to support and protect their local resources.

The success of this approach is evidenced by the relative proportions of captive-bred versus wild-caught fish in the freshwater market where 90% are captive-bred. However, most marine fish have complex life cycles with long planktonic larval stages which are difficult to replicate in captivity. Technological advances have meant that a growing number of species of marine fish are being captive-bred in increasing numbers for the trade over the past 10 years[27]. However, given the wider benefits of wild-caught ornamental fish for livelihoods, conservation, and international trade, captive-bred fish should not be seen as the best alternative to wild-capture ornamental fisheries. It is a highly diverse trade, and some species are more appropriate for captive breeding than others, whilst some are best wild-caught. It is also worth considering changes in the flow of income associated with captive breeding: typically, captive breeding of marine species takes place in developed "western" nations, taking sustainable livelihoods away from poorer local communities (normally considered as biopiracy). This will have subsequent impacts on conservation with fishermen finding alternative livelihoods such as coral mining, food fishing, *etc*.

Enforceability of regulation and guidance

The remaining concern is how any regulation will be enforced in practice. There are often challenges enforcing rules and regulations in the UK, but it may be naïve to think that this will any better in other countries where there is less legislative and commercial structure. The solution is in industry-led initiatives, guidance, auditing and education. A proactive drive to change, not an apathic ban.

How would a ban be policed? The BVA suggests that wild-caught fish are replaced with captive-bred fish, but how do you prove that a fish is wild-caught instead of captive-bred? This may be impossible, and it will still be necessary to rely on legislation and enforcement in the country of origin. The UK has the opportunity and has been driving change within this industry. It is regarded as one of the largest markets but also one with the highest standards of animal welfare and concern over sustainability. Consumer- or industry-led initiatives are driving real changes in various countries collaborating with government as well as various research collaborations in aquaculture, such as the breeding of corals and fish as well as climate change research and its ecological impact.

The implications of a ban on wild-caught fish exports to the UK

If a ban was to be approved by the government, what would that actually achieve? We feel that it is rather naïve to think that a ban will eliminate any alleged welfare concerns and it has been found that problems simply move elsewhere. TMC conducted a review on the seahorse trade[28] in which it was clear that when the ornamental fish trade stops, capture still continues and tends to increase as was noted by Project Seahorse[29], an independent institution highly regarded by CITES. Project Seahorse has worked with the industry and determined that a direct ban on its trade only led to more underground trade for commercial Chinese medicine.

[27] Pouil S, Tlusty M, Rhyne A and Metian M (2020) Aquaculture of marine ornamental fish: overview of the production trends and the role of academia in research progress. *Reviews in Aquaculture* **12**, 1217-1230. doi: 10.1111/raq.12381

[28] TMC (no date) *Seahorse trade review*. Report by Tropical Marine Centre, Chorleywood (document can be supplied on request)

[29] https://projectseahorse.org/

Exports emerge from at least 45 countries while imports largely go to the US (64%), the EU (14%), and Japan (7%)[30,31]. In addition to these importing areas, China is also considered to be a major importer and thought to be as large as the US, although no real data is currently available. Given that the UK represents around 25% of the EU market (pre-Brexit), a ban on wild-caught ornamental fish will target only 3.5% of the global market. The influence that a ban will have on the freshwater trade is not known although currently only 10% of freshwater ornamental fish are wild-caught. How much of those is imported into Europe is not known although a significant number is imported by countries such as Germany.

The UK is quite unique in its approach to promotion of sustainable well-audited supply chains unlike the majority of the trade in other importing areas which have not invested as much. In practice, ending the UK marine industry would only lead to more stock being sourced from long supply chains, resulting in a reduction of the positive impact witnessed in some Pacific islands and areas of the Indian Ocean. The export of ornamental fish is the main industry on some Pacific islands and the volume of exports is controlled by having only two flights a week, limiting the numbers of fish and increasing their individual value such that it is economically important to those local communities.

If the BVA truly believe there are issues in the ornamental fish industry and they care about the welfare of these animals, they should ensure that they have a seat at the table and participate positively in discussions. Only then then can we really change the situation. Banning the imports will only turn our back on potential issues and will not resolve any of them. In fact, it is more likely to make the situation worse, not only for the animals, but also the people involved in the whole supply chain. Not only will BVA destroy the livelihood of many people, BVA will also diminish the pleasure that many of us have in keeping fish.

[30] Tissot BN, Best BA, Borneman EH, Bruckner AW, Cooper CH, D'Agnes H, Fitzgerald TP, Leland A, Lieberman S, Amos AM, Sumaila R, Telecky TM, McGilvray F, Plankis BJ, Rhyne AL, Roberts GG, Starkhouse B and Stevenson TC (2010) How US ocean policy and market power can reform the coral reef wildlife trade. *Maine Policy* **34**, 1385-1388. https://docs.rwu.edu/cgi/viewcontent.cgi?article=1147&context=fcas_fp

[31] Wabnitz C, Taylor M, Green E and Razak T (2003) From Ocean to Aquarium: The global trade in marine ornamental species. United Nations Environment Programme World Conservation Monitoring Centre, Cambridge. https://stg-wedocs.unep.org/bitstream/handle/20.500.11822/8341/-From%20Ocean%20to%20Aquarium%20_%20The%20Global%20Trade%20in%20Marine%20Ornamental%20Species-20033641.pdf?sequence=3

The solution

The solution is not a 'one-size-fits-all' approach. A ban will only achieve exclusion from the conversation and loss of influence over the process. The concerns noted by supporters of a ban have been mainly historical. Many of the papers that discuss the concerns raised by the BVA and BVZS are over 10 years old, and many cite papers that are over 20 years old. Much has changed in the last decade and there should be more focus on the improvements made by the leading importers that supply the UK market and how they have raised industry standards. The industry is actively looking for collaboration and this presents a great opportunity in which to participate professionally and ensure good decision-making that will result in a better ecological and sustainable approach. This includes:

Breeding programs

Breeding programs have been very successful for freshwater species. Over 90% of ornamental freshwater fish species traded are captive-bred. In marine species, breeding programs can work for the most popular species but there are welfare implications that need to be addressed when doing so. Fish vets across the world will always be supportive of breeding programs. Pouil states: '*Results of the meta-analyses indicate that academic research has led to significant advances in the breeding of some of the more difficult to breed species. While it has a leading role in conservation, its advance of techniques still lags behind private companies and hobbyists. Partnerships promoting synergistic activities between academic research institutes and the private sector (aquaculture farms and public aquariums) are important to optimize future ornamental marine fish production*'[32]. While much progress has already been made, captive breeding programs are not the only solution, and a more holistic approach is needed to ensure that the cure is not worse than the problem. Captive breeding is not without its welfare impacts and in general, it moves income from poor to wealthier areas due to the technology and expertise required. The UK has led the way in fish breeding in the 90s and still leads with coral reproduction in some public aquaria and hobbyist projects. It is important to recognize the importance the industry has had in inspiring and guiding technological advances that allowed for many of the aquaculture successes witnessed over the last 20 years.

Trade agreements

There is a raft of trade agreements already in place. CITES is still the main mechanism that protects the most vulnerable species. The UK's CITES Scientific Authority, JNCC, actively seeks advice and better understanding from exporting countries on various species. Since Brexit, the UK has already diverged and enforced stricter controls on the importation from some countries such as Australia, while waiting for clarification on the 'non-detriment findings' (NDFs) for some species.

Conservation programs

Numerous examples of conservation programs for both marine and freshwater can be found in our literature references which should be considered if the BVA still has concerns after a full review in a separate working group. CITES currently have a work stream on this subject matter and although it is not focussed on welfare, it will look at questions of sustainability, conservation and livelihoods. This will be driven by a panel of experts and CITES will decide its terms of reference based on this at their COP meeting in November 2022[33].

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[32] Pouil S, Tlusty M, Rhyne A and Metian M (2020) Aquaculture of marine ornamental fish: overview of the production trends and the role of academia in research progress. *Reviews in Aquaculture* **12**, 1217-1230. doi: 10.1111/raq.12381

[33] CITES (2019) Conservation management of and the trade in marine ornamental fishes. CoP18 Doc. 94 (online) available at https://cites.org/sites/default/files/eng/cop/18/doc/E-CoP18-094.pdf (accessed July 2022)

Best practice guides and supply chain audits

As stated earlier, only a small number of traders regularly import wild-caught fish and most have signed up to OATA's Code of Conduct. All have internal audits of their supply chain and follow their trade organisation's best practice guidance while others use external auditors to avoid any suggestion of industry bias. Some businesses also fund conservation by non-governmental organizations (NGOs) such as LINI, the Indonesian non-profit nature foundation.

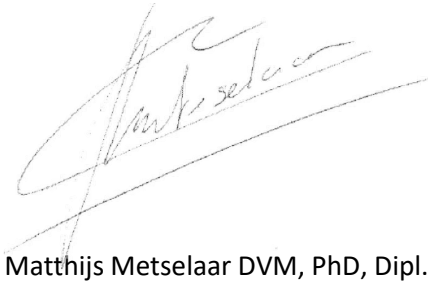
Education

There currently appears to be a clear misunderstanding of the ornamental fish industry by the BVA and BVZS. TMC is the leading importer of marine fish and invertebrates in the UK, and they have offered to host a delegation of the BVA and NTCA Working Group at their facility to show how their business operates and discuss this further. We hope you take them up on their offer and that we can come to an understanding on a positive way forward on this discussion.

Conclusion

The Fish Veterinary Society and its supporters remain opposed to a blanket ban on the importation of wild-caught ornamental fish and will not support any such wording in the BVA position statement on NTCAs. It is a complex subject and those supporting a ban have not produced any compelling evidence to justify such a ban. The Fish Veterinary Society will be supporting a separate policy on fish welfare, and this will include the importation of wild-caught ornamental fish. The Fish Veterinary Society truly believes that engagement is the only way to truly resolve problems and that a ban will make this impossible to achieve.

On behalf of Fish Veterinary society.



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APPENDIX 1: email to BVA NTCA working group 16 Jan 2022

16 January 2022 — William Wildgoose sent the following email to the BVA NTCA working group:

> *You have asked for some resources (other than from campaign groups). The following are from the other side of the fence, promoting their trade in ornamental fish:*
>
> *Wild caught ornamental fish: the trade, the benefits, the facts* (OATA, 2017)
> Wild-caught-ornamental-fish-the-trade-the-benefits-the-facts.pdf (ornamentalfish.org)
> *Fishing for facts: an introduction to the UK ornamental fish trade* (OATA, 2021)
> Fishing-for-facts-report-ONLINE-SPREADS.pdf (ornamentalfish.org)
> Both the above documents complement one another to a certain degree. The 2017 one is more basic but does not have references, whereas the other has an extensive list of references and presents the topics in the form of a more detailed review. Having said that, the section on *health risks and biosecurity* (annex 3) skirts around the zoonotic risks and fails to mention Mycobacteria, probably the most common zoonotic bacterial disease, even if its infectivity is complex. The comment that the widespread use of UV filtration in outdoor ponds reduces pathogens (eg legionella) by sterilization is an overstatement: in most cases these units are only algicidal and not powerful enough to sterilize.
> The following paper gives an independent review of some aspects of fish stress and welfare in the trade:
> Stress and welfare in ornamental fishes: what can be learned from aquaculture? (wiley.com)

APPENDIX 2: FVS survey results 21 Feb 2022

21 February 2022 — William Wildgoose sent the following FVS survey results to the working group

FVS survey results on proposed BVA call for a ban on wild capture of fish

…following circulation of the Minutes of Meeting5

The complete minutes were circulated to the Fish Veterinary Society committee members but due to the limitations of the list server, only an excerpt on the wild capture of NTCAs (sections 9-18) was sent to all society members. In particular, members were asked for their comments on section 15, that '*BVA should extend its existing position to call for a ban on the import of all wild-caught animals for non-conservation reasons, including fish*'.

FVS membership

The total membership is low at present, mainly due to the impact of Covid and the fact that there has not been an in-person conference since March 2020, when many members enrol. In the past, membership has been between 100-120, with up to 20 student members.

- Approx. 80% members are involved in food fish production
- Approx. 20% are involved with non-food fish (ornamental pet fish and public aquaria)
- Approx. 20% of members are not qualified veterinary surgeons
- One member is the chief executive of the Ornamental Aquatic Trade Association (OATA).

Current membership	
vets	55
non-vets	10
total members	65

RESULTS of the survey

I have summarised the total responses below, with key points raised overleaf, followed with more detail from individual respondents (with notes on their background and experience). The comments from OATA are in a separate document due to the length and detail of the response.

IN FAVOUR of supporting a ban	4	
NOT in favour of supporting a ban	10	(includes OATA)
total responses	14	

Four past presidents of FVS responded and NONE were in favour of a ban.

SUMMARY of comments made by respondents

IN FAVOUR of supporting a ban

- Considered unsustainable due to poor survival in captivity
- Capture methods may be questionable and little economic benefit to local population
- Greater welfare implications following capture and transfer to end users
- Uncontrolled public demand for some species may cause extinction (in the wild)
- Reducing the risk of importing exotic diseases will benefit owners and wider environment

NOT in favour of supporting a ban

- Wild fish capture results in killing for food, catch & release for sport or captivity as pets and the impact on welfare will be the same (or may even be less if captured for captivity)
- There are implications of banning wild caught pet fish that impact on fishing for food+ sport
- There are great concerns about welfare issues involved in angling and commercial fishing
- There are serious potential consequences if BVA's proposal is perceived as a ban on fishing

In relation to wild fish caught specifically for the pet trade:

- Trade in wild caught fish is highly regulated (in country of origin, in transit, on arrival to UK)
- Regular auditing of supply chains ensures high welfare standards resulting in healthy fish, a sustainable supply and protection of the environment
- Good sustainable sources already exist and support both local community and habitat
- 'No fishing' zones allow stocks to increase and encourages better reef management
- There is merit in advocating an approval scheme for fisheries that demonstrate sustainability
- Excluding socio-economic factors is considered naïve
- A more holistic One Health approach to wild capture is required
- Fishing maintains a balance between habitat conservation and economic survival of locals
- The tropical fish hobbyist community are instrumental in many conservation projects
- Many species live longer in captivity than in the wild
- Many tropical freshwater fish in tropical regions die annually due to drought and predation
- Wild caught fish do as well in captivity as their farmed counterparts
- There is no evidence that mortality is greater in wild caught fish than captive bred
- Mortalities are insignificant when fish are properly prepared for transportation, transported as per IATA regulations, and received into well managed acclimatisation facilities
- Poor transportation methods are a greater concern but applies to wild caught & farmed fish
- The welfare needs of wild caught fish are satisfied by:
    - reducing competition for space and food resources to survive in natural habitats
    - removing fish from a stressful environment containing predators
    - removing fish from risk of pollution and destruction of their natural habitat
    - removing fish from water pollution that may impact on the fishes' health/ survival
    - avoiding starvation resulting from limited or loss of natural food sources
- Reduced importation and stock availability will increase the cost for conservation centres

FVS survey results on proposed BVA call for a ban on wild capture of fish
…following circulation of the Minutes of Meeting5
Details of individual responses (NB some text has been paraphrased for clarity and brevity)

IN FAVOUR of supporting a ban
— **FOR** ban — vet pathologist (1996 grad+PhD) non-food fish species

- Ambiguity in the exact nature of what is to be agreed in the minutes:
  9 …Existing BVA position. BVA, BSAVA, BVZS and FVS currently support a ban on the import of wild-caught reptiles and amphibians to be kept as pets, except for defined and legitimate conservation reasons.
  15 …Proposed BVA position. Following this discussion, it was agreed that BVA should extend its existing position to call for a ban on the import of all wild-caught animals for non-conservation reasons, including fish.
  There is no mention of 'pets' in the new proposed statement. If 'non-conservation reasons' includes pets, then by default it also includes for research (lab fish), sport (angling) and food (trawling) *etc*. This contradicts the remit of only looking at NTCAs as pets.
- supports a transition to a ban and/or develop better and tighter accreditation systems for wild caught fish

— **FOR** ban — aquatic biologist (1977? grad+PhD) non-food fish

- feels it is 'an unstainable practice' because the vast majority of fish survive in captivity for 'very limited period of time'
- suggests rearing/breeding many common popular species in captivity
- states that capture methods may be questionable, and fishermen receive minimum recompense for time and effort with little economic benefit to local populations (of people).

— **FOR** ban — vet practitioner (2017 grad) non-food fish

- feels that wild caught specimens undergo greater welfare implications (collection, transit, arrival) and the process is overall detrimental to the local environment and ecology but also aware there are socio-economic benefits to local communities which need to be considered
- aware that marine species are particularly hard to breed in captivity/labs but thinks this should be furthered as much as possible to reduce numbers collected from the wild. The common public conception that fish are lesser organisms, have short lives and are readily replaceable when they die, is unsustainable
- feels that public demand for certain species, if left uncontrolled, will drive them to extinction and feels that if we can't breed these species in captivity, then we can't keep them as pets
- agrees with allowing these species to be collected for conservation efforts and zoological and public aquaria purposes.

— **FOR** ban — vet practitioner (1972 grad) industry & commerce

- there are challenges with the differentiation of wild caught fish and those farmed in their country of origin, particularly in the case of freshwater fish
- expertise in breeding certain wild caught marine species is on the rise to satisfy the demand
- banning importation will reduce the risk of importing exotic diseases, which will benefit private fish keepers and wider aquatic environment

NOT IN FAVOUR of supporting a ban

— **AGAINST** ban— vet practitioner (1980 grad+MSc) food fish— **past president FVS**

- to exclude socio-economic factors strikes me as naïve. For comparison, we only raise animals for food for socio-economic reasons and we deal with their welfare within that context.
- There is a very strong argument for improving the welfare of fish during capture, whether for captivity or as food – the differences between the protections given to farmed fish and wild fish are stark. If the case is that the handling, transport and subsequent husbandry of fish which have been captured compromises their welfare, and this is based on evidence of significant differences between the protocols for wild-caught or captive-bred fish, then I support the rationale. However, it seems to me that this may open a major can of worms. Fishing encompasses the capture of fish for various purposes, including being killed (for food or other uses), returned to the water (catch-and-release angling) or taken into captivity (as pets). I don't see a particular difference for the fish, welfare-wise, at this point - indeed, the capture method is likely to be more welfare-friendly if the fish are destined for captivity.
- If then BVA, is saying that for fish welfare reasons wild fish should not be captured (to become pets) that's a very significant statement. If the fish has its welfare compromised by being taken into captivity, surely the same argument applies to fishing for food? If so, fish should not then be captured for food, sport or any other reason as it compromises welfare.
- I am no supporter of angling and I have real concerns over the welfare of fish in commercial fishing. However, BVA supporting what could be perceived as a ban on fishing is definitely a step to be taken with full awareness of the potential consequences.

— **AGAINST** ban— vet uni lecturer (1980 grad+PhD) mixed fish— **past president FVS**

- While I personally agree that the import of wild-caught reptiles and amphibians to be kept as pets, I would strongly object to the inclusion of fish in the BVA statement, without a great deal more examination of the potential harms and benefits. I would not claim that the importation or keeping of wild fish is without problems, but there are several aspects that are quite different for fish compared with reptiles and amphibians.
- Fish welfare — Given the natural environment and behaviour of fish, it is possible to meet many of the needs of most of the commonly kept species in captivity. In addition, many of the wild caught species are at the more expensive end of the spectrum and are generally kept by people with expertise and resources. Many of the worst welfare issues with pet fish occur at the cheap and easily available end of the spectrum.
- Sustainability and socio-economic benefits — There is a considerable body of evidence that many wild fish captured for the pet fish trade are harvested sustainably. In some cases, through increasing the value of sustainable natural resources to local communities, the health of local ecosystems has demonstrably improved.
- I would welcome a review of the issues and would support further restrictions on either unsustainable capture of wild fish or issues of poor welfare. However, currently we could not even guess at the cost-benefit of a blanket ban. To ban the importation of wild caught fish would potentially do a great deal of harm throughout the value chain and including vulnerable local communities in low-income-food-deficit countries, without addressing the major conservation or welfare concerns.

— **AGAINST** ban— vet practitioner (2009 grad+MSc) food fish — **past president FVS**

- the interest of the BVA is to protect the health and welfare of the fish, the source of which should not matter. The trade in these animals is highly regulated with several schemes such as OATA and CITES. Although of importance, habitat and wild stock management *etc* is not the concern of the BVA and is best left to specialists (in that field). There are plenty of good sustainable sources of wild-caught fish where the practices support both local economies as well as the local habitat.
- unlike non-traditional mammalian pets, most wild-caught fish do just as well in captivity as their farmed counterparts
- appropriate (fish) housing and (owner) education is something the BVA can support and is still needed in some very specific cases where some commercially available species are not appropriate for keeping in home aquaria
- For the BVA to suggest or support a blanket ban on fish highlights the lack of knowledge that still exists within the general membership about fish.

— **AGAINST** ban— vet practitioner (1983 grad+MVPH) non-food fish

- BVA are displaying a degree of ignorance of the practical implications and a degree of "silo thinking[1]". A holistic view is required to consider human and animal welfare, and the effect on the environment (*ie*. incorporate One Health[2] principles). Transportation is of greater concern and "banning wild capture" will have little impact here. When fish are properly prepared for transportation, and transported as per IATA regulations, and received into acclimatisation facilities then mortalities are insignificant (0.0001%). BVA would be better focusing on developing "good transportation guidelines"

  [1] a mindset present when certain departments or sectors do not wish to share information with others in the same company.

  [2] *One Health is based on a global context in which humans, domestic and wild animals, and the environment are highly interconnected. One Health can be defined as the added value in terms of health of humans and animals, financial savings, and environmental services arising from closer cooperation of human and animal health and other related sectors* (López et al., 2016)
- (Many) ornamental fish live longer in captivity (up to 24months) than in the wild (6months)
- *Minutes: 13. Ultimately it was noted that these positive impacts are largely socio-economic and form part of a wider conversation around international development.* — This should be framed around One Health rather than socio-economics (which is considered out of date).

— **AGAINST** ban— vet practitioner (1977 grad+CertFHP) non-food fish

Brief notes on wild caught fish for the ornamental trade by purely considering the fishes' welfare needs under the *Animal Welfare Act*:

- *Need for a suitable environment:*
  - Wild capture removes the risk of pollution and destruction of the fishes' natural habitat (*eg*. tropical freshwater rivers and coral reefs)
  - Owners aim to reproduce as natural an environment as possible (including water quality) to prolong life in captivity and to minimise stress and disease
  - The financial and emotional investment encourages owners to provide optimal care
- *Need for a suitable diet:*
  - Wild capture avoids starvation resulting from limited or loss of natural food sources
  - Reducing competition for space and food resources to survive in natural habitats
  - Owners aim to feed balanced commercial or substitute diets as a compromise to maintain health and prolong life span

- *Need to exhibit normal behaviour:*
    - Wild capture removes fish from a stressful environment containing predators
    - Owners aim to recreate relatively natural environments for aesthetic reasons and improve the fishes' quality of life
- *Need to be housed with/apart from others:*
    - Wild capture removes fish from a stressful environment containing predators
    - Owners aim to recreate relatively balanced numbers of fish for aesthetic reasons and improve the fishes' quality of life (and encourage breeding)
- *Need to protect from pain, suffering, injury and disease:*
    - Wild capture removes fish from a stressful environment containing predators and where water pollution may impact on the fishes' health/ survival
    - Most marine fish are individually caught by hand net (without the use of chemicals), although some freshwater fish are caught using larger nets (also used in large mud ponds where koi and goldfish are bred in captivity)
    - Owners aim to reproduce a natural environment to prolong life in captivity and to minimise stress and disease

Beyond the actual physical capture process and transport to the local holding centre, there is not much difference between wild caught and captive bred fish since most of the latter are bred in tropical countries and require the same onward transportation. Whilst stress is inevitably involved in these processes, it does not necessarily equate to compromised welfare.

— **AGAINST** ban (phone call) — vet practitioner (1992 grad) non-food fish

- Banning will reduce importation and stock availability which will increase the cost of wild fish imported for conservation /public aquaria
- Some source communities have zones where no fishing is allowed for human consumption which increases local fish stock numbers and encourages reef management and protection by local fishermen.

— **AGAINST** ban— USA vet practitioner (1997 grad+MSc) mixed fish species

- I was one of the first vets to participate officially at Project Piaba in Brazil. There definitely needs to be some understanding prior to making some type of ban like this. Many of the tropical freshwater fish involved are annual in nature and, although they might not die after spawning because of the wet and dry seasons in these tropical and subtropical regions, they often are left high and dry without habitat and die a more horrible death or are predated upon (albeit part of the natural chain of events). There is a balance between trying to manage a lot of these areas for conservation while allowing the local populations to sustain themselves.
- The tropical fish hobbyist community has been instrumental in many of these conservation projects. Articles published in the hobby press frequently demonstrates their influence and knowledge, and their sincere belief in protecting many of these native fish. Preventing some species from being held in captivity or being brought back into captivity (especially for genetics stock selection), is very short-sighted. I supported Project Piaba because I sincerely believe that keeping these people fishing for hobbyists was better than the alternatives of mining, cattle ranching, and logging along many of these tributaries of the Rio Negro. Sadly, many of the newly discovered species may simply go extinct without this hobbyist support.
- It may be better to advocate for an approval process for some of the fisheries across the world that are sustainably harvested for both marine and freshwater animals.

— **AGAINST** ban — vet practitioner (1996 grad+MSc) mixed fish species

- I don't support a blanket ban on the import of all wild fish as I believe the unintended consequences might be too great and I don't see how the BVA can avoid considering them. A more nuanced position with a certification program to assess wild ornamental fisheries (eg. resurrecting the abandoned Marine Aquarium Council program) would allow the legal import of fish from approved fisheries and a general ban on fisheries that don't meet this standard.
- My purely observational experience is that wild caught fish are often in worse condition and need longer acclimation than captive bred fish. Consequently, welfare is likely to be better in captive bred fish (although of course there are many examples that defy this rule!). More importantly there is the issue of unsustainable capture practices in wild ornamentals - reef dynamite/cyanide etc.

— **AGAINST** ban — vet practitioner (1976 grad+MSc) mixed fish— **past president FVS**

- There are important breeding/management projects going on which provide support to indigenous communities, and if BVA really stick their necks out I may come back and chop them off! There is an increasing number/percentage of marines now bred (in captivity) and they are also sustainably managed in the wild *ie*. extensively farmed.

APPENDIX 3: OATA response to NTCA working group 21 Feb 2022

21 February 2022 — William Wildgoose presented the following OATA response to the working group

Ornamental Aquatic Trade Association Ltd
The voice of the ornamental fish industry

BVA Non-Traditional Companion Animal working group – Position on wild collection

Thank you for the opportunity to comment on BVA's consideration that it should extend its existing position to call for a ban on the import of all wild-caught animals for non-conservation reasons, including fish.

Below we outline why we consider a ban on the import of ornamental fish to be inappropriate. In summary:

- Wild capture fisheries for the UK trade are well managed from source to home.
- Our industry relies on healthy stock so high welfare standards throughout the supply chain are essential.
- The balance of evidence and risk does not support a wholescale ban on wild collected fish imports.
- A ban on imports of wild collected ornamental fish would create wider and more damaging environmental risks and an overall reduction in fish welfare whilst simultaneously depriving 10,000s people in less developed countries of their livelihoods.
- Where risks have been identified measures to tackle them are being actively addressed by the trade and being considered by inter-governmental organisations. See for example: https://cites.org/eng/dec/index.php/42104.

Our comments are referenced throughout.

We also comment below on the concepts of positive lists and traffic light systems.

The following additional supporting material is included in the covering email for your reference:

- OATA's Fishing For Facts report which aims to tackle many of the misconceptions about the ornamental fish trade.
- OATA's comments on the Scottish Animal Welfare Commission's interim report on exotic pets which we believe misrepresented issues relating to the ornamental fish trade and keeping.
- OATA's response to Defra's consultation on animal welfare in transport.

We would be happy to discuss further with you the issues identified below and in the accompanying documents.

Dominic Whitmee
Chief Executive
Ornamental Aquatic Trade Association

RESPONSE TO BVA PROPOSAL TO BAN ON THE IMPORT OF WILD COLLECTED ORNAMENTAL FISH

Overview

The ornamental industry exists because of the natural diversity of fish, providing keepers with a high variety of fish to keep as pets. Local fishers that supply the ornamental trade in source countries can and do act as stewards of aquatic ecosystems, because they rely on healthy fisheries for their livelihoods. Organisations that rely on wild collection also recognise the need for sustainable sourcing that protects the biodiversity of the areas they source from. Market demand by consumers is increasingly for animals that have been collected sustainably without damage to the ecosystems they inhabit (King, 2019). As such, the industry as a whole makes efforts to protect the biodiversity of aquatic habitats, not only for economic sustainability but also as a community of people that value the natural world (Maceda-Veiga *et al.*, 2016; Valdez and Mandrekar, 2019).

The ornamental aquatic industry plays an important role in supporting communities that rely upon it throughout the supply chain. Many fish that supply the industry are sourced from less developed regions and nations that rely heavily on it for their income. This fact is arguably inextricably linked to the welfare of wild animals that are destined for the trade. Ornamental fisheries are typically found in some of the most biodiverse and threatened ecosystems in the world, such as the Amazon and coral reefs (Evers, Pinnegar and Taylor, 2019). These same ecosystems are typically highly impacted by human activity, with environmentally damaging practises such as coral mining and logging threatening native biodiversity (Pedro *et al.*, 2017; Williams *et al.*, 2019; Alho, 2020). Ornamental fisheries in contrast present an alternative income stream for local people who live alongside these habitats, one that is low impact and can have neutral effects on the native biodiversity present (S Zehev and Vera, 2015; Watson and Roberts, 2015; Militz and Foale, 2017; Evers, Pinnegar and Taylor, 2019). Productive ornamental fisheries rely on pristine ecosystems and, as such, local fishers know the value of protecting their local ecosystems in order to preserve their catches (Dowd and Tlusty, 2000). For example, Project Piaba is a non-profit organisation and fishery initiative that works with local fishers to protect large areas of Amazon rainforest and gives local people incentive to protect local habitats from more destructive uses of local resources (Chao and Prang, 1997; Dowd and Tlusty, 2000). This is incentivised to the end consumer with their tag line “Buy a fish, save a tree”, which educates fishkeepers about the benefits of trade to the region and ecosystem. Rainforest fisheries such as this are well documented to have sustainable yields, driven largely by exploiting the natural boom and bust cycles that occur because of flood seasons. Fish that would otherwise die through competition and predation in the dry season are harvested for the ornamental aquatic trade, often prolonging their life far beyond what they would experience in the wild (Watson and Roberts, 2015).

Ornamental fisheries are typically low impact, both in terms of environmental damage and sustainable take. Although fisheries management techniques will vary between source countries, general trends in market demand mean that ornamental fisheries are typically more sustainable than food fisheries (Ornamental Aquatic Trade Association, 2017). Ornamental fisheries in general target small-bodied individuals, as the market for keepers is for younger, small-bodied fish over large fecund adults that support overall population productivity. For instance, the full adult body size of the Common Clownfish, *Amphiprion percula*, is around 10cm but individuals are commonly sold at 2-3cm (Fishbase.org). As such, the relative impact on overall fish stocks of targeted species is low. Targeting of small to medium sized individuals has long been a suggested strategy for reducing the impact of commercial food fisheries (Gwinn *et al.*, 2015). Recent work on the export of ornamental marine fish from Indonesia also found that approximately 85% of the species sold were listed as Least Concern on the IUCN red list (Akmal *et al.*, 2020). In addition, recruitment of fish to coral reefs (where most ornamental species in trade are found) is often said to be space limited, not resource limited (Shulman, 1984; Buston, 2003). Coral reefs are highly productive, and the removal of select individuals is likely

to free up space for new individuals to settle there, maintaining high levels of fish biomass (Munday, 2004).

Methods of fishing for ornamental marine species has often been scrutinised due to the prevalence of local fishers employing destructive and illegal fishing techniques such as cyanide poisoning (Vaz *et al.*, 2012) and blast fishing (Cohen, Valenti and Calado, 2013). Such practises are not supported by the UK trade in marine ornamental fishes, with industry and in particular wholesalers working with local fishers to discourage their use in favour of low impact, collected-to-order fisheries. Because of this, a general decline in the use of such practises has been observed in ornamental fisheries, with local fishers favouring low impact hand netting techniques (Van Beijnen and Yan, no date). Businesses that supply marine ornamentals regularly audit their supply chains to ensure that the animals are healthy and not the product of destructive fishing techniques. Ultimately, the trade and keepers alike are dependent upon the provision of live, healthy fish, and which drives high welfare standards throughout the supply chain (King, 2019).

Responses to perceived risks identified in BVA discussion

- *There is a general lack of traceability and on the ground data to verify welfare standards at point of capture, transport and habituation to new captive environment*

All wild collected ornamental fish entering the UK are packaged to International Air Transportation Association (IATA) standards to ensure the welfare of animals in transit. IATA rules apply and state: "Shippers must pack fish to survive unattended for at least 48 hours from time of acceptance by the airline" and sets out packaging and labelling requirements (International Air Transportation Association, 2020). Live fish travel in a sealed environment, packed in bags with water and oxygen and are fasted prior to travel to prevent the build-up of waste products which would compromise their welfare. In cases where fish are likely to transit for longer periods, precautionary measures are often taken by suppliers to ensure the welfare during transit, such as the use of media to absorb waste products and reducing the number of fish packed per bag. If a badly packed consignment reaches the UK it may result in a prosecution for animal cruelty after inspection at the border. Welfare of Animals in Transport Orders (HMGovernment, 2006) regulate the onward movement of animals within the UK to ensure fish are transported to acceptable standards and reach their destinations as quickly as possible. All those who transport live animals in the UK require an itinerary of the journey (an ATC), and for journeys over 8 hours transporters are required to have a contingency plan in place to ensure the welfare of the fish they are transporting should any problems occur in transport.

All live fish sourced within the UK are fully traceable, with importers and wholesalers regularly monitoring their own supply chains to ensure the best standards possible. For obvious reasons, sourcing of animals is commercially sensitive information for UK business and is not made publically available for this reason. That said, current research being undertaken by CEFAS and supported by OATA aims to understand traceability and diversity of traded species through analysis of packing data recorded during import to the UK.

Fish mortalities are often seen as a barometer of welfare standards throughout the supply chain, and any issues regarding welfare standards in the supply chain are likely to show themselves after periods of transit. The Heathrow Animal Reception Centre, where 80% of ornamental fish pass through its inspection processes, typically record less than 1% of mortalities on arrival (King, 2019; Quest and City of London Corporation, 2019). This figure is also supported by the Fish Health Inspectorate who monitor live fish consignments entering the UK (Scott and Fish Health Inspectorate, 2019). The CITES Animals Committee have acknowledged that high mortality amongst shipments of live animals is

mostly an issue associated with illegal trade. If animals are transported according to IATA rules there are few issues with mortality.

In retail settings, recent research shows mortalities reported were between 1-3% (Wood *et al.*, 2021) in the UK, indicating good welfare standards achieved in throughout the supply chain.

Furthermore, there is no substantiated scientific evidence of wild caught fish experiencing elevated mortality over their captive counterparts. Primary concerns on adaptability of wild species relate to adaptability to commercially available feeds (Van Beijnen and Yan, no date). Thanks in no small part to technological developments in industry, feeds that mimic the quality and form of natural feeds are widely available to keepers (Chen *et al.*, 2020; Hill, Pernetta and Crooks, 2020). Availability of live feeds is widespread in UK retailers, allowing for wild collected individuals to be successfully weaned onto commercial feeds. In addition, many retailers will offer a pseudo-quarantine for wild collected species that can take time to adapt to commercial feeds, allowing the retailer to acclimatise individual fish before onward sale, ensuring animals are feeding well, behaving normally and showing normal coloration.

- *Negative impact on bio-diversity*

Impacts of biodiversity and the role of wild collection ornamental fisheries are in part addressed in the overview section above (pages 2-3). In summary, the trade in wild-collected fish as companion animals can have multiple benefits for biodiversity in source countries. Due to the demand for healthy non-stressed fish, live capture ornamental fisheries are characterised by the use of low impact fishing techniques (Watson and Roberts, 2015; Evers, Pinnegar and Taylor, 2019). Common techniques such as live traps and lift netting that are commonly utilised to reduce stress on fish caught, also are far less environmentally destructive than fishing techniques associated with food fishing e.g. bottom trawling.

Ornamental fisheries promote the preservation of natural biodiversity by providing financial incentive to avoid alternative more environmentally damaging sources of income (Chao and Prang, 1997; Dowd and Tlusty, 2000; S Zehev and Vera, 2015). In addition, ornamental fisheries could arguably be said to promote carbon sequestration through the use of low impact fishing techniques, when compared to alternative livelihoods presented in similar ecosystems, such as bottom trawling and logging, both of which are detrimental for biodiversity and carbon loss (Pedro *et al.*, 2017; Barnes *et al.*, 2021).

- *Negative impact on species numbers and threat of extinction*

Sustainability and the relative risk to populations posed by wild collection ornamental fisheries are in part addressed in the overview section above (pages 2-3). Notwithstanding that sustainability of take does not necessarily constitute an issue of welfare, there is good evidence to suggest that wild collected ornamental fish are sourced sustainably. There is limited evidence to suggest that ornamental fisheries are the main cause of species decline or extinction. In fact, there are many species traded that are listed as threatened or worse under IUCN that are only present in the trade due to the efforts of aquaculture (Evers, Pinnegar and Taylor, 2019). Wild capture ornamental fisheries typically take advantage of biodiverse, highly productive ecosystems that facilitate sustainable take.

Marine ornamental fish are typically sourced from coral reef ecosystems where recruitment of fish is space not resource limited (Shulman, 1984; Buston, 2003). Coral reefs are highly productive, and the removal of select individuals is likely to free up space for new individuals to settle there, maintaining high levels of fish biomass (Munday, 2004).

In addition, it is also worth noting that the sustainability of wild caught ornamental fish is being actively considered by CITES (CITES, no date) and the UN Food and Agriculture organisation. Expert consideration from scientists and multiple stakeholders will feed into consultations by these intergovernmental organisations to ensure appropriate regulation is put in place to ensure take is sustainable across the trade. Many other fisheries are managed to ensure sustainability and there is no reason why ornamental fisheries should be any different (Food and Agriculture Organisation of the United Nations, 2018).

- *Risk of emergence and transmission of zoonotic diseases*

Historically there have been few recorded cases of zoonotic species jumps from fish to humans in multiple sectors, despite theoretically high levels of close contact and therefore exposure to potential pathogens (Boylan, 2011; Woolhouse *et al.*, 2012). Fishermen, fishmongers, fish farmers, as well as those who work in the ornamental aquatic trade, have had routine exposure to fish pathogens for hundreds of years. Although there have been historical changes in exposure levels and medical knowledge, the lack of recorded zoonotic outbreaks is underpinned by clear biological principles that afford humans a significant degree of protection. Phylogenetic distance, i.e. the evolutionary distance between organisms, has been shown to be a good predictor of how likely a zoonotic disease is to emerge between species (Latinne *et al.*, 2020). Recent work has shown that the greater the distance between hosts, the less likely it is that a disease may pass between them (Guth *et al.*, 2019). When talking of aquatic organisms, this manifests itself in clear bio-physical hurdles that potential pathogens would have to cross (Gauthier, 2015). Any pathogen that infects aquatic organisms is by definition adapted to infecting hosts in water. The main natural barrier to disease for humans in an aquatic context is skin, which is incredibly effective at protecting against pathogens (Proksch, Brandner and Jensen, 2008). To date, there are no recorded zoonotic jumps of fish viruses to humans (Boylan, 2011; Woolhouse *et al.*, 2012) and recent research has found minimal risk from food fish or their products (Boylan, 2011).

Disease incidences within the UK ornamental aquatic industry are effectively protected against by the implementation of high standards of hygiene such as recommended by OATA and legal requirements on health and safety. All businesses that sell live animals in the UK must adhere to risk assessments and standard operating procedures on hygiene in order to qualify for a licence to operate. In addition to this, OATA provides detailed guidance on biosecurity to its members by encouraging aquatic-specific hygiene measures such as covering cuts on hands and arms, wearing appropriate PPE, net dips, and hand washing before and after handling animals. This guidance is currently under review in collaboration with the Fish Health Inspectorate and the GB Non-Native Species Secretariat to ensure the highest standards of biosecurity for those that trade in live ornamental fish.

- *Negative impacts on animal welfare linked to capture and transport*

Addressed in comments above in relation to *"There is a general lack of traceability and on the ground data to verify welfare standards at point of capture, transport and habituation to new captive environment"*

- *Negative impact on animal welfare if there is a failure to adapt to a captive environment*

Addressed in comments above in relation to *"There is a general lack of traceability and on the ground data to verify welfare standards at point of capture, transport and habituation to new captive environment"*

In addition, it is worth noting that the provision of appropriate care advice is a legal requirement under the Licensing of Activities Involving Animals regulations in England, Scotland and Wales (Scottish Government, 2021; HM Government, no date c), where all sellers of live animals must ensure that correct husbandry information is supplied to prospective owners. For fish, this can be provided through verbal advice and a comprehensive collection of care sheets provided by OATA (Ornamental Aquatic Trade Association, no date). These care sheets cover husbandry of all species in trade and are currently under review by industry experts and specialist veterinarians to ensure the most up to date information is provided for high welfare standards.

- *Risk of non-native species release in destination countries, this could lead to transmission of pathogens, disruption of ecosystems, and predation/competition with native species.*

The trade in ornamental fish is highly regulated to ensure high standards on fish health and reduce potential for disease transmission (HM Government, 2009). This not only protects against stock loss and maintains high welfare standards, but also adheres to specific regulations on aquatic animal health. The use of sterilisation equipment, such as UV sterilisers and Ozone, is widespread throughout the UK industry (Ornamental Aquatic Trade Association, 2006), as well as in many of the facilities that fish are sourced from (Yanong, 2003; Yanong, Pouder and Falkinham, 2010). Checks on fish health are also carried out throughout the supply chain by trained officials such as the Fish Health Inspectorate (FHI) (CEFAS, no date) and other border control agencies, such as the Animal and Plant Health Agency (APHA) (HM Government, no date a). These checks are applied to a greater extent on "cold-water" fish in trade as they have the greatest likelihood of acting as a vector of disease to native fish populations. Some diseases in particular are heavily monitored, and are legally notifiable such as Koi Herpes Virus (KHV) and Spring Viraemia of Carp (SVC) (HM Government, 2009). Such diseases are kept at bay by high cooperation of industry who actively work with the FHI to report potential outbreaks.

The majority of fish in the UK trade are classed as "tropical", and as such require consistent average annual temperatures well above 20 degrees to survive (Ornamental Aquatic Trade Association *et al.*, 2021). Therefore, the invasive potential for most species is quite low due to the physiological needs of most species in trade. In addition to this, species kept as pets are generally kept in "closed" systems, i.e. ponds or aquariums that are not linked to natural watercourses. Species in trade that have a wide thermal tolerance and as such, could present a future potential risk of invasion, are regularly monitored for their invasive potential by the Fish Health Inspectorate and DEFRA. Recent research by CEFAS (Guilder et al, *in review*) has shown that most ornamental fish species in trade were unlikely to be able to establish under 2050 scenarios.

For those species in trade that are currently able to persist in UK climates – so called "cold-water species" – these species are highly regulated (HM Government, 2009) to ensure their sale is controlled. Imports of these species are subject to 100% checks at BCPs by the FHI to ensure there are no signs of disease, parasites or other species that pose an invasive or disease risk. Businesses that trade in these species are subject to more stringent checks on the biosecurity measures they have in place (HM Government, no date b)**Error! Hyperlink reference not valid.**. In addition, many of the most popular ornamental varieties that exist in garden ponds, such as Koi, Golden Tench and Golden Rudd are selectively bred varieties of species already endemic or naturalised to the UK (Water-Garden.co.uk, no date). Any escape of these species to localised water courses would be unlikely to result in significant ecological effects, particularly as garden ponds are closed systems not linked to natural water courses. In order to cause significant pressure on local species, introduced fish would have to overcome local predation, and exist in high enough numbers to spawn and breed (Copp, Templeton and Gozlan, 2007). Prevailing environmental conditions also must be optimal for the survival of any released species (Keller, Lodge and Finnoff, 2007). Simulation studies show that releases of non-endemic species in aquatic environments need to be in high enough numbers of individuals for

establishment (survival and reproduction) to occur (Drolet and Locke, 2016). Given that ornamental species that are either illegally or accidentally released are generally released singly or in small groups, the risk of ornamental species becoming established is considered very low by industry bodies such as OATA (Copp, Templeton and Gozlan, 2007).

In addition to regulatory controls, industry and keepers actively engage to the prevent the introduction of invasive species. OATA actively collaborates with government agencies to ensure that no-release messaging is effectively communicated to keepers through its care sheets, member updates and social media communications (Secretariat, no date; Ornamental Aquatic Trade Association, 2019, no date). Multiple businesses in the sector also include no release messages on their bags and packaging as standard. These efforts are backed up by legislation that enforces against the unregulated release of wild animals in the UK is illegal (HM Government, 1981), carrying a sentence of up to six months and an unlimited fine. As a result, recent research indicates that good biosecurity standards were widespread within the ornamental aquatic industry in the UK (Wood *et al.*, 2021).

Positive lists

OATA's view is that current laws are sufficient to address the key areas of concern in relation to wildlife trade, such as in relation to animal health and welfare, the introduction of non-native species, and the spread of disease.

There is no justification for a positive list approach. There are no identified issues of concern with the species our industry imports. Species should only be restricted where it can be properly demonstrated, based on a scientific risk assessment, that they constitute some form of risk. Tropical fish at present no risk as they cannot survive in the temperate climate of the UK, and recent research (Guilder *et al.*, no date) indicates a relatively low increase in likelihood of establishment under future climate change scenarios (average of 2.4% by 2050). Temperate fish are already subject to adequate controls and risk assessment.

The positive list approach is a disproportionate approach in light of current evidence need. The evidence that is available is often exaggerated by NGOs and the media but unsupported by wider scientific evidence and practical experience.

The vast majority of the species currently being kept in captivity are cared for properly, are demonstrating normal behaviours, the majority are bred in captivity. Whilst regrettably there will be poor welfare standards in a small number of cases, for all pets these are limited and should not be held up as justification for action to reduce the number of species in ownership when the large majority are well cared for. Poor welfare unfortunately happens with all pet species but it is not used as a justification to ban all pets. The fact that most animals are well cared for (and can be well cared for) would suggest they would be appropriate for a positive listing. But why have a positive list if this is the case in the large majority of cases? A negative list would be more effective in banning the keeping of animals that can truly be shown to be truly problematic.

Creation of a positive list would most likely result in an extreme reduction in the number of species available in trade and personal ownership as it would be prohibitively expensive to undertake risk assessments for all species currently in trade. Many of the NGOs that support a positive list are aware of this and see it is a key step in achieving their ultimate objective of a complete ban on trade in and ownership of any animals.

There are many risks of a significantly reduced number of species in trade/ownership that is a likely consequence of positive lists, including:

- Loss of conservation expertise – Private keepers and breeders and businesses have greater expertise than most in animal husbandry and about the physiology of the animals they breed. This knowledge is important for conservation breeding and any ban would mean a reduction in the available expertise. In addition, many captive-bred species in our sector are under threat in their natural ranges from habitat destruction, pollution and other anthropogenic impacts.

- Loss of developments in husbandry and keeping expertise - All the key advances in animal feeds, enclosure design, aquarium equipment, specialist reptile lighting, etc. are derived by virtue of having a large private market to sell to.

- Negative health impacts – There are plenty of studies that show the positive health benefits of keeping pets (Brooks *et al.*, 2018; Clements *et al.*, 2019; Ratschen *et al.*, 2020; Shoesmith *et al.*, 2021).

- Negative economic impact – The pet industry is a significant employer (directly and indirectly) across the EU, providing substantial tax revenues by virtue of a buoyant market sector for non-domesticated species.

- Increasing illegal trade – The Belgian experience, following the introduction of a positive list, is that the list has been ignored by many owners that simply keep their animals undercover, selling any surplus quietly in Belgium or more openly to clients in other EU Member States. Before Sweden acceded to the EU reptile ownership was banned but upon accession and a lifting of the ban many reptiles came to light. In Norway where a ban on reptile ownership still exists there is a very healthy private ownership of reptiles which is acknowledged by the Norwegian Government. So there is evidence that these bans, including bans arising as a consequence of Positive Lists, do not stop ownership, instead they drive it underground. We do not endorse illegal activity but any law that cannot get the majority of stakeholders to comply is not good law.

- Negative welfare impacts – A consequence of illegalising ownership is that owners would be less willing to take ill animals to a vet for fear of prosecution with negative implications for the animal in question.

Effectively banning large numbers of sustainably utilised and well cared for species through the introduction of positive lists could be perceived as undermining the UK's commitments on sustainable use of wildlife under the UN's sustainable development goals, including "sustainable consumption and production", "Conserve and sustainably use the oceans, seas and marine resources for sustainable development" and "Employment, decent work for all and social protection" (Nations, no date).

EMODE or "Traffic light systems"

Caution should be taken before the widespread imposition of traffic light style systems to regulate the sale of fish as NTCAs.

Many businesses already operate their own similar systems which are built from years of industry experience and materials provided by standard setting bodies, e.g. OATA care sheets. Given the

diversity of species in trade, the imposition of a traffic light style system for different species risks oversimplifying the keeping of some species, meaning that their needs are not adequately met by keepers. We believe the current guidance in LAIA regulations in England, Scotland and Wales is sufficient in ensuring the welfare of NTCAs, particularly fish, as licencing requires the provision of husbandry advice to prospective owners bespoke to the species they wish to buy. For fish, this is supplied by staff with often years of husbandry experience, industry training and a suite of care sheets made available by OATA which are reviewed by industry experts and specialist vets.

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APPENDIX 4: FVS statement to BVA Policy Committee 21 Feb 2022

Fish Veterinary Society statement to BVA Policy Committee

SUMMARY POSITION

- The Fish Veterinary Society (FVS) has significant concerns over discussions in the non-traditional companion animal (NTCA) working group regarding BVA's proposed position statement on NTCAs.

- Our Society's concerns focus on the working group's opinion that wild-caught fish for the pet trade are exposed to welfare problems and there should be a move towards banning wild-caught fish.

- FVS, recognising the majority view of our members who expressed an opinion, does not support a ban on the collection of wild-caught fish.

- FVS is concerned that long-term damage will be done to the reputation of the BVA and the veterinary profession by a poorly judged decision to support a ban.

- From discussions with the World Aquatic Veterinary Medical Association (www.wavma.org), their members would also oppose such a ban.

- To date, support for a ban in the NTCA working group appears to be supported by a minority and not to be based on scientific evidence but opinion.

- FVS does not believe there are significant welfare issues in wild collection which can only be addressed by a ban, or that captive breeding reduces any negative welfare experienced. In this current reply we provide a significant body of evidence to support this statement

- If the BVA does recommend including fish in a ban on wild-catch for the pet trade, it will do so without the support of the FVS, and this should be clearly noted in their policy.

- FVS might agree to a suitably-worded compromise to ensure that all animals sourced for the trade are collected sustainably and using methods that do not compromise their welfare, whilst also recognising that the science is currently unavailable and there is need for future research.

- FVS might also support removing fish entirely from BVA's NTCA policy (given the long tradition of fish keeping) and would commit to working with BVA to develop a fish welfare policy to cover all aspects of the profession's interactions with fish.

FVS concerns in detail

The trade…

The number of pet fish in the UK is estimated to be over 40million compared to a combined total of 24million dogs and cats. Over 2,000 different species of ornamental pet fish are kept by hobbyists. Wild-caught fish represents a small but important part of the pet fish trade and involves about 10% of freshwater species (from rivers and lakes) and 90% of marine fish (from coral reefs).

Although many common species of pet fish are bred in captivity, some species that are wild-caught have life stages where particular environmental conditions or food requirements are difficult if not impossible to replicate and therefore currently cannot be captive bred. Wild-caught fish have a high financial value in countries of origin and provide an important source of income that enables developments in local communities and encourages conservation of surrounding habitats. This is mentioned not because of the economic benefits to the local people but to highlight the very strong motivation for looking after the welfare of the animals: they are not treated as a commodity but are kept in optimal conditions.

Collection methods are also aimed to do minimal or no harm to the animal, with many being caught to order individually and/or in small numbers. The numbers of fish that are caught for the pet trade are small in comparison to the fish that are caught for human consumption. Fish are carefully and selectively caught by hand net to meet good welfare standards, ensure healthy fish, and avoid damage to the environment.

Because survival to adulthood is very low, most fish produce hundreds or thousands of eggs, and the collection of small numbers of young fish has little impact on the local wild population. These fish are effectively removed from an environment with predators, and one where there is constant competition for food and space. Environmental destruction and pollution due to human activity such as deforestation and agriculture are examples of harmful impacts that wild fish are subjected to, in addition to those caused by climate change and drought.

Commercial trade is important to provide funding for conservation of fish species and habitats, and provides an alternative income source to destructive activities such as logging and mining. Although these socio-economic benefits for deprived areas in lesser developed countries were acknowledged, this was not considered justification to continue the trade. FVS disagrees with this narrow-sighted view, given the potential impact on wild populations in the event of a ban.

Currently, there is no apparent public concern about the welfare of wild-caught fish, and hobbyists seek out wild varieties specifically for their robust health and introducing new genetic vigour. These hobbyists are often instrumental in promoting conservation of habitats in the countries of origin.

Welfare…

There are limited peer-reviewed articles providing evidence of any significant welfare problems associated with wild collection. The working group had requested published material that was not from campaign groups such as the RSPCA and Born Free. The Ornamental Aquatic Trade Association (OATA) is the industry's standard-setting body that provides advice to its members and the public on fish health and welfare. It employs two science graduates and where necessary seeks advice from other experienced and qualified outside consultants, including veterinary professionals. Their publication, *Fishing for Facts* (2021), is a detailed and fully referenced document that presents facts

on all aspects of the UK ornamental fish trade, including the welfare of wild caught fish. OATA also submitted a detailed response to the working group which was fully referenced but this was considered biased by some and seen to be defending the trade.

A survey of FVS members showed that 70% of respondents were against supporting a ban on the collection of wild fish for the pet trade. These members included vets with many years of experience working in both the ornamental and food fish industries. However, the results of this survey were also considered by some in the working group to be biased and defended the trade. It should be noted that those FVS members against the ban are not financially tied to any trade members and FVS considers the suggestion of financially-motivated bias disrespectful.

The appendix below summarises the main welfare issues of wild collection in relation to how fish are caught and mortalities in the supply chain. Three of the papers provide a good overview, indicating the problems and paucity of available data on the trade and the challenge of enforcing a ban:

> Evers, H. G., Pinnegar, J. K. and Taylor, M. I. (2019) 'Where are they all from? – sources and sustainability in the ornamental freshwater fish trade', *Journal of Fish Biology*, **94**(6), pp. 909–916. doi: 10.1111/jfb.13930.
>
> Biondo, M. V. and Burki, R. P. (2020) 'A systematic review of the ornamental fish trade with emphasis on coral reef fishes—an impossible task', *Animals*, **10**(11), pp. 1–21. doi: 10.3390/ani10112014.
>
> King, T. A. (2019) 'Wild caught ornamental fish: a perspective from the UK ornamental aquatic industry on the sustainability of aquatic organisms and livelihoods', *Journal of Fish Biology*, **94**(6), pp. 925–936. doi: 10.1111/jfb.13900

As yet, no referenced evidence has been submitted to the working group that supports the opinion that there should be a ban on wild-caught fish.
Although it was stated in the minutes that '*zebrafish in laboratory settings are very well protected in legislation*', it is unrealistic to expect that the same level of scientific scrutiny and legal pressures can be applied to the pet trade. The same would be the case for dogs, where a normal pet is not judged to the same standards as a laboratory dog. OATA constantly aims to improve all aspects of the UK trade, which is extensively audited and monitored from source to the home by various governmental and local authorities.

The veterinary profession…

Historically, the veterinary profession has had a poor reputation within the ornamental fish industry. Fish are excluded from the Veterinary Surgeons Act and there was very little interest or engagement by the profession in the past, in part due to the lack of coverage in the veterinary curriculum. Things have improved slowly over the last three decades but only a handful of vets are now involved in a limited capacity within this substantial industry which has an annual turnover in excess of £400million. In recent years, there have been slow but progressive developments in the veterinary care of pet fish with more use of laboratory investigations (histopathology), diagnostic imaging (radiography and ultrasonography) and surgical procedures.

It is important that we maintain and develop the profession's engagement in pet fish so that we can actively advise on improving their future health and welfare, both within the industry and with the

general public. To do so requires developing mutual trust and respect, and putting forward suggestions based on sound scientific evidence rather than opinion. With the current limited amount of veterinary undergraduate training regarding fish, it important that the profession demonstrates that it can take all aspects of fish health and welfare into consideration when making decisions that may have profound consequences for the trade and consumers in addition to the conservation efforts across the globe. Not to do so might also have a significant effect on future attempts to include fish within a revised Veterinary Surgeons Act, something to which both FVS and BVA have committed.

Wild-catch more generally

It would be naïve to assume that any position recommending a ban on wild-catch of fish for the pet trade would not draw comparison with wild-catch for other purposes. In addition to the obvious wild-catch for food, fish are also removed from the wild for other purposes, including on-growing in aquaculture. Particularly given that 2022 has been declared the International Year of Artisanal Fisheries and Aquaculture by the United Nations General Assembly, FVS would recommend that BVA considers very carefully the potential unintended consequences of calling for any ban on the wild-catch of fish.

APPENDIX:

Addressing welfare issues associated with the wild collection of fish for the pet trade

Collection techniques — Freshwater

- Fishing techniques are typically non-destructive and designed to reduce stress on individuals being caught – the value is in fish that are healthy and not stressed (King, 2019).
- Shoals of fish are encouraged into wide and shallow nets which are then lifted into wide tubs for transportation to holding pens (Watson and Roberts, 2015). Other methods include the use of real or artificial refuges of cryptic species, that are lifted up and fish swim into the net as they leave the refuges (Evers, Pinnegar and Taylor, 2019). In some cases, active netting (*eg* using seine nets) is used to gather larger fish such as discus and arowana over a wider area (Watson and Roberts, 2015).
- Freshwater fishing often takes advantage of boom-and-bust population cycles that occur because of rainy seasons (Zehev *et al.*, 2015). Newly flooded areas increase food availability causing an increase in fish biomass with fish then being caught in small bodies of water after the floods recede. These fish would otherwise die due to increased competition for food and space, predation, and disease (Jones *et al.*, 2021). Those individuals that are removed for the aquarium trade will often outlive conspecifics that are left behind.
- Wild-collection fishing incentivises low-impact livelihoods and protects habitats from pollution, logging, and habitat degradation. The welfare of wild fish is directly impacted by those effects if local livelihoods are removed.

Collection techniques — Marine

- Marine fisheries employ similar non-destructive methods to freshwater fisheries, such as the use of traps and artificial refuges. In addition, local divers and snorkelers can use sticks to

chase fish out of crevices for collection in barrier nets (Watson and Roberts, 2015).

- Some concern remains over the prevalence of illegal destructive collection techniques that were once common such as the use of cyanide to stun fish (Vaz *et al.*, 2012). There is no market demand among consumers for fish that are collected in this way (King, 2019). As such, a general decline in the use of these practices has been seen in ornamental fisheries, with local fishers favouring low-impact hand netting techniques (Van Beijnen and Yan, 2020).
- Unfortunately, while industry reports and audits of supply chains by UK businesses show a reduction in the use of cyanide for collection (Van Beijnen and Yan, 2020), there is little current understanding of its prevalence amongst ornamental fishers in published literature. Cyanide use is difficult to detect in the absence of laboratory techniques (Davis, Murray and Katsiadaki, 2017; Losada and Bersuder, 2017).
- Prevalence of cyanide use in ornamental fisheries is under active research and a study that has now been undertaken by scientists at CEFAS has assessed attitudes towards the practice by ornamental fishing communities in the Philippines, with results to be published soon.

Mortalities in the supply chain

- Mortalities are seen as a barometer of welfare issues in the supply chain. Although not specific to wild-caught fish, most recent estimates of mortality of fish on arrival and at retailers in the UK fall between 1-3% (King, 2019; Quest and City of London Corporation, 2019; Scott and Fish Health Inspectorate, 2019; Wood *et al.*, 2021). If issues associated with poor packing standards or handling were present, then it would likely be detected at this stage.
- There is a mixed picture from published literature on mortalities associated with wild-caught fish. Some papers state high mortality associated with wild-collection fisheries without data or appropriate references (Biondo and Burki, 2020). A bulletin that is widely cited stating high mortality associated with collection techniques of wild fish (Yan, 2016), provides no data or references at all to back up figures presented by the author.
- Much published literature on mortalities associated with wild-caught fish is now quite dated and ideally requires a more current assessment (Rubec and Cruz, 2005; Schmidt and Kunzmann, 2005; Yeeting and Pakoa, 2005; Monticini, 2010).
- Data on mortality specifically associated with wild collection is deficient and historic estimates vary considerably. Assessments often suffer from poor sample size with limited numbers of observations associated with particular suppliers and areas of origin (Schmidt and Kunzmann, 2005; Yeeting and Pakoa, 2005; Monticini, 2010).
- Mortalities also appear to be species-dependent, with some species more sensitive to travel than others (Rubec and Cruz, 2005; Schmidt and Kunzmann, 2005), although these papers are focussed on marine fish.

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APPENDIX 5: Letter to BVA Council 15 Apr 2022

To The BVA Council,

The Fish Veterinary Society (FVS) would like to address the BVA Council on the current review of NTCA and the proposed ban on the importation of wild-caught fish for non-conservation reasons, e.g. the pet trade.

The review in Annex A currently includes the following statements:

Positive impacts
However, it is important to recognise that wild capture can play a role in sustaining local economies and provide important benefits to the communities in the country of origin. This is particularly pertinent in the case of wild-caught fish. The OATA Wild caught ornamental fish: The trade, the benefits, the facts report, highlights benefits of the wild capture fish industry include:

- *It provides vital livelihoods for tens of thousands of fishermen and communities in remote areas that have fewer employment opportunities and less welfare provision*
- *Local people use and maintain local resources to make a living*
- *The source country benefits are monetary, technological and information-based*
- *Fishkeepers are knowledgeable of habitats like reefs and rainforests and are empathetic to their conservation needs*

Draft recommendations:

- *BVA supports a ban on the import of all wild-caught animals for non-conservation reasons, including fish. Fish are sentient and therefore there is no justification for making an exception for wild-caught fish.*
- *We recognise that the wild-caught fish trade may confer positive social and ecological benefits in the context of international development. However, As an animal-welfare focused profession, our position is primarily informed by animal welfare considerations, which, for the veterinary profession, are not outweighed by potential social and ecological benefits.*
- *Conservation should occur for its own merits. Prospective owners should consider the provenance of NTCAs and whether they have been responsibly sourced. In addition, consideration could be given to the development of an assured breeder scheme for NTCAs that have been captive-bred in the UK.*
- *An alternative to wild-capture should be the focus, rather than improvements to the status quo. A ban on wild-caught fish should be phased in, supported by the responsible captive breeding of popular species.*

The FVS wishes to highlight the importance of economics in animal welfare. The suggestion that economics should *not* be considered in welfare is both naïve and narrow-minded: without economics, there is no welfare. Welfare is the sole outcome of wealth. People will always do as much as they can, or think, they can afford. The veterinary profession is formed under that same driver from its humble beginnings in food safety. It is important to mention that no vet in the FVS is financially dependent on any trade in wild-caught fish and overall these fish form a very small percentage of the ornamental trade. In addition, the ornamental sector is a highly consolidated trade in the UK (and elsewhere), meaning that the sector will mostly make up only a small part of any veterinarian's responsibility. Furthermore, the FVS membership that has reviewed our interaction with the NTCA workgroup is highly educated, with most having additional MScs, PhDs, or diplomates from the European College of Aquatic Animal Health. Amongst these is Prof J.F. Turnbull BVM&S, MSc, PhD, FHEA, MRCVS, an

internationally-recognised Professor of Aquatic Population Health and Welfare at the world-renowned Institute of Aquaculture. He has been closely involved in this response and is in full support of our position. Lastly, the FVS has made additional statements on why welfare is not an issue in this part of the trade which have been overshadowed by the BVA's misinterpretation of the FVS's previous use of economics as reasoning.

The BVA claims to be an evidence-based organisation. The FVS has put forward an array of scientific evidence supporting our viewpoint, whereas those who oppose and dismiss these views have provided no evidence, and base their views solely on what appears to be personal and anecdotal experience, from other species. This is inherently incorrect and is far from the spirit of the evidence-based philosophy the BVA is trying to cultivate.

The BVA also states that fish are sentient, which is fully supported by the FVS. However, it is not synonymous with welfare implications when taking animals from the wild, especially if no further explanation is given. Looking at the welfare of wild-caught fish, and the process in which this comes about, the FVS has clearly stated we have found no evidence of adverse welfare that justifies a ban, and we have highlighted many reasons why we felt this was the case. We would like to add that if a wild-caught fish moves further within the animal trade, it will not experience conditions any worse than a captive-bred fish. They have similar survival outcomes during transport, and they adapt well to a captive environment. The trade is regulated in such a manner that the needs of specific species are known and displayed, and non-compatible animals are not sold together. The individuals buying and selling are specialists in their trade, and there is a clear distinction in comparison to other NTCAs in that the needs of fish can be met throughout the process.

For any BVA statements which refer to the fact that wild fish should simply not be taken from their environment at all, we would like to point out this would be a concern of animal rights, rather than one of animal welfare.

With regards to the statement that conservation should occur for its own merits and assuming that the BVA means taking fish from the natural environment, this would refer to the 'sustainability' of such practices. The FVS would like to state that we believe these practices can be carried out sustainably in most, if not all, cases for the following reasons:
Firstly, in regions such as the Amazon, fish are removed from flood plains where, if the fish remained, the habitat would completely dry out and most animals would die from natural causes, e.g. predation, and competition.
Secondly, the animals captured are mostly juvenile specimens. In comparison with most species of birds, mammals, and reptiles, fish have a significantly higher number of offspring which relates to a high mortality and predation rate. The taking of a percentage of these individuals does not impact the overall population status of that species.
Lastly, most wild-caught fish come from areas where, if not for the capture of these species, the local livelihoods would change from catching fish to more environmentally destructive methods such as logging or commercial fishing. In other words, these trades are not only carried out in a sustainable manner, but they are also preserving the local environment in which they live. On this matter, the World Aquatic Veterinary Medical Association's (WAVMA) director for Africa said: "*In addition, there is the Convention of Biodiversity and Aarhus Convention to which several states around the world that include EU and UK are signatory. The emphasis should be on regulating and managing the ornamental fish trade within these frameworks, and these in themselves cannot be achieved unless aquatic animal welfare is safeguarded right across from the wild and within the ornamental industry. Rather than*

being simplistic and banning wild-caught ornamental fish, and bearing in mind the threats to aquatic biodiversity and the role captive holding provides/can inadvertently play in this regard + community benefits for human welfare, the BVA should rather focus on promoting and ensuring Best Practices in aquatic animal welfare are applied from source, during trade and by keepers of such animals.". One such example project is https://projectpiaba.org/

The Fish Veterinary Society recognises that there are certain aspects of the trade where welfare standards could be improved. These, as described, do not pertain to fish taken from the wild. As such, any welfare issues relating to fish taken from the wild equally applies to captive-bred fish. However, since the BVA policy is recommending that currently wild-caught species should in future be bred in captivity, the FVS would like to make sure that the council is aware of the implications that would follow, and how it would not improve the welfare of the species, and, in the professional opinion of the FVS, would make it considerably worse.

In the case of marine species, it has already been stated that the survival of fry is very low. We base this on several species of marine fish that are cultured in aquaculture. Even under optimized conditions, the survival rate of commonly farmed species may be less than 20% and is often less than 5%. In less established or newer species, 1% survival is a realistic number. The very low survival rate is also seen in the wild but when observed in a controlled environment with human oversight, these mortality rates would be viewed as a significant welfare concern. There are several species of ornamental marine fish that have been bred in captivity, such as blue tangs and clownfish which have been popularized by Hollywood movies. These breeding programs are far from perfect and taking these species from the wild can be done sustainably (and without welfare issues) without any adverse impact on the wild population.

The FVS would also like to point out that if the BVA were to go forward with this policy in its current form, it would severely damage the profession as it would be seen as unscientific, naïve to the workings of the industry, and would further support the field opinion that vets don't know anything about fish.

WAVMA states: "*It should be emphasized that, although welfare issues are increasingly and importantly on the radar globally as we seek to manage our world in a better way, a decision like this is premature in its rash and potentially very impactful long term outcomes, and runs counter to the increasingly important focus on One Health".*

One Health is defined as "A collaborative, multi-sectoral, and transdisciplinary approach—working at the local, regional, national, and global levels—with the goal of achieving optimal health outcomes recognizing the interconnection between people, animals, plants, and their shared environment'. Or a more operational definition of One Health as 'an integrated, unifying approach that aims to sustainably balance and optimize the health of people, animals and ecosystems."

The Ornamental Aquatic Trade Association (OATA) responded as follows to the minutes of the BVA Policy Committee meeting: *"This is an extremely disappointing outcome which, in our view, reflects badly on the veterinary profession. The fact of the matter is that the evidence does not exist to support a ban on welfare grounds."*

In view of these remarks, including previous statements submitted to the working group, the FVS would like to make it clear that if the BVA does take forward the policy in its current form with wild-

caught fish included in the ban, it would do so without the support of their specialist division. The FVS would insist on a statement within the policy that the policy on fish is against the advice given by the FVS as a specialist division of the BVA. At that point the FVS will also release a statement on why we are not supporting this policy, giving the reasons for this stance and protecting members of the FVS against any resulting damage to the veterinary profession and fish veterinarians in particular.

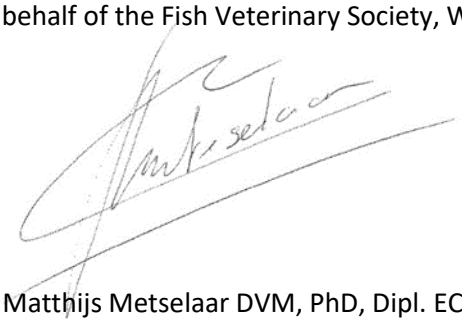
The FVS would like to state that the above is a last resort and we would prefer to see an alternative solution to these issues. Due to the significant differences in fish ecology, husbandry and management that make it impossible to include them in the NTCA policy on wild capture, we propose a separate BVA policy on fish welfare, to which the FVS would be happy to contribute. This could include ornamental fish, aquaculture (as this is not captured in the sustainability policy), angling, and perhaps even commercially wild-caught food fish.

In summary,

- The FVS believes that there are no welfare issues of concern in wild-caught ornamental fish of such significance to justify a blanket ban.
- The FVS recognizes that there may be welfare issues later in the process, which is why it is proposing a general welfare policy for fish.
- The FVS state that these will be very specific issues, that not only have defined remedies but are also not discriminatory on the origin of the fish. Replacing wild-caught fish with captive-bred alternatives, as proposed by the BVA, would only result in increased welfare concerns, due to issues relating to marine fish reproduction and socio-economic webs that should not be ignored.
- The FVS is supported in these statements by the World Aquatic Veterinary Medical Association and the Ornamental Aquatic Trade Association.

As such we highly recommend that you take the advice of your specialist division in to consideration to not include a ban on wild-caught fish in your NTCA policy.

On behalf of the Fish Veterinary Society, WAVMA and OATA



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Founding director of Aquatic Vets ltd.