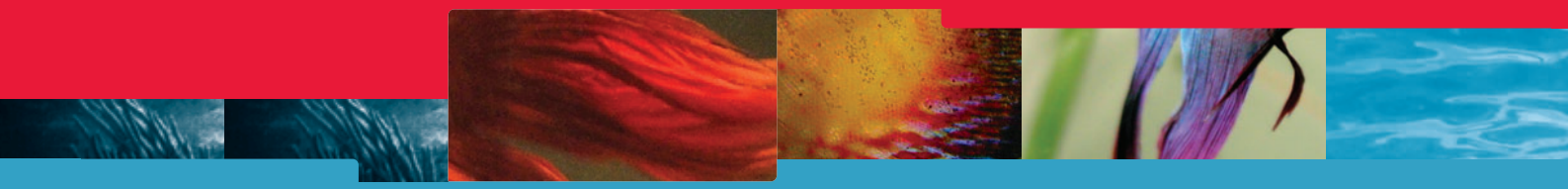
Australian Government

Department of Agriculture, Fisheries and Forestry



A STRATEGIC APPROACH TO

THE MANAGEMENT OF ORNAMENTAL FISH IN AUSTRALIA

DEPARTMENT OF AGRICULTURE, FISHERIES AND FORESTRY

A STRATEGIC APPROACH TO **THE MANAGEMENT OF ORNAMENTAL FISH** IN AUSTRALIA

Natural Resource Management Ministerial Council
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EXECUTIVE SUMMARY

The ornamental aquarium fish trade in Australia has been estimated to be worth approximately $350 million annually, although concise details are unavailable. This figure includes commercial fish-breeding facilities, wholesale traders, retail outlets and the hobby industry.

The trade is complex, with each jurisdiction having different regulatory frameworks and management regimes. Translocation of fish across borders occurs with impunity and no-one, apart from some major wholesale businesses and hobby groups, really knows which species are being traded in Australia, or the numbers of prohibited or noxious fish being bred and traded in the industry.

Ornamental fish present a significant risk to aquatic systems in Australia and have the potential to trigger or contribute to a future major aquatic animal pest or disease incursion, particularly in freshwater habitats. This document does not specifically discuss disease risks associated with ornamental fish as those risks are subject to separate review by Biosecurity Australia and the National Aquatic Animal Health Committee.

A number of populations of exotic or non-endemic ornamental fish species are established in Australia, and these 'pests' are seriously impacting on biodiversity in our freshwater systems. Some aquatic plants, such as *Caulerpa taxifolia* (which was traded in the aquarium industry until recently), can have devastating effects on marine systems if released, and future escapes and invasions need to be avoided.

Many fish species in the trade are not on the current national permitted species lists established under Part 13A of the *Environment Protection and Biodiversity Conservation Act 1999* or covered by quarantine regulations. It may be that such species have been permitted under previous statutory arrangements, but they are no longer on the list and are unlikely to have been assessed for their potential risk to the environment. There is no consistency between mechanisms or controls across regulatory agencies to deal with the serious issue of noxious aquatic pests, with the exception of a few species. Past efforts to regulate the ornamental fish industry have failed, primarily as a result of heavy-handed approaches to regulation and a lack of consultation and failure to engage effectively with industry stakeholders. The Pet Industry Association of Australia (PIAA) has supported this review of the ornamental fish trade. The PIAA, in association with state and territory governments, has committed to the implementation of this report's recommendations, to ensure that the industry has an economically sound and environmentally sustainable future.

This report contains seven recommendations for the future management and regulation of the ornamental fish trade in Australia (see page 24). The Ornamental Fish Policy Working Group, which researched the industry and developed the recommendations, recognises that unless there is a consistent, national approach to regulate and manage the industry, the ad hoc approach taken to date will continue, with the likely outcome of further exotic invasions and disease threats to Australian fisheries and aquaculture industries.

The recommendations of the report address the need for a nationally recognised noxious species list and new management frameworks for the ornamental sector as a whole. The report also recognises the importance of improved communication with all stakeholders and the wider community through a comprehensive communication plan.

At its 11th Meeting on the 24 November 2006, The Natural Resource Management Ministerial Council endorsed this report and agreed to provide funding to implement the key recommendations.

CHAPTER 1

INTRODUCTION

Worldwide, the keeping of ornamental fish in aquaria is a popular hobby; aquaria are a regular sight in many homes and in workplaces and other public spaces. In the United Kingdom, for example, the population of pet fish is estimated to be 140 million, or about two and a half times the human population. In Australia, the total pet fish population is not known but it undoubtedly totals many millions, with just over 15.5 million fish being imported during 2005. About 97% of these imports were freshwater species.

In Australia, it is also estimated that between 12% and 14% of the population participate in the aquarist hobby at some level (Patrick 1998). The Australian aquarium industry is relatively small, with total turnover at the retail level estimated to be about $65 million. Approximately 1500 retailers (aquariums and pet shops) across Australia deal in aquarium fish. According to the Pet Industry Association of Australia (PIAA) approximately 60% of aquarium fish are supplied domestically by local breeders; the other 40% are imported.

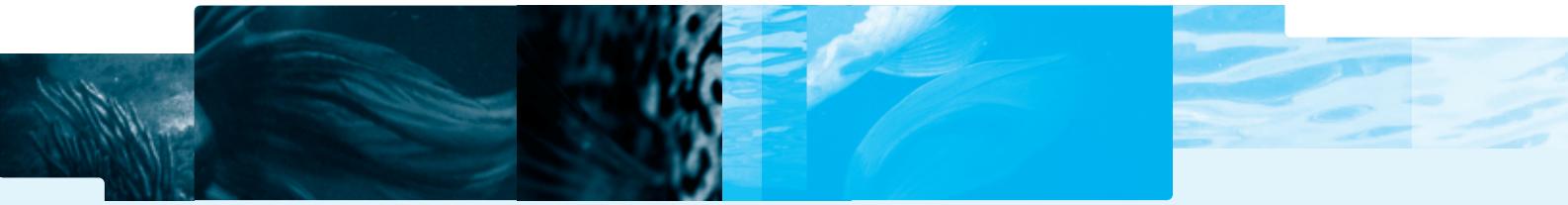
There is an active but difficult to quantify unregulated trade in fish within hobby associations and between enthusiasts. Given data for the United Kingdom which estimates that about 7% of hobbyists keep more than 100 fish (over 40% of the total number of pet fish owned) and indications that this trend is global, it is reasonable to assume that there is a significant unregulated and (officially) unrecorded trade in fish between hobbyists in Australia. This view is certainly supported by the anecdotal information available in club bulletins, magazines and aquarium websites.

With many millions of fish being transported around the globe, many well beyond their natural range, importation of aquarium fish is seen by many countries as a major potential source of invasive species (McDowall 2004). Recent studies (Lintermans 2004) suggest that approximately 34 exotic freshwater species have established populations in Australia; the pathway for 22 of these species is thought to have been the ornamental fish industry. Given the well-demonstrated difficulties in eradicating species once they are established, the sound investment of resources requires a focus on effective management and control both of new species coming into Australia and of those already known to be circulating in the trade and hobby associations within the country.

A number of key challenges have been identified in progressing a national approach to the management of ornamental fish. The points below are far from all-inclusive, but summarise some of the key issues that have been raised in recent years:

- Within jurisdictions, a lack of personnel adequately trained to identify aquarium species (fish and aquatic plants) is leading to ineffective monitoring of aquarium retailers and hobbyists.
- Listed plants and aquatic organisms (both prohibited and permitted) need to be revised to clarify the status and actions required for many species already in the country. This information also needs to be published and made broadly available to regulators and stakeholders.
- A system is needed that recognises aquarium industry and large-scale hobby operators who are not covered by existing state and territory fisheries or aquaculture regulations. This is not to create unnecessary regulatory burdens, but rather to:
  - facilitate effective and timely dissemination of information to all sectors within the aquarium industry—information from government about matters affecting the industry has often been slow to reach it under current arrangements;
  - improve aquarium dealers' access to information about differing regulations across jurisdictions, including notification of changes to prohibited species lists; and
  - disseminate information to those dealers and hobbyists who are outside existing formal networks (e.g. professional associations).
- There is a strong informal system of trade among hobbyists, which is currently unrecorded and unregulated. While formal regulation of this sector may not be necessary, the capacity to develop networks for the collection and dissemination of information (particularly about pests and animal health issues) is important for future strategic management.
- A concise guide to the variations in regulations and permitted species between jurisdictions is needed to reduce confusion and abuse of the system. Interstate trade and other cross-border movement of aquarium specimens are currently inadequately controlled.

Inconsistencies between jurisdictions in the regulation of aquarium fish species have meant that many species that have managed to bypass import control arrangements (i.e. species smuggled, or legally imported under previous legislation) can be, and frequently are, openly traded commercially and



among hobbyists. Currently, through one avenue or another, any exotic fish species sought is effectively available in Australia.

A recent review (McNee 2002) suggested that over 1100 exotic ornamental fish species are in Australia. As the 'permitted import' list under Part 13A of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) currently lists only 481 species or genera that have been assessed as permitted imports, it is clear many species were either here before the Act was passed or have entered the country illegally. Uncertainty about these species and how best to regulate them was one of the driving factors in the establishment of a national review of the ornamental fish trade.

Need for a national approach

On 13 September 2002, Australian Government and State/Territory fisheries agency representatives met aquarium industry representatives and officers from Environment Australia (now the Department of the Environment and Water Resources, DEW) and Biosecurity Australia (BA) in Coffs Harbour, New South Wales to get a better overall picture of the aquarium industry and to find a practical way to deal with the issues of pests and diseases within the aquarium fish trade.

Key issues arising from this meeting included concerns about:

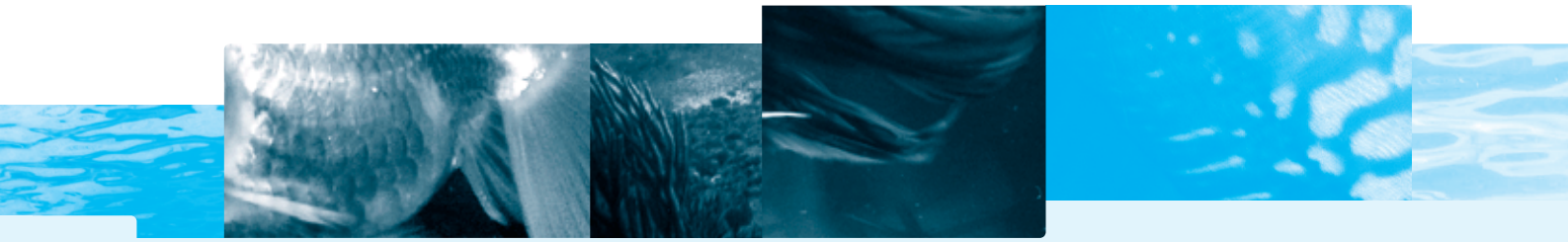
- the large number of ornamental species in the country that are not on the permitted list under the EPBC Act
- the disease and pest status of animals that may have entered the country illegally
- inconsistencies between jurisdictions in legislation and policy relating to permitted/noxious species and effective controls
- the effectiveness of current border controls to prevent illegal imports of species and consequent potential animal health risks.

These issues were summarised in a report submitted to the third meeting of the Australian Fisheries Managers Forum (AFMF).

Having reviewed the paper at its fourth meeting, on 14 July 2003, the AFMF agreed to pursue the development of a national strategic approach on ornamental/exotic fish to address these matters. The meeting also agreed that it should form a national policy working group to further this aim. Subsequently, the Marine and Coastal Committee of the Natural Resource Management Standing Committee (MACC) endorsed this approach at its seventh meeting on 16 July 2003.

The Ornamental Fish Policy Working Group (OFPWG) consisted of representatives from state and territory fisheries agencies, all Australian Government agencies with responsibility for ornamental fish importation and animal health, and representatives of the industry and hobby sectors.

The full membership of the OFPWG is listed in Appendix 1.



Terms of reference

The key objectives for the development of a nationally agreed approach on aquarium fish addressed in this plan are:

1 the development of a strategic plan for management for ornamental fish[1] in Australia;

2 the development of a national list of high-risk noxious species;

3 the development of a national exempt list (low risk) of species permitted in the ornamental fish trade[2];

4 a process for assessing the risks[3] associated with any species currently in Australia that may not have previously been assessed;

5 a process for dealing with species already in the country deemed to be undesirable, including but not limited to recall/removal/licensing, monitoring, and surveillance; and

6 consultation with stakeholder groups on the implementation of proposed changes.

Notwithstanding that fisheries legislation in most jurisdictions includes aquatic invertebrates within the definition of 'fish', the OFPWG made a conscious decision to focus this strategic plan primarily on freshwater fish species used in aquaria. Comments on aquatic plants and 'live rock' were included because they have been identified as significant potential pest issues within the aquarium industry, but they have not been reviewed in any detail. A full review of aquatic invertebrates, such as those occurring on or as live rock, would potentially be as large a task as for fish, but there is little or no background information on such species.

Marine species currently make up a small proportion of the trade (<5%). Most of the current permitted import listings for marine species under the EPBC Act are at the family or genus level, which means that any clarification of the risk status of specific species in the country would be a significant task.

The OFPWG has been cooperating with the National Introduced Marine Pest Coordinating Group, which has agreed to consider the outcomes of this process on ornamental fish as it applies to its work on the development of a national approach to introduced marine pests.

The National Aquatic Animal Health Committee is currently considering potential disease transmission risks within the aquarium trade and this information would be used in future assessments of fish imports.

1 'Ornamental fish are defined here to include freshwater and marine invertebrates and vertebrates and 'living rock', but not plant species. Note that this report focuses primarily on freshwater fish.

2 This refers to low-risk species, within Australia, that may not be on the current permitted list.

3 Risks include potential risk to biodiversity and the potential for introduction of disease and parasites. Risks to biodiversity also include the introduction of native species outside their natural range (non-endemics).

CHAPTER 2

EXISTING CONTROLS

Currently, management and regulation of the ornamental fish or aquarium trade occurs at two main levels:

- The importation of fish into Australia is controlled at the Australian Government level by DEW and by the Department of Agriculture, Fisheries and Forestry (DAFF) through the Australian Quarantine and Inspection Service (AQIS).
- Commercial-scale domestic breeding, keeping and movement are controlled through state and territory legislation.

Importation

Both the EPBC Act and the *Quarantine Act 1908* regulate the import of live animals and plants into Australia. These Acts are administered by DEW and AQIS, respectively. It is important to note that approval from both agencies may be required when importing live specimens.

Section 303(EB) of the EPBC Act establishes a list of specimens that are approved for live import. If a species is not on the list, it cannot be legally imported into Australia. The list of approved specimens is available on the DEW website.[4]

The list comprises two parts and covers both unregulated and regulated imports:

- Part 1 is a list of live specimens that do not require an import permit under the EPBC Act. It may not include any specimen listed on the Convention on the International Trade in Endangered Species of Wild Fauna and Flora (CITES).
- Part 2 is a list of live specimens that require an import permit from DEW under the EPBC Act. Imports of specimens from this part of the list may also be subject to certain conditions or restrictions.

Applications to amend the list of permitted imports

If a species intended for live import does not currently appear on the list of specimens approved for live import, a person may apply to amend the list. A new species can be added to the list only after the potential impacts of the species on the environment have been fully assessed to the satisfaction of the Minister for the Environment and Water Resources.

Details of the procedures for applying to amend the list of specimens suitable for live import are available on the DEW website.[5]

Amending the list may take 6–12 months, depending on the complexity of the case.

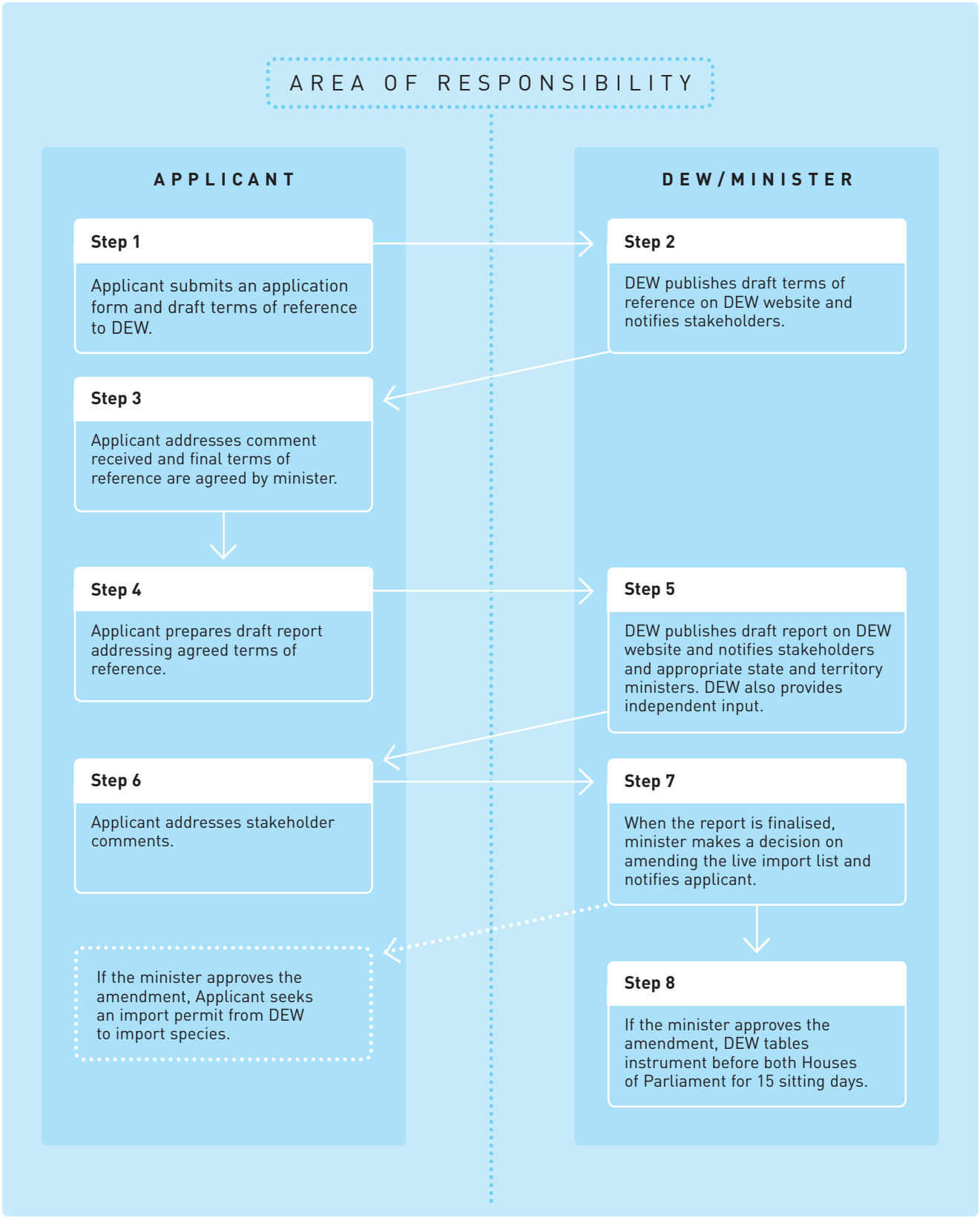
The flow chart in Figure 1 is a simplified diagram of the steps involved in submitting an amendment for consideration. However, the process is currently under review, so the DEW website should be consulted for the most up-to-date information.

4 http://www.environment.gov.au/biodiversity/trade-use/lists/import/index.html

5 http://www.environment.gov.au/biodiversity/trade-use/lists/import/amend/index.html

FIGURE 1

Flow chart of DEW live import process



Roles and responsibilities of AQIS and Biosecurity Australia

All fish import permits are issued in Canberra by the Live Animal Import Section of AQIS. The section is responsible for assessing and issuing all live ornamental fish permits, providing import protocol advice to AQIS regional officers and importers, and ensuring that all national documented information, including work instructions and training packages, is updated as required.

AQIS quarantine officers in each region implement the operational aspects. Their duties involve approval and registration of quarantine approved premises (QAPs), inspection of documentation and fish at point of entry, final inspection of tank records and fish at the QAP, and release of fish from quarantine.

AQIS verifies that the health certificates match the import permit conditions and have been prepared by the appropriate certifying authority. The fish are visually inspected to confirm that they are species on the permitted import lists under the EPBC Act and quarantine regulations.

The fish must be contained in bags of single species and must be clearly visible to the inspector. Fish that appear to be healthy (active, with no obvious signs of disease) are directed to a QAP to undergo post-arrival quarantine. Shipments or consignments of fish that are obviously diseased are rejected and either re-exported or destroyed at the importer's expense. Full details of quarantine requirements for particular species can be found in ICON, the AQIS import conditions database, which is available on the AQIS website.[6]

Biosecurity Australia (BA) is responsible for developing and reviewing biosecurity policies and, on request, provides technical advice to AQIS about the interpretation of those polices. BA is also responsible for assessing the competence of overseas authorities and makes recommendations to AQIS about the recognition of those authorities.

An application for the live import of a genetically modified fish (which is a genetically modified organism, or GMO) will be referred to the Office of the Gene Technology Regulator (OGTR). The OGTR undertakes a risk assessment process (based on the effect of the genetic modification—not the organism per se—on human health and the environment) and issues a licence if risk is minimal. The import consignment will still require an AQIS import permit as well. If the OGTR refuses import of a GMO, the DEW and AQIS will defer to that decision. If the GMO is approved for import, it must still undergo AQIS and DEW assessment before import or addition to permitted import lists.

State/Territory regulation

All states and territories have some controls in place to manage exotic fish in the aquarium trade, usually within the umbrella of fisheries regulation through fisheries agencies. However, the controls are far from comprehensive and are not necessarily tailored to the needs or concerns of the sector. In most jurisdictions, larger commercial breeders of fish are usually required to operate under conditions on an aquaculture licence. The retail sector, however, does not fall specifically under fisheries regulation in most jurisdictions, and retailers would only be covered by industry codes of practice if they are members of the PIAA. Membership of the PIAA is voluntary.

The states and territories generally rely on one or both of two mechanisms to regulate the aquarium fish trade—a prohibited species list and a permitted species list. Under the former approach, authorities target fish species that are recognised as pests (in the broadest sense) and include them on a prohibited (or noxious) species list, usually making the possession of such fish illegal.

Prohibited species lists are generally relatively short and easy to enforce, however, they do not provide a mechanism to prevent trade in species whose pest risk status is unknown and which therefore do not appear on the list. Under this arrangement, fish that are not on the EPBC Act permitted import list and are not on a state or territory prohibited list can be owned and traded easily once they are in the country, as their legal status is not specified in any legislation.[7] Most of the fish that are smuggled into Australia belong to this group, along with species that may have been imported into the country before the advent of existing legislation.

Inconsistency between jurisdictions also compromises the efforts of individual jurisdictions to manage risks through restricting trade in potentially noxious species. In many cases, a fish that is prohibited in one jurisdiction is freely available in neighbouring jurisdictions and may be moved across borders relatively freely by the public. Another difficulty is inconsistency in applying noxious fish legislation as demonstrated by some states allowing trade in domesticated 'Koi' carp despite listing *Cyprinus carpio* as a noxious species.

A further difficulty in controlling smuggling at borders and enforcing existing prohibitions is the difficulty in identifying species permitted for import among the wide diversity of the world's freshwater fish species. The identification of exotic ornamental fish species on sight, particularly at all life stages, is a relatively specialised skill not always readily available in regulatory agencies. The permitted import system

6 http://www.aqis.gov.au/icon32/asp/homecontent.asp

7 Under the EPBC Act, it is an offence to be in possession of an individual specimen that was not legally imported.

relies heavily on accurate records being provided with imported stock. However, it is suspected that individuals seeking to bypass regulations may simply mix cryptic juvenile forms of prohibited species together with legitimate species.

Table 1 summarises state, territory and Australian government regulations relating to the declaration of noxious species and the capacity to recall or seize fish species.

TABLE 1

Summary of current legislation across jurisdictions used for the regulation and control of exotic fish

STATE	LEGISLATION	RESPONSIBLE AGENCY	CAPACITY TO DECLARE NOXIOUS SPP	CONTROL/ SEIZURE OF ANIMALS
ACT	*Nature Conservation Act 1980*	Environment	✔	
	Fisheries Act 2000	ACT	✔	✔
	Pest Plants and Animals Act 2005		✔	✔
NSW	*Stock Diseases Act 1923*	Dept. of Primary		✔
	Fisheries Management Act 1994	Industries	✔	✔
NT	*Fisheries Act and Regulations 1988*	Industry and Fisheries	✔	✔
Qld	*Fisheries Act 1994*	QDPI	✔	✔
	Fisheries Regulations 1995		✔	
SA	*Livestock Act 1997*	PIRSA		✔
	Fisheries Act 1982		✔	✔
	declared under regulation		exotic fish	
Tas	*Living Marine Resources Act 1995*	DPWIE	✔	✔
	Inland Fisheries Act 1995	IFC	✔	✔
			controlled spp	
Vic	*Livestock Disease Control Act 1994*	VDPI		✔
	Fisheries Act 1995		✔	✔
WA	*Exotic Diseases of Animals Act 1993*	Dept. of Agriculture		✔
	Fish Resources Management Act 1994	Dept. of Fisheries	✔	✔
Cwth	*Fisheries Management Act 1991*	AFMA		✔
	Quarantine Act 1908	AQIS	✔	✔
	Environment Protection and Biodiversity Conservation Act 1999	DEW	s 301A has provision for listing species that threaten biodiversity	✔

Risk assessment framework

As indicated previously, a major concern is the number of species already in Australia that have not been assessed for their pest or disease potential. The policy arm of AQIS (now Biosecurity Australia) conducted an import risk analysis for ornamental fish (AQIS 1999). However, this only covered species on the permitted import list at the time and therefore did not consider other species that may already have been in the country, and are being bred and traded.

The DEW's statutory process for assessing the environmental risks associated with live species proposed for import into Australia can be time consuming. Moreover, many of the unassessed species may currently be bred successfully here, so there is little need to import fresh stock.

The key to assessing the risks of a given species' establishment in the environment is the identification of those factors that determine the probability of its successful establishment. Bomford (2003) developed a model for assessing the risks in Australia, from the import and keeping of exotic terrestrial vertebrates. The model was developed following a review of past introductions to determine the factors most likely to influence successful establishment of a species in the wild. Unfortunately, this report did not consider any fish species among the vertebrate pests reviewed.

The DEW has recently concluded a consultancy with the author of this model to develop a risk assessment model for the establishment of freshwater and estuarine fish (Bomford and Glover 2004). The review of the risk assessment model for terrestrial vertebrates found that the established framework was an effective tool for measuring risk of establishment (as tested against species known to have established, versus those that have been released but failed to establish). The key factors identified for determining establishment risk in exotic fish are:

- number of release events
- climate match
- history of establishing feral populations elsewhere
- size of overseas geographical range
- taxonomic group.

While many other factors are thought to affect the probability of establishment, the advantage of using the factors listed above is that information on most is readily available in easily accessible sources (e.g. Fishbase[8]). This allows relatively quick and effective screening of large numbers of species.

DEW representatives on the OFPWG have indicated that they now use this risk assessment model as part of their suite of tools for conducting assessments of potential risks of importing exotic live freshwater fish species. The OFPWG also recommended that the model could be used by a scientific/technical review group established to review 'grey listed' species.

This report does not specifically examine the disease risks associated with ornamental fish imports as those risks are subject to separate review by BA and the National Aquatic Animal Health Committee.

8 http://www.fishbase.org/

CHAPTER 3

NOXIOUS SPECIES

Of the 34 alien fish species that have established feral populations in Australian waters, 22 are thought to have come into the country via the ornamental fish trade (Lintermans 2004). However, it should also be noted that feral populations of some fish species, such as salmonids, were deliberately introduced and are maintained in the wild to provide recreational fishing opportunities and tourism. It is commonly accepted in invasive species management theory that eradication of species once they are established is difficult, if not impossible, and that the most (cost) effective management is achieved through the prevention and management of introduction and spread.

As noted previously, changes to regulations relating to permitted imports and permitted and noxious species lists across Australia have created significant uncertainty within government and industry and among hobbyists about the status of many species already here (and, in many cases, still actively traded in industry and hobby circles). Attempting to remove some of this uncertainty, particularly in the context of identifying future potentially invasive species and regulating them accordingly, was one of the key drivers in the formation of the OFPWG.

One of the terms of reference of the OFPWG was to develop a nationally agreed list of high-risk noxious species. A number of noxious species lists are currently in use across jurisdictions. These range from those containing a few species to comprehensive lists. When the OFPWG was formed, both Queensland and Victoria were in the process of reviewing their noxious species listings. Both jurisdictions agreed to utilise the MACC process to progress their deliberations, with a view to adopting any nationally agreed noxious species list. The starting point for consideration of the nationally agreed list was a compilation of existing jurisdictional lists, including the species proposed for addition in Queensland and Victoria.

All jurisdictions assessed this list of species independently and results were compiled to form the agreed list. Uniform criteria for listing were not predetermined, however, reasons were provided when a species was proposed as noxious, and these followed the primary criteria by which potential 'pestiness' of a species is determined. These include aggressive behaviour; piscivorous diet; high fecundity and/or frequent spawning and long life span (i.e. effective reproductive potential); potentially large size; broad habitat tolerances; and similar environmental requirements to native species. Meeting one of these criteria alone was not sufficient to qualify a species as noxious; those species proposed for addition to a national list met many, if not all, of the criteria.

The compiled lists (see Appendix 2) are the outcome of deliberations within the OFPWG and feedback from consultations held with key scientific and industry stakeholders across jurisdictions. The only species that have been included in the proposed noxious list are those to which all OFPWG members agreed. It should be noted that some states may have additional species on their particular noxious species listings due to different climatic conditions across jurisdictions.

Where there was not unanimous agreement on the status of a species, it was added to what is described in this report as the 'grey' list. Species on the grey list require further scientific review and investigation to determine whether they should be added to, or exempted from, a national noxious species list in the future.

It should be noted that the species currently on the grey list are those that were being considered by jurisdictions for possible addition to their own noxious species lists. During the public consultation process for this strategy there was considerable representation from Koi carp producers and societies expressing concern about *Cyprinus carpio* being on a

national noxious species list. Whereas 'European' or 'common' carp are an acknowledged pest in wild habitats, are declared noxious by several states and are a nationally prohibited import, domesticated Koi carp are widely cultivated/kept in Australia. Hence, the OFPWG recommended that 'domesticated Koi carp' be placed on the grey list until a method of resolving this intra-species problem is agreed. Similarly, the OFPWG acknowledged that alligator garfish (*Lepisosteus* spp) are being bred in Australia and proposed moving these species from the proposed noxious to grey list for further review.

Recent reviews of ornamental species thought to be in the country (McNee 2002) list many species that are not on the current permitted import lists and that do not appear on either of the proposed lists. Potentially, these species should be added to the grey list (along with any other species that subsequently come to light in the trade or hobby sectors) for further review and clarification of their status.

Any species proposed for addition to the live import list under the EPBC Act would still be required to be assessed for potential environmental risk, consistent with the requirements of that legislation.

Proposed action

With the endorsement of the proposed national noxious species list by the Natural Resource Management Standing Committee, a process is being developed to gather information and assess the status of species on the grey list. This is a national priority if management and control of ornamental fish across Australia is to be successful.

The OFPWG proposed that a scientific/technical working group be established, drawing relevant expertise from around the country (academia, museums, government, industry and private sector) to conduct assessments of these species. The proposal is that grey list species will be put through the risk assessment framework outlined in Chapter 2, with the scientific/technical working group providing information on species (although detailed information will be limited for many species) and ultimately deciding the status of species guided by the outcome of the risk assessments. It is critical that the PIAA and representatives of the hobby sector are directly involved in this process, or acceptance of the process and the outcome by the wider ornamental fish/aquarium trade will be unlikely.

Those species that have been through the assessment process and are not considered for addition to the national noxious species list would then constitute a group of low-risk species known to be in the trade or hobby sectors. It would then be up to individuals or industry, should they so desire, to have the species assessed by the DEW and BA for addition to the permitted import list.

As the DEW uses the risk assessment framework outlined in Chapter 2 as one of its tools for future live import determinations, there is a reasonable expectation that the assessments conducted through the scientific/technical working group could be utilised in future DEW assessments, thereby potentially reducing the timeframe for the live import assessment process. If, however, a species is found to fall outside the scope of the existing BA–AQIS ornamental fish risk assessment (AQIS 1999), the species would also need to undergo risk assessment by BA.

It was noted during the public consultation process that fish on all lists, permitted, noxious or grey, should be described at species level. Listing at the genus or family level should be avoided in future listings. The current list of permitted imports established under the EPBC Act has a number of genus and family level listings, which are currently under review by DEW.

The OFPWG was also tasked with investigating other potential risks in the aquarium trade, including live rock and aquarium plants. Details of the group's considerations of those matters are provided below.

Live rock

'Live rock' is material considered to include live coral, live sand and coral rubble. According to Oz Reef Marine Park (1997) and Fossa and Neilsen (1997), coral rock is colonised and burrowed through by various organisms, such as:

- bacteria
- unicellular animals (Protozoa)
- sponges (Porifera)
- soft and hard corals (cnidarians)
- flatworms (Platyhelminthes)
- threadworms (Nematoda)
- ringed worms, annelids (Annelida)
- peanut worms (Sipunculida)
- crustaceans (crabs, shrimps, other Crustacea)
- sea spiders (Pycnogonida)
- molluscs (clams, nudibranchs, snails, chitons, other Mollusca)
- bryozoans (Bryozoa)
- entoprocts (Entoprocta)
- starfish, brittle stars, (echinoderms)
- sea squirts (ascidians)
- algae (including coralline, micro and macro algae).

The use of live rock in marine aquaria is considered a natural method of filtration to remove the pollution caused when uneaten food, excreta and other alien matter breaks down into nitrogen gas and forms nitrates (Hargreaves 1978).

Because of the costs of collection, protective packaging and shipping, live rock is an expensive way of cycling the tank, compared with other methods such as adding ammonia directly to the tank or using mechanical filters. Only the more enthusiastic and dedicated aquarists maintain marine aquaria, but live rock use is considered to be increasing in Australia.

Information provided by the various state and territory fisheries agencies indicates that most live rock and coral collected in Australia originates from Queensland reefs. Smaller amounts are harvested from reefs in Western Australia and the Northern Territory. The consultation draft of this document indicated that between 12 to 23 tonnes were harvested annually, but feedback during the public consultation process indicated that the actual amount was significantly higher. Queensland/GBRMPA have just introduced a comprehensive live rock logbook and Western Australia are in the process of better regulating this industry, so more accurate harvest/trade figures should be available in future.

The risks of introducing exotic species and diseases through the movement of live rock have yet to be quantified. As most live rock originates in tropical marine waters and is destined for markets in temperate Australia, the tropical species in and on the rock would be unlikely to establish viable populations in temperate southern waters. If an exotic pest or disease establishes in an area of Australia from which live rock is sourced, the potential for translocation arises if the pest is not detected and contained, or if there is no process for tracking live rock from the point of collection to its final destination.

It is illegal under the EPBC Act to import species from overseas into any part of Australia, other than those species listed as approved for importation (this is enforced by AQIS and the Australian Customs Service). As some live rock potentially carries a wide array of unknown species, it is not a permissible import; this restriction must be continued, unless a thorough risk assessment suggests otherwise. It is not known whether an illegal 'black trade' in imported live rock exists and this possibility cannot be ruled out.

Potential management options

Management options to address marine pest risks from live rock should be developed in conjunction with the National Introduced Marine Pests Coordination Group. Although the risks of the spread of marine pests through the trade in live rock and associated aquarium products are likely to be minor in comparison with risks from other activities (e.g. the trade in species with identified pest potential), several potential management options could be considered:

- Improved education of public and industry about the risk of dumping unwanted fish where they could end up in waterways, and the risk of microscopic organisms/spores from live rock entering waterways when tanks are cleaned.
- Improved monitoring of and information sharing on the distribution of marine pests.
- Increased regulation of the trade in live rock within Australia. This could involve tracing the movement of live rock between states and territories, possibly through a permitting/licensing process. The prospect of effective control/compliance of illegal imports would also have to be considered.
- Certifying cultured products, which could involve enhancement of artificial culturing of live rock (see Box 1). The rock to be seeded would also need to be collected locally, taken from the terrestrial environment or artificially created. There would need to be ways of sanitising the rock or certifying what would grow when the rock is introduced to a tank.

A descriptive paper on live rock in Australia was prepared for the OFPWG and is held at the Bureau of Rural Sciences, Canberra.

BOX 1

Culture of live rock in the United States

Due to the large amounts of coral rock being exported from the Florida Keys in the early 1990s, Florida banned the harvest of live rock from its waters in 1997. As a result, marine ornamental companies in the United States started to develop aquaculture for live rock. To 'create' live rock, ordinary dry rock is placed in the ocean and harvested one to several years later.

Live rock can be purchased either 'cured' or 'uncured'. On collection from the ocean, the rocks harbour a large variety of sea life, some of which (such as certain species of anemones and mantis shrimp) are common pests on live rock. 'Uncured' rock is rock that has been collected and directly exported. 'Cured' rock, on the other hand, is material that has been placed under a fine spray of highly saline water for several hours or days before export. The objective is to keep the coralline algae alive but kill and wash out less hardy, unwanted organisms, which would foul the tank water.

Aquatic plants

The OFPWG also considered the issue of known noxious weeds being traded within the aquarium industry. Problems arising from ornamental aquatic plants are well documented, particularly through the work of the Cooperative Research Centre for Australian Weed Management (the Weeds CRC), the Australian Weeds Committee and state and territory agencies.

Good summaries of nationally noxious aquatic plants and those that are considered problems in particular jurisdictions can be found at the websites of the New South Wales Department of Natural Resources[9] and the National Weeds Strategy[10]. The Australian Weeds Committee has produced a list of key noxious aquatic plant species and this is provided in Appendix 3 of this report.

A limited survey of plants for sale in the aquarium industry (including those sold as pond plants for outdoor use) indicated the availability of about a dozen species listed as weeds, either nationally or in one or more jurisdictions. The OFPWG acknowledged that it did not have extensive expertise in water plants, but recognised the need to establish national linkages between groups currently working on noxious aquatic plants (such as the Weeds CRC) and to encourage a review of ornamental aquatic plants. Further, fisheries agencies and their enforcement officers need to develop the capacity (training, field guides, etc) to recognise noxious plant species that they may encounter in dealings with the aquarium industry.

9 http://www.dnr.nsw.gov.au/water/wetlands_facts_weeds.shtml#NationalSignificance

10 http://www.weeds.org.au

CHAPTER 4

PROPOSED REGULATORY FRAMEWORK

The breeding and sale of ornamental fish is being controlled and regulated in a number of different ways by the various jurisdictions, ranging from internal policy arrangements through to legislative arrangements. Currently, there is no consistency of approach across Australia, which creates uncertainty among both industry and the general public about the movement and sale of fish between states and territories. Existing regulations specific to the ornamental fish industry across jurisdictions are summarised in Appendix 4.

One major issue is that the largest sector in the industry is the hobbyist or enthusiast group. The policy or regulatory boundary between a 'hobby' and a 'commercial activity' is blurred and open to various interpretations. Currently, there is no clear direction from the jurisdictions on this matter. However, it is important to recognise that this strategy is primarily focused on large-scale operators who are breeding large numbers of fish, not the local hobbyist with a small number of fish in a tank in their home.

In some jurisdictions, there is friction between licensed commercial aquaculture operators and 'backyard' breeders. In general, the main complaint from licensed aquaculture operators is that they are required to obtain development consents from local government, pay licence or permit fees to state regulatory bodies, and pay appropriate taxes. The backyard breeder or hobbyist might not obtain such approvals, nor pay such charges. For example, public Koi carp auctions are a regular event in NSW. This results in tough competition in the ornamental fish market, allows 'noxious' fish to be freely traded without much chance of detection, and creates an obvious pest and disease risk.

BOX 2

When is a hobby a business?

The courts have provided some guidelines to help determine whether an activity is a business or a hobby, but there are no hard and fast rules. The Australian Taxation Office looks at all the circumstances of a case in determining whether a business exists. Guidelines adopted by the courts include the following:

- Does the activity have a significant commercial purpose or character?
- Does the person have more than just an intention to engage in business?
- Does the person have a purpose of profit as well as a prospect of profit?
- Is there repetition and regularity to the activity?
- Is the activity of the same kind and carried on in a similar manner to businesses in that industry?
- Is the activity planned, organised and carried on in a businesslike manner?
- What are the size, scale and permanency of the activity?
- Is the activity better described as a hobby, recreation or sporting activity?

The reasons for seeking to regulate the ornamental fish trade in Australia include:

- to provide a communication capability (distribution lists) to industry breeders and stakeholders for current information and educational materials on management issues;
- to provide an avenue through which to monitor and control disease (including point-of-import records to determine possible trends or to give advance warning of potential disease problems with offshore suppliers);

- to ensure that all appropriate local and state government regulatory requirements are being met (publicity about poor adherence to regulatory requirements by a licensed operator may also reflect badly on other licensed operators);
- to confirm the status of species being traded;
- to address the minority of illegal operators; and
- to reduce or eliminate smuggling distribution points for noxious fish or endangered species.

In most jurisdictions, the keeping and/or trading of pets is controlled by various means, which may include:

- restrictions on numbers that may be kept by individuals in urban areas, and licensing arrangements for those wishing to keep more than the permitted numbers (e.g. breeding kennels or poultry breeders);
- licensing arrangements for the keeping of native fauna;
- licensing arrangements for the keeping of exotic animals; and
- licensing arrangements for the keeping of noxious or pest species.

Therefore, the precedent of regulating hobbyists is already in place for non-aquatic animals, and regulation of the aquarium fish trade may fit in with other pet industry sectors. That said, the regulation applied at this level is usually low cost and may simply be a one-off or annual permit, or even a voluntary registration through some form of online system. There is a need for some form of national labelling scheme and this would involve close liaison with all stakeholders. Registration would assist with compliance, disease control and communication programmes.

The aim of regulation at this level is not to raise revenue or to apply 'zero tolerance', but to establish networks through which information can be gathered and distributed for better long-term management (e.g. disease or pest notifications, changes to regulation, permitted/prohibited species).

Similarly, the classification of large-scale breeding activity in the hobby sector as aquaculture under state regulations is not an attempt to leverage licence fees from non-commercial operations, but rather to ensure consistency of accountability and traceability of product across all large-scale producers for the purposes of future management. In some jurisdictions, this may require minor regulatory changes to recognise different classes of aquaculturalists for licensing/levy purposes. The OFPWG concurred that, given adequate communication and education, self-regulation is the most effective option for the hobby sector.

Regulation of pet shops

Pet shops in most jurisdictions are not required to be licensed or registered by fisheries agencies, and may only require licensing by local government or the jurisdiction's environmental protection agency, if they dispose of wastewater to the sewerage system or the environment.

The PIAA has developed a voluntary code of practice for its members. The association is also working towards an accreditation scheme whereby member operators would have the option of going through a series of training programmes to achieve accredited operating standards and also submit to an auditing regime to ensure that standards are being maintained. While these schemes would only apply to member premises, if accreditation programmes are successful in improving standards of operation, it is hoped that commercial pressure would mean that accreditation will have significant financial benefit and there will be an incentive to pursue it. Details of the code of practice are in Appendix 5.

Decision support trees for regulation of the ornamental fish trade and hobby sectors

The decision trees in Figures 2 and 3 have been developed to help jurisdictions consistently classify operations into particular sectors of the ornamental fish industry. They do not provide prescriptive regulatory frameworks because, in many cases, control may fall outside formal regulatory frameworks. Instead, they require individual jurisdictions to examine their existing regulatory frameworks and amend them as necessary to provide a consistent framework across Australia.

The decision trees provide regulators, those in the ornamental fish industry and hobby sector, and the general public with simple pathways for determining how a particular activity should be classified. Working through the first tree (Figure 2), for example, it is obvious that a person trading the odd fish with fellow hobbyists or at a local fete is not running an ornamental fish business. Similarly, following that line through the second tree, it is clear that regulatory agencies would only be interested in the activities of that person if they were keeping and/or breeding particular species (either noxious or determined to be of special interest after the assessment process), or to provide the person with general information of interest (new permitted/prohibited species, known disease or pest issues, etc).

The note at the bottom of the second tree (Figure 3) is important. There have been concerns that, under this decision framework, large hobby operations could fall within the water volume criteria to be considered for a state or territory aquaculture permit. Most concern

stems from the costs associated with the permit system in some jurisdictions. During discussions with jurisdictional aquaculture regulators, it was recognised that this is a minor issue that can be clarified by the introduction (in regulations) of a tiered permit system in those jurisdictions without such a system. The tiered permit system would create a minor registration permit, possibly based on additional criteria such as 'qualifying as operating a business' (see Box 2).

FIGURE 2
Classification of activities on the basis of the sale/trade of fish

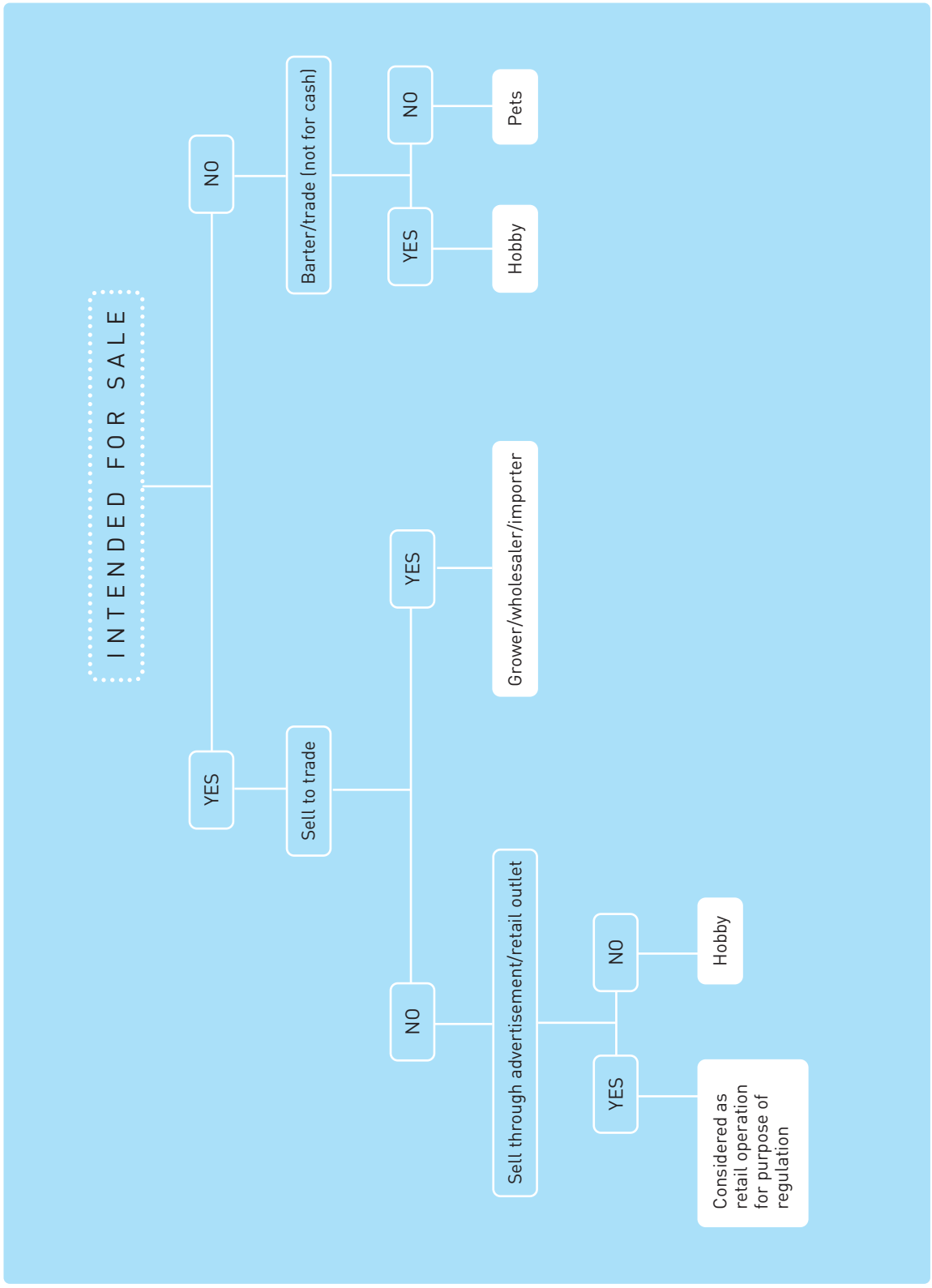
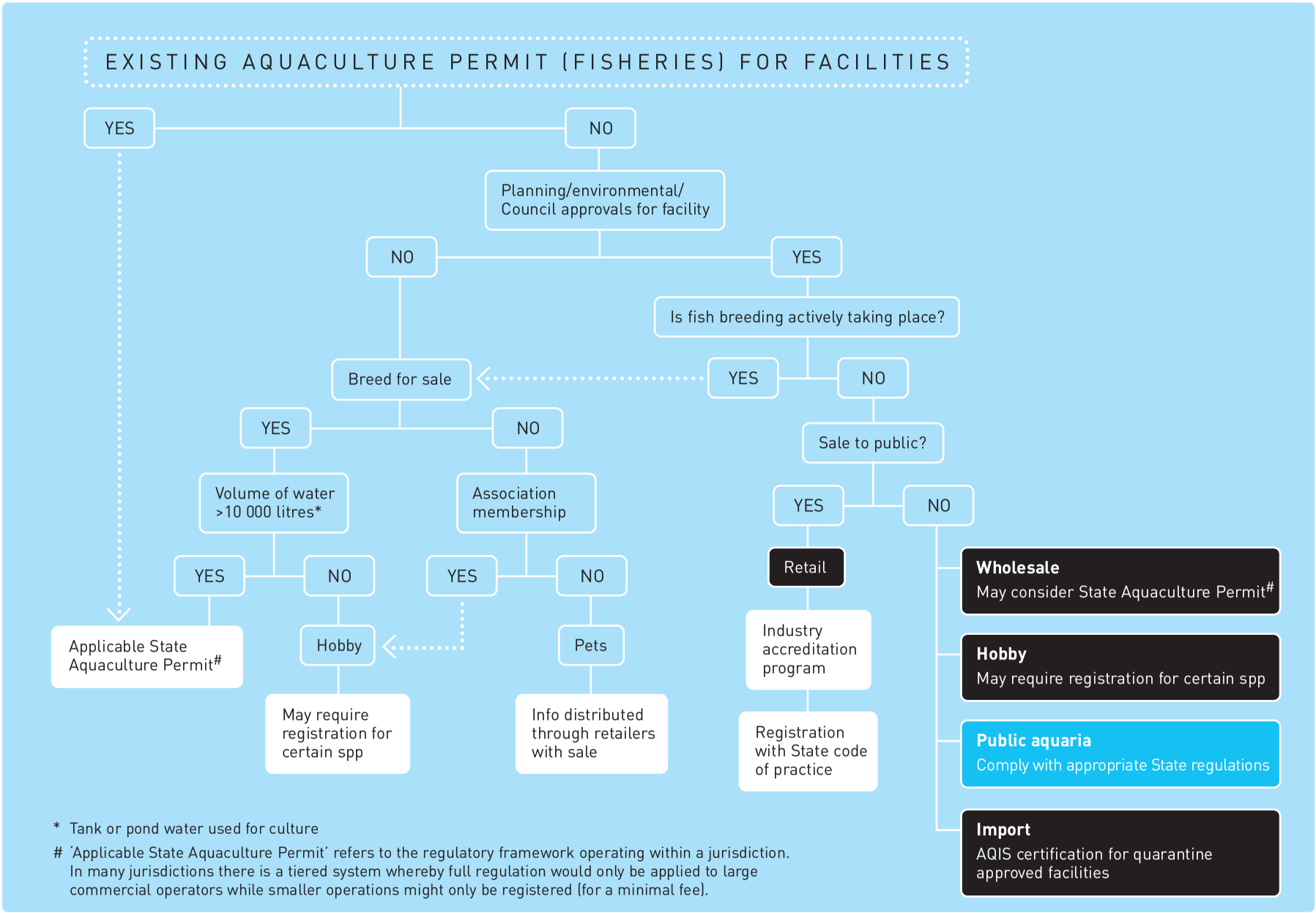


FIGURE 3

Ornamental fish regulation decision tree



* Tank or pond water used for culture

\# 'Applicable State Aquaculture Permit' refers to the regulatory framework operating within a jurisdiction. In many jurisdictions there is a tiered system whereby full regulation would only be applied to large commercial operators while smaller operations might only be registered (for a minimal fee).

CHAPTER 5

MANAGEMENT OF ORNAMENTAL PESTS AND NOXIOUS SPECIES IN AUSTRALIA

In developing a regulatory framework for ornamental fish, it is important to recognise the diversity of players involved, including aquaculturalists, breeders, wholesalers, importers, retailers, and hobbyists and enthusiasts. To date, discussions on regulation have focused on the need to improve knowledge of the species of fish available, and of when and where they are being traded. With the development of a new national noxious species list to supplement import lists, there will also be a need to create clarity and certainty about those species that can be possessed and traded, particularly for species considered noxious that are already in the country.

The decision trees in Figures 2 and 3 are an attempt to develop pathways to:

- classify an operation type on the basis of sales of or trade in fish; and
- determine the level of regulation that should be applied in different situations.

The next stage of regulation of aquarium species is the development of a process for dealing with those species that it is determined should be removed or controlled. Table 2 is a summary of options derived from discussions by the OFPWG.

It will be necessary to develop an agreed set of decision rules that can be incorporated into the regulatory framework to support existing regulatory arrangements within jurisdictions. Where there is no existing framework, these decision rules may form the basis of new regulation.

This strategic planning document sets out a framework for future management of ornamental fish. For most issues, implementation will mainly occur within individual jurisdictions. Assuming that national agreement is reached on national noxious species lists and guidelines such as those outlined in Table 2, regulation should have much in common across jurisdictions.

The next stage in the process would be the establishment of an implementation plan to guide the adoption of the nationally agreed approaches outlined in this strategy and to address cross-jurisdictional issues, such as translocation and movement and regulatory or licensing requirements for such actions. Nationally agreed guidelines for the translocation of live aquatic organisms already exist (MCFFA 1999); there are also existing regulatory frameworks for the movement of other live animal species across Australian jurisdictions, and these may well guide the development of such arrangements for exotic fish. Regulations controlling movements should complement the national translocation policy.

An implementation plan would also need to finalise appropriate reporting arrangements to review progress on the implementation of agreed actions within the strategic plan. Much of the on-ground implementation will fall to jurisdictional fisheries agencies. However, because of the close links between this work and current work on marine pests and aquatic disease risks, it will be important to ensure that longer term arrangements maintain those linkages. Close liaison with groups such as the Aquatic Animal Health Committee, Biosecurity Australia and the Australian Weeds Committee should be fostered and maintained. Marine species represent only a small proportion of the total aquarium trade, but some species that may be imported or translocated could have a significant impact on Australia's marine environment if released. Actions involving ornamental marine species should be developed in conjunction with the National Introduced Marine Pests Coordination Group to ensure that they are integrated into the National

System for the Prevention and Management of Marine Pest Incursions. This system should develop a noxious ornamental marine species list, assess risks from the translocation of live rock, and improve the information available on marine species that are or might be traded in Australia. Communications activities should be developed to ensure consistency with the National System and to take advantage of established networks in the aquarium industry.

Options available for management of undesirable species fall into three categories, as broadly summarised in Table 2 :

- nationally agreed noxious species;
- jurisdiction-specific noxious species; and
- high-value species or those listed by the Convention on International Trade in Endangered Species (CITES) or the International Union for Conservation of Nature and Natural Resources (IUCN).

TABLE 2

Options available for management of undesirable species

ACTIONS	SPECIES STATUS			
	NATIONAL NOXIOUS	JURISDICTION SPECIFIC NOXIOUS	CITES IUCN RARE	COMMENTS
Education/ awareness	Y	Y	Y	Preparation and distribution of consistent information
Amnesty	Y	N	N	First option for noxious species removal after agreement of noxious fish list
Buyback	Y	N	N	Alternate option for more valuable species or added incentive
Permit	Y*	N	Y#	Used for CITES, display (public aquaria etc), research and high value species already in the country*
Registration	N	Y	Y#	
Ban	Y	N	Y#	Second tier consideration, would need a well developed enforcement plan (national agreement)
Sterilise	Y##	N	N	Limited situations (linked to permits above)
Microchip	Y##	N	Y	
No sale	Y	N	Y	Always. Would also be listed as permit conditions. (Breeding may be permissible in research situations with conditions on permit re handling)
No translocation	Y	N	Y	
No breeding	Y	N	N	
Report existence	Y	Y	Y	Mandatory requirement

* limited life of animal in high value/cultural significance cases only
\# regulations exist
\## mandatory conditions in restricted permitting situations

At the appropriate time, consideration should be given to categorising fish species placed on the noxious list in a manner consistent with the categories that may be developed under the National Weeds Strategy and the National Pest Animal Strategy. The Senate Inquiry on Invasive Species report, published as *Turning back the tide—the invasive species challenge*, suggested three national invasive species control classes that could be established. Lists could be developed under these classes and agreed by the Australian and all State and Territory governments. The three control classes are included here. However, it is understood that no decision has as yet been made on their official use:

- ***National Quarantine List***: Comprised of invasive species of national importance that are a high invasion risk for Australia, may or may not have already invaded Australia, and whose early detection will enable cost-effective eradication.
- ***National Alert List:*** Comprised of invasive species of national importance that are naturalised, have a restricted range, are predicted to have a major impact on the environment or industries, and whose eradication is feasible and cost-effective.
- ***National Control List:*** Comprised of invasive species of national importance that are naturalised and generally widespread, are having a major impact on the environment or industry, and whose containment or control will assist protect the values of areas of national environmental significance.

TABLE 3

Proposed Uniform National Invasive Species Control Classes

NATIONAL NOXIOUS SPECIES LIST CLASSES	DESCRIPTION	STATUTORY REQUIREMENT	RESPONSIBILITY
National Quarantine List	Invasive species of national importance that are a high invasion risk for Australia and not known to be present in Australia, and whose early detection will enable cost effective eradication	Prohibited import into Australia Listed as controlled species under State/Territory laws Prohibited for trade nationally Early warning surveillance programmes Eradication programme (where detected and feasible)	Australian Government State and Territory governments Australian, State and Territory governments Australian, State and Territory governments Australian and appropriate State and Territory governments
National Alert List	Invasive species of national importance that are naturalised, have a restricted range, are predicted to have a major impact on the environment, human welfare or industries, and which may be, is currently, or was, subject to a State or national eradication effort	Prohibited import into Australia Listed as controlled species under State/Territory laws Prohibited for trade nationally Early warning surveillance programmes Eradication programmes (where appropriate) Containment programmes (where appropriate)	Australian Government State and Territory governments Australian, State and Territory governments Australian, State and Territory governments Australian and appropriate State and Territory governments Australian, State, Territory and local governments
National Control List	Invasive species of national importance that are naturalised and generally widespread are having a major impact on the environment or industry, and whose containment or control will assist protect the values of areas of national environmental significance	Prohibited import into Australia Listed as controlled species under State/Territory laws Prohibited for trade nationally National Control Action Plan	Australian Government State and Territory governments Australian, State and Territory governments Australian, and appropriate State and Territory governments

Source: Australian Biosecurity Group (2005)

There is also a need to harmonise inconsistent noxious fish classes into a uniform set of State and Territory invasive species control categories. This will greatly assist planning, evaluation and reporting.

TABLE 4

Proposed Uniform State and Territory Invasive Species Control Classes

UNIFORM STATE AND TERRITORY INVASIVE SPECIES CONTROL CLASSES	DESCRIPTION	STATUTORY REQUIREMENT	RESPONSIBILITY
CLASS 1 Quarantine and Eradication List	Comprised of invasive species in other jurisdictions but not commonly present in own jurisdiction, and if introduced would cause an adverse economic, environmental or social impact	Prohibited from import and trade in jurisdiction	State/Territory government
		Subject to early warning surveillance	State/Territory government
		Subject to eradication if found	State/Territory government, Land/water manager
		Notifiable	Land/water manager
CLASS 2 Containment List	Comprised of invasive species not commonly present in own jurisdiction or regionally contained, which have, or could have adverse economic, environmental or social impact	Prohibited from import and trade in jurisdiction	State/Territory government
		Subject to early warning surveillance on edge and outside of containment area	State/Territory/local government
		May be subject to eradication or continual suppression	State/Territory government
		Notifiable	Land/water manager
CLASS 3 Control List	Comprised of invasive species that are established in jurisdiction and have, or could have an adverse economic, environmental or social impact.	Prohibited from import and trade	State/Territory governments
		Conditions may apply to movement of contaminated materials	Merchants, land/water managers
		Landowners must take reasonable steps to keep land/water free of Class 3 pests	Land/water managers
		Government agencies must take reasonable steps to keep land/water free of Class 3 pests	State agencies, local governments
CLASS 4 Restricted List	Comprised of invasive species whose trade would result in spread in extent and/or abundance, and increase the probability of an adverse economic, environmental or social impact either within or without the jurisdiction	Prohibited from import or trade	State/Territory governments
CLASS 5 Regional Declaration List	Comprised of invasive species of regional importance	Regionally specific actions	Local governments or regional bodies

CHAPTER 6

COMMUNICATION PLAN

An essential part of any strategic plan is a clear indication of the tools by which the plan's messages can be communicated to a range of audiences. The keys to successful communication are to identify the messages and the target audiences and to ensure that the messages are appropriately constructed for the audiences. Similarly, a range of communication tools are available, and it is important to choose the medium that will most effectively get the message to the audience. Where possible, the communication plan should link with associated communication strategies such as those promoting the *National System for the Prevention and Management of Marine Pest Incursions*.

For the ornamental fish strategy, the target audience can be broadly divided into the general public and the industry sector. Hobbyists probably fall within both audiences (depending on the scale of their operation) and will therefore need access to the full range of information.

A communication strategy is absolutely essential to minimise misinformation and produce community understanding and awareness about the potential threat of ornamental fish and plants to our environment. Better communication between industry and regulators about the status of species and the provision of timely updates on changes in regulatory arrangements will be key factors in improving hobby and trade practices.

The key message for community education is that 'ornamental fish are wonderful pets, but they should never be released into natural waterways'. The aim is to develop a range of material identifying noxious species, and giving tips about what to do with unwanted fish and what the individual can do to prevent spread of a pest species. Basic information brochures would be made available through aquarium retail outlets; industry representatives have indicated that they will cooperate by making this information available to new fish purchasers. Relevant material is already well developed in some jurisdictions (e.g. Queensland's Ornamental Fish Can Become Monumental Pests); other jurisdictions can benefit from the exchange of ideas and the development work that has already been done.

The main objective of developing a communication plan is to develop communications material that can be utilised by all Australian jurisdictions, thereby reducing the cost and effort for each jurisdiction while ensuring a consistent message across the country. This can be achieved by:

- development and delivery of training packages for fisheries compliance staff to ensure that they can identify particular ornamental species and understand the risks from those species;
- production of general educational materials (flyers or posters that can be distributed through retail outlets) on the risk posed by ornamental fish to marine and freshwater ecosystems and, importantly, what to do if fish are no longer wanted;
- production of information sheets (fish facts/notes/brochures) on species or groups of species of particular significance that have established feral populations, providing detailed information for the community on the impacts of those populations and details of control or eradication programmes;
- further development of a cooperative working relationship with the aquarium industry, particularly via a joint 'Don't dump your aquarium fish' campaign; and
- development of networks between regulators, industry and major hobby groups to ensure that information on regulatory changes gets to the groups that need it, and also to provide for input to the regulatory process by these stakeholders.

A communication strategy needs to be finalised as part of a national implementation plan.

CHAPTER 7

RECOMMENDATIONS AND NEXT STEPS

The strategic plan recommends the following actions to manage ornamental fish in Australia.

1 Agree on and adopt a national noxious species list across all jurisdictions, noting links to existing lists and lists under development for marine pest species.

2 Agree to review the status of fish on the 'grey list' as a national priority.

3 Establish a scientific/technical working group reporting to the Natural Resource Management Standing Committee (through the Marine and Coastal Committee), to conduct assessments of fish on the grey list over the next 2–3 years.

4 Adopt a regulatory framework and licensing to manage large fish-breeders and ornamental fish importers in each state and territory.

5 Develop control mechanisms for the regulation and management of noxious fish and rare fish (e.g. CITES listed) already in circulation in Australia, again noting links to control plans for marine pests of concern.

6 Initiate a rigorous review of aquatic plants used in the ornamental fish trade, in order to control and regulate the spread of a number of recognised aquatic pest species.

7 Implement a national communication strategy to raise awareness in the community and industry about the management, control and regulation of ornamental fish and invertebrates.

Next steps

An Ornamental Fish Management Implementation Committee will be established to coordinate and lead the implementation of this national strategy. The plan needs to address the need for a process of consultation with stakeholders, including:

- national education on the new noxious species list and the new regulatory and management arrangements (government and industry to communicate through agencies and customers);
- implementation of new regulatory arrangements by each jurisdiction; and
- agreement on management and funding mechanisms to deal with noxious fish being traded and kept in the community.

A national communication plan will form a framework for delivery of many of these objectives.

The Marine and Coastal Committee will also need to consider the outcomes of the review by the Aquatic Animal Health Committee of disease risks associated with ornamental fish when that review is finalised and any implications the review may have for future management actions for the ornamental fish sector.

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APPENDIX 1

ORNAMENTAL FISH POLICY WORKING GROUP MEMBERSHIP

COMMONWEALTH

Department of Agriculture, Fisheries and Forestry
- Fisheries and Aquaculture Branch
- Bureau of Rural Sciences
- Australian Quarantine Inspection Service
  - Animal and Plant Programme
- Product Integrity, Animal and Plant Health
- Biosecurity Australia

Department of Environment and Water Resources
- Approvals and Wildlife Division

STATE/TERRITORY

Environment ACT
New South Wales Department of Primary Industries
Northern Territory Department of Primary Industry, Fisheries and Mines
Queensland Department of Primary Industries and Fisheries
Department of Primary Industry and Resources, South Australia
Inland Fisheries Service Tasmania
Victoria Department of Primary Industries
Western Australia Department of Fisheries

INDUSTRY/HOBBYIST

Pet Industry Association of Australia Ltd
One independent aquarium hobby representative (Victoria)
One commercial fish breeding representative (NSW)

APPENDIX 2

NOXIOUS LIST AND GREY LIST SPECIES

NOXIOUS FISH

(Noxious in all jurisdictions)

FAMILY	SPECIFIC NAME	COMMON NAME
Acestrorhynchidae	*Acestrorhynchus microlepis*	
Alestiidae	*Hydrocynus* spp	Pike characin Giant tigerfish
Amiidae	*Amia calva*	Bowfin
Anabantidae	*Anabas testudineus*	Climbing perch
Bagridae	*Anaspidoglanis macrostoma* *Bagrus ubangensis*	Flatnose catfish Ubangi shovelnose catfish
Centrarchidae — entire family		Banded or spotted sunfish, largemouth bass, bluegill
Centropomidae	*Centropomus* (12 spp) *Lates microlepis* *Lates niloticus*	Snooks Forktail lates Nile perch
Channidae	*Channa* spp	Snake head
Chacidae	*Chaca chaca*	Angler, frogmouth and squarehead catfishes
Characidae	*Colossoma* spp *Serrasalmus* spp *Pygocentrus* spp	 Redeye piranha Red piranha
Cichlidae	*Boulengerochromis microlepis* *Oreochromis* spp *Hemichromis fasciatus* *Sargochromis* spp *Sarotherodon* spp *Melanotheron melanotheron* *Serranochromis* spp *Tilapia* spp. (All except *T. buttikoferi*)	Giant cichlid, yellow belly cichlid Tilapia Banded jewelfish Pink, slender, greenwoods, mortimers, cunean and green happy Blackchin tilapia Redbelly tilapia

FAMILY	SPECIFIC NAME	COMMON NAME
Citharinidae	entire subfamily *Ichthyborinae*	African pike-characin, tubenose poacher, fin eater
Clariidae	*Clarias* spp	Walking catfish
Cobitidae	*Misgurnus anguillicaudatus*	Weatherloach
Cyprinidae	*Aristichthys nobilis* *Barbodes hexagonolepis* *Catla catla* *Catlocarpio siamensis* *Cirrhinus cirrhosus* *Ctenopharyngodon idella* *Cyprinus carpio* *Labeo calabasu* and *L. rohita* *Zacco platypus* *Hypophthalmichthys molitrix* *Tor* spp (17) *Notropis* spp *Phoxinus erythrogaster*	Bighead carp Copper mahseer Catla Giant barb Mrigal Grass carp 'European' carp Orange fin labeo, rohu. Freshwater minnow Silver carp River carp, Deccan, high backed, jungha, putitor, Thai mahseer Shiners Southern redbelly dace
Doradidae	*Oxydoras* spp (4)	Ripsaw catfish, black doras, black shielded catfish
Elassomatidae	*Elassoma* spp	Pygmy sunfish
Eleotridae	*Oxyeleotris marmorata*	Marble goby
Erythrinidae	*Erythrinus* spp *Hoplerythrinus* spp *Hoplias* spp	Trahiras
Esocidae	*Esox* spp	Pikes
Gasterosteidae	*Pungitius pungitius* *Apeltes quadracus* *Culaea inconstans*	Ninespine stickleback Four spined stickleback
Gobiidae	*Acanthogobius flavimanus* *Tridentiger trigonocephalus*	Yellow fin goby Chameleon goby, striped goby
Gymnarchidae	*Gymnarchus niloticus*	Aba aba
Gymnotidae	*Electrophorus electricus*	Electric eel
Hepsetidae	*Hepsetus odoe*	African pike
Heteropneustidae	*Heteropneustes fossilis*	Stinging catfish
Lepisosteidae	*Atractosteus* (3 spp) *Lepisiosteus* (4 spp)	American, armoured or alligator gars
Malapteruridae	*Malapterurus* spp	Electric catfish
Mormyridae	*Mormyrops anguilloides*	Bottlenose, Cornish jack
Poeciliidae	*Belonesox belizanus* *Gambusia* spp	Pike minnow, pike killifish Mosquito fish

FAMILY	SPECIFIC NAME	COMMON NAME
Polyodontidae	*Polyodon spathula*	Mississippi paddlefish
	Psephurus gladius	Chinese swordfish
Protopteridae	*Protopterus annectens*	African lungfish
Schilbeidae	*Schilbe mystus*	African butter catfish
Siluridae	*Silurus* spp	European catfish, wels catfish
Trichomycteridae	*Paravandelia oxyptera*	Parasitic catfish
Valenciidae	*Valencia hispanica*	Valencia toothcarp
Cambaridae	*Procambarus clarkii*	Red swamp crayfish

GREY LIST

(species requiring further scientific/technical consideration and risk assessment)

NOTE This list is by no means exhaustive and should not be taken as definitive as other species will be added. A technical working group will be adding to the list as it assesses and reviews the species currently in Australia.

FAMILY	SPECIFIC NAME	COMMON NAME
Acipenseridae	*Acipenser* spp	Sturgeons
Anabantidae—entire family	*Ctenopoma* (21 spp)	
	Ctenopoma ansorgi	
	Ctenopoma argentoventer	
	Ctenopoma nanum	
	Anabas (2 spp)	
	Microctenopoma (11 spp)	
	Microctenopoma ansorgii	
Chacidae	*Chaca* spp	Angler catfishes, frogmouth catfishes
Characidae	*Astynax* spp	
	Astyanacinus spp	
	Bryconops spp	
	Bryconops affinis	
	Bryconops melanurus	
	Ctenobrycon spp	
	Hollandichthys multifasciatus	
	Knodus savannensis	
Cichlidae	*Amphilophus citrinellus*	Midas cichlid, false red devil cichlid, citrinellum
	Amphilophus zaliosus	
	Amphilophus labiatus	Red devil
	Caquetaia kraussii	Bucketmouth
	Caquetaia spectabilis	
	Caquetaia umbrifera	Turquoise cichlid
	Cichla spp	Peacock cichlid, tucanare
	Cichlasoma urophthalmus	Mexican mojarra
	Crenicichla spp	

FAMILY	SPECIFIC NAME	COMMON NAME
Cichlidae (continued)	*Crenicichla lacustrus*	
	Crenicichla lepidota	
	Crenicichla notophthalmus	
	Crenicichla saxatilis	
	Herichthys cyanoguttatum	Rio Grande cichlid
	Parachromis dovii	Guapote, wolf cichlid
	Parachromis managuensis	Guapote tigre, jaguar cichlid
	Parachromis motaguensis	False yellow jacket cichlid
	Petenia splendida	Bay snook
Ctenoluciidae	*Ctenolucius* spp	
	Ctenolucius hujeta	
	Boulengerella spp	Gar characin, hujeta
Cyprinidae	*Tinca tinca*	Tench
	Rutilus rutilus	Roach
	Cyprinus carpio	Domesticated koi carp
Dasyatidae	*Himantura* spp	Freshwater stingray
Eleotridae	*Eleotris* spp	
	Batanga lebretonis	Sleepers
Fundulidae	*Fundulus* spp	
	Fundulus chrysotus	
	Leptolucania spp	
	Leptolucania ommata	
	Adinia spp	
	Adinia xenica	
	Lucania spp	Topminnow
Ictaluridae—entire family except Prietella, Satan and Trogoglanis,which are harmless and IUCN listed	*Ameirus* (7 spp)	Bullheads, madtoms
	Ictalurus (9 spp)	
	Ictalurus punctatus	
	Pylodictis (1 spp)	
	Noturus (26 spp)	
Lebiasinidae	*Lebiasina* spp	
	Lebiasina bimaculata	Twospot lebiasina
Lepidosirenidae	*Lepidosiren paradoxa*	South American lungfish
Lepiosteidae	*Lepisosteus* (4 spp)	alligator gars
Mastacembelidae—subfamilies	*Mastacembelus* spp	
Mastacembelinae and Afromastacembelinae except Macrognathus spp	*Caecomastacembelus* spp	Spiny eel, tyre-track eel, zig
	Aethiomastacembelus spp	zag eel
Notopteridae	*Chitala* spp	Featherbacks or knifefish
Osteoglossidae	*Arapaima gigas*	Arapaima, giant arapaima, pirarucu
	Osteoglossum spp	
	Osteoglossum bicirrhosum	Arawana
	Scleropages formosus	Golden arowana

FAMILY	SPECIFIC NAME	COMMON NAME
Pangasiidae—entire family	*Pangasius* (22 spp)	
	Pangasius gigas	Mekong giant catfish, shark catfishes, blue shark
	Helicophagus (3 spp)	
Percidae	*Perca fluviatilis*	European perch
Pimelodidae	*Leiarius* spp	Sailfin antenna, saddle or painted catfish
	Perrunichthys perruno	Leopard catfish
	Phractocephalus hemioliopterus	Red tail catfish
	Pseudoplatystoma fasciatum	Barred sorubim (tiger catfish)
	Sorubim (5 spp)	Duckbill catfish, shovelnose catfish
	Sorubim lima	
	Sorubimichthys spp	
	Brachyplatysoma spp	
Poeciliidae	*Alfaro* (2 spp)	Amazon or knifetail
	Alfaro amazonus	livebearer
	Alfaro huberi	
	Heterandria spp	
	Heterandria bimaculata	Two-spot livebearer
	Tomeurus gracilis	
Polypteridae	*Polypterus* spp	Birchirs or ropefish
	Polypterus enlicheri	
	Polypterus retropinnis	
	Erpetoichthys spp	
	Erpetoichthys calabaricus	
Potamotrygonidae	*Potamotrygon* (18 spp)	River stingrays
	Paratrygon (1 spp)	
	Plesiotrygon (1 spp)	
Protopteridae	*Protopterus* (7 spp)	(excluding African lungfish) Pannectdens
Rivulidae	*Leptolebias* spp	
	Leptolebias aureoguttatus	
	Leptolebias marmoratus	
	Leptolebias minimus	
	Leptolebias opalescens	
	Leptolebias opalescens	
Schilbeidae	*Schilbe* spp	African butter catfish
Siluridae	*Ompok* spp	Butter catfish
	Sandelia (2 spp)	ctenopomas
Tetraodontidae	*Chelenodon* spp (except C. patoca)	Freshwater
	Colomesus spp	pufferfish
	Chonerhinos (5 spp)	
	Carinotetraodon (6 spp)	
	Takifugu (~21 spp)	
	Auriglobus (1 sp)	
	Tetraodon (~22 spp)	

APPENDIX 3

NOXIOUS AQUATIC PLANTS

(DECLARED AQUATIC PLANTS OF AUSTRALIA)

NAME	MUST NOT BE SOLD	MUST BE CONTROLLED OR ERADICATED
Alligator Weed (*Alternanthera philoxeroides*)	All states and territories	All states and territories
Anchored water hyacinth (*Eichhornia azurea*)	NSW, Q	NSW, Q
Arrowhead (*Sagittaria graminea* subsp. *platyphylla*)	NSW, WA	WA, Parts of NSW
Arrowhead (*Sagittaria montevidenis*)	NSW, SA, Tas, WA	SA, Tas, WA
Cabomba (*Cabomba caroliniana*)	All	ACT, NT, Q, SA, TAS, WA
Canadian Pond Weed (*Elodea canadensis*)	NT, SA, Tas, WA	SA, Tas, WA
Eurasian Water milfoil (*Myrophyllum spicatum*)	NSW, Q, SA,	NSW, Q, SA
Hornwort (*Ceratophyllum demersum*)	Tas	Tas
Horsetails (*Equisetum* spp)	All states and territories	All states and territories
Hydrilla (*Hydrilla verticillata*)	Tas	Tas
Hydrocotyl (*Hydrocotyle ranunculoides*)	SA, WA	SA, WA
Hygrophila (*Hygrophila costata*)	NSW, Q	NSW, Q
Hygrophila (*Hygrophila polysperma*)	NSW	NSW
Hymenachne (*Hymenachne amplexicaulis*)	All states and territories	Q, NSW
Lagarosiphon (*Lagarosiphon major*)	NSW, NT, Q, SA, Tas, Vic, WA	NSW, NT, Q, SA, Tas, Vic, WA
Leafy Elodea (*Egeria densa*)	NT, SA, Tas, WA	SA, Tas, WA
Limnocharis (*Limnocharis flava*)	NSW, Q	NSW, Q

NAME	MUST NOT BE SOLD	MUST BE CONTROLLED OR ERADICATED
Mimosa pigra (*Mimosa pigra*)	All states and territories	NT, Q
Parrot's feather (*Myriophyllum aquaticum*)	ACT, Tas, WA	ACT, Tas, WA
Peruvian primrose (*Ludwigia peruviana*)	Q, SA, NSW	Q, SA
Pond Apple (*Annona glabra*)	All states and territories	NSW, Q
Salvinia (*Salvinia molesta*)	All states and territories	All states and territories
Salvinias (*Salvinia* spp not *molesta*)	Q	Q
Senegal tea (*Gymnocoronis spilanthoides*)	NSW, NT, Q, SA, Tas, WA	NSW, Q, SA, Tas, WA
Shield pennywort (*Hydrocotyle verticillate*)	WA	WA
Water Caltrope (*Trapa* spp)	NSW, QLD, SA (*T. natans*), Tas	NSW, QLD, SA (*T. natans*), Tas
Water hyacinth (*Eichhornia crassipes*)	All states and territories	All states and territories
Water lettuce (*Pistia stratiotes*)	ACT, NSW, NT, Q, WA	ACT, NSW, NT, Q, WA
Water soldiers (*Stratiotes aloides*)	NSW, Q, SA,	NSW, Q, SA
Willow (*Salix* spp other than *babylonica*) *calodendron* and *reichardtii*)	All states and territories, (excluding S. calodendron, and S. reichardii in SA)	ACT, Q, SA (excluding S. calodendron, and S. reichardii), Tas

Disclaimer Declarations are correct as of May 2006. This list may not contain all aquatic and semi aquatic plants banned from sale in your state/territory. Also, aquatic plants banned from sale may also be prohibited or not allowed entry in your state/territory. Weed legislation is regularly updated and other plant species may be prohibited from sale, so check with local or state weed control authority for the most up-to-date list.

APPENDIX 4

CURRENT REGULATION OF ORNAMENTAL FISH IN AUSTRALIA

JURISDICTION	CURRENT LICENSING ARRANGEMENTS	BASIS FOR LICENSING ARRANGEMENTS	CRITERIA FOR LICENSING ARRANGEMENTS	ARE CRITERIA CURRENTLY BEING REVIEWED?
Victoria	In theory, anyone breeding or selling ornamental fish requires a licence or permit under the *Fisheries Act 1995*. However, currently we only license large breeders	Licensing arrangements are targeted towards larger aquaculture ventures, where fish are produced for human consumption	Sections 42 and 43 of the Act provide the criteria. In effect, it states that you need authorisation under the Act if you hatch, breed, display or grow fish for sale or other commercial purpose or use or create habitat to do the above	Currently reviewing what appropriate licensing arrangement there should be for the ornamental fish sector
South Australia	South Australia has a legislative basis, through the *Aquaculture Act 2001*, for aquatic organisms kept for the purposes of business or trade. Some producers of aquarium species are already licensed under the Aquaculture Act, and powers exist within this legislation to move towards broader licensing of ornamental fish breeders under the Act. Upon application, permits are issued under the *Fisheries Act 1982* for the keeping of particular listed 'permitted' ornamental fish species. There is currently no impetus to enforce the permit system due to various flaws and difficulties	Current licensing arrangements for fish keepers are targeted towards marine and landbased aquaculture ventures of varying scales. A permit system is proposed in the review of the Fisheries Act, which is likely to be changed in 2006	Currently in South Australia and according to legislation, if you breed any fish you need to be licensed, and if you want to keep fish on the 'permitted' lists you need a permit. In practice, if you breed ornamental fish, you most likely have not to date been required by PIRSA Aquaculture to comply with the licensing system, and most likely won't have a licence. This will be addressed once the ornamental fish review progresses to ensure a complementary approach with other states/territories	All management and licensing arrangements are under review. South Australia will await the recommendations of the Ornamental Fish Policy Group before reviewing licensing arrangements thoroughly

JURISDICTION	CURRENT LICENSING ARRANGEMENTS	BASIS FOR LICENSING ARRANGEMENTS	CRITERIA FOR LICENSING ARRANGEMENTS	ARE CRITERIA CURRENTLY BEING REVIEWED?
Queensland	In theory, anyone breeding or selling ornamental fish requires a licence or permit under the *Fisheries Act 1995*. However, currently we only license large breeders	Licensing arrangements are targeted towards larger aquaculture ventures, where fish are produced for human consumption	Act applies to all forms of aquaculture	Yes Development authority required for anyone who wants to conduct aquaculture (grow and sell fish). For smaller, low-risk developments, a self-assessment code has been drafted and is being tested • No registration is required for developments >5000 L capacity. • Registration only required for developments with – pond area not exceeding 5 hectares – gross floor area not exceeding 50 square metres • note: there are some restrictions to the above. Larger developments, and those not considered low risk, require approval and permits
Western Australia	Do not license the retail sector. Prohibit import of noxious fish. Require operators to apply for approval to translocate aquaculture fish species	N/A	N/A	No. Department may support changes if there are demonstrable benefits from licensing in terms of protection of environmental and fisheries values. National Competition Policy would have to be addressed, as well as resource issues. In short, it won't be done unless there were clear cost/benefits not achievable in cheaper ways

JURISDICTION	CURRENT LICENSING ARRANGEMENTS	BASIS FOR LICENSING ARRANGEMENTS	CRITERIA FOR LICENSING ARRANGEMENTS	ARE CRITERIA CURRENTLY BEING REVIEWED?
Northern Territory	Import of live fish through permit system. All aquarium sales reported through licensing. Licensing of ornamental fish species production under aquaculture permit	Knowledge of who is importing and trading. Knowledge of what is being imported and traded. Knowledge of origin where the 'fish' are sourced. Control of species imported for EPBC Act and noxious list considerations. Control for translocation issues with respect to disease issues	Any individual/ company trading in ornamental fish meeting criteria described in the Northern Territory Fisheries Act Regulations182 and 199	No
Australian Capital Territory	No licence required for sale of fish. Import licence required for live fish. Suitable live fish restricted by declaration Pet trade is licensed and must report stock holdings and numbers of live imports or exports	Live fish imported/ exported from the ACT must be subject of licence. This is to enable the possibility of trace forward/back in the event of an animal disease outbreak	Section 22 *Fisheries Act 2000*. The import/export of live fish to/from the ACT. Section 28 provides the 'relevant considerations'	No
New South Wales	Pet shops are not regulated by NSW Department of Primary Industries In theory, any person producing fish for the aquarium trade requires a permit under *NSW Fisheries Management Act 1994*. Presently, there are seven aquaculture permit holders producing aquarium fish	Targeting of breeders rather than retail outlets	Permit holders are required to abide by the same protocols as other aquaculturalists	No

JURISDICTION	CURRENT LICENSING ARRANGEMENTS	BASIS FOR LICENSING ARRANGEMENTS	CRITERIA FOR LICENSING ARRANGEMENTS	ARE CRITERIA CURRENTLY BEING REVIEWED?
Tasmania	The only persons permitted to sell freshwater fish are those persons holding: • a commercial freshwater fishing licence • a fish farm licence • a fish dealers registration, and • an exemption permit. The 'fish farm licence' and the 'fish dealers registration' are both relevant to the freshwater aquarium fish trade. Fish cannot be imported, bred or sold without a licence or registration appropriately endorsed. Conditions cover the activities permitted and the species allowed. Applicants are required to provide comprehensive information about their intended business, covering applicant details, site details, system design, species, culture techniques and marketing	Applications are assessed, and licences/registrations granted with conditions to ensure (as far as is practical) that the site and system are adequate and suitable, and that the operation does not pose an unacceptable risk in relation to disease and pest potential which could adversely impact on cultured and native fish populations and their ecosystems. The process itself is an educative device requiring applicants to think about and be aware of the potential risks posed by their business, but this is not the main focus of the licensing/registration system. In the event that something does go awry, the licensing/registration system gives us a greater capacity to trace forward and back, and implement controls quickly and efficiently. Fees are charged for licences/ registration, but this is to offset the costs, not as a revenue raising exercise	All those who wish to import, breed and/or sell freshwater fish	No

APPENDIX 5

PIAA MEMBER'S CODE OF ETHICS

PET INDUSTRY ASSOCIATION OF AUSTRALIA LTD

MEMBER'S CODE OF ETHICS

1 Members shall ensure that all animals under their care shall be provided with humane treatment and with correct and proper housing in accordance with applicable state and federal regulations.

2 Members shall take any necessary action to discourage any acts of cruelty or mistreatment to animals under their care and to protect those animals from undue stress or discomfort.

3 Members shall not offer for sale any animal that is known to be suffering from disease, illness or injury and shall seek prompt, proper veterinary attention for any animal in their care that is so affected.

4 Members shall ensure that any animal in their care is provided with an adequate and proper diet, in accordance with the needs of the species.

5 Members shall not offer for sale any animal that is classified as protected fauna other than those species allowed under state and federal Acts, for which the necessary certificates must be provided.

6 Members shall ensure that employees in charge of livestock shall be familiar with the care and needs of such species or shall be under the supervision of a person who is knowledgeable and competent in this regard.

7 Members shall, wherever possible, accurately describe the needs and care of any animal sold and provide or promote any literature relevant to the well-being of the animal after purchase.

8 Members shall not offer for sale any item or product that does not knowingly conform to applicable state or federal regulations or that may endanger the safety of the user or animal.

9 Members shall endeavour to maintain their business premises in a clean and safe condition and provide any necessary ventilation or lighting that may be required for the comfort of livestock, employees and customers alike.

10 Members will trade in accordance with applicable state and federal regulations and, by example, shall strive to promote the Australian pet industry and the benefits of responsible animal ownership to potential customers and members of the general public.

Pet Industry Association of Australia

PO Box 7108
Baulkham Hills Business Centre
NSW 2153

Telephone (02) 9659 5811
Fax (02) 9659 5822
Email info@piaa.net.au

APPENDIX 6

REGIONAL CONTACTS

STATE/TERRITORY	CONTACT PERSON	TELEPHONE, FAX & EMAIL
Australian Capital Territory	ACT - Parks, Conservation & Lands Fisheries	Telephone 13 22 81
New South Wales	Aquatic Pest Unit Department of Primary Industries	Telephone (02) 4982 1232 Fax (02) 4982 1107 Email pests@dpi.nsw.gov.au
Northern Territory	Aquatic Pest Management	Telephone (08) 8999 2126 Email aquaticpests@nt.gov.au
Queensland	Fishwatch Hotline DPI&F Business Information Center	Telephone 1800 017 116 Telephone 13 25 23
South Australia	FISHWATCH or PIRSA Fisheries	Telephone 1 800 065 522 Telephone (08) 8226 2316
Tasmania	Inland Fisheries Service BUSHWATCH	Telephone 1300 INFISH Telephone 1800 005 555
Victoria	DPI Customer Service Centre	Telephone 136 186
Western Australia	FISHWATCH Biosecurity Officer	Telephone 1800 815 507 Telephone (08) 9482 7385

ABBREVIATIONS AND ACRONYMS

AFMF . . . . . Australian Fisheries Managers Forum

BA . . . . . Biosecurity Australia

CITES . . . . . Convention on the International Trade in Endangered Species of Wild Fauna and Flora

DEW . . . . . Department of the Environment and Water Resources

EPBC Act . . . . . Environment Protection and Biodiversity Conservation Act 1999

GMO . . . . . genetically modified organism

IUCN . . . . . International Union for Conservation of Nature and Natural Resources

OFPWG . . . . . Ornamental Fish Policy Working Group

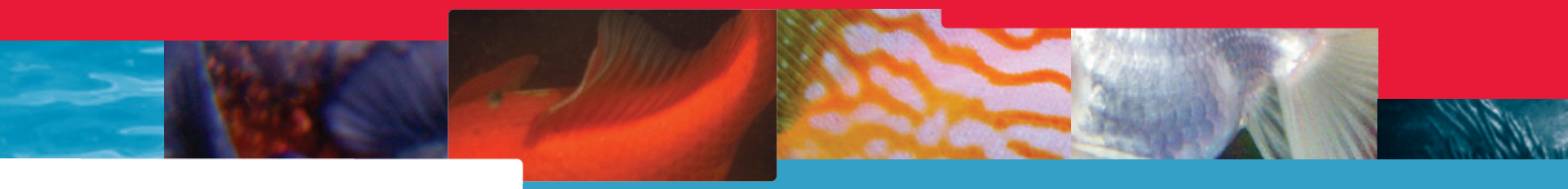
OGTR . . . . . Office of the Gene Technology Regulator

PIAA . . . . . Pet Industry Association of Australia

QAP . . . . . quarantine approved premises

Weeds CRC . . . . . Cooperative Research Centre for Australian Weed Management

A STRATEGIC APPROACH TO **THE MANAGEMENT OF ORNAMENTAL FISH** IN AUSTRALIA



Fish for the future

Inland Fisheries Service

Northern Territory Government

NSW Department of Primary Industries

Government of South Australia
Primary Industries and Resources SA

Queensland Government
Department of Primary Industries and Fisheries

State Government Victoria
Department of Primary Industries

Department of Fisheries
Government of Western Australia