Committees
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Environment and Sustainable Development

Terms of Reference

INQUIRY, INVASIVE SPECIES AND MANAGEMENT PROGRAMS
The following matter be referred to the Environment and Sustainable Development Committee for inquiry and report - (1) The Northern Territory's capacity to prevent new incursions of invasive species, and to implement effective eradication and management programs for such species already present; and (2) That the committee in its inquiry will:
a) begin its investigations by engaging the scientific community to conduct a scientific summit on invasive species;

(b) use case studies to inform the analysis, and will draw its case studies from a range of invasive species;

(c) while investigating the value of control programs, focus on community based management programs for weeds and feral animal control; and

(d) as a result of its investigations and analysis will recommend relevant strategies and protocols for government in dealing with future incursions and current problem species.

A Proactive Approach to Reducing Accidental and Intentional Introductions of Ornamental Fish Species into Natural Waters of the Northern Territory: A Case for Control through Minor Legislative Changes and a Public Education Program.

Dave Wilson
National President ANGFA Inc.
PO Box 756
Howard Springs NT 0835

Scoot Andresen
Pet Industry of Association Australia NT Coordinator
PO Box 3029
Alice Springs NT 0871

Summary

This document is intended to outline what the Community and the Aquarium Traders can do toward reducing the risks of the introduction unwanted ornamental species. It gives an alternative view to Fisheries Administrators tendencies to ban everything on the grounds that is the safest thing to do for environmental protection. It gives reasons why prohibition is not safe practice among the fish keeping community. It may also be against the principles of the Constitution to have free trade in other states of all the allowable fish species but not the NT.

It outlines the popularity of keeping ornamental fish, the reason why people keep ornamental fish and the possible implication of banning more species in the NT than are banned at a federal level.

The report outlines simple legislative changes that will help protect the natural waterways of the NT by increasing public awareness and giving the public a set of guidelines to reduce the risks of accidental introductions of fish and fish disease to natural water ways while still allowing them to have all the species approved by the federal government.

An important consideration is that 64% of Australians have pets. After cats and dogs fish are the most popular. Thirty percent of all pets are fish. If Fisheries Administrators continue to ban fish species that are allowable imports under federal legislation then there is likely to be some sort of protest.

Key points to consider

- The keeping of ornamental fish has a history that goes back some 4000 years (See 3d for detail)

- The popularity of keeping fish is increasing. (See 3e, 4a & 4b for detail)

- Parts of the current legislation supposed to regulate the comercial trade are illogical and un-enforceable (See 2, 4h,4i, 4m & 4o for detail)

- Abitrary banning of species available elswhere will not stop their importation into the NT. (See 2, 4h, 4p & 5 for detail)

- Many aquarium keepers are currently largely unaware of the potential risks associated with improper management of exotic species. This is dispite an inherant respect for the natural aquatic environment (See 4h, 4i, 4j, 4m, 4n & 4o for detail)

- Some simple legislative changes, in conjunction with an education program, will provide far more environmental protection than the current Fisheries approach simply banning species. (See 4j, 4m, 4n, 4o & 5 for detail)

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1. Issue

A Proactive Approach to Reducing Accidental and Intentional Introductions of Ornamental Fish Species into Natural Waters of the Northern Territory: A Case for Control through Minor Legislative Changes and a Public Education Program.

2. Introduction

The Aquarium Industry relies on new and interesting fishes to keep the interest of fish collectors and to increase trade. Due to the retrictions imposed upon the aquarium industry in the Northern Territory, the range of aquarium species commercially available is limited. Accordingly, Territorians travel interstate to acquire their aquarium fish to bring him to the Territory, and consequently and unwittingly break the law.

Aquarium keepers seek new species regularly and the aquarium industry attempts to provide new and interesting species. The Department responsible for ornamental fish has not let any new species into the NT trade even though at least six species have been approved on a National level for inclusion on the allowable ornamental list. This submission is an attempt to provide mechanisms that allow all the new nationally approved aquarium species to be used in the NT, with minimum risks to the environment from so-called invasive species from the aquarium trade.

The NT Fisheries Department has a policy that excludes most of the aquarium fish species in circulation in Australia. The NT list of species is even less than the allowable list for export into Australia under the provisions of the EPBC Act.

This document presents a case for a review of current policies regarding the control of ornamental fish being introduced into the Northern Territory to protect the aquatic environments of the Territory from the adverse impacts of exotic aquarium species. Recommendations are made for simple changes to the legislation, and a case is made for the implementation of a public education program relating to the dangers of exotic introduced fish species. The education program has the requirement for the private aquarist to have knowledge of the dangers of escaped ornamental fish, their diseases and management of potential disease in contaminated waters under their control. A successful education program will result in a much reduced risk of introduction of ornamental fish into natural waters, ownership of healthier fish and a more knowledgable aquarium operator.

3. Background

3 a. Adverse Impacts of introduced Exotic Ornamental Fish

The intentional or unintentional release and subsequent establishment of exotic ornamental fish species in natural waterways has had major adverse impacts on aquatic environments in Australia and elsewhere. Numerous examples exist of exotic fish causing serious, and in some cases, irreversible damage to aquatic ecosystems.

Adverse impacts of exotic ornamental fish may be divided into two categories,

(1) ecological disruption; and

(2) incursions of disease.

Numerous examples exist of ecological disruption associated with the establishment of exotic species of fish in new locations. Bomford and Glover (2004), and Humphrey (1995) identified at least 88 diseases, pathogens and parasites, many of them serious and capable of causing severe disease, which had been spread internationally due to the translocation of living fish. Other adverse impacts include habitat disruption through introduced fish digging in the substrate and silting the natural waters causing aquatic vegetation to die off from light disruption. Invaders can overwhelm locals by occupying their space and competing for available food resources.

3 b. Protection of the Northern Territory Aquatic Environment

The Northern Territory has major social, economic and scientific interests in maintaining its high profile, unspoilt natural environment and image. Tourism is to a large part dependent on the promotion of the Territory's pristine environment and relies heavily on promoting the flora and fauna associated with aquatic ecosystems in particular. Fisheries and aquaculture depend on healthy natural aquatic environments. The Territory is fortunate that it has a well managed, sustainable commercial and recreational fishery and an environment where aquaculture can proceed in the absence of many serious diseases that limit or preclude aquaculture elsewhere. The scientific importance of Territory aquatic ecosystems is paramount, with new species of fish and invertebrates being described, local strains of fish and invertebrates being used for aquaculture and with the potential of bio-harvesting of unique Territory species.

3 c. The Philosophy of Keeping Fish

The keeping and exhibiting of fish in aquaria is an attempt by people to satisfy curiosity of what is hidden beneath the ocean, freshwater lakes and rivers. Stephen Spotte compares the exhibiting of fish in a public aquarium to staging a play giving the illusion of reality carefully staged so the audience concentrates on the subjects and not the background (Spotte 1992). Private aquariums are kept for entertainment, the beauty of a living picture and for educational purposes. Fish are mostly regarded as display animals with the occasional fish with character and the appearance of recognising its keeper being thought of as a pet.

Aquaria are used to teach young people responsibility with regard to the parents making sure the young person performs the routine tasks involved. Aquaria are used for entertainment and education. One large planted aquarium at the Territory Wildlife Park was regularly used to demonstrate photosynthesis to students from visiting schools. The growing submerged aquatic vegetation was giving off oxygen bubbles from the surface of the leaves thus giving a visual display of photosynthesis in action.

3 d. The History of Keeping fish

The goldfish bowl was seen in Europe from as early as the 17th Century. It is said to have come from China where the keeping of fish for food and ornamental purposes has a history that can be traced back to 2000 BC. At about 1950 the development of the modern aquarium started in England and Europe with metal framed glass aquarium with a slate bottom heated by a small gas flame (Horst & Kippar 1986).

3 e. Aquariums in recent times

The aquarium hobby today is big business in populated areas where man has altered the landscape producing food, clothing and shelter for man's ever-increasing numbers. It would appear that people in these big cities require contact with things natural by producing gardens and putting plants and animals around them under their care. An aquarium can be a little glass bowl with some plastic fluorescent ornaments and one or more fish up to a living coral reef with an attached plant room that houses sophisticated equipment to maintain physical and biochemical conditions close to that of an outer part of a barrier reef.

A survey conducted by the Pet Industry Association of Australia (PIAA) has indicated that 64% of Australians have pets, 30% of all pets are fish and 16% (about 1 in 6) of Australian households have one or more aquaria. Enthusiastic hobbyists have rooms dedicated to keeping and breeding the fishes they want to keep. Part of this hobby is the forming of clubs, study groups, associations and societies where fish are swapped and traded among members. It has been estimated by the Aquarium Industry for Alex McNee of the Bureau of Rural Sciences that there were more than 1180 species of aquarium and ornamental pond fishes moving around the country by various means in 2002. Of these, 481 had been assessed and approved for use in the trade.

The small, most common aquarium fish, such as guppies, have been sold to people in the Top End of the NT to put in their pond for mosquito control. There are even some people who believe that guppies are native species. Most garden ponds that are seen here in peoples' yards have guppies (observations by Dave Wilson). In more recent times, the members of NT Frogwatch have been promoting local endemic fish, the Delicate Blue-eye *Pseudomugil tenellus*, as a more benign species for mosquito control in ponds than Guppies (www.frogwatch.org.au).

4. Discussion

4 a. Increasing Popularity of Aquariums, Ponds and Water Features

Aquariums, water features and ponds are becoming increasingly more popular every year as demonstrated by the opening of another very large pet shop on 30 November 2005 here in the Top End. They are popularised by television shows, local nurseries, pet shops, glossy magazines and the internet. Humans have a history of putting aquatic organisms in tanks that dates from the first record 2000 years BC (Horst & Kipper). There is still a basic urge in all to manipulate their close surroundings to produce suitable habitats. We bring plants and animals that we like into and around the place we live. A garden, lawn, a dog, a cat, some chooks, a pet parrot, an aquarium and a fish pond.

4 b. Promotion and Availability of Ornamental Fish

Ornamental pond and aquarium subjects are freely available and promoted by glossy magazines, the internet, specialty shops, through clubs and societies. There is a constant movement of ornamental fishes around the world, throughout Australia and into and out of the NT, not necessarily authorised by permit and definitely more species than those listed under S.303EB of the EPBC Act. Regardless of what legislation or regulations are put in place the trade continues with species that are in demand by enthusiasts and collectors.

The aquarium trade relies on a continuing supply of fresh new animals. These are required to keep the interest of customers in the ornamental fish industry to, in turn, encourage customers to continue purchasing regularly. The success of the trade relies on this. The ornamental aquatic trade is similar to the fashion industry, with various new products becoming popular, thus generating more interest in new purchases. Sometimes organisms that have been produced in large numbers lose their popularity and are not saleable. This is the practical nature of the business that industry has invested in. Any proposed management and or regulatory regime has to be based on this fundamental principle, otherwise it will fail. (Iain Smith, NT Seafood Council)

4 c. Exotic Freshwater Fish Species Known to have Established in Australia

From: http://www.fishbase.org

Species Name	Common Name
Archocentrus nigrofasciatus	Convict cichlid
Carassius auratus auratus	Goldfish
Cichlasoma octofasciatum	Jack Dempsey
Cyprinus carpio carpio	Common carp (Not an ornamental)
Gambusia affinis	Mosquitofish or Plague Minnow (Not an ornamental)
Gambusia dominicensis	Dominican gambusia (Not an ornamental)
Gambusia holbrooki	Eastern mosquitofish (Not an ornamental)
Hemichromis bimaculatus	Jewelfish or Jewel Cichlid

Jordanella floridae	Flagfish
Misgurnus anguillicaudatus	Oriental weatherfish
Oncorhynchus mykiss	Rainbow trout (Not an ornamental)
Oncorhynchus tshawytscha	Chinook salmon (Not an ornamental)
Oreochromis mossambicus	Mozambique tilapia
Perca fluviatilis	European perch (Not an ornamental)
Phalloceros caudimaculatus	Dusky millions fish (Not an ornamental)
Poecilia latipinna	Sailfin molly
Poecilia reticulata	Guppy
Puntius conchonius	Rosy barb
Puntius tetrazona	Sumatra barb
Rutilus rutilus	Roach (Not an ornamental)
Salmo salar	Atlantic salmon (Not an ornamental)
Salmo trutta fario	Brown trout (Not an ornamental)
Salmo trutta trutta	Sea trout (Not an ornamental)
Salvelinus fontinalis	Brook trout (Not an ornamental)
Tilapia mariae	Spotted tilapia
Tinca tinca	Tench (Not an ornamental)
Tridentiger trigonocephalus	Chameleon goby
Xiphophorus hellerii	Green swordtail
Xiphophorus maculatus	Southern platyfish

The *Tanichthys albonubes* or White Cloud Mountain Minnow has been reported by ANGFA members to be in a couple of natural locations in NSW (Pers. com. Mark Abell, ANGFA, NSW)

4 d. Adverse Ecological Impacts of Undesirable Exotic Species

Undesirable exotic species displace native species by out-competing for food and aggressive behaviour chasing them from their usual habitat. Trout have been implicated in the disappearance of Galaxia from many locations. Other exotics disrupt aquatic environment by digging or other substrate disturbances that cause silting, killing aquatic plants and changing the habitat to the detriment of native aquatic life. European Carp have been responsible for digging the bottom of most places they reside, silting the water, killing the aquatic vegetation and removing habitat for small forage fishes and invertebrates. Gambusia overtake by sheer numbers and replace the small forage fishes of the area they inhabit. They nip fins and nibble the tails and eyes from tadpoles. They have been implicated in the decline of the frog species where they have colonised. Goldfish and Gouramis have carried disease that have been passed onto native species.

4 e. Incursions of Diseases attributed to Ornamental Fish

Whether or not diseases and parasites which occur in wild or non-captive fish populations were derived from imported ornamental fish is difficult to prove, as it generally impossible to identify the original source of the disease or parasite. Nevertheless, several serious diseases are known to have established in Australian native species as a direct consequence of spread from imported ornamental fish, and based on the unlikely occurrence of co-evolution of

morphologically identical parasites, it can readily be inferred that a range of parasites now established in native fish were derived from imported fish.

Humphrey (1995) recorded that a plethora of pathogens and parasites of fish had been spread internationally by the uncontrolled movement of fish including ornamental fish, many of which had established in their new environment and in many cases causing disease. This author identified at least 19 pathogens and parasites in ornamental fish imported into Australia. Further, Chong and Whittington (2005) identified at least 20 different pathogens and parasites, some unidentified, recorded in imported ornamental fish in quarantine in Australia.

It is the firm opinion of Humphrey (personal communication) that, given all batches of imported ornamental fish are not tested, that only fish suffering disease are investigated in Quarantine, and given the known propensity of fish to carry pathogens or parasites in a latent or asymptomatic form, it is impossible to avoid the passage through quarantine of a high number of potentially pathogenic micro-organisms and parasites.

Aeromonas salmonicida is a serious bacterial pathogen affecting of a wide range of fish species and causing a range of diseases including furunculosis of salmonid fish, septicaemia, erythrodermatitis and ulcerative syndromes. Humphrey and Ashburner (1993) described its introduction in imported goldfish, its subsequent spread throughout Australia, its eventual occurrence in feral populations of goldfish as a result of the use of live goldfish as bait and the disposal of unwanted goldfish into waterways and its occurrence as an ulcerating disease of non-captive silver perch Bidyanus bidyanus.

Despite the recognition of a serious lethal viral infection of imported gouramis (gourami iridovirus) over many years, little attempt was made to restrict the importation or release of infected fish from quarantine (Humphrey – personal communication). Recently, Chong and Whittington (1995) using molecular characterisation of a virus isolated from a lethal disease of Murray cod (*Maccullochella peeli peeli*) showed the virus from Murray cod to be identical to that of gourami iridovirus. Thus, there is irrefutable evidence that Murray cod have been infected as a result of infection derived from imported gouramis and grave concerns are held that the virus may now be endemic in the Murray-Darling basin.

Ichthyophthirius multifiliis is a cosmopolitan protozoan parasite that causes gill and skin disease in all freshwater fish. The parasite is widespread in fish in Australia. Humphrey (1995), in investigating the spread and establishment of diseases through translocation of living fish, concluded that there was strong circumstantial evidence that the parasites had been introduced into Australia in the 1930's concurrent to the importation of goldfish and carp.

4 f. Exotic Ornamental Fish Species Known to have Established in the Northern Territory

Platies *Xiphophorus maculatus* and guppies *Poecilia reticulata* have been introduced into the town billabong in Nhulunbuy and still exist at this location

(personal observations Wilson 1988). A further species Sword tail *Xiphophorus hellerii* has been reported from that location late 2005 (Pers. Comm. Scott Wheler of Nhulunbuy). Jewel cichlids had established in a small creek near the racecourse in Darwin and subsequently eradicated by a NT Fisheries poisoning program. Guppies have established a small colony in the old railway dam within the Darwin suburb of Stuart Park. The appearance of exotic aquarium species has been a regular occurrence within disturbed habitats in the suburbs of Darwin over the years. Drains in Coconut Grove, Charles Darwin University, and the Botanic Gardens in Gilruth Avenue have all had livebearing toothcarp introductions that have been controlled by Fisheries or joint operations between Fisheries and the Parks and Wildife Service (Rolland Griffin, Dave Wilson 1994). Wilson urged the public to return unwanted pet fish to their place of purchase on local television news. Fisheries granted a dispensation to Sapphire Aquariums on Bagot Road to receive peoples' unwanted fish without any compensation in 1994. Dispensations similar to the 1994 arrangements are currently being considered by Fisheries.

The Gambusia that were removed in the Alice Springs region should not be thought of as ornamental fish but bought to the country in the mid 1930's by the Army and introduced into water ways on the belief that they were a good mosquito control. This species has been implicated in the near extinction of Green and Golden Bell Frog, *Litoria aurea* in NSW.

4 g. Factors Increasing Likelihood of Establishment of Exotic Ornamental Species

Bomford & Glover 2004 concentrated on factors that can be measured and for which there was supporting evidence. Other factors that can not be measured easily such as local predator numbers and diversity, rate of population increase, environmental tolerance for abiotic conditions, ability to acclimatise to less suitable conditions, dispersal ability, broad diet, ability to live in disturbed habitats, parental care of eggs and young or give birth to live young, the individuals age and health, aggressive behaviour and territoriality, gregariousness, body size, source of animals and the attitude and actions of the public and government are all relevant but deemed too difficult to measure for a quick yet effective assessment tool.

The factors that Glover has concentrated on and that can be measured are:

1. Propagule pressure - the number of release events;
2. Climate Match - comparing the temperature and rainfall from the natural range of the fish to the Australian Environment;
3. History of establishing elsewhere;
4. Overseas geographic range size; and
5. Taxonomic group - closely related species that have similar habits to the fish under assessment.

4 h. Pathways for Establishment of Exotic ornamental Fish in the Northern Territory

Every NT introduction of ornamental fish species from the pet trade that authors have information available has been from a pond. The pathways outside the normal aquarium retail outlets for ornamental fish into the Territory are people moving here from interstate, people going on holidays visiting aquarium outlets then bringing their aquatic life back from other capital cities. People with high disposable incomes that work in remote localities regularly go to capital cities during stand down periods, and are free to return with new species for their collections. Mail order outlets from the internet do their utmost to ensure that they do not break the law but put the onus on the receiver to comply with laws in the receiving jurisdiction. Hobbyists can send viable fish eggs through the mail. International transfers of viable fish eggs of certain species are common. Many Australian Rainbowfishes have been sent to hobbyists in other countries as eggs through the mail. The Killifishes associations send eggs that desiccate quite easily through the mail. Border barriers against this type of live material transfer are not effective.

The introduction of fishes from pond to the environment is very simple. Most ornamental ponds are not designed with a secure water release system to keep their residents in during heavy rainfall and all ponds do not retain their occupants during a flood when the pond is inundated. Indoor aquaria on the other hand are very secure containers. There were reports that aquarium fish remained in their aquariums during the Katherine floods of 1999 when houses containing aquaria were completely submerged by floodwater (pers. com. Quentin Alsop).

4 i. NT Legislation Definition of Aquarium

The NT of Australia, Fisheries Regulations Part 2, Section 3 as in force at 18 May 2005 downloaded from the NT Government web site 12 July 2005 defines **Aquarium** as “a **pond**, tank or other container with a surface area not exceeding 10 m^2 used for keeping live fish or aquatic life, and used otherwise than for the purposes of aquaculture.”

Likelihood of Escape of Exotic Ornamental Fish from Ponds is much higher than aquatic life kept in indoor aquaria with secure fitting lids.

When people place aquarium fish in a pond they place them at risk of being put into the local waterway during the next wet season. If aquaria and ponds were separated in the legislation then the types of aquatic life that can be kept in an aquarium could be separated from the types of aquatic life that could be put in a pond.

4 j. Quarantine and Risks of Disease Incursion: Aquaria Versus Ponds

Quarantine in its broadest sense is the physical containment of living organisms such that they will not present a threat to living organisms in the surrounding environment. In a comprehensive review of quarantine policies and practices

relating to living aquatic animals including ornamental fish, Humphrey (1995) concluded that the placement of imported ornamental fish in aquaria provided a high measure of quarantine security, compared with placement in ponds or locations which had immediate access to natural water bodies and that the holding of imported ornamental fish in aquaria presented a lower threat of disease incursion compared with fish held in non-aquarium situations.

4 k. Current Federal Legislation

Environmental Risk Assessment for Introduced Exotic Ornamental Fish has been changed regularly over the years and the responsibility now resides with Department of Environment and Heritage (DEH) and Biosecurity Australia (BA), Department Agriculture Fisheries and Forestry (DAFF) where the mechanics for change are the Environment Protection Biodiversity Conservation Act 1999 (EPBC Act) and the Quarantine Act 1908. These departments have environmental and disease risk assessment processes that are slow and cumbersome.

4 l. The EPBC Act and current assessment system

The EPBC Act has finish times built into it and is useable but Biosecurity Australia have no guarantees and put ornamental fish on a low priority rating that makes them likely to remain on the bottom of the list un-assessed. This BA process that does not have finish or result times is likely to be a contributing factor in the unrest among aquarium fish keepers that result in unlawful behaviour when they see there is no legal pathway to access the latest discovered species.

A contemporary model to evaluate the risk to the environment following the introducing exotic ornamental species is now available (Bomford and Glover 2004). This risk assessment model determines the likelihood of the species in question to establish in its new environment. The Bomford assessment score system concentrates on the risk of establishment in natural Australian Waters.

4 m. Current NT Legislation

Currently it is illegal to release fish including ornamental species into natural waterways, however, fish can be released with impunity into outdoor ponds as these are classified as “Aquaria” under existing legislation.

4 n. Proposed Education for Exotic Ornamental Fish Species

A public education system could be put in place to advise and inform the public that there are two classes of ornamental fish; Aquarium and Pond fish. Make the education system about the difference between pond suitable fish and an aquarium suitable fish. Make the education system concentrate on the risks that ornamentals pose to the environment and the aquaculture industry in relation to environmental damage, disease, and translocation issues. The public education system could give reasons and directions for people to dispose of unwanted water and fish correctly. This will educate and put the onus on the fish keeper to be responsible. Currently there are posters and campaigns in other jurisdictions

but not much in the NT in the way of education material that is attractive to aquarists. A good public education campaign with interest to hobbyists will not make it reliant on the average person to read the Fisheries Act and Fisheries Regulations. It is the belief of the authors that Aquarium Traders would support and promote such a program.

4 o. Unwanted Fish

The system at present will not allow anybody to return unwanted fish to the point of sale. Aquarium fish keepers need an easy place to dispose of unwanted fish. Even though unwanted fish cannot be bought back from the owner by the licensed Aquarium outlet, the fish owners do need a place to dispose of the unwanted fish. It is the belief of the Authors that people with unwanted fish they can't give away will release them to a natural water body instead of the unbearable thought of actually killing their pets.

4 p. Consequence of Banning Ornamental Fish Species

If banning most species is attempted, less fish will come in through the licensed and regulated channels, instead the trade in fish will move away from licensed operators where disease issues can be monitored to unlicensed operators with no regard for the rules. The reptile trade when banned from the mid 1970's went to organised crime and no control over disease was possible. If Fisheries prohibits a large number of ornamental species for ease of administration the trade will be pushed underground thus causing many more opportunities for disease and feral introductions. Queensland regulators once moved to cancel many species of fishes from the ornamental list. The Cichlid clubs warned that any species that were in their possession that were removed from the allowable list would end up released in natural waterways. Environmental Terrorists or fish keepers so frustrated by the system that they were prepared to make these threats? Their cichlids are very valuable and safe while in an aquarium. It is hard for people to contemplate not having the fish they want when they are kept safe in an aquarium. They believe it is unfair to treat the whole population the same as the lowest level of moron.

5. Conclusions

The ornamental aquarium fish trade will not go away. If administrators deem that banning federally approved fish species is the best way to safeguard the environment, it is likely to get an ugly reaction from community as happened in Queensland in the 1990's when the Government of the day tried to licence all hobbyists and reduce the numbers of species available. Threats were made to Government that all the banned species would be placed in natural waterways and all hobbyists threatened to apply for Aquaculture licences that would have clogged the administrative sections of offices at a state and local government level.

The Territory enjoys a privileged position with respect to its relatively unspoilt aquatic environment, in particular, freedom from many noxious ornamental fish species that have cause major ecological disruption and which have resulted in the incursion of serious diseases in other areas of Australia and elsewhere (Burns Letter 23 June 2003).

A large section of the Northern Territory community depends on this unspoilt healthy aquatic environment for social, economic and scientific purposes.

It is of the utmost importance that the aquatic environment of the Territory be protected from the establishment of noxious ornamental fish species.

The Territory is in a good position to introduce simple changes to legislation and to implement a public education program to help control noxious fish releases whilst at the same time offering unrestricted access to non-noxious species.

Prohibiting the keeping of fish that are freely available elsewhere in Australia will not stop them coming into the NT. Banning the trade drives it underground where it is impossible to regulate or police.

The definition of a "pond" as an aquarium is inconsistent with sound quarantine practice with respect to prevention of establishment of noxious exotic ornamental species and/or incursions of disease.

A contemporary environmental risk assessment model exists for evaluating the risks posed by exotic ornamental fish should they gain access to natural waters. If the definition of aquarium can be split away from the definition of a pond then the ornamental species that can be used in each situation can be split into those that can only be maintained in an aquarium (i.e. secure environment) and those which may be kept in a pond (i.e. non-secure environment).

A public education program for aquarium species could be introduced and could be funded by various Enviro funds, National Heritage Trust or even the Rural Industried Research Development Corporation. Most things that are wanted by a majority of the community are regulated by education programs (eg. motor vehicle use, drinking alcohol, firearms use). If more ornamental fish species are

banned it is likely that a community awareness campaign of a different nature could be started. Something like “I keep fish and I vote”.

Politicians that are our law makers should look at the figures in the general population as they relate to fish. The PIAA has researched the community’s habits and concluded that 64% of Australians have pets, 30% of all pets are fish. After dogs and cats fish are the most popular pet.

The public education program could be run through ornamental fish outlets and cover things such as disease management in ornamental fish, water management from diseased fish, quarantine of new fish, disposal of unwanted fish, pond security, pond management in flood prone areas.

The way things are at the moment there will eventually be more feral fish species each year.

Recommendations

- That the definition of aquarium and pond relating to ornamental fish in the legislation be split apart to two different definitions. Ponds and aquaria.

- All the species that are allowable imports as per section 303EB of the EPBC Act should be run through a risk assessment system (such as Mary Bomford's system). This will give two groups of fish, those that pass below a predetermined acceptable theoretical risk level, and those that pass above it. At this point, historical use and species history within the NT would need to be considered with a view to granting pond status to some species even if they have passed above the acceptable risk level. An example of this would be gold fish as they have been in the NT since the beginning and have never posed a problem as it is too hot here in the top end and there is not enough water around the town of Alice Springs.

- That all native endemic species and exotic species that pass a risk assessment below the predetermined risk level, be allowable as pond or aquarium fish.

- That all the fishes on 303EB EPBC Act that pass above the acceptable risk level and natives not endemic to the NT be allowed to be used as aquarium fish only.

- That a public education program be initiated covering knowledge about owners' responsibilities for the correct handling of ornamentals, their water, diseases, translocation and their disposal.

- That the ornamental fish species be divided into aquaria and pond suitable species within the legislation.

- That the general population is encouraged to return unwanted fish to a lisenced retail outlet for proper disposal.

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