National Centre for Marine Conservation and Resource Sustainability

Submission on the:
Quarantine and Biosecurity Review – Issues Paper

April 2008

UTAS The Australian Maritime College is an institute of the University of Tasmania

Preface to submission

This document represents a joint submission of academics at the National Centre for Marine Conservation and Resource Sustainability of the Australian Maritime College[1]. Collectively, we have provided significant contribution to the marine biosecurity and quarantine systems of several countries including Australia, Chile, Ecuador, New Zealand, Palau, the United States of America, and others. We come from multiple different perspectives on quarantine and biosecurity relating to the marine environment spanning from wild capture fisheries, aquaculture farms, natural environment, and the social context including societal, cultural and economic values. Participants in this submission are identified in Appendix 1 for your consideration.

Our submission follows the format of the document, *Quarantine and Biosecurity Review - Issues Paper*, addressing aspects of the document for which we have comment.

[1] The Australian Maritime College became a specialist institute of the University of Tasmania as of 1 January 2008.

PART A – INTRODUCTION

No comment

PART B – CONTEXT AND BOUNDARIES

B1. Quarantine and biosecurity

12. We note that the use of the term 'pest' in the definitions of **biosecurity** and **quarantine** is problematic providing opportunity for a subjective overlay in the quarantine and biosecurity system. The term "pest" infers a judgement of significance in terms of either direct impact assessment or evaluation of risks but note that unless explicitly defined in quantifiable and measurable terms, the use of the term will remain pejorative and a point of contention.

As defined here, the quarantine system may be interpreted as not taking into account the protection of the environment, despite the statement in the Scope of the Review that indicates this is not the case. This issue frequently arises in application of the Office International des Épizooties; (OIE) and International Plant Protection Convention (IPPC) codes and should be addressed explicitly. ***Scope of the Review***

14. The review's scope is limited to exotic pests and diseases and will not address the spread within or between states, of endemic pests and diseases. While the definition of **established** is provided, the determination is unlikely to occur in a timely fashion in the marine environment where baseline information is restricted. Many marine invasions appear to be restricted within Australia and transfers of these species may result in significant expansions of range. Similarly, the strongly defined provincial boundaries in Australia suggest that many native species can become introduced (ie transferred by human agencies) in regions of Australia. The prime example of this is the transfer of *Caulerpa taxifolia* from Queensland to New South Wales and South Australia.

16. The changing trade patterns and alteration of pathways of introduction in the marine environment are, at first view, not represented here. We provide the following Table (Table 1) for consideration of some of the vectors of introduction in the marine realm.

We note that the increase in trading activities, specifically the formulation of free trade agreements opening up new opportunities, considers terrestrial biosecurity risks, however the opening of marine transport corridors to our knowledge are not considered in the negotiations. It is worthy to note that Australia's export activities increase the risks associated with ballast water and hull fouling (biofouling) transport.

Table 1 List of international and domestic pathways of relevance to marine biosecurity (from Hewitt et al 2004).

Category	Pathway
Ships	Ballast water and sediments
	Hull fouling
Moveable structures	Solid ballast
(Oil platforms, barges, dredgers, floating docks)	Hull fouling
	Ballast water and sediments
Other craft	Hull projections and cavities
(Merchant, fishing and recreational/leisure)	(sea chests, thrusters and internal piping)
	Hull boring
	Aquatic cargo (wells and tanks)
	Anchor/anchor chains/lockers/moorings
	Scuppers and bulwarks
	Small craft trailers
	Dredging spoil
Aquaculture fisheries	Intentional release and stock movements
	Accidental release
	Gear movement
	Discarded nets, floats, traps
	Discarded packaging materials
	Discharge of feeds (live, fresh and frozen)
	Release of transgenic and GMO species
Wild fisheries	Stock movement
	Population re-establishment
	Processing of live, fresh and frozen products
	Live and fresh frozen bait movement
	Gear and transport media (water) movement
	Discarded/lost fishing gear
	Discard of target and non-target species (bycatch)
	Live trade for consumption: accidental/intentional release
Aquarium industry and public aquaria	Intentional release
	Accidental release
	Untreated aquarium and waste discharge
	Living food movement
Marine leisure tourism	Live bait and fresh frozen movement
	Accidental/intentional transport and release of fishing catch
	Diving gear movement
	Fishing gear (including boots) movement
Research and education	Intentional release
	Accidental release
	Water and waste discharges
	Living food movement
	Diving gear movement
	Field and experimental gear movement
	Restoration, mitigation and rehabilitation
Other	Alteration of water courses and flow regimes
	Irrigation canals (including saline ponds)
	Municipal and other waste/water treatment discharges

B2. Australia's system

We note that the Australian system for marine biosecurity and quarantine is immature in relation to its terrestrial counterpart and a generic concern is that the lack of baseline knowledge of what currently exists in Australia, what impacts are likely to occur in marine systems and the lack of information about potential pests overseas. Similarly, the definition of ALOP in the marine context is poorly defined and largely focussed on economic resources such as wild capture fisheries and aquaculture.

PART C – ISSUES FOR CONSIDERATION

C1. Risk across the quarantine and biosecurity continuum

Australia's quarantine and biosecurity requirements are too low in some areas, resulting in high risk of introduction of exotic pathogens and the accidental introductions of environmental pests. An example of an area where the risk of introduction of exotic pathogens is high is ornamental fish import (Chong and Whittington 2005), where a wide range of species is imported live, relying on certification issued by the exporting country. Similarly, ALOP is poorly defined for environmental, social and cultural systems.

While ALOP may be understood in the terrestrial context, it is not applied in a consistent way across ecosystems or transport pathways. Some sectors have higher risk management expectations resulting in higher demands for quarantine and biosecurity control. For example, researchers and research institutions have a high burden, despite possibly representing low risks, whereas others (eg ornamental fish) have fewer limitations or obligations though the risks are likely to be much greater.

The wider implications should always be taken into account when establishing quarantine and biosecurity arrangements. These implications, to exporters, consumers and the economy, should only be taken into account in the context of the role of quarantine and biosecurity for the wider community interests. Protection of Australia, from exotic species such as pathogens and pests, should be the main priority following the protocols of biosecurity. The other implications should come into consideration in a secondary fashion. Each exporter or consumer claim would have a counterclaim from our local industry and other consumers. If imports are allowed to please exporters and consumers they may have detrimental effects on the existing primary industries and as a result have a long term negative impact on Australian economy. Some of the claims from consumers are simply based on price with no understanding of product quality and human health implications and implications for Australian industry.

Australia's current approach to quarantine and biosecurity is laudable on the world stage, however its application varies across sectors. If applied correctly, the benefits to Australia include:

1) Economic benefits: disease and pest free industries leading to increased access to overseas markets, higher quality products with better

marketability, lower production costs for agriculture and aquaculture (savings due to the lack of need for control or treatment for the exotic pathogens). Transparent treatment from trading partners with equivalent sense of biosecurity concerns.

2) Environmental benefits: maintaining Australia's unique biodiversity and distinctive habitats, resulting in functional ecosystems that provide a robust resistance to changing climates. This may also result in continued ecotourism and aesthetic benefits.
3) Social and cultural benefits: the aesthetic and connectedness of communities to pristine communities which have no introduction of exotic pathogens and pests.

It is now well understood in the Australian community that quarantine measures can only be applied to the extent that they are necessary to protect human, animal or plant life or health that they are the not more trade restrictive than required, and that they may not be used as industry protection mechanisms.

In many cases, Australia's risk assessments (including import risk analyses) assess competently and comprehensively risk and risk management issues when providing advice on market access requests and import applications. These risk assessments usually provide all definitions needed for interpretation (for example what "negligible risk" means). However, there are some cases when the risk assessment is questionable; for example, the ornamental fish risk assessment insufficiently accounts for the risk which is much greater than assessed and the resulting risk management is inappropriate.

The quarantine and biosecurity framework may not be adequate to analyse and manage risks to the environment. There are a lot of risks to environment and wildlife which are not fully understood or taken into account. There is a lack of research in this area. Risk assessments for accidental or unintentional introductions, or for transport vectors and pathways in the marine environment, specifically resulting in environmental, social or cultural impacts, require more attention. Currently Biosecurity Australia does not have skills/ability to analyse and manage those risks.

In general, the risk assessments in Australia appear to be taking a significant amount of time, although these timeframes are similar to the rigorous assessments undertaken overseas.

There is a need for multidisciplinary input from a wide range of experts to assess threats to Australia's marine environment, aquaculture and fisheries arising from bio-fouling on ships' hulls and organisms in ballast water. The current focus of quarantine and biosecurity framework is border control. Ballast water is currently addressed under the IMO framework, however domestic transfers of ballast water, including the secondary and tertiary ports of call where international ballast water may be transported and discharged, may require a stronger relationship with States. The biofouling regulatory framework is currently soft and needs to be much more rigorous at the State, national and global scale. This should be equivalently applied across the commercial and recreational sectors.

Risk analyses, import policy determinations and permit conditions are usually sufficiently updated through monitoring of actual experience in the application of risk management measures in many sectors, however the accidental and environmental impacts are poorly assessed and monitored. In many instances, policy and regulatory agencies are unaware of research results that can feed into risk analyses, import policy determinations and permit conditions. Clearer, more transparent, communication between researchers and policy agencies need to be established for the marine system.

The arrangements for sharing pest and disease information between Commonwealth, the States and Territories and industries working well, at least most of the time. These arrangements and emergency response plans for aquatic environment have been significantly improved after the mass mortality of pilchards caused by pilchard herpesvirus (Whittington et al 1997, Hyatt et al 1997) resulting in **AquaVet Plan**, followed by the outbreak of the black striped mussel, *Mytilopsus sallei* (Bax 1999; Willan et al 2000) resulting in the **National System for the Prevention and Management of Marine Pest Incursions**. While Australia's emergency response plans for exotic diseases (AquaVet) may be adequate on paper, in reality the response is inadequate, for example slow and inadequate response to the abalone herpesvirus outbreak in Victoria, which was potentially caused by an exotic pathogen. Even if the pathogen was not exotic, fast response would most likely reduce the spread of the virus.

The current cost-sharing arrangements between Commonwealth, state and territory governments and affected industries, that apply in the event of a pest or disease incursion, are not appropriate. For example, the cost sharing agreement for culling down of aquaculture stock appears to be lacking, resulting in (at least in some States) a reluctance to order compulsory slaughter. Again, the outbreak of herpesvirus in abalone is a good example, in this particular case an immediate compulsory slaughter could have prevented spread of this pathogen.

Similarly, the National System for the Prevention and Management of Marine Pest Incursions remains a work in progress with the relationship between States and Territories and the Commonwealth government still to be finalised. The management of incursions has significantly restricted the scope of its activities, largely as a result of poor funding, resulting in a limited number of responses. The example of the *Caulerpa taxifolia* incursions in New South Wales and South Australia is a significant failure of the system. The arrangements for incursions with a principally environmental impact do not seem to be appropriate or adequate.

C2. The legislative framework

The current roles and responsibilities of the Commonwealth and the states and territories appear to be well understood and operating effectively, with the exception of the **National System for the Prevention and Management of Marine Pest Incursions**, as stated previously.

The human health aspects of the Act should be removed and placed into a separate (new) Act administered by the Department of Health and Ageing. This would be more appropriate as there should be more human health expertise there. However, a good flow of information between the departments would have to be ensured to efficiently deal with any zoonoses. It is imperative to note that the management of living vectors will still be managed by the Act and the risk assessments underpinning pre-border and border control will need to access the human health expertise.

An import permit should be used to restrict a product from a particular region in Australia if it is determined on a scientific basis to be regionally free of a pest or disease, while still allowing general access to the Australian market. At times there is a legitimate need to protect one region more than others. In many other countries biosecurity risks are managed on regional scales and it appears to be working well. There are numerous examples, including some in Australia where the appropriate use of disease free or high risk regions worked very effectively. This is not only because of trade access (so the protected area can still maintain its disease free status and market access) but also to manage disease outbreaks or endemic species absent from other areas.

This infers that Australia will establish internal borders for management. These "borders" should be established keeping in mind natural barriers and provincial breaks that may result in limitations to spread. This would also provide a basis for managing internal introductions of species (such as *Caulerpa taxifolia*).

C3. Jurisdictional and institutional arrangements

The contributors of this document cannot agree on the jurisdictional arrangements. The disease and pathogen perspective is that the current approach is sufficient, and the roles and responsibilities of AQIS, Biosecurity Australia and the Product Integrity Animal and Plant Health Division, should not be integrated.

In contrast, the environmental and pest experts feel that a new statutory authority, bringing together the quarantine and biosecurity functions across the range of activities, much like Biosecurity New Zealand, would better serve Australian interests and allow a transparent funding balance, while reducing the competition and duplication in the public sector.

It was felt that a new statutory agency should not be embedded in DAFF as it would necessarily need to work across sectors and should not be unduly influenced by economic drivers associated with the primary industries.

An independent public servant or statutory authority should have the ultimate decision making power on risk policy and import permits. This is to avoid any conflict of interest, political bias and point scoring with industries/stakeholders.

The joint responsibilities of facilitator and regulator create unacceptable conflicts within the Department and should be reconciled by isolating the responsibilities into separate sections, or through the establishment of a statutory authority for regulation, and leaving facilitation to other agencies (such as DAFF and DFAT).

C4. Culture, efficiency and resourcing

There are some cases where private facilities are not effective as quarantine and biosecurity system. For example, they are used for ornamental fish, but the conflict of interest (the same people who are managing the quarantine and biosecurity are the ornamental fish industry selling fish) and complexity of potential issues (a wide range of fish species, pathogens and diseases) can result in not enough attention paid to quarantine and biosecurity issues. However, in some other cases where the issue is simple (for example imported baitfish for feeding of farmed Southern Bluefin Tuna – prevention to stop introduction of VHS) and requirements are easy to follow, private facilities can work very well. The same applies to the monitoring, auditing and supervision – in the straightforward cases these are effective but in more complex ones there is a need for much more training of the people involved and an increase in the monitoring, auditing and supervision.

There is a pervasive and generic problem with a lack of training. AQIS staff generally demonstrate a poor understanding of biosecurity issues across the range of ecosystems and work to a suite of rules. For example, histological slides (fixed and processed) or histological blocks (tissue fixed, processed and embedded in paraffin) are considered to be a serious risk, despite the fact that these research tools are fixed (dead) and therefore represent no risk. Similarly, specimens that are in formalin or ethanol present no risk. There is a need for more education and training in the area of biosecurity, quarantine and exotic diseases. Additionally, there is a need for skills in identification of different organisms, for example different species of ornamental fish. This requires funding and an increase in control and inspection of the personnel.

There are strict requirements for diagnostic laboratories and containment facilities, which are adequate to stop spread of exotic pathogens and pests from these facilities. However, there is always a need to improve our ability for the detection of exotic pathogens and pests.

C5. Communication and consultation

The relevant communities understand that Australia's ALOP is very low, but not zero.

Many existing communication tools provided to AQIS personnel are misinterpreted by the target audience. Instead of raising awareness of exotic diseases they appear to give the false sense of security of being able to diagnose exotic diseases. While they are made with best intentions, they are often seen as diagnostic guides. Similarly, pest awareness sheets for marine species are not intended as diagnostic information for AQIS personnel.

TV shows (such as Border Security) are much more effective in raising public awareness without providing false expectations. Simple messages work better than information overload.

Consultative arrangements for risk analyses are ineffective, often times the opportunities to respond are limited, resulting in inadequate consultation. Targeted consultation of experts and stakeholders may provide an additional method for improving the risk assessment process.

C6. Research

Any research itself even if successful is not effective, the effectiveness results from its application and uptake by stakeholders. The uptake of research by stakeholders is not under the researchers' control. That means that effectiveness of research on quarantine and biosecurity issues can be only evaluated on the basis of final reports and publications arising from this research.

Insufficient funding is available for research on quarantine and biosecurity, with many funding opportunities having unrealistic costs structures or timelines. Similarly, the distribution of the research effort is not equal across sectors and a significant focus on terrestrial issues over aquatic.

An example is research on ornamental fish diseases. Iridovirus was most likely introduced to Australia with dwarf gouramis (ornamental fish imports) and caused mortalities in Murray cod (Go et al 2006, Go and Whittington 2006). The proposal for funding to continue this research (develop diagnostic test) was initially unsuccessful and only recently received funding. Ornamental fish are most likely carriers of many other pathogens which are lethal to Australian fish. However, there is a lack of research investigating those issues. Funding applications (even those supported by ornamental fish industry) were rejected in the past on the grounds that "it was not a proper industry".

Research priorities should be evaluated both by stakeholders and research providers. This should include government departments, industries and scientists. It should be noted that CSIRO is not necessarily the automatic scientific representation, nor does it represent the appropriate scientific knowledge. Research priorities could be then establish and reviewed by DAFF or the relevant agency.

Information from research activity is not incorporated into Australia's risk management measures very effectively. The information on risk of introduction of exotic pathogens and species with imports of ornamental fish has been scientifically documented (Chong and Whittington, 2005, Go et al 2006, Go and Whittington 2006), however it has not been incorporated in ornamental fish risk management. Similarly, risks associated with vectors leading to accidental marine introductions does not incorporate much research.

Taxpayers and stakeholders should cover costs of research (there is a lot of common good in the quarantine and biosecurity research), particularly for risks to environmental, social and cultural impacts. Some of the costs should be also covered by interested industries - if possible indirectly - through appropriate Research and Development Corporations or other funding bodies to avoid any potential research bias). While the exacerbator pays rule is appropriate when the exacerbator can be identified, in many instances the specific industry that led to the problem is unidentifiable. In contrast, identification of those who benefit from research may also provide cost sharing partners.

C7. Review

The existing monitoring and review mechanisms for many aspects of the quarantine and biosecurity policy and operations are reasonable. The reviews should be conducted by experts in the area with a track record and international recognition. Efforts should be made to attract the widest possible expert groups.

Monitoring should be undertaken both at the border (and at junctions across internal borders) as well as monitoring associated with vector management breakdown in support of risk assessments and management evaluations.

Monitoring should fulfil two primary purposes: the early detection of incursions in support of a post-border management and control system; and the evaluation of the appropriateness of regulatory and policy frameworks resulting in management strategies. In order to achieve either of these goals appropriate funding is necessary to undertake the basic research to determine how monitoring should proceed, what level of detection is necessary to underpin the defined ALOP, and the baseline against which change can be evaluated.

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Appendix 1 - Personnel

Academic Staff	**Areas of Expertise**
Professor Chad Hewitt	• Marine Biosecurity • Invasion Ecology • Marine Ecology • Invertebrate Zoology
Assoc Prof Marnie Campbell	• Introduced marine species • Marine Ecosystem restoration • Ecological Risk Assessment and Analysis • Marine protected area establishment and efficacy
Assoc Prof Barbara Nowak	• Aquatic Animal Health • Aquatic Animal Health Risk Assessment • Aquaculture Biosecurity • Salmon Diseases • Tuna Diseases
Dr John Purser	• Feeding and Activity Rhythms in Fish • Development of Technologies to Optimise Feeding • Fish Behaviour • Marine Fish, Salmonid and Seahorse Culture Techniques
Dr Christopher Bolch	• Algal Culture and Ecology • Algal Molecular Biology • Harmful Algal Blooms • Population Genetics and Marine Biogeography • Ballast Water and Introduced Species
Dr Melissa Nursey-Bray	• Natural Resource Management Policy and Planning • Marine Management, especially Marine Protected Area and Multiple Use Management • Indigenous Resource Management • Community Based Planning and Management • Property Rights in Marine and Fisheries Contexts