

# SENATE ENQUIRY INTO ENVIRONMENTAL BIOSECURITY REVIEW

## Response on behalf of the DEPARTMENT OF FISHERIES, WESTERN AUSTRALIA 8th October 2014

### INTRODUCTION TO AQUATIC BIOSECURITY

Pests and diseases are some of the most significant threats to the world's aquatic environments damaging the economy, environment, social amenity and human health.

The Department of Fisheries is the lead agency in Western Australia responsible for aquatic biosecurity, and aims to minimise the negative impacts of aquatic pests and diseases in marine- and fresh-waters through prevention, eradication, containment and targeted asset protection actions. In partnership with industry and community, the Department uses a risk-based approach to ensure cost-effective and efficient management.

Unlike terrestrial biosecurity where there is a higher chance of containing a detected pest (such as in cargo, or on farms), aquatic pests and diseases are often found in open or semi-open systems where containment is highly problematic. To have any chance of preventing establishment, aquatic pest or disease incursions must be dealt with in the earliest stages of arrival. Indeed, to date there has been no known successful eradication of an established marine pest anywhere in the world. Therefore to maximise outcomes and return on investment, the key focus of the Department is on prevention of aquatic pests and diseases arriving and establishing in WA (see Figure 1).

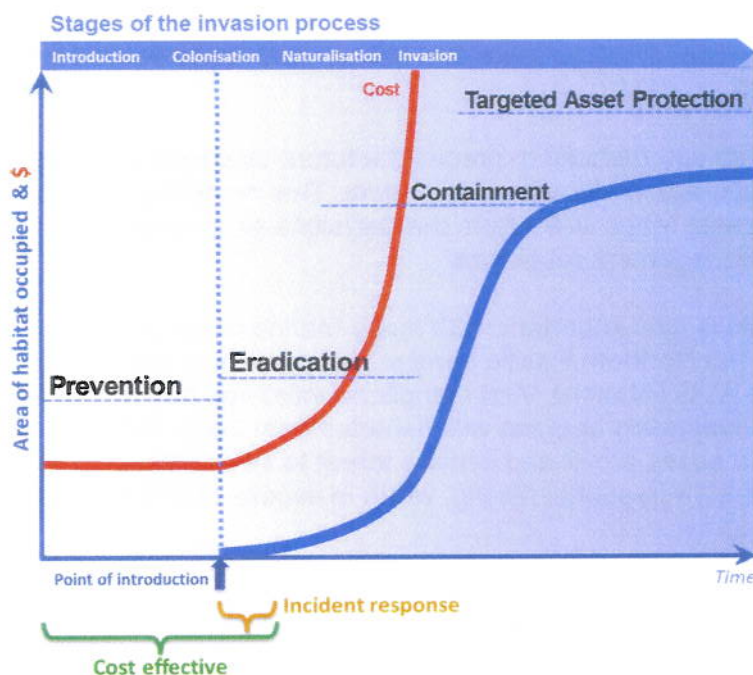


Figure 1: Illustration of stages of the invasion process and relative costs of mitigation.

## **WHAT ARE OUR (WAs) RISKS?**

### **Vectors and pathways**

The Department targets the main pathways of introduction for aquatic pests and diseases from overseas and domestically. These include:

- The biofouling and ballast water of vessels and moveable equipment, including illegal vessels and 'ghost' nets.
- Ornamental fish trade (through retail, translocation, waste discharge, packaging)
- Aquaculture (commercial, non-commercial / aquaponics, pearling, and feeds)
- Food trade (frozen and live seafood, intentional release, waste discharge)
- Recreational fishing (baits, fishing gear, intentional release)

To date most aquatic pests detected in WA are thought to have arrived either via biofouling on vessel hulls in the marine environment (such as Asian green mussels and the white colonial ascidian *D. perlucidum*), and through accidental or deliberate release of ornamental fish species (such as pearl cichlids) in the freshwater environment.

In addition to identifying and managing the highest risk vectors and pathways, the Department has also identified and listed the marine and freshwater pests and diseases from which it considers the State is at most risk. This 'Priority List' of species includes most of the species on the national list.

The Department has undertaken research and published a paper on the likelihood of a range of international ports being the source of any the priority marine pest species. This informs the risk assessment of vessels coming into WA waters from these sites.

In addition to this, the Department has commenced the development of maps showing high value and high risk assets for WA, including marine protected areas, world heritage areas, core areas for aquaculture and fishing, and areas around intake pipes for desalination plants.

Dispersion modelling has also commenced to predict the future dispersal and spread of pests such as the white ascidian *Didemnum perlucidum*. This modelling, overlaid by the high value/high risk asset maps, will inform the decisions as to where to allocate future biosecurity management resources.

Domestic movement of pests is also important, with many marine pests present in the eastern states, such as the Northern Pacific seastar, not present in WA. Similarly, the severe abalone disease AVG (Abalone Viral Ganglioneuritis) has had outbreaks in Victoria and Tasmania, devastating abalone wild fisheries from 2005-2010. Translocation of this disease poses a real and serious threat to WA abalone aquaculture, wild fisheries and recreational fishing, worth in excess of \$13.8 million per annum.

## **HOW DO WE (WA) RESPOND TO THESE RISKS?**

### **Port monitoring**

In order to have a chance of eradication of any pest that becomes established in the marine environment, it is imperative to understand what pests (if any) are currently

present, and have 'early warning systems' in place. The National System identified 18 high risk areas around the country that required monitoring for marine pests. In WA this includes Fremantle, Dampier, and Port Hedland, which have comprehensive monitoring regimes in place. The Department has also identified, and now regularly monitors, an additional seven high risk sites.

WA also assists in the development and implementation of the National System for the Prevention and Management of Marine Pest Incursions (National System).

### **Response to newly detected incursions**

Rapid detection and response is critical to maximise the chance of preventing a pest establishing in the aquatic environment. Developing new surveillance and rapid detection methods is a priority for further research. For example, WA launched the citizen science mobile application "WA Pestwatch", a mobile phone, tablet and online pest reporting and mapping tool, which enables the public to quickly and effectively notify the Department if they find a suspected pest.

The Department also has biosecurity research focussed on developing rapid and accurate molecular tools, i.e. DNA based identification systems, and improving marine monitoring techniques.

### **Biosecurity incident response**

The Department has developed a Biosecurity Incident Management Protocol, for pest and disease responses. Further documents will fit within this protocol, including training manuals, standard operating procedures for routine situations, and species action plans for priority species.

At the national level, WA is also a signatory of the Intergovernmental Agreement on Biosecurity.

### **Pest Detections**

Since the Aquatic Biosecurity program was launched at the Department in 2011, there have been over 20 detections of high risk marine and freshwater pests which have required management responses. Several of the marine species below are identified as high risk and of national significance, and hence reportable to the national Consultative Committee on Introduced Marine Pest Emergencies (CCIMPE):

#### **Marine:**

- Asian green mussels, *Perna viridis* – 8+ detections on vessels 2013 – 2014, near Barrow Is and Fremantle
- Brown mussels, *Perna perna* – detected on 2 vessels 2013-2014
- Green lipped mussels, *Perna canalicula* – 2 vessel detections 2013
- Asian paddle crab, *Charybdis japonica* - 3 detections in Swan River 2012-2013 caught by recreational fishers. Full incident response mounted, 4 trapping campaigns, large ongoing awareness raising campaign, ongoing monitoring, no further detections.
- White barnacle, *Amphibalanus improvises* – on vessel 2013, treated.
- Colonial white ascidian, *Didemnum perlucidum* – first detected 2010, unfortunately now wide spread around WA via vessels. State cross agency working group focussing on high value asset protection.
- Introduced barnacle, *Fistulobalanus kondokovil* – on vessel near Dampier in 2013, removed

#### **Freshwater / Estuarine:**

- Convict cichlid, *Cichlasoma nigrofasciatum* – now eradicated
- Murray cod, *Maccullochella peelii* – now eradicated.
- Eel tailed catfish and red spot disease, *Tandanus tandanus* and *Pseudomonas anguilliseptica* – over 2000 fish removed by trapping, large comms, eradication attempts in progress 2014.
- Platyfish & freshwater snail, *Xiphophorus maculatus* and *Planorbella* spp. – current part of a project using predator native species to control.
- Indistinct river shrimp, *Caridinia indistincta* (detection, comms response).
- Pearl cichlids, *Geophagus brasiliensis* – Swan & Canning Rivers, unfortunately now established in parts of the river, control actions have been taken to prevent spread to other catchments

The impacts of these pests are varied, potentially impacting: -

- Economically – through fouling of water intake pipes at powerplants, fouling aquaculture facilities such as pearling, damaging tourism
- Environmentally – outcompeting native species and reducing biodiversity, degrading habitats; and spreading diseases
- Socially – reducing social amenity, and creating significant human health issues.

### **WHAT ARE THE RESIDUAL RISKS & HOW CAN THE COMMONWEALTH ASSIST**

Primarily, we see as the top priority across Australia the need for more consistency and streamlined processes to manage biosecurity risks. In particular, greater consistency regarding:

- The criteria and processes used to determine import risks;
- The criteria to identify and prioritise key pest species. Numerous lists exist at the national level, which causes confusion for stakeholders, and inconsistency between jurisdictions. An agreed prioritisation process across Australia would provide jurisdictions consistency and transparency, while still having the flexibility to have a species list specific to that area;
- tools used to risk assess aquatic species, vessels and other risks;
- the identification and mapping of national high value and high risk assets;
- Incident preparedness, for example training of staff and the presence of compliance staff varies greatly between jurisdictions;
- Response protocols and species action plans; and
- communication processes and information management across jurisdictions regarding pest detections;
- biosecurity messages and awareness raising to all stakeholders, for example - vessels should be clean before arriving in Australia
- Treating industry as a collaborative partner, where Government and industry work together to resolve biosecurity challenges. With over 10,000 vessel movements annually in WA alone, working with stakeholders is imperative.
- Port monitoring - unfortunately, despite identifying national high risk ports, to date the eastern states do not have monitoring regimes in place. This means pest risk of these ports is unknown, and poses a risk for other Australian ports through biofouling on domestic vessels.
- Potential cost-recovery mechanisms from beneficiaries and risk creators

Secondly, there is an urgent need for increased biosecurity research at the national level. The continuing growth of shipping suggests risks of introducing marine pests from vessel movements will only increase. To minimise disruption to shipping and

related economic development, more research is needed into rapid pest detection technologies, such as DNA analysis, so detected pests on vessels can be confirmed and managed quickly. National research is also needed to provide real and practical aquatic pest control options for stakeholders, such as aquaculture facilities and vessel managers.

Thirdly, greater biosecurity legislation is needed at the national level to provide sufficient regulation of key risk factors such as biofouling. Vessel ballast water is managed at the national level, however there is currently no national legislation in place to manage biofouling of vessels or equipment at the national border. As biofouling is thought to provide the vast majority of marine pests vectored by vessels, up to 75%, it is the most significant risk of marine pest incursions. Therefore a consistent and high level approach to regulation and management across Australia is urgently needed.

There are also inconsistencies across the states with the standard and level of domestic ballast water management, despite this being a significant risk of spreading pests such as the Northern Pacific Seastar, found in Victoria, to other states including WA.

Lastly, biosecurity management of freshwater pest fish is not so well established at the national level as it is for marine. There are nationally 38 introduced fish species in freshwater environments, mostly (68%) aquarium-related species. Responses to new detections of freshwater pest fish are not nationally prioritised or coordinated and are unlikely to be adequate, under current arrangements. National monitoring or data sharing is needed, as are national mechanisms to capture and analyse data on freshwater fish incursions. The non-existence of a Consultative Committee to report to and discuss new freshwater fish incursions is a significant gap.

## Attachment 1: Aquatic Pest Incursions

### Marine Pest incidents

- **Asian green mussels, *Perna viridis*** – 8+ detections on vessels 2013 – 2014, near Barrow Is and Fremantle. (full incident response, vessel risk management, monitoring, awareness raising, resolved 2013, lessons identified with industry)
- **Brown mussels, *Perna perna*** – detected on 2 vessels 2013-2014 on vessels
- **Green lipped mussels, *Perna canalicula*** – 2 vessel detections 2013
- **Asian paddle crab, *Charybdis japonica*** - 3 detections in Swan River 2012-2013 caught by recreational fishers. Full incident response mounted, 4 trapping campaigns, large ongoing awareness raising campaign, ongoing monitoring, no further detections.
- **White barnacle, *Amphibalanus improvises*** – on vessel 2013, treated.
- **Colonial white ascidian, *Didemnum perlucidum*** – first detected 2010, unfortunately now wide spread around WA via vessels. State cross agency working group focussing on high value asset protection. (response, research, monitoring, treatment options developed)
- **Introduced barnacle, *Fistulobalanus kondokovi*** – on vessel near Dampier in 2013, removed

### Freshwater pest incidents

Pest Species	Detection	Response	Outcome
<b>Convict Cichlid (<i>Amatitlania nigrofasciata</i>)</b>	First and only detection in WA was in 2011 in a lake adjacent to Waterledge Road in Thornlie.	Removed by fyke netting. Three follow up surveys confirmed no further convict cichlids present in the lake	Eradicated from the natural environment in WA
<b>Murray Cod (<i>Maccullochella peelii</i>)</b>	Only confirmed detection in WA in recent decades was in Harmony Lake, Atwell	Removed by fyke netting. Follow up surveys show no further fish in the lake. However some anecdotal reports of further <i>M. peelii</i> in WA.	Eradicated from the lake and possibly from natural environment in WA
<b>Eel-tailed Catfish (<i>Tandanus tandanus</i>)</b>	First and only detection in WA was confirmed in 2012 in Lake Marmion, Myaree	Eradication attempts 2014 using the fish toxin rotenone	In progress
<b><i>Pseudomonas anguilliseptica</i>, the bacterial disease organism that causes red-spot disease</b>	First and only detection in Australia was in 2013 in the <i>T. tandanus</i> population in Lake Marmion,	Eradication attempt in February 2014 using the fish toxin rotenone (ie bacteria should be eradicated	Bacteria no longer detected following first rotenone treatment.

	Myaree.	when the catfish are eradicated)	
<b>Freshwater snail (<i>Planorbella sp</i>)</b>	First and only detection in WA was in 2013 in the Bodkin Park lakes	Control attempts 2014 through the introduction to the lake of a native predator (Black Bream) which should prey on this fish	In progress
<b>Platyfish (<i>Xiphophorus maculatus</i>)</b>	First and only detection in WA was in 2013 in the Bodkin Park lakes	Control attempts 2014 through the introduction to the lake of a native predator (Black Bream) which should prey on this fish	In progress

