Bioinvasion and Global Environmental Governance: The Transnational Policy Network on Invasive Alien Species

Australia's Actions on IAS

Description¹

Australia, the world's smallest continent but sixth-largest country, has over 7.6 million square kilometers and over 21 million people. The British established a series of penal colonies from 1788 onwards, as well as one province of South Australia in 1836. Australia became a federation state on January 1, 1901. Its climate is mostly arid, though more temperate climates exist in the south. The invigorating sea breeze known as the "Fremantle Doctor" affects the city of Perth on the west coast, and is one of the most consistent winds in the world. Given its huge landmass and more than 25,000km coastline, Australia has suffered numerous cases of IAS throughout its history. Fortunately, the country has committed many resources towards publicity, legislation, customs inspection, and scientific documentation pertaining to IAS.

Australia benefits from strong trade relations with economic powerhouses such as Japan, China, and the United States. Its top exports are coal, crude oil, gold, and iron ore, while its top biological exports include beef, wheat, wool, and cotton. It imports machinery and transport equipment, computers, and telecommunication equipment and parts. Australia has a been a champion of free-trade both regionally and internationally given its persistence in negotiating agreements with various countries including, most recently, Singapore, the United States, and Thailand.

Invasive species are now considered to be the single greatest threat to biodiversity in Australia, after habitat loss from land clearing. Invasive species have greatly reduced the number and range of many native species, often causing local or total extinction, through predation, disease, by swamping native species' food supply and shelter, and altering habitat.¹²

Overview of Biodiversity

Australia has about one million of species of plants, animals and micro-organisms, which represents about 7% of the world's total and is more than twice the number of species in Europe and North America combined. Megadiversity describes countries with very high levels of biodiversity. Twelve of the megadiverse countries, including Australia, contain about 75% of Earth's total biodiversity.

- Australian Museums on-line Biodiversity Portal
- CBD Country Profile
- Earth Trends Country Profile on Biodiversity and Protected Areas
- Australian Government Biodiversity Portal

Legislation relating to IAS

- Environmental Protection and Biodiversity Conservation Amendment (Invasive Species) Bill 2002 [2004]
- Ouarantine Act 1908

- Review of the Export Control Act 1982
- Imported Food Control Act 1992
- National Parks and Wildlife Regulations (Amendment) 1992 No. 319
- Gene Technology Act 2000-Sect 72B
- Antarctic Marine Living Resources Conservation Act 1981
- Lake Macqurie Local Environmental Plan 2004—Regulation 15

Government Agencies/Programs/Ministries dealing with IAS

- The Australian Department of Agriculture, Fisheries and Forestry (DAFF)
 - o Australian Quarantine and Inspection Service
 - o Biosecurity Australia
- Department of the Environment, Water, Heritage and the Arts
 - o Australian Antarctic Division
- Queensland Government (northeast Australia)
 - o Department of Natural Resources and Water Queensland (NR&M)
 - o Department of Primary Industries and Fisheries Queensland

Major Invasive Alien Species¹⁹

<u>Acacia farnesiana</u> (tree, shrub)

<u>Acanthogobius flavimanus</u> (fish)

Acridotheres tristis (bird)

Ambrosia artemisiifolia (herb)

Ardisia crenata (shrub)

<u>Ascidiella aspersa</u> (tunicate) <u>Asterias amurensis</u> (sea star)

Batrachochytrium dendrobatidis (fungus)²

Bufo marinus (amphibian)³

<u>Cactoblastis cactorum</u> (insect)

Carduus nutans (herb)

Chrysanthemoides monilifera (herb)

<u>Cinnamomum camphora</u> (tree)

<u>Crassostrea gigas</u> (mollusc)

<u>Dalbergia sissoo</u> (tree)

Dipogon lignosus (vine, climber)

<u>Glyceria maxima</u> (aquatic plant, grass)

<u>Gymnodinium catenatum</u> (algae)

Felis catus (mammal)⁴

Hiptage benghalensis (vine, climber,

shrub)

Hypericum perforatum (herb)

Ligustrum lucidum (tree)

Ludwigia peruviana (aquatic plant)

Mimosa pigra (shrub)

Morella faya (tree, shrub)

<u>Musculista senhousia</u> (mollusc)

Onopordum acanthium (herb)

Opuntia stricta (shrub)

Parthenium hysterophorus (herb)

Pennisetum ciliare (grass)

Pennisetum macrourum (grass)

Phytophthora cinnamomi (fungus)⁵

Polysiphonia brodiei (algae)

Potamopyrgus antipodarum (mollusc)

Psittacine circovirus (virus)⁶

Rhamnus alaternus (tree)

Salix cinerea (tree, shrub)

Solenopsis invicta (insect)⁷

Solenopsis invicta (Ilisect)

Technomyrmex albipes (insect)

Tilapia mariae (fish)

Tradescantia fluminensis (herb)

Tridentiger trigonocephalus (fish)

Vulpes vulpes (mammal)⁸

Ziziphus mauritiana (tree, shrub)

Native Species Exported/Introduced to Non-Native Environments¹⁹

Abelmoschus moschatus (herb, shrub) *Melia azedarach* (tree, shrub) Acacia mearnsii (tree, shrub) Parthenium hysterophorus (herb) Acacia melanoxylon (tree) Phyllorhiza punctata (jellyfish) Adenanthera pavonina (tree) Phragmites australis (grass) Casuarina equisetifolia (tree) Pittosporum undulatum (tree, shrub)

Rottboellia cochinchinensis (grass) Cyathea cooperi (fern) Ficopomatus enigmaticus (annelid) Sphaeroma quoyanum (crustacean) Ficus rubiginosa (tree, shrub) *Trichosurus vulpecula* (mammal) Gymnorhina tibicen (bird) Waterhousea floribunda (tree, shrub) *Kunzea ericoides* (shrub) Ziziphus mauritiana (tree, shrub)

Landoltia punctata (aquatic plant)

Australia has a List of Specimens taken to be Suitable for Live Import under the Environment Protection and Biodiversity Conservation Act. This list is separated into two parts: Part 1 lists live specimens that do not require an import permit while Part 2 lists live specimens that require an import permit.

Table 1 Actions to prevent, detect and manage IAS categorized into three themes: biodiversity, human health, and economic

Note: Actions (such as projects, publications and programs) are classified according to the most obvious theme but may also fit into the dimensions of another.

Theme	Action
Biodiversity	 Under the Environmental Protection and Biodiversity Conservation Amendment (Invasive Species) Bill 2002 invasives can be listed as a key threatening process and as such have a threat abatement plan created to address them. Since 2000, nine key threatening invasive alien processes have been identified and assessed by the national Threatened Species and Scientific Committee a further 2 are currently under consideration: - predation, competition and lethal toxic ingestion caused by Cane Toads (Bufo Marinus); and - loss of biodiversity and ecosystem integrity following invasion by the yellow crazy ant (Anoplolepis gracilipes) on

- across northern Australia for signs of new animal or plant pests, diseases and weeds. The NAQS also carries out joint survey and monitoring activities with their counterparts in Indonesia, Papua New Guinea and Timor Leste.⁹
- Quarantine measures: to prevent introduction and spread of the Varroa mites (Varroa destructor) live bees cannot be imported into Australia without strict quarantine measures. Visitors must declare all bee and honey products for inspection and some states also have their own quarantine restrictions on the movement of honey and bee products within Australia.
- The <u>Australian Antarctic Division</u> created the Antarctic Marine Living Resources Program in 1999 which conducts research with the intention to further the objectives of the Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR) by providing the science on which to base policy and management decisions⁹
- The <u>Australian Antarctic Division</u> also created a website entitled <u>Aliens in Antarctica</u>, an international project endorsed by the Scientific Committee on Antarctic Research: examining the extent to which people from various nations unintentionally carry propagates of alien species into the Antarctic region with a focus on the transport barrier. Assessing the propagate loads and pathways is hoped to help plan realistic prevention and complete removal of alien species in Antarctica.
- Scientific grant provided ... Recipient: Dr Paul Sunnucks Project Title: Introduced invasive terrestrial invertebrates on Macquarie Island: studies on ecology origins and control¹⁴
- Australia recently hosted the first international meeting to consider disease in Antarctic wildlife and has been asked to convene a group to develop practical measures to diminish the risk of introduction and spread of diseases to Antarctic wildlife¹⁰
- AMLR program conducts strategic research into various issues relevant to the CCAMLR using an 'ecosystem approach'9
- Australia seeks to protect Ramsar sites (wetlands) through a range of activities including appropriate legislation and policy frameworks, development and implementation of site management plans, and community education and awareness programs.
- Australia's 'operational objective' with regards to IAS: Develop guidance and promote protocols and actions to prevent, control or eradicate invasive alien species in wetland systems¹²
- Environmental impact assessments (EIA) are required prior to any action concerning wetlands. EIAs must include full and appropriate consideration of the environmental, social, economic and cultural impacts¹²
- National Weeds Strategy through this strategy Australia has developed a 'rigorous' management strategy for 20 invasive plants

- of national significance. 12 The strategy is currently under review.
- Australia's highest priority weeds were assessed under the project Weeds of National Significance, including the species Alligator Weed, Cabomba, Salvinia, Pond Apple and Hymenachne. Strategic plans and national management guides exist for all weeds. A set of core attributes for mapping Weeds of National Significance has been developed through consultation with representatives from research and academic groups, regional groups and Federal and State and Territory agencies, including its invasiveness, which can be found at The Process for Determining Weeds of National Significance.
- There are a number of examples for broad assessment of alien species that pose a threat to ecosystems and wetlands: 12
 General risk assessments have been carried out for exotic marine aquatic pests that may threaten Australia's marine environment through detrimental alteration of marine habitat, alteration of trophic interactions and food webs, dominating and out-competing native species, and predation of native species. See: 12
 - Hayes, K, Sliwa C, Migus S, McEnnulty F, Dunstan , (2005)

 National Priority Pests: part II Ranking of Australian Marine Pests

 Hayes: An independent report undertaken for the Department of the

 Environment and Heritage by Commonwealth Scientific and
 Industrial Research Organisation Marine Research;
 - <u>Murray-Darling Basin Commission Native Fish Strategy</u> broadly assesses risks to native fish from alien species;
 - <u>National Strategy for Carp Control 2000-2005</u> assesses the risk from carp;

The Supervising Scientist Division of the <u>Department of the Environment</u>, Water, Heritage and the Arts has undertaken <u>A Risk assessment of the tropical wetland weed Mimosa pigra in northern Australia</u> (Walden D, et al. Supervising Scientist Report 177, Supervising Scientist, Darwin, NT).

- The Australian Government has created the <u>National System for the Prevention and Management of Introduced Marine Pests</u>, which has produced a <u>Report</u> (1999), which made recommendations, *inter alia*, for an national ready response capability to be established immediately, within existing arrangements, to carry out emergency procedures in the event of an outbreak of an introduced marine pest.
- <u>Department of Natural Resources and Water Queensland</u> (NR&M) have undertaken state Weed Risk Assessment. 12
- Threats to wetlands, including invasive species, are identified through the Management Planning processes. The <u>Australian Ramsar Management Principles</u> require site managers to identify the threats and appropriate management actions. Australia is currently in the process of providing e-links to management plans (where available) to the Ramsar Bureau. 12
- Assessments for *Hygrophila costata* (Hygrophila) and *Rhizophora*

- *mangle* (American Mangrove) to assist with decisions regarding pest declaration in Queensland. NR&M have published a literature review for *Limnocharis flava*. ¹²
- (Yellow bur head) *The Biology of Australian Weeds Limnocharis flava* Weber, J.M. (2004); and a full Pest Status Assessment (PSA) for *Hymenachne amplexicaulis* (Hymenachne) *Hymenachne in Queensland* Csurhes S., *et al.* ¹²
- Status Review Series Land Protection (1999) ¹²
- <u>Department of Primary Industries and Fisheries Queensland</u> has established a Consultative Committee for Exotic Fish Species, an Exotic Pest Fish Reporting Kit, extension materials, etc. ¹²
- The Department of the Environment, Water, Heritage and the Arts commissioned the development of a Marine and Terrestrial Introduced Species Prevention and Management Strategy for the Ashmore Reef National Nature Ramsar COP9 National Planning Tool-National Report Format Page 53 Reserve. The strategy identified the presence of the introduced Ginger Ant (Solenopsis geminata) in the Reserve and highlighted the threat to ground nesting birds. The strategy recommended an assessment of the impacts of the Ginger Ant, with a particular attention to impacts on colonies of seabirds, as a matter of priority. In 2004, a preliminary ecological risk assessment of the impact of Ginger Ants at Ashmore Reef was initiated. Site visits were conducted in late 2004 to determine the location and abundance of Ginger Ants and their impact on nesting seabirds. A final report is due by the end of June 2005. 12
- National Management Groups have been established for Cabomba, Salvinia and Alligator Weed and similar groups exist for Pond Apple and Hymenachne. Management groups include representation from state and territory jurisdictions among others, to help implement the national management plans for the particular weeds, including identifying priorities for management. National coordinators help coordinate activities under the management plans on a national scale for each of these aquatic weeds. Department of Natural Resources and Water Queensland (NR&M) is taking the lead, including the Coordinator and National Management Group, for Pond Apple and Hymenachne. The NSW Department of Primary Industries (NSW Agriculture) is taking the lead, including the Coordinator and National Management Group, on the aquatic weeds Alligator Weed, Salvinia and Cabomba.

Human health

- NAQS also runs Top Watch, a quarantine awareness campaign which encourages local communities to keep a 'top watch' and to report to Quarantine any unusual pests and diseases or illnesses in animals or plants.⁹
- Legally required to protect migratory shorebirds as they are recognized as a matter of national environmental significance under

the EPBC Act 1999¹³

- A Task Group comprising senior representatives from all governments in Australia are currently developing a framework designed to address exotic pests, weeds and diseases and will propose a comprehensive approach to manage the risk of entry, establishment or spread, emergency response to incursions, and management of invasive species, the Task Group will focus on invasive species with primary production and environment impacts... this will result in a system that can also extend to species with human health and other social impacts... Task Group has identified that opportunities exist for improving current arrangements for predominantly environmentally invasive species, particularly with regard to responses to new incursions. 12
- Quarantine Act 1908, Export Control Act 1982, Imported Food Control Act 1992 and various other Acts are administered by the <u>Australian Quarantine and Inspection Service</u> in order to protect Australia's animal, plant and human health status¹³
- Animal Quarantine: applies to all kinds of animals and their products, including insects, fish, reptiles, birds and mammals.
 Animals entering Australia must spend time at quarantine stations to ensure they are free of disease before being released¹⁴
- Plant Quarantine: All plants or parts of plants fruits, seeds, cuttings, bulbs, and wood or bamboo items must be examined and if necessary treated by Quarantine. Live plants must be kept at plant quarantine stations when they arrive to ensure they are not carrying pests or diseases¹⁴
- Human quarantine: quarantine officers monitor reports from the captains of aircraft and ships about the health of passengers arriving in Australia¹⁴
- The Australian Quarantine and Inspection Service uses World Health Organization approved insecticide sprays on all commercial aircraft flying into Australia to manage disease risks. Aircraft cabins are treated with residual sprays when no passengers or crew are on board. In addition, all of Australia's international airports have mosquito trapping programs to ensure that high-risk insect carriers of human disease are detected quickly¹⁴
- Australian Quarantine and Inspection Service provides quarantine inspection for international passengers, cargo, mail, animals, plants and animal or plant products arriving in Australia, AQIS also provides inspection and certification for agricultural products exported from Australia 14
- Border Control: passenger and cargo clearance at entry points into Australia... techniques including risk assessment, detector dogs, xray machines, surveillance and inspection at international airports, seaports, mail exchanges and container depots¹⁴

Economic

• Biological Control Agents: The Australian Department of

- Agriculture, Fisheries and Forestry (DAFF) is responsible for approval of the importation of biological control agents for the control of weeds and invertebrates under the Quarantine Act 1908... it is also responsible for approval of host-specificity test list and release of the biocontrol agent.¹⁰
- Biosecurity Australia develops new policy, usually through Import Risk Analyses (IRAs) and also reviews existing quarantine policy on imports of animals, plants and their products. An IRA is required where there is no quarantine policy or a significant change in existing quarantine policy is to be considered such as for new commodities that have not previously been imported and commodities that are already imported but the import request is from a different country/area with a significantly different pest and disease status.¹⁷
- IRAs are used to identify and classify potential quarantine risks and develop policies to manage them... the process followed in conducting an IRA is outlined in the IRA Handbook 2007
- Import or export of Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) specimen permitted if for an eligible non-commercial purpose (these include research, education, exhibition, conservation breeding or propagation, a travelling exhibition or as a household pet or personal item)... strict criteria apply to recognition of these eligible purposes¹⁷
- Commercial trade in CITES species may occur subject to specific conditions related to the particular appendix in which the species is listed and whether the species is being imported or exported ¹⁷
- Australia does not permit the export of live native mammals, amphibians, reptiles or birds for commercial purposes¹⁷
- CITES allows individual party states to set stricter limits than those imposed by CITES ... this involves treating an Annex II species under the same guidelines for Annex I species... Australia has done this for two species¹⁷: *Loxodonta Africana* (African Elephant) and all species of the order Cetacea (whales, porpoises and dolphins)
- The <u>National System for the Prevention and Management of</u> <u>Introduced Marine Pests</u> will have three major components: ¹⁸
 - 1. Prevention: systems to reduce the risk of introduction and translocation of marine pests (including management arrangements for ballast water and biofouling)
 - 2. Emergency response: a coordinated emergency response to new incursions and translocations, and
 - 3. Ongoing control and management: managing introduced marine pests already in Australia, where eradication is not feasible.

It will also have several supporting components that are currently being developed. These include strategies for:

1. Research and development

- 2. Communications
- 3. Monitoring, and
- 4. Evaluation and review.

The National System includes the regulation of ballast water entering Australian waters and moving between Australian ports:

- Mandatory ballast water management requirements for international vessels introduced by the Australian Quarantine and Inspection Service in July 2001
- Establishment and operation of the national emergency response network overseen by the Coordinating Committee for Introduced Marine Pest Emergencies (CCIMPE)
- The CCIMPE's national emergency response network may have up to AUD 5 million to combat an introduced marine pest outbreak of major concern that is viable for eradication
- Initial voluntary implementation of a protocol for management of biofouling risks on small international vessels
- Australia has suitable conditions for Karnal Bunt, a disease caused by the fungus *Tilletia indica* which affects wheat and durum wheat and found primarily in India.... Due to the risks of introduction Australia has strict quarantine regulations for imports of new wheat varieties or breeding lines for sowing.... Because Karnal Bunt can survive in soil and on agricultural machinery, Australia also requires that imported agricultural machinery must be cleaned... feed meals, seeds and fertilizers that may have been handled in the same transportation system as affected wheat must also be free of wheat seed contamination¹⁴
- Plum pox virus poses a considerable risk to Australia's stone fruit industries... all import of stone fruit planting material are screened in quarantine facilities. Many stone fruit products containing seeds require heat treatment to kill the seed and prevent the spread of the virus¹⁴
- To prevent the introduction of some pests including the Asian longhorn beetle, all timber products from Asia must be treated before being imported or on arrival in Australia.¹⁴
- An outbreak of Papaya fruit fly (*Bactrocera papayae*) around Cairns, North Queensland in 1995 devastated local crops but was successfully eradicated in 1999. The eradication campaign cost \$33.5 million¹⁴
- Plant Biosecurity, a division within <u>Biosecurity Australia</u> develops quarantine policies that protect Australia's horticultural industries and the natural environment from exotic pests and diseases.¹⁵
- Biosecurity Australia uses World Trade Organization's Agreement on the Application of Sanitary and Phytosanitary Measures (SPS Agreement) as their primary agreement in setting quarantine measures. Ten phytosanitary standards are in place and more are

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being developed ¹⁶
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Table 2 Actions on IAS in cooperation with other countries

Agreement/	Countries/	Action
Organization	Member	110001
Australia – Chile Free Trade Agreement	Chile	 Chapter 6 – Sanitary and Phytosanitary Measures 6.4.3 Parties should cooperate in relevant international bodies including the WTO SPS Committee, the various Codex Committees (including the Codex Alimentarius Commission), the International Plant Protection Convention, the World Organization for Animal Health (OIE) and other 6.5.1 Each shall identify an overall contact point relating to SPS measure (for Australia in the Department of Agriculture,
Australia –	Singapore	Fisheries and Forestry; for Chile the General Directorate of International Economic Affairs, Ministry of Foreign Affairs) Agreement is meant to build on the Mutual Recognition
Singapore Free Trade Agreement	Singapore	 Agreement on Conformity Assessment Chapter 5 – Technical Regulations and Sanitary and Phytosanitary Measures: applies to all good and/or assessment of manufacturers or manufacturing processes of goods traded between the parties regardless of the origin of those goods unless otherwise specified in a Sectoral Annex or unless otherwise specified by any mandatory requirement of a Party 6.2 develop further the use and product coverage of electronic means of data transfer, including electronic health certificates 7.2 for the purpose of conformity assessment each party shall take reasonable steps to facilitate access in its territory for inspection, testing and other relevant procedures 10.4 where urgent problems of safety, health, consumer or environmental protection or national security arise that party may suspend the operation of any Sectoral Annex immediately
Australia – United States Free Trade Agreement	US	 Chapter 7 – Sanitary and Phytosanitary Measures Article 7.4.1: provides for the establishement of a Committee on Sanitary and Phytosanitary Matters Annex 7-A – Establishment of the Standing Technical Working Group on Animal and Plant Health Measures Annex 7-B – Development of Specific Work Plans Chapter 19 – Environment

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