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National Centre for Marine Conservation & Resource Sustainability (NCMCRS)

Submission on the:
Possible Australian Participation in a Trans-Pacific Partnership Agreement

The Trans-Pacific Strategic Economic Partnership (TPSEP, also known as P4), which is currently between Brunei Darussalam, Chile, New Zealand, and Singapore, entered into force in 2006. It sets a precedent amongst trade agreements as the first free trade agreement between three continents and the first with a timeline to eliminate all customs duties, as well as tariff and non-tariff measures (with a few exceptions). Parties to the TPSEP consider it a potential launch-point for a comprehensive, APEC-wide Free Trade Area of the Asia-Pacific (the TPSEP contains an accession clause for this purpose). So far, Peru and Vietnam have expressed interest in joining; the U.S. began discussions on September 22, 2008; and Australia announced on September 23, 2008 that is will consider participation in TPSEP (dfat.gov.au). Rounds for expansion to potentially include U.S. and Australia are scheduled to begin in Singapore in early 2009 (dfat.gov.au).

Australian entry into this agreement would produce both benefits and challenges, particularly for the issue of nonindigenous invasive species management. While a regional trade agreement would provide an opportunity for cooperation amongst nations to reduce the international spread of nonindigenous species, the increased levels of trade and the relaxed regulations would necessitate proactive management to reduce the risk of increased transfer, establishment, and spread of these species.

Introductions of nonindigenous species have dramatically affected many coastal ecosystems. Documented impacts of nonindigenous species introductions include: 1) ecological changes, such as alterations to food webs and displacement of native species, 2) economic costs of removal and management of ANS, and 3) public and ecosystem health concerns from exposure to exotic pathogens (National Research Council, 1996). Vectors for nonindigenous species spread have historically included hull boring (wooden vessels); biofouling on wooden or steel hulls; ballast (both rocks/dirt and water); aquaculture (both intentional and accidental movements) (Carlton 1996); movement of live or dead food products and aquarium trade (Weigle et al. 2005); transfer via biological packing materials (A. Whitman Miller 2004); and via research. Of these, ballast water in commercial ships is one of the primary vectors for the introduction of nonindigenous species to estuaries throughout the world, and international, national, and local governmental organizations have started to take legislative and regulatory action. In particular, after 12 years of debate and consideration by the Marine Environmental Protection Committee (MEPC) of the United Nations' International Maritime Organization (IMO), a Conference of Parties adopted an international ballast water management regime in February 2004 titled, *The International Convention for the Control and Management of Ships' Ballast Water and Sediments.* The convention will enter into force 12 months after it is ratified by 30 nations, representing 35 percent of the world shipping tonnage. There is an increasing realization, however, that biofouling is a significant vector for nonindigenous species introduction, in some areas responsible for more introductions than ballast water (Chad Hewitt 2008; Coutts 1999; Hewitt et al. 2004). For example, an analysis of marine bioinvasion numbers (by transport mechanisms) averaged across 18 large scale IUCN bioregions found that 55.5% of invasive and cryptogenic species have life histories that indicate biofouling as a vector of introduction, while 30.8% have life histories that indicate ballast water as a vector (Chad Hewitt 2008). And unlike ballast water, biofouling remains unregulated at the international level. Biofouling (aka vessel fouling or hull fouling) refers to marine organisms (including nonindigenous species) that attach themselves to objects immersed in salt water, including the hulls and ancillary gear of commercial and other vessels. Nonindigenous species, including small fish, barnacles, mussels, sponges, algae, crabs, and sea squirts, can attach themselves to ships, fouling the wetted surface areas (WSA), or live within the matrix of the fouling community and protected nooks and crannies. These organisms then colonize the hull and are transported from one port to the next. Typically, transport results in stress upon organisms that triggers/induces spawning events. So, upon arrival in a port environment fouling community, species attached to the hull of a vessel or within a sea chest have most likely undergone shear stress (via vessel movement) and water temperature and salinity

stress (via movement through different geographic basins), and are likely to spawn. Hence, invasions can occur when these fouling organisms come in contact with structures in a new port or release their larvae into its waters, resulting in potential establishment in the new port, with dispersal and spread to nearby areas. In many countries, including Australia and New Zealand, recent incursions of biofouling species are having significant impacts on the marine environment, natural resources and industries (e.g., the Japanese seaweed, *Undaria pinnatifida*; the Asian sea-squirt, *Styela plicata*; the serpulid worm, *Hydroides sanctaecrucis*).

In addition to accidental transfers, the potential increase in live import trade created by participation in TPSEP presents a risk to Australia that needs assessment. Live imports have had such impacts as: competition with livestock and wildlife for resources (food, water, shelter, breeding sites), predation on stock and native wildlife, damage to grain and horticultural crops, soil disturbance and general land degradation, damage to fences and water sources, and biosecurity risk for potential transmission of diseases to livestock and wildlife (Sciences 2008).

Nonindigenous species literature has identified trade as an activity that significantly contributes to nonindigenous species transfer, introduction, and establishment (Jeffrey 2006; Westphal et al. 2008). For example, countries with significant trade activity often have more nonindigenous species (M. Vila 2001). For the biofouling vector, this is likely due to the fact that increased trade correlates to increased vessel traffic, which results in increased WSA, which increases not only the chance of introducing a previously-absent nonindigenous species, but also increases the likelihood of one of those species establishing due to the increase in propagule supply (Westphal et al. 2008). Consequently, because past levels of trade have resulted in the current number and consequences of nonindigenous species, it follows that trade liberalization through reduced or eliminated tariffs and customs duties may cause the rate of transfer, introduction, and establishment to increase. In its Quarantine and Biosecurity Review Issues Paper, DAFF recognized that the "rapid growth and changing patterns in international trade mean Australia faces increased risks that exotic pests and diseases can be accidently introduced by passengers, imported commodities, packaging material, and transport vessels (such as cargo containers)". The risk (likelihood of a negative event occurring) from each of these vectors will increase with increased trade, necessitating a risk assessment (which asses the likelihood and impacts of the negative event).

Risk accompanies most actions or events, and the risk assessment process often occurs informally in order to assess whether or not the potential consequences of that risk outweigh the potential benefits of the action. The formal risk assessment process aids the decision making process by clearly defining the components of the decision involved. This helps take into account all potential impacts including those on environmental, economic, social, and cultural values that may have gone unrecognized without a formal impact analysis process. Biosecurity risk assessments are performed to improve decisions regarding nonindigenous species introductions (such as quarantine regulations), and decisions requiring the most effective use of limited resources (Andersen et al. 2004).

McNeely (2006) recognized that few trade-related risk assessments are completed, and recommends risk management as a method to reduce nonindigenous species transfer. In addition, in response to the aforementioned DAFF Issues Paper, the Australian Maritime College's National Centre for Marine Conservation and Resource Sustainability (NCMCRS) noted 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." The NCMCRS also notes that, "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...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." CSIRO's input to the Issues Paper lists examples of potential R&D areas, which includes "invasion pathways under changing trade patterns," and also encourages Australia to take a leadership position in establishing cooperation within trading and regional partners regarding biosecurity. DEWHA's input to the Issues Paper underscores the cost-effectiveness of risk assessment. Due to the nature of a regional free trade agreement (which facilitates trade between multiple countries, not just between two) and biofouling (which is a process that accumulates species as the vessel moves between countries) a TPSEP-specific risk assessment that analyses the cumulative risk of increased trade between multiple countries is required.

It is clear from the direct relationship between biofouling risk and increasing levels of trade that Australia needs to establish priorities and objectives related to nonindigenous species management in order to prevent negative economic, regional, social, cultural and environmental impacts associated with entry into the TPSEP. Minimizing these impacts will likely be achieved via trade and quarantine measures. Before setting such trade and quarantine measures to achieve its established appropriate level of protection (ALOP) within the context of the TPSEP, however, Australia is required under the WTO SPS Agreement to complete a scientifically-based risk assessment (Riley 2005). Risk assessment is also part of Australia's policy for marine pest management. Australia's National System for the Prevention and Management of Marine Pest Incursions includes elements to prevent nonindigenous species incursions: minimising the risk of international incursions of marine pests to Australia, and minimising the risk of marine pest translocations within Australia. Of interest to this submission is the risk from international pests, of which biofouling is a significant component (Department of Agriculture 2008).

The Asia-Pacific Economic Cooperation (APEC) also deserves consideration within the TPSEP discussion: Australia is an APEC member, and if TPSEP members hope to establish the TPSEP as the trade agreement for APEC, it will likely need to consider APEC policies. APEC is an intergovernmental group that makes voluntary agreements to facilitate economic growth, development and trade between 21 member economies, which primarily consist of countries along the Pacific Rim. APEC contains the Marine Resource Conservation Working Group (MRCWG), which focuses on marine and coastal sustainable economic development. They have developed programs and policies that address nonindigenous species risk management, including the Bali Plan of Action and a Regional Risk Management Framework for APEC Economies for Use in the Control and Prevention of Introduced Marine Pests. The Bali Plan of Action recognizes the value of healthy oceans and coasts, as well as instruction from international agreements (such as the CBD), and commits APEC economies to managing the marine environment sustainably. It includes a section on marine invasive species, which acknowledges the need to take action to limit incursions, as they pose a threat to the region's ecosystems and economy. Specifically, this section urges countries to: continue to develop and implement the Regional Risk Management Framework for APEC Economies for Use in the Control and Prevention of Introduced Marine Pests; promote ratification of the IMO Ballast Water Convention; reduce incursions via all vectors through increased training, regulations, and information exchange; and increase communication amongst APEC members (CITE BPA). The Regional Risk Management Framework for APEC Economies for Use in the Control and Prevention of Introduced Marine Pests (hereafter, the Framework) identifies the threats of nonindigenous species to APEC economies, ranks the responsible vectors, and discusses existing capacity to address the threat. Specifically, the Framework identifies risk management as a solid tool to reduce risks and impacts of nonindigenous species. The Framework recommends using a methodological approach, including identifying impacts of nonindigenous species, identifying hazards within APEC economies associated with the introduction process, identifying hazards within APEC economies associated with species, analyzing current risk management approaches, and review cost-benefit analyses. The Framework found that the nonindigenous species has greatest impacts on human health, aquaculture, international shipping, fish trade, commercial tourism, biodiversity, and commercial fisheries. Identification of hazards yielded shipping vectors as the highest risk, with ballast water and biofouling the primary components of this risk. The strength (frequency) of a trade route had a major influence on the hazard. The Framework recommends a comprehensive hazard analysis and assessment of APEC economies. The identification of species hazards revealed that certain subregions are more likely to be nonindigenous species donors and other subregions likely to be nonindigenous species recipients, an occurrence that may result from economic activities of that subregion. The Framework recommends a comprehensive list of nonindigenous species in the APEC region, as well as baseline port surveys. The review of risk management frameworks led to agreement that each economy should complete an analysis of their nonindigenous species problem, as well as an APEC-wide analysis, using standardized methods and tools. Additionally, the Framework recommends valuation of environmental, social, and economic impacts of and potential management strategies for nonindigenous species (2005). A risk assessment for TPSEP would help achieve these ends, as well.

While participation in the TPSEP would benefit Australia in many ways, DFAT needs to consider the economic, regional, social, cultural, and environmental impacts from nonindigenous species' that will also occur. The need for a risk assessment to identify the impacts of negotiated trade measures is supported by researchers, national departments and agencies (DEWHA, DAFF, and CSIRO) and national policy (Quarantine Act 1908, National System for the Prevention and Management of Marine Pest Incursions). Although other TPSEP members have much to offer Australia in this agreement, they also contain species that have the potential to harm Australia's natural environment, economy, and culture. Thus, before or during TPSEP negotiations, a biofouling risk assessment is required to assess these impacts and allow

steps to minimize or prevent them, maintaining Australia's status as a country relatively free of nonindigenous species and therefore, desirable in international trade markets. In association with staff and faculty at Australian Maritime College's National Centre for Marine Conservation and Resource Sustainability, I propose to undertake such a risk analysis to aid DFAT in assessing these risks while undergoing negations for entry into TPSEP.

References

(2005) Development of a Regional Management Framework for APEC Economies for Use in the Control and Prevention of Introduced Marine Pests. In: Martin Tsamenyi RK, Angela T. Williamson (ed), Asia-Pacific Economic Cooperation, Singapore

A. Whitman Miller ALCNC-MGMR (2004) A NEW RECORD AND ERADICATION OF THE NORTHERN ATLANTIC ALGA ASCOPHYLLUM NODOSUM (PHAEOPHYCEAE) FROM SAN FRANCISCO BAY, CALIFORNIA, USA¹. Journal of Phycology 40: 1028-1031

Andersen MC, Adams H, Hope B and Powell M (2004) Risk assessment for invasive species. Risk Analysis 24: 787-793

Carlton JT (1996) Pattern, process, and prediction in marine invasion ecology. Biological Conservation 78: 97-106

Chad Hewitt MC (2008) Assessment of relative contribution of vectors to the introduction and translocation of marine invasive species. AMC National Centre for Marine Conservation and Resource Sustainability, Launceston

Coutts A (1999) Hull fouling as a modern vector for marine biological invasions: investigation of merchant vessels visiting northern Tasmania, Faculty of Fisheries and Marine Environment, Australian Maritime College, Launceston, Tasmania, 283 pp

Department of Agriculture FaFD (2008) The National System for the Prevention and management of Marine Pest Incursions. Retrieved from http://www.daff.gov.au/animal-plant-health/pests-diseases-weeds/marine-pests/national-system on

Hewitt C, Campbell M, Thresher R, Martin R, Boyd S, Cohen B, Currie D, Gomon M, Keough M, Lewis J, Lockett M, Mays N, McArthur M, O'Hara T, Poore GB, Ross DJ, Storey M, Watson J and Wilson R (2004) Introduced and cryptogenic species in Port Phillip Bay, Victoria, Australia. Marine Biology 144: 183-202

Jeffrey AM (2006) As the world gets smaller, the chances of invasion grow.
M. Vila JP (2001) In: M. Vila JP (ed) The Great Reshuffling: Human Dimensions of Invasive Alien Species, IUCN, Gland

Riley S (2005) Invasive alien species and the protection of biodiversity: The role of quarantine laws in resolving inadequacies in the International legal regime. p 323

Sciences DBoR (2008) Feral animal impacts and management in Australia. Retrieved from http://www.daff.gov.au/brs/land/feral-animals/management on

Weigle SM, Smith LD, Carlton JT and Pederson J (2005) Assessing the risk of introducing exotic species via the live marine species trade. Conservation Biology 19: 213-223

Westphal M, Browne M, MacKinnon K and Noble I (2008) The link between international trade and the global distribution of invasive alien species. Biological Invasions 10: 391-398