Conflict between International Treaties: Failing to mitigate the effects of introduced marine species

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Introduction

Humans have changed the face of the earth - we have intentionally altered the locations of species in order to achieve food and economic security (eg, aquaculture of the freshwater fish *Tilapia* and the marine algae *Kappaphycus*) while also appealing to our cultural and aesthetic values (eg, the introduction of gorse to New Zealand and Australia). We have accidentally spread pathogens and diseases beyond their natural ranges[1] and we have improved our technologies (such as shipping) to such an extent that we can transit our planet in shorter and shorter time-frames.[2] All of these activities have occurred over many hundreds of years[3] and have led in one way or another, to an increasing number of species being introduced beyond their natural ranges. Such introductions are now considered one of the top five threats to native biological diversity.[4,]

This paper examines how humans have impacted upon the marine environment through the introduction of species beyond their native ranges. Introduced species impact upon native biodiversity, spread diseases and pathogens, and have had economic and social impacts in their 'new' ecosystems. Because of the range and extent of introduced species impacts, numerous methods to mitigate the effects of introduced species have been developed and implemented. Within this paper we will examine how two international legal instruments, the *Convention on Biological Diversity*, *1992* (CBD) and the World Trade Organization's *General Agreement on Tariffs and Trade 1994* (GATT), in particular its associated *Agreement on the Application of Sanitary and Phytosanitary Measures* (SPS), deal with introduced species. In this context, the paper focuses on the potential for conflict that may arise with the application of these international legal instruments, thus causing a failure to effectively mitigate for the effects of introduced species.

What are introduced species?

Introduced species (also called non-indigenous, exotic or alien) are those species that have been recognisably transported (directly or indirectly) by the agency of humans to a new biological region from where they did not previously exist. In a terrestrial context, we define as 'naturalised' those introduced species that: i) have established self-supporting populations, ii) been present for a prolonged period of time, iii) have subsequently dispersed, and, iv) are considered to have become incorporated into the native ecosystem.[5] However, this terminology is not typically used in a marine context. Instead, introduced species that have been present for a long period of time are often referred to as historic introductions.[6] Introduced species that have deleterious affects in their new ecosystems are often referred to as 'weeds' or 'pests', though use of these terms are often politically motivated. The term invasive species is not synonymous with introduced species: invasive species can be introduced or native species that have traits that are unwanted by humans. Cryptogenic species are those species that we cannot determine whether they are native or introduced. As such, this is a catch-all category for species that have hidden origins. The management and control (including eradication) of introduced marine species is termed marine biosecurity.

Why should we care about introduced species?

It has been argued that increasing biodiversity is a good thing. We are constantly fighting to stop the loss of biodiversity, so surely adding one more species locally must

be good? [7] Globalisation of the world is leading to human, culture, services, and information interconnectedness[8,] but also to the biotic homogenisation of the marine, terrestrial and freshwater species.[9,] It has been argued that the current approach to introductions is xenophobic.[10] However, homogenisation is resulting in economic losses that are equivalent to approximately 5 per cent of the world economy (ie, trillions of dollars are being lost) and we are expending millions trying to understand, prevent, control, eradicate and mitigate introduced species, especially pest species. [11]

What is bad about introduced species? Human mediated transfers of species occur at a much faster rate than natural dispersal,[12] which has biological and ecological implications for the introduced species and the receiving ecosystem. For example, introduced species have fewer predators, pathogens and diseases than native species[13,] making them more capable of out-competing native species. Introduced species also lack co-evolutionary ties with the receiving community species[14,] and hence they can easily expand beyond their realised niche. Introduced species can predate upon native species, hybridise with natives (to the detriment of the natives) and compromise natural ecosystem services such as clogging waterways (eg, *Spartina* sp[15]), or damaging fisheries (eg, Nile perch[16]). All of these impacts ultimately reduce biodiversity, not increase it.[17] Consequently, introduced species are a widely recognised problem.

In a marine context, introductions can be categorised into those that are introduced intentionally (imported species) and those that are introduced unintentionally (not imported; hitchhikers, accidental transfers). Examples of intentionally introduced species include species that are used for human food (eg, abalone in Chile[18]), animal feeds (eg, microalgae[19]), bait (eg, pilchards in Australia[20]), the aquarium trade (eg, *Caulerpa*[21]), research (eg, *Botrylloides sandiegensis*[22]), and teaching (eg, *Gymnodinium catenatum*). Unintentional examples include species that arrive via hull fouling or hull boring (eg, the ascidian *Styela clava*), species that have survived in ballast water (eg, the sea star *Asterias amurensis*), pathogens that have hitchhiked with bait (eg, the pilchard herpes virus), and species that have hitchhiked with aquaculture species (eg, the crab *Petrolisthes elongatus* associated with oysters). Intentional introductions are more easily managed as countries can legislate to control what species and how it enters their jurisdictional area. For example, a species may be deemed to be a high risk and hence can only be imported to a country if it is maintained in a quarantine facility.[23]

How do humans transport introduction species?

In the marine environment, introduced species are moved from one place to another via various transport methods termed vectors. Examples of vectors include shipping (ballast water, dry and semi-dry ballast, hull fouling, hull boring, sea chests etc), trade (procurement of species via trade and their subsequent shipment), and tourism (eg, hitchhiking species that attached to tourists' equipment). The route which the species takes to arrive in an introduced locale is referred to as the pathway. A pathway can be convoluted and hence epidemiological analyses are used to determine pathways for species arrivals. For example, a ship may travel from port A to port B and along the journey visit a number of intermediate ports taking on and releasing ballast water, which retains a mix of species from the various ports. When the ship finally arrives at its destination port, the pathway has not taken a direct route and subsequently the destination port is exposed to the original port of call species but also to the species picked up at the numerous ports that were visited on route. To expand upon this, ports do not trade in isolation (ie, port A to port B transfer is overly simplified); thus,

potentially the available species in a trading port is a mix of all the species from all the different ports that trade with that one port.

To aid in the control of introductions countries have developed quarantine regulations, import health standards and legislation that prevents the unregulated entry of species.[24] These regulations target known species that are being intentionally introduced to a region[25,] (ie, species that are being imported) but do little to aid with unintentional species that are introduced due to poor regulation of a pathway (transfer route) or vector (transport mechanism).[26]

In an effort to redress such concerns, international law has sought to deal with introduced species in a manner that will aid their management, and if required their eradication. The CBD and GATT (including the SPS), each deal with introduced species in a manner that meets their specific agendas and, from this perspective, are discussed in further detail below. It could be said that the 'precautionary principle' is applicable to the operation of both these treaties, however, because each treaty has a different agenda and because each takes a different approach to the application of the precautionary principle, the potential for conflict exists.

Precaution: what does it mean?

The precautionary principle has been applied in the interests of environmental protection since the 1970s.[27] Various explanations of the principle have been provided, including the commonly referred to statement of the principle found in Principle 15 of the Rio Declaration on Environment and Development. As an example, this statement provides that in situations presenting with the threat of 'serious or irreversible damage, scientific uncertainty must not be used as a basis for 'postponing cost-effective measures to prevent environmental degradation'. [28]

Whilst international environmental principles, such as the Rio Declaration, assist in illustrating the precautionary principle, unless the precautionary principle is expressly incorporated into an international treaty, there can be difficulties in requiring its application ie, 'a precautionary approach'.[29] This is because of a number of factors, including the 'soft law' status of guiding principles within the international legal framework, and in the particular case of the precautionary principle, the ongoing debate as to whether or not it has achieved the status of customary international law and can therefore be automatically applied.[30]

In response to this, a number of international treaties and declarations have incorporated versions of the principle into their texts to help facilitate an approach.[31]

Within discussions about the application of the precautionary principle, the terms 'precautionary principle' and 'precautionary approach' are often used. The distinction between use of these two terms generally lies with the term 'approach' being used to describe the principle's application.[32] The World Commission on the Ethics of Scientific Knowledge and Technology, comments on this by acknowledging that there is discussion on the meaning of the two expressions, but that in general the term 'principle' is associated with the philosophical basis of the precaution concept, and the term 'approach' is used in the context of 'its practical application'.[33] The wording of Principle 15 of the Rio Declaration provides a direct example of this distinction. Prior to the statement of the principle itself, the text also requires that the precautionary approach must be taken by a State in a manner commensurate with their ability to do so.[34] In furthering the understanding of the distinction between 'principle' and 'approach', it could be suggested that the wording in Principle 15, in allowing an approach that varies with the ability of a State to apply the principle, intentionally

provides an inherently extensive level of flexibility associated with the principle's application.

Moving away from the flexible approach associated with the 'soft law' version of the principle, it could also be argued that the manner in which the various versions of the principle have been expressed in a treaty, when read with the objectives of that treaty, can assist in indicating the degree of the approach to be taken in applying the principle.[35]

It should also be noted that the precautionary principle philosophy and precautionary approach to be taken, as intended by an international treaty, is also strongly influenced by the domestic legislation and policy requirements of a particular country in its implementation of a treaty.[36] In addition to this, the wording of the precautionary principle in a treaty will often lack definitive direction,[37] and it could be said that this allows a considerable amount of leeway for the way in which countries formalise the principle and approach in legislative requirements.

An example of the variation in the 'precautionary approach' is illustrated below in a discussion of the comparison between the application of the CBD and SPS documents. In this context it could be said that the differing approaches form part of the basis for the potential conflict between international treaties that seek to manage similar issues eg, introduced marine species.

The Convention on Biological Diversity and introduced species

As mentioned earlier, this paper seeks to highlight the potential for conflict between the goals of two international treaties, the CBD and GATT 1994/ SPS; in particular where there is an application of the precautionary principle, or the 'precautionary approach'.

The objectives of the *Convention on Biological Diversity, 1992* (CBD) include biodiversity conservation and its sustainable use.[38] Within the CBD, three articles focus on introduced species in the context of conserving global biodiversity:

- Article 3,which deals with transboundary movement: '…to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or areas beyond the limits of national jurisdiction';
- Article 8(h), which deals with the managerial component of biosecurity: 'to prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species'; and
- Article 14, which deals with 'Impact Assessment and Minimizing Adverse impacts' and includes requirements for the accountability for and management of measures affecting biodiversity both within and beyond jurisdiction; including those relating to the consequential impacts of a State's programs and policies that are deemed likely to have significant adverse effects on biological diversity.

Although they are not identified in the CBD itself, the jurisdictional limits and general responsibilities of States for the marine environment, that allow a State to fulfill its CBD obligations relating to introduced marine species, are provided for by the *United Nations Law of the Sea Convention, 1982* (UNCLOS III). The marine jurisdictional requirements for invasive species and their management under the CBD are also supported in UNCLOS III by reference to the control of introduced marine species as a matter for marine environmental protection and regulation at Article 196. This Article in itself is important for the regulation of vectors ie, shipping. However, concerns about the lack of guidance on how to achieve the objective of this Article have been raised.[39] Similar concerns have also been raised about the strength and guidance of regulatory control associated with Article 8(h) of the CBD.

To overcome such concerns about the CBD's management of marine invasive species, it is suggested that the application of the precautionary principle and as such the strength of the approach taken is an important element in achieving the CBD's general objectives. Articles 8(h), 3 and 14, in reference to introduced species, are underpinned by the precautionary approach detailed in the CBD's preamble. The precautionary approach appears as such:

> Noting also that where there is a threat of significant reduction or loss of biological diversity, lack of full scientific certainty should not be used as a reason for postponing measures to avoid or minimize such a threat.

As discussed by Riley, Article 1 of the CBD Guidelines provides further support for the use of the precautionary principle. In doing so, the guidelines state that the precautionary principle sets 'an appropriate standard' for managing invasive species. Riley also discusses that the CBD, as an organisation, emphasises that the impetus for this relates to 'the unpredictability of the invasion process' as justification for prohibiting introductions, unless proven safe.[40]

The precautionary principle when considered with the CBD's requirement that the onus for assessment, management and control of activities related to trade of introduced species rests with the State proposing to undertake the activity[41,] (known in trade circles as the exporter), indicates that the burden of proof lies with the proponent of an activity.[42]

This in itself, and alongside the intrinsic values of the CBD, could suggest that the precautionary approach to be taken by those implementing the CBD requires a strong emphasis within decision-making.

In addition, the essence of this is that it presents a 'guilty until proven innocent by science' approach to the transboundary movement of organisms by the importing and exporting country.[43] Member countries of the CBD are obliged, under the Convention, to ensure that their trade activities adhere to the protection of biodiversity. Importers of introduced species need to heed Articles 8(h) and 14; while the weight of the onus is on exporters who need to observe all Articles 3, 8(h), and 14.

The World Trade Organisation and introduced species

The World Trade Organisation (WTO) was established to facilitate and promote a global increase in trade through liberalisation of world markets.[44] As market liberalisation stimulates trade, thereby increasing trade volumes, the opening of the world to free markets facilitates and increases trade activity.[45] As a consequence of this increased global trade activity, there has been a concomitant global increase in frequency of introduced species via trade, increasing the risk of harmful introductions to plant, animal and human health.[46]

This concern is dealt with in the text of the WTO and operational measures are solidified under the *General Agreement on Tariffs and Trade 1994* (GATT). While allowing a country to block trade, GATT ensures bans and restrictions on trade are not protectionist measures by a Member State under the guise of environmental protection.[47] It is serviced by three standard setting bodies in formation under the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS). They include the International Plant Protection Convention (IPPC 1952, revised 1997), the World Animal Health Organisation (Office Internationale des Epizooites (OIE)) and Codex Alimentarius (food standards) (CA).

In particular, these mechanisms under the SPS prescribe the use of risk assessment methods in order to quantify possible negative effects of introduced species on these

three domains.[48] The right of an importing nation to protect itself against introduced species by blocking trade of certain items is made possible under these mechanisms. However, decisions based on these standardised risk assessments can be scrutinised and overruled by WTO organs, forcing a Member to comply with WTO rules and continue the trade of suspect introduced species. This approach could be said to represent the absence of the precautionary approach in the WTO,[49] as well as promote the stance of an 'innocent until proven guilty by scientific proof' approach to introduced species[50] and the importer.

That said, it has been acknowledged that the SPS and even parts of GATT embed a variation of the precautionary principle through 'gateway' provisions. The evidence for this has been discussed by Cheyne as being present within Articles 5.1 and 5.7 of the SPS, as well as the potential for its application through the GATT in Articles XX(b), XX(g) and, although considered with ambivalence, the chapeau of Article XX.[51]

Article 5.7 of the SPS incorporates a form of precautionary approach, in relation to 'Assessment of Risk and Determination of the Appropriate Level of Sanitary or Phytosanitary Protection' as follows:

> In cases where relevant scientific uncertainty is insufficient, a Member may provisionally adopt sanitary or phytosanitary measures on the basis of available pertinent information, including that from the relevant international organizations as well as from sanitary or phytosanitary measures applied by other members. In such circumstances, Members shall seek to obtain the additional information necessary for a more objective assessment of risk and review the sanitary or phytosanitary measure accordingly within a reasonable period of time.

However, Cheyne points out there has been division amongst commentators as to the extent that this Article and the other Articles within the GATT and SPS allow for the application of the precautionary principle. Cheyne also appears to conclude that the question as to the strength of the precautionary approach appears to remain somewhat uncertain due to the WTO Appellate Body's acknowledgement of its existence yet failure to embrace it as a part of international law, and refusal to allow it to cancel out the intended meaning of provisions, such as Article 5.7 and 3.3 of the SPS.[52]

Another aspect of the WTO that should be examined in the context of introduced species is the recognition by the Trade Related Intellectual Property Rights (TRIPS) Council of traditional knowledge during the Doha Declaration. This area is usually examined in the context of the rights of traditional owners to traditional medicines and the lack of shared benefits. As more private interests are claiming intellectual property rights (IPR) incentives in trade of this 'intellectual property'[53] further encourages the trade and dissemination of more exotic species, genetic materials, pathogens, disease and bacteria to other parts of the world, increasing the incidence of introduced species.

Ultimately the WTO, with SPS Agreement, has developed into an authority that attempts to liberalise trade, while attempting to reduce the risk that introduced species may harm human, animal and plant health, through trade blocking, while also administering an operational arm that removes impediments to trade restriction.[54] This operation alone can result in managerial friction.

The conundrum: marine biosecurity under CBD and WTO

Those operating in marine biosecurity realise the importance of the precautionary approach and are more inclined to adopt preventative measures to manage the problem. In addition to this, given the variable natures of introduced species, marine ecosystems and predicting impacts on the marine environment, marine biosecurity

measures seek to engage adaptable approaches, managing introduced species on a case by case basis. Under the agreement of the CBD, this is an adequate approach for the protection of biological diversity against introduced species. However, this approach can conflict with SPS instruments under the WTO.

Under the SPS Agreement, strict guidelines govern the reasoning for blocking trade in a species. In particular, an action to block trade cannot be based on protectionism, but must be based on a risk assessment (that has an endpoint of protection for humans or animals against food-borne diseases, and/or protection against pests and diseases) that has a sound scientific basis backed by strong evidence.[55,]

For example, *Australia – Salmon* is a case where Canada brought Australia before the WTO's Apellate Body (AB) to appeal Australia's actions. In this situation Australia attempted to block the importation from Canada of frozen and fresh salmon that were suspected of carrying pathogens. Australia believed these pathogens could pose a level of risk to native fish. In addition to the ruling, which resulted in Australia failing in their attempt to block the salmon importation, the AB noted that Australia's allowable level of protection (ALOP: also known as 'acceptable level of risk') was deemed higher in the case against Canadian salmon than with other similar products of import (fish and bait), and therefore deemed the risk assessment to be unsatisfactory and not based on science. [56] Of interest is that a WTO member can determine its own ALOP, but in this case Australia had not been consistent with its application of ALOP and had violated Article 5.1. According to Cheyne, in the *Australia – Salmon* case, the AB identified that the precautionary principle existed within the limits of the discretion associated with determining an ALOP.

However, this ruling is typical of the uncertainty of the SPS and illustrates the restrictions it can impose on a State that wishes to fulfil obligations of 'hard law' such as the CBD. In the alternative, however, it should also be noted that the CBD does not provide a forum in which the rights and obligations associated with other international treaties can be imposed upon, and therefore fails to abrogate trade restrictions that relate to invasive species issues.[57]

Developing countries have criticised the WTO approach to introduced species.[58] While the onus is on the importer to provide a risk assessment to protect the health of the receiving State's humans, animals or plants, the burden of proof and associated costs are borne by the importing countries. This places poorer countries in a difficult position as they generally do not have the frameworks or the funding capacity to carry out adequate risk assessments. Some of these countries have protested that the SPS measures in the OIE, IPPC and CA are designed primarily for developed countries that can afford these assessments and have access to technologies associated with them. In essence, these developing countries are more susceptible to damaging introduced species under WTO free trade because they benefit from liberalised trade regimes, that stimulate their economy, yet are unable to perform risk assessments to maintain their biosecurity.

Economic and social implications

Given the similar goals of societal wellbeing, both the CBD and WTO initiate different approaches when dealing with introduced species. WTO focuses on the benefits of global trade to economies and societies. In a marine context this has a focus on fisheries and aquaculture[59] and has short term goals at its heart. Alternatively, the CBD promotes the protection of global biodiversity via sustainable practices, with long term goals at heart. The CBD views the environment as a finite resource that needs to be shared equitably within and between generations for the benefit of humankind, and

preservation and responsible management of the environment are central to that aim. The impacts associated with the loss of biodiversity through harmful introduced species are a decrease in environmental services, which decreases employment in economic activities, reduces the quality of natural surroundings, and human resource opportunity costs in science and technology are foregone for the management of introduced species outbreaks. [60]

Conclusions

The inconsistency between WTO policy direction and the CBD can be attributed to the absence and presence, including strength and weakness, of vital driving principles. The main principle of note is the precautionary principle, which is a common thread, linking international environmental laws with environmental State laws in the pursuit of protecting the environment, and in the case of CBD, biodiversity. Based on the discussion above, it could be suggested that the precautionary approach taken by the WTO is somewhat weaker than that evident within the CBD, and the seemingly higher authority the WTO has over multilateral environmental agreements, seems to benefit the primary goal of the WTO, which is to facilitate increased trade which may impede the implementation of CBD operations. Based on the available information and simply stated, this conflict places an increased risk of harmful introduced species impacting on global biodiversity, economics and social wellbeing.

The potential for the WTO's SPS Agreement to foil efforts of a State to protect its environment from the harm of introduced species is counter-productive to the primary goals of the WTO. The economic harm associated with introduced species can and should be conducive to controls on trade and the SPS Agreement needs to incorporate a more integrated approach with multilateral environmental agreements such as the CBD.

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[32] See manner of general discussion in Cheyne (2007) *op cit*, Stein (2000) *op cit*, and Riley (2005) *op cit*. Also see, for example, the definition of 'precautionary approach' provided by the European Environment Agency (an agency of the EU) in their 'Environmental Terminology and Discovery Service'. The definition being 'precautionary approach: A decision to take action, based on the possibility of significant environmental damage, even before there is conclusive, scientific evidence, that the damage will occur'. This definition can be found at <http://glossary.eea.europa.eu/EEAGlossary/search_html> accessed on 26/03/09.

[33] COMEST and UNESCO (2005) *op cit.*

[34] UNCED (1992) *op cit*, Principle 15.

[35] For example, see the general discussion in Cheyne (2007) *op cit*, about the application of the precautionary principle in the context of the WTO, GATT and SPS.

[36] For example, Australia, in adopting the concept of ESD within the Intergovernmental Agreement on the Environment 1992 at Section 3.5.1, amended the wording of the precautionary principle, through the use of the word 'should' instead of 'shall' so as to imply a discretionary directive instead of a mandatory directive. In turn, this has been reflected in the Australian Government's principal piece of legislation for environmental protection, the

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