

Invasive alien species and the protection of biodiversity: the role of quarantine laws in resolving inadequacies in the international legal regime

Author:

Riley, Sophie

Publication Date:

2008

DOI:

<https://doi.org/10.26190/unsworks/18104>

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**INVASIVE ALIEN SPECIES AND THE PROTECTION
OF BIODIVERSITY: THE ROLE OF QUARANTINE
LAWS IN RESOLVING INADEQUACIES IN THE
INTERNATIONAL LEGAL REGIME**

**A thesis submitted in fulfillment
of the requirements for the degree of
Doctor of Philosophy**

Sophie Riley

2008

ABSTRACT

The problem of invasive alien species (IAS) is recognized as the second most serious threat to loss of biodiversity after habitat destruction. It is a problem largely created by humans as they transport and introduce species, deliberately and accidentally, from one part of the globe to another. The pressures exerted on biodiversity by international trade are one of the most serious aspects of the IAS problem. Although states are under obligations in international environmental law to prevent the entry of, and control, those alien species that threaten biodiversity, to date state practice has often been found wanting. In particular, quarantine regulation, which can be a state's first line of defence against IAS, is mainly used by states to protect their farming and agricultural product sectors rather than biodiversity at large. The reasons for this include lack of domestic resources and lack of guidance at the international level. However, even if states were to expand the purview of quarantine, the question arises whether they would be able to use quarantine regulation to protect biodiversity from IAS while simultaneously fulfilling their international trade law obligations. This study seeks to answer this question by examining international environmental law and international trade law in their application to quarantine regulation. In doing so, the study identifies many areas of conflict. The different policies that underpin environmental and trade regimes mean that environmental concepts, such as the precautionary principle and the ecosystem approach, are difficult to apply within the international trade law regime. A way of achieving a more harmonized international response to the problem of IAS is suggested by incorporating environmental considerations into the international standards used by states to design and implement domestic quarantine measures. To facilitate the practical implementation of international standards the study further recommends appropriate financial and institutional capacity building mechanisms.

ACKNOWLEDGEMENTS

Heartfelt thanks to my husband, Frank, for his support , encouragement and patience; to my supervisors, Professors Andrew Byrnes, Ross Buckley and Professor Rosemary Rayfuse for their guidance, help and insightful questions and comments; and to Kerrie Daley for her assistance. Thank you also to Eileen Kee from the IMO secretariat and to Ricardo Guillermo Muñoz Ossandon of the FAO David Lubin Memorial Library for assistance in retrieving information and documents.

To Mrs Lazar and Miss Ruprecht, two teachers extraordinaire and Frank, my loving husband and partner.

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LIST OF ABBREVIATIONS

ACAP	Agreement on the Conservation of Albatrosses and Petrels
ATS	Australian Treaty Series
AWEA	Agreement on the Conservation of African-Eurasian Migratory Waterbirds
ALOP	Appropriate Level of Protection
CBD	Convention on Biological Diversity
CCAMLR	Convention on the Conservation of Antarctic Marine Living Resources
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
COP	Conference of the Parties
CTE	Committee on Trade and Environment
CSIRO	Australian Commonwealth Scientific and Industrial Research Organization
EC	European Community
EEC	European Economic Community
EIA	Environmental Impact Assessment
FAO	Food and Agriculture Organization
GATT	General Agreement on Tariffs and Trade
GEF	Global Environment Facility
GISP	Global Invasive Species Programme
IAS	Invasive Alien Species
ICES	International Council for the Exploration of the Sea
ICJ	International Court of Justice
ICPM	Interim Commission on Phytosanitary Measures
ILM	International Legal Materials
IMO	International Maritime Organization
IPPC	International Plant Protection Convention

IUCN	World Conservation Union, also known as International Union for the Conservation of Nature
MEA	Multilateral Environmental Agreement
NASCO	North Atlantic Salmon Conservation Organization
OIE	Office International des Epizooties
SCM	Agreement on Subsidies and Countervailing Measures
SCOPE	Scientific Committee on Problems of the Environment
SPREP	South Pacific Regional Environment Programme
SPS	Sanitary and Phytosanitary
SPSA	Agreement on the Application of Sanitary and Phytosanitary Measures
TBT	Agreement on Technical Barriers to Trade
TED	Turtle Excluder Device
TRIPS	Agreement on Trade Related Aspects of Intellectual Property Rights
UN	United Nations
UNTS	United Nations Treaty Series
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational Scientific and Cultural Organization
USA	United States of America
WHO	World Health Organization
WTO	World Trade Organization

INTRODUCTION

FORMULATION OF THE PROBLEM

On Christmas day in 1859, Thomas Austin released 24 rabbits that he had imported from the United Kingdom into the Australian state of Victoria,¹ with the aim of providing game for hunting purposes. So successful was this scheme that, seven years later, in 1866, Mr. Austin was congratulating himself that as many as 14,253 rabbits had been shot on his property.² However, by 1910, the destructive potential of this introduced species had been fully unleashed, with rabbits having developed into a pest of national proportions and importance which, to the present, have cost Australia in the vicinity of \$AU113 million per annum in eradication and containment measures and lost agricultural production.³

Similarly, in the nineteenth century European importers were introducing North American grapevines into Europe. Unknowingly, destructive aphids called *Phylloxera Vastatrix* had accompanied the grapevines and, by 1865, accounts of vine deaths started to emerge.⁴ *Phylloxera* proceeded to devastate the European viticulture industry, destroying one million hectares of vines in France alone. The industry was saved by grafting European vines on to

¹ G Wilson, N Dexter, Peter O'Brien and Mary Bomford, *Pest Animals in Australia*, Kangaroo Press and Bureau of Rural Resources (1992) 8; Anti-Rabbit Research Foundation of Australia, *National Launch of Rabbit Control Handbook*, <<http://www.csiro.au/communication/rabbits/rab111297.htm>> February 2007.

² Anti-Rabbit Research Foundation of Australia, above n 1, 1.

³ Ross McLeod *Counting the Cost: Impact of Invasive Animals in Australia*, Cooperative Research Centre for Pest Animal Control, Canberra (2004) 14. This a conservative estimate and other estimates have put the figure as high as one billion dollars. See G Wilson, N Dexter, Peter O'Brien and Mary Bomford, above n 1.

⁴Phylloxera and Grape Industry Board of South Australia, *A Growers' Guide to Choosing Rootstocks in South Australia* (2003). Available from: <http://www.phylloxera.com.au/viticulture/rootstocks/choose_rootstocks.asp> June 2005

phylloxera-resistant native North American vines⁵ – a practice that continues to this day.

Although eventually both the rabbit and *phylloxera* infestations were controlled, this did not occur until after these species had already caused considerable damage. Additionally, by the time their destructive propensities had become apparent, both species were so well established that total eradication was impossible. Their legacy remains in the form of continuing monitoring and containment measures that are still necessary to ensure the species are held in check.

One of these introductions was deliberate and the other accidental. However, in both cases, trade provided the pathway for the importation of these species, while inadequate or non-existent quarantine measures facilitated their entry. Although lack of knowledge of the likely consequences of species' introductions might have excused these nineteenth-century introducers, the same cannot be said today. At the beginning of the twenty-first century, awareness of the problems caused by introduced species is widespread and it is generally accepted that tighter preventative regulation against what have come to be called invasive alien species (IAS)⁶ is necessary.

Environmental problems attributable to IAS have recently received considerable attention at the international level. Agenda 21,⁷ for example,

⁵ IUCN, World Conservation Strategy, (1980) XXIII *International Protection of the Environment* B Rüster, B Simma and M Bock (eds) Oceana New York, (1981) 420, 435.

⁶ The meaning of the term, 'invasive alien species', is discussed in detail in Chapter 1 of this study. The term is used in conformity with the use of the term by the parties to the Convention on Biological Diversity in 'Guiding Principles for the Prevention, Introduction and Mitigation of Impacts of Alien Species that Threaten Ecosystems, Habitats or Species' adopted as part of Decision VI/23 of the Conference of the Parties, Report of the Sixth Meeting of the Conference of the Parties to the Convention on Biological Diversity, UNEP/CBD/COP/6/20 (23 September 2002). *Convention on Biological Diversity* 1992, adopted 5 June 1992, [1993] ATS no 32 (entered into force 29 December 1993). The convention had 190 Parties as of November 2007.

⁷ Adopted at the United Nations Conference on Environment and Development, Rio de Janeiro 3-14th June 1992. Agenda 21. paragraph 15.3. Printed in: *Agenda 21 and the UNCED*

specifically recognizes that inappropriate plant and animal introductions have contributed to biodiversity loss. Reflective of this, Article 8(h) of the 1992 Convention on Biological Diversity (CBD) calls upon the contracting parties to “prevent the introduction of or control or eradicate those alien species which threaten ecosystems, habitats or species”. The Conference of the Parties (COP) to the CBD has pinpointed the IAS dilemma as a cross-cutting issue to be dealt with in each of its thematic work programs,⁸ while the World Conservation Union (also known as the International Union for the Conservation of Nature or IUCN)⁹ has called invasive alien species “one of

Proceedings, 3rd Series, Volume 4, *International Protection of the Environment*, Nicholas A Robinson (ed) Oceania New York (1993).

⁸ The Conference of the Parties to the Convention on Biological Diversity has identified 5 thematic work programmes: biodiversity of marine and coastal areas, agricultural areas, forest areas, inland waters, and dry and sub-humid lands. Cross-cutting programmes pinpoint issues relevant to all thematic areas. See: Report of the Second Meeting of the Conference of the Parties to the Convention on Biological Diversity (UNEP/CBD/COP2/19) (30 November 1995), Decision 11/10 Annex 1, paragraph (xi) relating to Conservation and Sustainable Use of Marine and Coastal Biological Diversity (paragraphs 1, 3-6 retired by decision VI/27B Operations of the Convention UNEP/CBD/COP/6/20 (23 September 2002); Report of the Fourth Meeting of the Conference of the Parties to the Convention on Biological Diversity UNEP/CBD/COP/4/27 (15 June 1998), Decision IV/4 Annex 1 (contained in UNEP/CBD/COP/4/L.2 (June 1998)) on Status and Trends of the Biological Diversity of Inland Water Ecosystems (Decision IV/4, paragraph 1, 4 to 5, 8, 10, and annex 1 retired by Decision VII/33 Operations of the Convention UNEP/CBD/COP/7/21 (13 April 2004) , Decision IV/5 on Marine and Coastal Biological Diversity (contained in UNEP/CBD/COP/4/L.2Add.1 (June 1998)) (Decision IV/5, paragraph I(1), I(2), II(1) to II(3) and annex retired by Decision VII/33 Operations of the Convention UNEP/CBD/COP/7/21 (13 April 2004) Decision IV/7 on Forest Biological Diversity (contained in UNEP/CBD/COP/4/L.2/Add.3 (June 1998)) (Decision IV/7 retired by Decision VII/33 Operations of the Convention UNEP/CBD/COP/7/21 (13 April 2004) ; Report of the Fifth Meeting of the Conference of the Parties to the Convention on Biological Diversity UNEP/CBD/COP/5/23 (22 June 2000); Decision V/2, Progress Report on the implementation of the programme of work on the biological diversity of inland water ecosystems; Decision V/3, Progress Report on the implementation of the programme or work on marine and coastal biological diversity; Decision V/5, Agricultural biological diversity: review of phase I of the programme or work and adoption of a multi-year programme of work; Decision V/23, Consideration of options for conservation and sustainable use of biological diversity in dryland, Mediterranean, arid, semi-arid, grassland and savannah ecosystems.

⁹ The World Conservation Union was founded on 5 October 1948 as the International Union for the Protection of Nature. In 1990 the name of the organization was changed to the World Conservation Union, although the acronym, IUCN remained in use. The IUCN draws its membership from over 140 countries and currently has more than 10,000 acknowledged scientists and other experts that volunteer their services. The IUCN applies ecosystem management principles aligning both environmental and economic issues. <<http://www.iucn.org>> March 2007.

the major threats to biological diversity”, with their impacts considered to be as damaging as loss of habitat.¹⁰

The impacts of IAS upon biodiversity are numerous and include direct predation, loss of habitat and out-competing of native species for food and other resources. The means of introducing IAS are just as varied and include discharge of ballast water, movement of goods and people, instigation of human activities, such as construction of canals, and introduction of species for biocontrol purposes. Some species have been introduced deliberately and others accidentally. Given the diverse challenges and situations to be met, comprehensive and effective international regulation of IAS remains elusive.

One of the primary sources of introductions is international trade. Overall trends in international trade reveal increases in both the volume of trade and the physical distance between trading partners. The link between international trade and the potential for increased incidence of transfer and introduction of IAS globally cannot be ignored.

One of the most effective means of preventing the introduction and spread of IAS through trade is to stop them from gaining entry in the first place. Thus, quarantine control is a state’s primary line of defence. The use of quarantine laws to regulate the movement of people and species finds its origins in fifteenth-century initiatives by individual states to protect human health from plague epidemics.¹¹ In more modern times national quarantine measures have been adopted to protect human health and commerce in agricultural commodities. The adoption of national quarantine measures, coupled with increasing movement of people, items, and species, across international

¹⁰ IUCN, ‘Guidelines For the Prevention of Biodiversity Loss Caused by Alien Invasive Species’, Species Survival Commission of IUCN, Gland, Switzerland (2000) paragraph 1.

¹¹ William McNeill *Plagues and Peoples*, Bantam Doubleday Dell Publishing Group, Inc. New York, NY (1976), 170. McNeill says that ‘the idea of quarantine had been present even in 1346 – this stemmed from biblical pages preaching the ostracism of lepers and by treating plague sufferers as though they were temporary lepers – forty days’ quarantine eventually became a standard’.

borders, has led to attempts to standardise or harmonise aspects of quarantine regulation at the international level. The International Plant Protection Convention (IPPC)¹² seeks to secure national action to prevent the spread and introduction of pests of plants and plant products and to promote appropriate measures for their control.¹³ Measures relating to animal health and disease control are coordinated under the auspices of the International Agreement for the Creation at Paris of an International Office for Dealing with Contagious Diseases of Animals and Annex (OIE).¹⁴

Behind these initiatives lies an expectation that quarantine regulation is well equipped to play a key role in the prevention and control of IAS. However, whether this is so depends, at least in part, on the extent to which national legislators are able to adopt and implement effective quarantine measures. Constraints on the efficacy of quarantine measures in protecting biodiversity from the adverse effects of IAS may arise from both lack of willingness and lack of capacity to act in the domestic arena. Moreover, international law may exert powerful constraints on national action, as is evident in the tension between the ideals of global free trade and protection of the environment. While the former emphasises the need for scientific certainty as a basis for

¹² *International Plant Protection Convention 1997* is the second revised text of the *International Plant Protection Convention 1951* (as revised 28 November 1979), adopted 17 November 1997, [2005] ATS No 23 (entered into force 2 October 2005). As of November 2007, the *International Plant Protection Convention 1997* (IPPC) had 166 parties. The first revised text of the *1951 International Plant Protection Convention* is the 1979 *International Plant Protection Convention*, adopted 28 November 1979. [1991] ATS No 50, (entered into force 4 April 1991). As at November 2007 73 governments had adhered to the convention. The initial *International Plant Protection Convention 1951* adopted on 6 December 1951, [1952] ATS No 5 (entered into force 3 April 1952). As of November 2007, 127 governments had adhered to this convention. The 1979 and 1997 amendments to the 1951 IPPC came into force for each contracting government on the 30th day after acceptance of the amendments by two-thirds of the contracting governments. The exception to this being amendments that imposed new obligations. These amendments come into force for each contracting government on the 30th day after acceptance of the amendments. See Articles XXI (4) and (5) of the 1997 IPPC; Article XII(4) of the 1979 *International Plant Protection Convention* and Article XIII(4) of the 1951 *International Plant Protection Convention*.

¹³ IPPC, Article 1.

¹⁴ *International Agreement for the Creation at Paris of an International Office for Dealing with Contagious Diseases of Animals, and Annex 1924*, adopted 25 January 1924 [1925] ATS No 15, (entered into force 12 January 1925). The organization is known as the OIE and as of November 2007 had 173 members.

action, the latter emphasises the need for action based on precaution in the face of scientific uncertainty. This tension is illustrated by the different approaches to regulation of IAS embodied in the Agreement on the Application of Sanitary and Phytosanitary Measures (SPSA)¹⁵ on the one hand, and the CBD on the other.

THE OBJECTIVE OF THE STUDY

The objective of this study is to examine the extent to which states are able to use quarantine regulation to protect biodiversity from the deleterious impacts of IAS, while simultaneously fulfilling their international trade law obligations. Central to this objective is an examination of the nature and efficacy of quarantine law in protecting biodiversity in general and an analysis of the influences that international trade law and international environmental law exert on national quarantine systems. Admittedly, much of the analysis provided here will apply equally to all trade and environment issues, not just to the biodiversity issue. However, the purpose here is to place that analysis in the context of a ‘case study’ relating to the use of quarantine measures in protecting biodiversity. Having identified the legal constraints on using quarantine regulation to protect biodiversity, this study makes a number of proposals for achieving improvements to the international regime.

THE FRAMEWORK FOR THE ENQUIRY

In conducting this study, attention will be focused on the interrelationship of three areas of law: environment, quarantine and trade. The first body of law to be examined is international environmental law, where a number of

¹⁵ *Agreement on the Application of Sanitary and Phytosanitary Measures* [1995] ATS No 8, 65, entered into force 1 January 1995. See below n 21.

instruments might potentially be relevant. A somewhat fragmented and uncoordinated range of binding and non-binding instruments that refer to IAS have been adopted since the beginning of the twentieth century. The primary obligation with respect to IAS comes from Article 8(h) of the Convention on Biological Diversity that requires states to control and regulate those alien species that threaten biodiversity. Nevertheless, this is a framework provision in a framework convention. The detail is therefore to be found elsewhere and, mainly, the most detailed instruments come from plant and animal protection conventions¹⁶ and non-binding guidelines adopted under the auspices of the CBD.¹⁷ However, vagaries abound and the instruments evidence, *inter alia*, lack of clarity as to definition of IAS, whether it is deliberate or actual introductions that need regulating, lack of details of the evaluation processes to be followed, and criteria for selection of the most appropriate measures. Rules of customary international law, such as the prohibition on transboundary environmental harm, may also play a role in the analysis.

The second area of law examined is quarantine. “Official” descriptions of quarantine are found in national legislation¹⁸ and definitions for limited purposes are found in instruments such as the IPPC.¹⁹ As used here, a working definition of ‘quarantine’ refers to the package of legal or regulatory processes adopted by states which are aimed at imposing measures on the import or export of plants, animals, agricultural products and other organisms and micro-organisms in order to prevent, control or delay the introduction or establishment of harmful or potentially harmful species. At the national level, quarantine laws need to be adopted and also underpinned by adequate resources and institutional mechanisms. At the international level,

¹⁶ IPPC, above n 12; OIE above n 14.

¹⁷ The Guiding Principles for the Prevention, Introduction and Mitigation of Impacts of Alien Species that Threaten Ecosystems, Habitats or Species above n 6; see also IUCN Guidelines For the Prevention of Biodiversity Loss Caused by Alien Invasive Species above n 10.

¹⁸ See for example section 4 of the Australian *Quarantine Act 1908* (Cth) discussed in section 3.5.2 of Chapter 3 of this study.

¹⁹ IPPC, Article II definition of ‘quarantine pest’, ‘non-regulated quarantine pest’. See discussion in section 3.3.1 of Chapter 3 of this study.

international regimes such as those established by the CBD, IPPC and the OIE are needed to provide guidance to states on appropriate measures and to provide a harmonisation function to strengthen the efficacy of the national regimes.

Trade law instruments, too, can exert considerable influence over both the content and implementation of national quarantine regulations. The international trade law regime is a vast one, encompassing over three hundred free or preferential trade agreements.²⁰ Each of these agreements will potentially have an impact on the ability of their parties to adopt and enforce quarantine measures. However, an analysis of all of these agreements and their impact is beyond the scope of this study. Rather, this study focuses on the law of the World Trade Organisation (WTO)²¹ and its effects on the ability of states to adopt preventative quarantine measures, including import and post-import controls. In examining the WTO system, reference is made to its predecessor regime, the General Agreement on Trade and Tariffs (GATT),²² Article XX of which is particularly linked to both the issue of quarantine, and to the more recent SPSA. Of special importance to this study is an analysis of the level of protection required and the concomitant content and process of risk assessment.

²⁰ The WTO web site indicates that as at July 2007 more than 380 regional trade agreements had been notified to it. See < http://www.wto.org/english/tratop_e/region_e/region_e.htm > September 2007.

²¹ The World Trade Organization (WTO) was established on 1st January 1995 by the *Marrakesh Agreement establishing the World Trade Organization*, adopted 15 April 1994, [1995] ATS No 8, 1 (entered into force 1 January 1995). As at November 2007 the WTO has 151 members. States who become members of the WTO automatically become members to a set of agreements that include the *General Agreement on Tariffs and Trade* (GATT) [1995] ATS No 8, 14; the *Understanding on Rules and Procedures Governing the Settlement of Disputes* [1995] ATS No 8, 375 ; and the Agreement on the Application of Sanitary and Phytosanitary Measures (SPSA).

²² *General Agreement on Tariffs and Trade* (1947) adopted 30 October 1947 [1948] ATS No 23 (entered into force 1 January 1948). GATT (1947) had 123 members. Upon commencement of the WTO GATT 1947 became inoperative and its provisions were incorporated into GATT 1994. See discussion in section 4.1 of Chapter 4 of this study.

Each of these areas of law represents a distinct discipline. However, regulation of a cross-sectoral problem such as IAS can only be effectively accomplished through the coordinated and harmonious application of all three. In this respect, quarantine laws represent a state's first line of defence against IAS. Pre-import border controls can be designed to evaluate planned introductions for their invasive potential, and to detect and intercept unplanned introductions. In this way, quarantine regulation can impact directly upon trade and a state's international trade obligations. By the same token, quarantine regulation can also be relevant to a state's international environmental obligations, for introductions gone wrong, unplanned introductions, and post-import measures, such as control and eradication, all have the potential to touch upon biodiversity.

The relationship between trade and the environment is also enlivened here. Apart from a handful of treaties that have a direct impact on trade, such as those dealing with plant and animal protection, and treaties such as the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) 1973,²³ and the Montreal Protocol on Substances that Deplete the Ozone Layer (Montreal Protocol) 1987 to the Vienna Convention for the Protection of the Ozone Layer 1985,²⁴ international environmental instruments do not generally address their relationship with international trade law. While this is understandable, given the different objectives of the two regimes, this sectoral approach leads on the one hand to gaps and on the other to potential overlap and conflicting rules and jurisdiction; all of which

²³ 1973 *Convention on International Trade in Endangered Species of Wild Fauna and Flora* (CITES) adopted 3 March 1973, [1976] ATS 29 (entered into force 1 July 1975). As at November 2007 CITES had 172 parties. Articles VIII Articles III, IV and V regulate trade in listed species. See also Article II(1) that refers to species listed in appendix I as those species that are in danger of extinction and which therefore must be subject to 'particularly strict regulation in order not to endanger further their survival'.

²⁴ 1987 *Montreal Protocol on Substances that Deplete the Ozone Layer* (Montreal Protocol) to the Vienna Convention for the Protection of the Ozone Layer 1985 adopted 16 September 1987, [1989] ATS 18 (entered into force 1 January 1989). As at November the *Montreal Protocol* had 192 parties. Article 4 of the Protocol deals with control of trade with non-parties while Article 4A deals with control of trade between parties to the protocol.

means there is currently a lack of coherence and consistency in the international regulation of the IAS problem.

Against this backdrop this study seeks to examine the gaps and inconsistencies in and between these three regimes in an effort to identify possible improvements to all three to provide more effective and holistic regulation for the protection of biodiversity from the deleterious effects of IAS.

METHODOLOGY

The research has been designed to develop an understanding of the important role that quarantine plays in the protection of biodiversity from invasive alien species and the impact of international trade law on that role. The study adopts a traditional set of methods, procedures and techniques to the conduct of the research and primarily centres on the analysis of legal texts, case studies, state practice and literature review. A major consideration of the research was deciding what legal texts and areas of state practice were relevant to the study. The data collection needed to include information on three areas of law: the environment, quarantine and trade. In addition, the data collection also needed to include legal texts at both national and international levels. Finally, the data collection needed to incorporate binding instruments, such as treaties, and non-binding instruments, such as guidelines, codes of conduct and standards adopted by international organisations. Indeed the latter instruments can provide more substance to framework treaty provisions and hence are as important to regulatory regimes as treaties and binding instruments.

In order to highlight gaps and inconsistencies in the IAS regime, information was needed on state practice in the areas of invasive alien species, quarantine

and international trade. Extensive use was made of the databases set up by various organizations such as the CBD, the Global Invasive Species Programme (GISP),²⁵ the IUCN, the WTO, the IPPC and the OIE. Specifically with respect to quarantine practice, Australia has been used as a case study.

Another key consideration was how to analyse the information that was collected. A combination of qualitative and quantitative methods has been used. This includes the generation of statistical information on state practice sourced from examination and analysis of national reports lodged with the CBD. In addition, comparative analysis was undertaken of the environmental, quarantine and trade regimes and their impacts on state practice with respect to invasive alien species.

THE OUTLINE AND SCOPE OF THE STUDY

This study is divided into seven chapters. Chapter One provides an introduction to what IAS are and why they are a problem, both in terms of the damage they can inflict on biodiversity and in terms of the difficulty of their regulation.

Chapter Two examines international environmental law relevant to IAS to determine whether international environmental agreements provide states with sufficient guidance to implement efficient IAS regulation. The number and variety of international instruments that touch upon IAS exceeds fifty. However, the most comprehensive references and guidelines are found in

²⁵ GISP is the Global Invasive Species Programme. It is an international organization that was formed in 1997 and has initially been funded through the World Bank. GISP works closely with international organizations, such as, the IUCN, the secretariat of the CBD and scientific, research and conservations groups, such as CAB International, SCOPE and CSIRO to develop best practices to control IAS on a global scale. The institution of this organization serves as a basis to gather and collate information on IAS on a world-wide scale. Their web site is <www.gisp.org> July 2007.

non-binding instruments. Consequently, the regime is weakened by a lack of mechanisms that promote fulfilment of environmental goals and objectives. This is borne out by state practice. Studies on this topic undertaken within the last decade by the CBD²⁶ and the IUCN²⁷ reveal that states are not achieving effective IAS regimes. Currently, this still appears to be the case. Statistics generated from the latest CBD national reports and supplemented by case studies indicate that only a handful of states have instituted comprehensive IAS regulation and many states concentrate efforts on the most pressing and conspicuous of IAS problems. This attitude is reflected in quarantine regimes that mainly focus on agricultural pests and plant and animal diseases, rather than biodiversity in general.

Chapter Three examines the nature and scope of quarantine regulation to determine how it can be used to protect biodiversity from IAS using Australia's quarantine regime as a case study. In general, effective implementation of quarantine regimes is hindered by resource and knowledge constraints that are exacerbated by weaknesses in the international plant and animal protection regime.

Chapter Four introduces international trade law with particular emphasis on the WTO. The objective of the chapter is to describe how the rules of international trade relate to the regulation of invasive alien species. The chapter starts with a brief overview of GATT, and a more detailed description of the Article XX exceptions. Article XX(b) is particularly important as it

²⁶ See for example, Convention on Biological Diversity 'Alien Species that Threaten Ecosystems, Habitats or Species' – Note by the Executive Secretary to the Conference of the Parties to the CBD UNEP/CBD/COP/6/18 (18 January 2002); Convention on Biological Diversity SBSTTA 'Invasive Alien Species: Comprehensive review on the Efficacy of Existing Measures for their Prevention, early Detection, Eradication and Control' UNEP/CBD/SBSTTA/6/7 (20 December 2000); Convention on Biological Diversity SBSTTA 'Note By The Executive Secretary, Invasive Alien Species, a Review of the Efficiency and Efficacy of Existing Legal Instruments Applicable to Invasive Alien Species' UNEP/CBD/SBSTTA/6/INF/5 (26 February 2001).

²⁷ See for example, Clare Shine, Nattley Williams and Lothar Gundling *A Guide to Designing Legal and Institutional Frameworks on Alien Invasive Species* IUCN Gland Switzerland Cambridge and Bonn (2000).

permits states to invoke an exception against GATT's customary embargo on trade restraints where quarantine-related measures are necessary to protect human, animal, or plant life or health. These exceptions are seen as notoriously difficult to challenge under GATT's discrimination-based concepts which, to some extent, set the scene for the adoption of the Agreement on the Application of Sanitary and Phytosanitary Measures (SPSA).

The discussion of the SPSA includes a commentary on the level of risk a state is prepared to accept – otherwise known as the “appropriate level of protection” – and the use of international standards and risk assessment as part of quarantine regulation. Finally, measures need to be the least trade-restrictive ones available. This is a similar requirement to that found in Article XX GATT. However, under Article XX GATT, measures do not need underpinnings of scientific certainty, which means that in many respects it is easier to argue an Article XX exception than defend proceedings based on a violation of the SPSA.

Chapter Five analyses the relationship between international trade, IAS and quarantine. The aim of the chapter is to determine the extent to which the rules of international trade adopted within the WTO limit the types of quarantine measures that states can implement. The chapter analyses risk assessment in the context of the strong emphasis that the SPSA places on science. While reliance on science is not in itself a problem, problems nevertheless do occur with the amount of information needed to satisfy a risk assessment conducted in accordance with the SPSA. The high threshold of compliance can potentially lead to the design of weakened quarantine regimes that increase the chances of invasive alien species gaining entry. This chapter concludes that the international trade regime encourages the implementation of reactive quarantine systems, rather than the evolution of proactive quarantine systems.

Chapter Six explores whether the convergence of rules and obligations found in the international environmental law regime, quarantine regimes and international trade law regime assists or hinders states in their use of quarantine regulation to protect biodiversity from invasive alien species. Key environmental principles and concepts including the precautionary principle, ecosystem approach and prevention of transboundary harm are examined to determine whether states are able to fulfill obligations specified in Article 8(h) of the CBD. The chapter examines how the strong focus on risk assessment and science within the SPSA contrasts markedly with the use of environmental impact assessment and the inclusion of social and policy considerations in environmental regimes. Moreover the differing treatments afforded to the allocation of the burden of proof, the role of the precautionary principle, the ecosystem approach and transboundary issues means that states are potentially hindered in preventing entry of IAS where scientific information is not conclusive. The conclusion reached in this chapter is that under the rules of international trade the system is strongly predicated on allowing entry to alien species in a way that impinges upon states' obligations to prevent the entry of alien species that threaten biodiversity.

Chapter Seven, the final chapter, explores how the IAS regime might be improved. One possibility incorporates strengthening the international environmental regime by adopting an IAS Protocol to the Convention on Biological Diversity. The real challenges, however, lie in finding ways of harmonising the ideal IAS regime with existing rules of international trade law. Even if, for example, the CBD Guiding Principles were to be adopted as a Protocol to the CBD, this would not necessarily settle the question of which instrument would take precedence in the event of a conflict. Nor would it settle issues with respect to participation, compliance and implementation of the protocol.

One possible way forward is to use international standards developed by the IPPC and OIE in order to incorporate salient environmental features into the evaluation process for invasive alien species. In addition, states also need appropriate capacity and resources to participate in the standard-setting process and to implement standards. The study, therefore, concludes with a discussion on capacity building and as a part of that, a suggestion for raising funds based on the Australian levy system.

THE LIMITS OF THE STUDY

The study is not designed to provide a complete review of the IAS dilemma. First, it is designed to assess state practice and international regimes as they apply to biodiversity. The study does not, for example, review those IAS such as allergens²⁸ and diseases²⁹ that have a direct impact on humans. Nor does the study review those IAS that have other impacts on humans, such as the destruction of biocultural diversity.³⁰

Second, while the study touches on resource issues by examining funding to support quarantine laws, it does not address wider and equally important issues associated with liability and reparation for damage caused to

²⁸ For example, the Asian gypsy moth can cause allergic reactions in some individuals that come into contact with its larvae and eggs. See fact sheet on *Lymantria dispar* on the Global Invasive Species data base. IUCN. <<http://www.issg.org/database/species/ecology.asp?si=96&fr=1&sts>> May 2007

²⁹ For example, the Avian influenza that has killed humans as well as birds. See material on web site of the World Health Organization. <http://www.who.int/csr/disease/avian_influenza/en/> May 2007.

³⁰ Biocultural diversity describes the link between biological and cultural diversity. See generally James C Russell, 'Invading the Pacific: Biological and Cultural Dimensions of Invasive Species in the Pacific Region' (2004) 2 (2) *Graduate Journal of Asia-Pacific Studies* 77, 80; L Maffi (ed) *On Biocultural Diversity Linking Language, Knowledge, and the Environment* Smithsonian Institution Press 2001; J Joh and D Harmon, 'A Global Index of Biocultural Diversity' (2005) 5 *Ecological Indicators* 231; Adela Baer, 'Maintaining Biocultural Diversity' (1989) 3(1) *Conservation Biology* 97.

biodiversity by IAS. In the greater context of environmental law, this hugely complex and involved issue merits its own detailed study.³¹

Third, although the study recommends changes and improvements to international standards, it is not intended to redraft those standards. Rather, the study provides guidance as to policy direction and in some cases specific improvements that can be made.

The law in this study is current up to 30 June 2007³² although some developments after this date are included.

³¹ See for example, Anne Perrault and William Carroll Muffet 'Encouraging Prevention, Developing Capacity and Providing Accountability: A strategy for Addressing International Invasive Alien Species Issues' Center for International Environmental Law, Washington DC, USA paragraph 16. Distributed at the Sixth Meeting of the SBSTTA Montreal, 12-16 March 2001. Available from: <<http://www.ciel.org/Publications/IASDiscussionPaper.pdf>> June 2004; M A Daniel 'Civil Liability Regimes as a Complement to Multilateral Environmental Agreements: Sound International Policy or False Comfort?' (2003) 12 (3) *Review of European Community and International Environmental Law* 225, 237; Peter Jenkins 'Paying for Protection from Invasive Species' Fall [2002] *Issues in Science and Technology* 67; See M O'Connor 'The Internalization of Environmental Costs: Implementing the Polluter Pays Principle in the European Union' (1997) 7 *International Journal of Environment and Pollution* 450; Daniel Esty and Robert Mendelsohn 'Moving from National to International Environmental Policy' (1998) 31 *Policy Sciences* 225; Andy Conway 'A Role for Economic Instruments in Reconciling Agricultural and Environmental Policy in Accordance with the Polluter Pays Principle' (1991) 18 *European Review of Agricultural Economics* 467; Paul Ekins 'European Environmental Taxes and Charges: Recent Experience, Issues and Trends' (1999) 31 *Ecological Economics* 39; Anil Markandya and M N Murty 'Cost-Benefit Analysis of Cleaning the Ganges: Some Emerging Environment and Development Issues' (2004) 9 *Environment and Development Economics* 61.

³² In particular, decisions handed down after this date are not discussed in the study: for example, *Brazil — Retreaded Tyres* WTO Doc WT/DS332/AB/R (Report of the Appellate Body 3 December 2007).

CHAPTER 1

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CHAPTER 1

THE PROBLEM OF INVASIVE ALIEN SPECIES

1.0 INTRODUCTION

Clarity of definition, articulation of the object or activity to be regulated, and the determination of goals to be achieved, are fundamental to the efficacy of any regulatory regime.¹ In the absence of clear definitions and goals, regulators cannot know what to regulate, when to implement measures, or what type of measures to implement. Yet, definition and articulation of the object and purpose of regulation may require knowledge and understanding of a plethora of factors relating to the identity, nature and use of the object, or the nature and conduct of the activity.

In the context of attempts to regulate invasive alien species, it is necessary first to define what we mean by “invasive alien species”, or IAS; and in formulating this definition it is possible to identify common elements that make these species a problem requiring regulation. However, to apply this definition in a way that achieves effective protection of biodiversity requires the allocation of substantial resources. Accordingly, at the very least, states need to gather and collate a great deal of knowledge and information on alien species, evaluate the potential of alien species to become invasive and identify the various pathways by which alien species can be introduced. Only

¹ R Lidskog, L Soneryd and Y Ugglå, ‘Knowledge, Power and Control - Studying Environmental Regulation in Late Modernity’ (2005) 7 *Journal of Environmental Policy and Planning* 89, 98-9. The authors discuss an ‘interest-based perspective’ to regulation that results from the struggles between divergent interests. Governments need to be sure of regulatory goals to balance these diverging interests.

when all these factors are known can a regulatory regime be established which protects biodiversity from the deleterious effects of IAS.²

The difficulties inherent in developing such a regime are compounded by the divergent uses and values humans place on certain species, and complicated by the great number of human activities which can, and do, result in intentional or accidental introductions. Hence, regulation of IAS may be coloured by the fact that one person's IAS is another's useful resource. For example, the plant *Echium plantagineum* is regarded as "Paterson's Curse" by Australian graziers, because its leaves are poisonous to cattle, while bee-keepers refer to it as "Salvation Jane", because its pollen provides food for bees.³ Effective regulation, therefore, also requires the political will to take into account the fact that a species may be an invasive alien species, even though it provides economic benefits to one product sector.

This chapter begins with a discussion of the definition of IAS. It then considers why IAS might be considered a problem in need of regulation and the difficulties associated with regulating these species. In other words, the chapter provides the justification for the need to prevent or limit introductions of IAS. The chapter then examines the various ways, or pathways, by which IAS may be introduced, with an emphasis on the role of trade in introducing species to new locations. The fact that species may be introduced, both intentionally and unintentionally, adds further complication and difficulties to the design and implementation of IAS regimes. These complications and difficulties are the final points discussed in this chapter. They include: consideration of whether species are IAS, or are a useful resource; whether problems that stem from regulation undertaken are along political, rather than

² See generally, Clare Shine, Nattley Williams and Lothar Gundling, *A Guide to Designing Legal and Institutional Frameworks on Alien Invasive Species* IUCN Gland Switzerland Cambridge and Bonn (2000).

³ See Richard Groves, Robert Boden and Mark Lonsdale, *Jumping the Garden Fence Invasive Plants in Australia and their Environmental and Agricultural Impacts* a CSIRO report for WWF, WWF-Australia (2005) 29.

ecosystem boundaries; the uncertainties inherent in determining the existence of a ‘threat’ to biodiversity; the difficulties in detecting and intercepting accidental introductions; and the cost of prediction, detection and eradication of IAS.

1.1 DEFINING “INVASIVE ALIEN SPECIES”

1.1.1 An Abundance of Terminology

No universally-accepted definition of the term “invasive alien species” exists. Rather, an abundance of terms has been used to describe unwanted species which depend upon how the species itself and/or the damage it can inflict are perceived. This definitional quagmire is partly explained by the origins of the concept of an IAS as a response to the deleterious impacts of some species on human health,⁴ and partly explained by the evolution of a range of terms designed to assist human endeavours, such as agriculture and farming.⁵ This means that where an alien species is seen as a resource, there may be resistance to regulation. Indeed, the development of terminology in both national and international law often describes species that may simply share the common failing of being unwanted.⁶ The species may not necessarily

⁴ See discussion in sections 3.2.1 and 3.2.2 of Chapter 3 of this study.

⁵ See discussion on the difficulties in Australia of regulating alien fish species in John Koehn and Rachael Mackenzie ‘Priority Management Actions for Alien Freshwater Fish Species in Australia’ (2004) 38 *New Zealand Journal of Marine and Freshwater Research* 457, 458; see also Department of the Environment and Heritage Commonwealth of Australia, ‘Australia State of the Environment Report 2001’, Bureau of Rural Sciences, CSIRO, Publishing on behalf of the Department of the Environment and Heritage Commonwealth of Australia (2001). Part 3, ‘Introduction of Novel Biota into Native Habitats and Communities’, woody weeds are described as those impacting upon land use, rather than ecosystem functioning.. <<http://www.deh.gov.au/soe/2001/land/land03-5.html>> July 2004.

⁶ For example, the *Rural Land Protection Act 1989* (NSW) section 96, permitted the Governor to declare native fauna unprotected, unless they are a threatened species, or a threatened ecological community. Similar provisions are found in sections 143(1) and 143(2) of the successor to this legislation, the *Rural Lands Protection Act 1998* (NSW), that permit the Minister to make an equivalent declaration other than with respect to animals that are protected fauna or a threatened species (section 143(5)).

share other, more important, characteristics, such as being a source of environmental damage.⁷

Historically, the issue was not so much whether a species was an alien one that had established and spread, but whether the species served any useful purpose.⁸ In land and water management practices, the notion of what is invasive has frequently assumed a secondary role to the species' perceived desirability. Crops, forestry plants, farm animals, farmed fish and garden plants are not ordinarily regarded as invasive species because these species grow where humans anticipate and want them to grow⁹ – despite the fact that farming, fisheries and forestry practices rely on just a few human-introduced species and result in the establishment of biodiversity-poor monocultures.¹⁰ Moreover, if these cultivated species escape, they can also cause environmental damage, leading subsequently to complex regulatory and containment issues.¹¹

In international instruments, for example, an abundance of terms has been used to describe a proliferation of unwanted species. In the farming context, where protection of crops or livestock health has been at issue, terms such as “pest”,¹² “weed”,¹³ “disease”,¹⁴ and “noxious”¹⁵ have been used. In the

⁷ See for example, Australia State of the Environment Report 2001 above n 5; Rural and Regional Affairs Reference Committee, Parliament of Australia, Senate *Commercial Utilization of Australian Native Wildlife*, Commonwealth of Australia (1998) Chapter 4b ‘Potential Environmental Impact’ paragraphs 4.27 and 4.31 and the discussion of superabundant native wildlife detailing the cost to the farming community of eradicating these pests, which include kangaroos, brushtail possums, and cockatoos.

⁸ Tim Low, *Feral Future* Viking Victoria, Australia (1999) 83, where he refers to pasture plants as an example.

⁹ Ibid.

¹⁰ CBD Conservation and Sustainable Use of Agricultural Diversity 1996 Decision 111/11 of COP 3 of the CBD. Annex 1 paragraph 7(a) UNEP/CBD/COP/3/38 (11 February 1997).

¹¹ See generally Tim Low, above n 9, Part VII.

¹² *International Plant Protection Convention 1951* adopted on 6 December 1951, [1952] ATS No 5 (entered into force 3 April 1952). As at November 2007 127 governments had adhered to this convention. The text has been superseded by *International Plant Protection Convention 1997*, adopted 17 November 1997, [2005] ATS No 23 (entered into force 2 October 2005). As of November 2007, the *International Plant Protection Convention 1997* (IPPC) has 166 parties.

conservation context, terms used have included “exotic”,¹⁶ “alien”,¹⁷ “indigenous”,¹⁸ “native”,¹⁹ “non-indigenous”,²⁰ “non-native”,²¹ and “invasive alien”.²² From the marine sector come references to “harmful marine organism” and “unwanted aquatic organism”,²³ while the international plant

¹³ 1959 *Agreement Concerning Co-Operation in the Quarantine of Plants and Their Protection Against Pests and Diseases* adopted 14 December 1959, (1962) Volume 422 UNTS 42, Preamble (entered into force 19 October 1960). As at November 2007 the Agreement had 9 parties.

¹⁴ 1952 *Agreement Concerning Epizootic Diseases Between The Kingdom of Greece and The Federal People's Republic of Yugoslavia*, adopted 2 February 1952 Volume IV *International Protection of the Environment*, B Rüster and B Simma (eds), Oceana New York (1975), 1833 (entered into force 8 April 1954).

¹⁵ 1976 *North American Plant Protection Agreement*, adopted 13 October 1976 Volume XX *International Protection of the Environment*, B Rüster, B Simma, M Bock (eds), Oceana New York (1979), 10364 Article 1C (entered into force 13 October 1976). As at November 2007 the Agreement had 3 parties.

¹⁶ The Code of Conduct for the import and release of exotic biological control agents. *International Protection Of The Environment: Conservation in Sustainable Development* Wolfgang Burhenne and Nicholas Robinson (eds) 01-11-95/1, 1993 North American Agreement on Environmental Cooperation, adopted 8 September, 1993 32 ILM 1482 Article 10(2)(h) (entered into force 1 January 1994). As at November 2007 the Agreement had 3 parties.

¹⁷ 1980 *Convention on the Conservation of Antarctic Marine Living Resources* (CCAMLR), adopted 20 May 1980, [1982] ATS No 9 (entered into force 7 April 1982). As at November 2007 the Convention had 27 parties.

¹⁸ 1933 *Convention Relative to the Preservation of Fauna and Flora in their Natural State*, adopted 8 November 1933, 172 UNTS 241 (entered into force on 14 January 1936). As at November 2007 the Convention had 10 parties. This Convention was superseded by the *African Convention on Nature and Natural Resources*, adopted 15 September 1968 1001 UNTS 3 (entered into force on 16 June 1969). As at November 2007 the Convention had 28 parties); and the *African Convention on the Conservation of Nature and Natural Resources 2003*, adopted on 11 July 2004, Text is available from: http://www.ecolex.org/en/treaties/treaties_fulltext.php?docnr=3325&language=en

(November 2007). The convention is not yet in force.

¹⁹ 1979 *Convention on the Conservation of European Wildlife and Natural Habitats*, adopted on 19 September 1979, (1982) UKTS 56 Article 11(2)(b) (entered into force 1 June 1982). As at November 2007 the Convention had 46 parties.

²⁰ 1964 *Agreed Measures for the Conservation of Antarctic Fauna and Flora*. Recommendation III-VIII reprinted in *Handbook of the Antarctic Treaty System* (1992) in *Antarctica and International Law* Volume 1 W M Bush Oceana Publications (1992).

²¹ 1995 *Agreement on the Conservation of African-Eurasian Migratory Waterbirds* (AEWA), adopted 16 June 1995, *Basic Legal Documents on International Animal Welfare and Wildlife Conservation*. M Austen and T Richards (eds) Kluwer (2000), 617, Article III (2)(g) (entered into force 1 November 1999). As at November 2007 the Agreement had 61 parties.

²² *Convention on Biological Diversity* 1992, adopted 5 June 1992, [1993] ATS no 32. (entered into force 29 December 1993). The convention had 190 parties as of November 2007.

²³ *International Convention for the Control and Management of Ships' Ballast Water and Sediments*, 2004 BWM/CNF/36. 16 February 2004, Article 2.

quarantine regime²⁴ prefers the designation “quarantine pest”.²⁵ This cornucopia of terminology is duplicated in Agenda 21,²⁶ which variously refers to species as “exotic,”²⁷ “pests”²⁸ and “foreign”.²⁹ Similarly, in national legislation, a profusion of terminology designed to indicate the impact of a species upon humans and human activities has emerged. In some cases, native species that interfere with agriculture, or other human activities, may be declared “pests”.³⁰ In other cases, the terminology includes traditional labels, such as “noxious”, which could apply to plants, animals or aquatic species,³¹ “weed”,³² “environmental weed”,³³ “pest”,³⁴ “feral”³⁵ and “exotic”.³⁶ More recently-evolved terms include “alien”³⁷ and “invasive

²⁴ The term ‘international quarantine’ is used in the sense described in section 3.3 of Chapter 3 of this study.

²⁵ 1997 International Plant Protection Convention Article II.

²⁶ Agenda 21 printed in: *Agenda 21 and the UNCED Proceedings, International Protection of the Environment*, Nicholas A Robinson (ed) Oceana 3rd Series, Volume 4 (1993).

²⁷ Agenda 21, Paragraph 11.13(g).

²⁸ Agenda 21, Paragraph 14.77(b).

²⁹ Agenda 21, Paragraph 15.3.

³⁰ Sections 143(1) and 143(2) *Rural Lands Protection Act 1998* (NSW) above n 7.

³¹ In the Australian state of Victoria, the *Fisheries (Further Amendment) Act 1997*, section 75 creates a procedure for declaration of an aquatic species as ‘noxious’, unless the species is protected notably under the *Wildlife Act 1975* (Vic) and the *Flora and Fauna Guarantee Act 1988* (Vic).

³² In New South Wales, the minister may make weed control orders under section 7 of the *Noxious Weeds Act 1993* (NSW).

³³ Environment Protection Authority NSW, *State of the Environment Report 1997*, EPA NSW Government (1997), paragraph 2.6 defines environmental weeds as: ‘those of major concern to bushland or rainforests rather than agriculture that have become more common, despite being on declaration lists in NSW’. Available at <<http://www.environment.nsw.gov.au/soe/97/ch2/10.htm>> (May 2001)

³⁴ The Nigerian *Endangered Species (Control of International Trade and Traffic) Act 1985* Chapter 108 gives the relevant minister the power to provide for the declaration and control of internationally recognised pests. <<http://faolex.fao.org/docs/texts/nig18379.doc>> (May 2001).

³⁵ The Australian government has instigated a National Feral Animal Control Program, which aims to ‘reduce damage to agriculture and the environment from feral animals.’ These feral animals include introduced rabbits, goats, pigs, horses, donkeys, buffalo, and foxes. <<http://www.daff.gov.au/content/output.cfm?ObjectID=D2C48F86-BA1A-11A1-A2200060B0A06278>>(November 2005).

³⁶ The Florida Exotic Pest Plant Council was established in 1984 and focuses attention on alien species. It is a member of the National Association of Exotic Pest Plant Councils in the United States. The Florida Exotic Pest Plant Council defines ‘exotic’ as a non-indigenous species, or one introduced to Florida, either deliberately, or accidentally, which then escapes into the wild where it reproduces on its own. A ‘native species’ is defined as one already occurring in Florida at the time of European contact (1500) <<http://www.fleppc.org/>> (January 2002).

alien”,³⁸ reflecting growing concern at the environmental impacts of some alien species.

This traditional terminology reveals conceptions of a species’ value, or lack thereof, to humans. In this respect, the terms share some common characteristics: the species is a known species; it has already caused damage; and the damage is quantifiable as detrimental, either in terms of human health, or a human pursuit. Nevertheless, this multiplicity of terms makes it difficult to identify what ought to be regulated. While sectoral interests have succeeded in developing terminology that accommodates their own specific objectives, these objectives may not necessarily convert well from one sector to the other.³⁹ It is questionable, therefore, whether this plethora of terminology can provide a basis for effective regulation of invasive alien species in the context of biodiversity protection.

Interestingly, the CBD does not specifically use the terminology of ‘invasive alien species’. Rather, article 8(h) calls on states to ‘prevent the introduction of, control or eradicate those alien species which threaten ecosystems, habitats or species’. The question thus becomes, what is an “alien” species and at what stage does an “alien” species threaten ecosystems, habitats or species such that it can be described as an “invasive alien species”?

1.1.2 The Meaning of “Alien”

To assist member states in identifying alien and invasive alien species, the Conference of the Parties to the CBD (COP) has adopted the Guiding Principles for the Prevention, Introduction and Mitigation of Impacts of Alien

³⁷ 2004 *Japanese Invasive Alien Species Act* (Japanese IAS Act) Law no 78 June 2, 2004. English version available at the site of the Ministry of the Environment (for Japan) <<http://www.env.go.jp/en/nature/as.html>> (May 2007).

³⁸ *Executive Order No 13112 on Invasive Alien Species* Adopted by President Clinton 3 February 1999 www.epa.gov/owow/invasive_species/EO13112.pdf (may 2007) See also Environment Protection and Biodiversity Conservation Amendment (Invasive Species) Bill 2002 (Cth).

³⁹ Rural and Regional Affairs Reference Committee, Parliament of Australia, Senate *Commercial Utilization of Australian Native Wildlife*, above n 8.

Species that Threaten Ecosystems, Habitats or Species (CBD Guiding Principles).⁴⁰ The IUCN has also adopted its own Guidelines for the Prevention of Biodiversity Loss Caused by Alien Invasive Species (2000) (the IUCN Guidelines).⁴¹ Both instruments provide similar, though not identical, definitions of the word “alien”. The CBD Guiding Principles define an alien species as one that has been introduced outside its natural past or present distribution,⁴² with an introduction being defined as the movement by a human agency, either directly or indirectly of an alien species outside its natural range. The IUCN Guidelines refer to an alien species as one that occurs outside its past, or present, natural range or dispersal, being the range it could occupy without direct or indirect introduction or care by humans.⁴³

The similarities in these definitions stem from the fact that both accentuate the ecological origin of the species and the differences arise from the extent of human interaction required to classify the species as alien. Notably, the IUCN criteria expand the CBD definition by including “care” by humans as an equal consideration to “movement” by humans. In a differing context, the FAO Code of Conduct for Responsible Fisheries 1995⁴⁴ (the FAO Fisheries Code) describes the aquatic alien species as an “introduced species” – namely any species intentionally or accidentally transported and released by humans into an environment beyond its present range.⁴⁵

⁴⁰ Guiding Principles for the Prevention, Introduction and Mitigation of Impacts of Alien Species that Threaten Ecosystems, Habitats or Species. Adopted April 2003 as part of Decision VI/23 of the Conference of the Parties. Report of the Sixth Meeting of the Conference of the Parties to the Convention on Biological Diversity, UNEP/CBD/COP/6/20 (23 September 2002).

⁴¹ IUCN Guidelines For the Prevention of Biodiversity Loss Caused by Alien Invasive Species (IUCN Guidelines) Published by the Species Survival Commission of IUCN, Gland, Switzerland 2000.

⁴² CBD Guiding Principles, definitions in footnote (57) paragraph (i).

⁴³ IUCN Guidelines, paragraph 3.

⁴⁴ The FAO Code of Conduct for Responsible Fisheries 1995, the code was adopted at the 28th session of the Food and Agriculture Organization (FAO) on 31 October 1995 and is supported by 9 Technical Guidelines and 4 Plans of Action, FAO, Rome, (1995).

⁴⁵ The FAO Code of Conduct for Responsible Fisheries 1995, Article 2 Definitions.

These three instruments have differing objectives, which are reflected in their use of the word “range”. The CBD Guiding Principles are designed to assist parties to implement Article 8(h) of the CBD,⁴⁶ while the IUCN Guidelines are designed to assist members to preserve natural and semi-natural areas from the deleterious effects of IAS.⁴⁷ Consequently, both the CBD and IUCN instruments encompass broad environmental goals and the definition of an “alien” species found within these instruments is premised on the “natural range” of a species.⁴⁸ This latter term identifies the presence of a species that occurs without human intervention and may be contrasted with provisions found in the FAO Fisheries Code, which are intended to enhance aquaculture safety in a commercial setting and employ the phrase “present range” to describe the location of farmed species. Hence, the “present range” of a species is a reference to the current location of a species that has been introduced as a result of human activity.

There is considerable difference between a range that has been created because of human activity, and a range that is a naturally occurring component of a species’ existence. Indeed, the difference between “present” and “natural” range is fundamental to whether a species is classified as “alien”. Although the term “natural range” is not defined, its use in the IUCN and CBD guidelines corresponds with that found in treaties such as the Convention on the Conservation of Migratory Species of Wild Animals.⁴⁹ In that treaty, “range” encompasses areas that the species naturally occupies and can include areas inhabited even on a temporary basis. The emphasis is on the fact that the range is established without interference by humans. The notion of human interference itself is a flexible one, as illustrated by the differences

⁴⁶ CBD Guiding Principles, Paragraph 5.

⁴⁷ IUCN Guidelines, Parts 1 and 2.

⁴⁸ CBD Guiding Principles, Footnote 57 Paragraph (i).

⁴⁹ 1979 *Convention on the Conservation of Migratory Species of Wild Animals* adopted 23 June 1979, [1991] ATS 32 (entered into force 1 November 1983). As at November 2007 the Convention had 104 parties. Article 1.1 defines range as all the areas of land or water that a migratory species inhabits, stays in temporarily, crosses or overflies at any time on its normal migration route.

between the CBD and IUCN definitions, meaning that the degree of human interference tolerated within each description can alter what is meant by “natural range” and, hence, the very definition of an alien species itself.

Where a species moves into a new range of its own volition, but is assisted in establishing itself by humans, or where a species normally stays in a range temporarily, but human intervention has assisted it to establish itself permanently, the IUCN definition would categorically state that the species is alien while the CBD definition would not. In this respect, the IUCN definition of “alien” is preferable to the CBD one, as it takes into account more precisely whether a species is a naturally established component of an ecosystem. What the IUCN definition leaves unanswered, however, is whether that human care or intervention has to be aimed at the species in question. Consider, for example, the cattle egret that flew to Australia from Indonesia in the 1940s. Although it flew under its power, it was only able to arrive, establish and spread because human activity in the fields of agriculture, farming and forestry both in Indonesia and Australia created an environment conducive to its progressive establishment and spread.⁵⁰ These human efforts, however, were not directly aimed at the egret. It is unclear whether this would be sufficient to classify the cattle egret as an alien species.

If the natural range of a species is the range it would have occupied without human influence, and since farming and agricultural practices rely almost entirely on introduced species, almost every farmed plant, animal and aquatic organism should be classified as an alien species, although not necessarily an *invasive* alien species.⁵¹ On this basis, the fact that the species were introduced by humans would be sufficient to designate them as alien.

⁵⁰ Tim Low, above n 9, 257; For spread of cattle egrets elsewhere, see Mark W Schwartz, ‘Defining Indigenous Species: An Introduction’ in J Luken and J Thieret (eds) *Assessment and Management of Plant Invasions* Springer-Verlag New York Inc (1997) 12.

⁵¹ CBD Conservation and Sustainable Use of Agricultural Diversity 1996, Decision 111/11 of COP 3 of the CBD. Annex 1 paragraph 7(a) above n 10. In addition, the fact that in agriculture and farming species are kept under control might also favour excluding farming and agricultural species from the definition of an IAS.

Whether the species were “invasive” alien species, however, would depend on the degree of harm caused by them and whether that harm is severe enough to trigger regulation. The use of the term “present range” largely avoids these types of considerations. In the context of the FAO Fisheries Code the “present range” is the range a species currently occupies. Both the origin of the species and the manner in which it arrived are irrelevant to this determination.

In management terms, therefore, the “present range” of a species represents those areas where humans anticipate the species to thrive. This approach strongly duplicates practices found at the national level, where the classification and regulation of species often centres on the species’ usefulness.⁵² However, while such an approach might promote fishery, or agricultural, systems it does not always adequately take into account the fact that those same practices operate as part of the general environment, and that what suits a farming or fisheries sector, may lead to environmental degradation elsewhere. Effective regulation should not disregard environmental damage, merely because it results from commercially profitable activities.

In addition to the extent of human facilitation in the spread of a species, the date and manner of introduction may also be relevant to the definition of alien. Ecologists disagree over whether species introduced in the distant past should be designated as alien. Often species with “long historical records suggesting pre-Neolithic distributions are readily categorized as indigenous... (while) [s]pecies with no historical record are problematic”.⁵³ The essence of the dilemma centres on how far back in time we should delve. Some ecologists consider that introduced animals, such as the Australian dingo that

⁵² See for example, Australia State of the Environment Report 2001 Part 3 ‘Introduction of Novel Biota into Native Habitats and Communities’ above n 5; Rural and Regional Affairs Reference Committee, Parliament of Australia, Senate *Commercial Utilization of Australian Native Wildlife*, above n 8, paragraphs 4.27 and 4.31.

⁵³ Mark W Schwartz, above n 50, 10.

has long interacted with Australian species, should now be considered indigenous.⁵⁴ Others classify the Australian dingo as an alien species, but maintain from a management perspective that it has reached “ecological integration” and should be preserved to safeguard ecosystem functioning.⁵⁵ Perhaps as a result of these complexities, legislators often choose a cut-off date for classification of a species as native or indigenous that coincides with the first European contact, or European occupation of a country.⁵⁶ While this approach has the benefit of consistency, if it is used as a quasi-geographical indicator, rather than a temporal one, it can potentially lead to ecological confusion with different jurisdictions having different cut-off dates for the same species. Consequently, the date of entry will not necessarily provide a uniform method of classification of a species as alien.

Other difficulties arise in the case of introduced species that have evolved differently from their alien ancestors. Alien species transplanted into a new territory will have a limited gene pool and evolution is expected to happen more quickly than in their country of origin.⁵⁷ Studies have shown, for example, that English house sparrows in Australia are already diverging from

⁵⁴ Tim Low, above n 9, 256 explaining the views of Laurie Corbett.

⁵⁵ Ibid, 257.

⁵⁶ Even, in this instance, different dates may be chosen with respect to different laws. In Australia, for instance, the definition of wildlife that had been formulated in the Commonwealth of Australia’s *National Parks and Wildlife Conservation Act 1975* (Cth), defined wildlife as animals and plants indigenous to Australia, the coastal sea, sea-bed, subsoil continental shelf and the Australian Fishing Zone, but also included animals and plants introduced into Australia by Aboriginals before 1788. This act was ultimately repealed by the *Environment Protection and Biodiversity Conservation Act 1999* (Cth). Both that act and its predecessor, the Australian *Endangered Species Protection Act 1992* (Cth), embrace species as native if they were present in Australia or an external Territory before 1400. Non-Government environmental groups, such as the Florida Exotic Pest Plant Council, may also use a cut-off date to define native species. In that case, a native species is considered to be one already occurring in Florida at the time of European contact (1500). In Europe, a variety of approaches is taken. For instance the *Danish Protection of Nature Act 1992* refers to ‘naturally occurring animals’ that includes introduced species that have become integrated. Henrik Jørgensen ‘Control of Invasive Species in Denmark: Legislation and Practical Experiences’ in O Sandlund, P Schel, A Viken (eds) *Proceedings of the Norway/UN Conference on Alien Species* Trondheim July 1995 Directorate for Nature Management Trondheim (1996) 136; for a short discussion on the role of humans and their activity in classifying species as alien, see Mark W Schwartz, above n 50, 13-14.

⁵⁷ Tim Low, above n 9, 242.

their English ancestors.⁵⁸ Additionally, where alien and indigenous species interbreed, this hybridisation can result in a new species.⁵⁹ Opinions diverge as to whether these species should be labelled as alien.⁶⁰

1.1.3 The Meaning of “Invasive”

The second definitional difficulty relates to the meaning of the word “invasive”. Not only does this word mean different things in different administrative contexts, but historically, these meanings have also differed from the manner in which “invasive” is used by ecologists. In an ecological sense, labelling a species as “invasive” only operates as a designation of the species’ status, without conveying insinuations of damage and need for control. Such was the use of the word in 1882, when “invasion” was first used to describe “the spread of non-native species”.⁶¹ This early meaning persisted up to the publication in 1958 of *The Ecology of Invasions by Animals and Plants*,⁶² a work that is regularly regarded by ecologists as heralding the start of invasion ecology.⁶³ The use of the term “invasive” as a taxonomic description of the spread of non-native species is still understood in that sense by ecologists today.

The ‘ecological’ use of the term is, however, at odds with the emergence of “invasive” as an administrative classification, where it is used to describe a

⁵⁸ Ibid.

⁵⁹ Ibid, 243 In describing the hybridization of an Australian pine that is invading Florida he says: ‘A hybrid of two she-oaks it has the height of one and the leaning limbs of the other but doesn’t look much like either. A few years ago the classification of she-oaks was revised and many new species were named some of them derived by hybridization. Many are less distinctive than this tree so it could certainly be recognized as a new species, say *Casuarina horribilis*.’

⁶⁰ Ibid.

⁶¹ M Rejmánek, D Richardson, M Barbour, M Crawley, G Hrusa, P Moyle, J Randall, D Simberloff and M Williamson, ‘Biological Invasions: Politics and the Discontinuity of Ecological Terminology’ (2002) 83 *Ecological Society of America* 131, 131.

⁶² Charles S Elton, *The Ecology of Invasions by Animals and Plants* Metheun, London (1958), reprinted by the University of Chicago Press (2000).

⁶³ M Rejmánek, D Richardson, M Barbour, M Crawley, G Hrusa, P Moyle, J Randall, D Simberloff and M Williamson, above n 51, 131.

species whose spread and abundance is causing damage.⁶⁴ The mere presence of an alien species is insufficient to designate it as invasive, for not all alien species are, or will become, invasive alien species.⁶⁵ Consequently, not all alien species necessarily pose a threat to biodiversity. Indeed, the present biodiversity of many ecosystems is attributable to the introduction of alien species.⁶⁶ Thus, in some ecosystems, species can be introduced without obvious ill effects.⁶⁷ In addition, alien species often serve useful social and economic purposes, as, for instance, in agriculture or aquaculture production.⁶⁸ Nevertheless, while some alien species may provide benefits and have insignificant impacts on native biodiversity, as a stranger to its new location, every alien species has the potential to inflict severe damage upon the biodiversity of its host.⁶⁹

Administrators traditionally regard the “invasive” qualities of a species measured against the utility of the species to human endeavours.⁷⁰ A species may or may not be causing environmental harm⁷¹ and may indeed be a native species, whose only transgression is the disruption of farming, or agricultural

⁶⁴ See, for instance, The United States *Executive Order No 13112 on Invasive Alien Species*, where an invasive alien species is defined as an alien species whose ‘introduction does or is likely to cause economic or environmental harm or harm to human health’.

⁶⁵ Jeffrey A McNeely ‘The Great Reshuffling: How Alien Species Help Feed the Global Economy’ in O Sandlund, P Schel, A Viken (eds) *Proceedings of the Norway/UN Conference on Alien Species* Trondheim July 1995 Directorate for Nature Management Trondheim (1996) 53.

⁶⁶ Jeffrey A McNeely, *ibid*; and also Convention on Biological Diversity SBSTTA, ‘Development of Guiding Principles for the Prevention of Impacts of Alien Species by Identifying Priority Areas of Work on Isolated Ecosystems and by Evaluating and Giving Recommendations for the Further Development of the Global Invasive Species Programme’, at paragraph 23, where the report states that ‘human introductions may have enriched the biological diversity of certain geographical areas, such as in the case of British mammalian fauna...’ UNEP/CBD/SBSTTA/4/8 (15 February 1999).

⁶⁷ Q Cronk and J Fuller, *Plant Invaders the Threat to Natural Ecosystems* Chapman and Hall London (1995) paragraph 1.2.1.

⁶⁸ Department of the Environment Food and Rural Affairs (DEFRA), *Review of Non-Native Species Policy* Report of the Working Group DEFRA Publications, London (2003) 8; Tim Low, above n 9, 42.

⁶⁹ CBD ‘Invasive Alien Species: Comprehensive review on the efficacy of existing measures for their prevention, early detection, eradication and control’ UNEP/CBD/SBSTTA/6/7 (20 December 2000) paragraphs 85-93.

⁷⁰ See, for example, the Australia State of the Environment Report 2001 above n 5.

⁷¹ *Ibid*.

activities.⁷² In reality, the disruption to human activities is often the decisive factor. Once a species has proved invasive, remedial measures are often required by legislation, regardless of whether the species is currently causing damage or is native or alien.⁷³

Depending on whether it is used in an administrative or an ecological sense, “invasive” may, therefore, carry different connotations. This difference has prompted debate amongst ecologists as to whether new terminology should be developed that accords with the meaning of “invasive” as used by regulators.⁷⁴ Arguments in favour of the change include the benefits of using uniform terminology across all sectors, in order that each sector can contribute in a manner that is understood by all.⁷⁵ Arguments against the change point to the fact that pronouncements on invasive alien species,

⁷² Rural and Regional Affairs Reference Committee, Parliament of Australia, Senate *Commercial Utilization of Australian Native Wildlife*, above n 8; see also See Chau Diem Pham ‘Pest or Beloved Mascot: The Kangaroo, Over-Population, the Environment and Trade’ (1998) 8 (2) *Trade and Environment Database Case Studies* no 488 <<http://www.american.edu/ted/class/all.htm>> (November 2007)

⁷³ Rural and Regional Affairs Reference Committee, Parliament of Australia, Senate *Commercial Utilization of Australian Native Wildlife*, above n 8; see also general discussion George Oduor, ‘Biological Pest Control and Invasives’ in O Sandlund, P Schel, A Viken (eds) *Proceedings of the Norway/UN Conference on Alien Species* Trondheim July 1995 Directorate for Nature Management Trondheim (1996) 116; Keith Hart, ‘Legal and Policy Responses to the Problem of Pest Animal Impacts on Natural Resources in NSW’ (2002) 19 *Environmental and Planning Law Journal* 355. By way of example of how measures may be implemented against species interfering with agriculture we may consider measures implemented in the Australian state of New South Wales pursuant to the *Noxious Weeds Act* 1993 (NSW). This Act authorizes the minister for primary industries to declare weeds as noxious. Local government councils must then implement measures to eradicate or control the weeds. One such plant that has been declared a weed is witchweed, a plant that is a significant weed of crops. Witchweed has been given the most stringent classification meaning that landowners must eradicate this species from their properties and keep their lands clear of the plant, whether or not it is causing any damage on their property.

⁷⁴ M Rejmánek, D Richardson, M Barbour, M Crawley, G Hrusa, P Moyle, J Randall, D Simberloff and M Williamson ‘Biological Invasions: Politics and the Discontinuity of Ecological Terminology’ above n 51; M Davis and K Thompson, ‘Invasion Terminology: Should Ecologists Define Their Terms Differently Than Others?’ (2001) 82 *Ecological Society of America* 206; Robert Colautti and Hugh MacIsaac, ‘A Neutral terminology to define “invasive” species’ (2004) 10 *Diversity and Distributions* 135.

⁷⁵ M Davis and K Thompson, above n 74.

especially at the international level, have made it clear that it is only those invasive alien species that are harmful that need regulating.⁷⁶

The concept of a “threat” is indeed a common feature of definitions and descriptions in international instruments. According to the CBD, an invasive alien species is an alien species that threatens ecosystems, habitats and (other) species;⁷⁷ the CBD Guiding Principles define an invasive alien species as a species whose introduction and spread threatens biological diversity.⁷⁸ The IUCN Guidelines define an “invasive alien” species as an alien species which “becomes established in natural or semi-natural ecosystems, is an agent of change, and threatens native biological diversity”.⁷⁹ One major difference between the IUCN and CBD definitions is that the IUCN definition is spatially limited to natural, or semi-natural, ecosystems.⁸⁰ A natural ecosystem is defined as one that is not perceptibly altered by humans, whereas a semi-natural ecosystem is defined as one which has been altered by human actions, but which retains significant natural elements. The IUCN Guidelines were designed specifically to deal with the invasive alien issue within such areas.⁸¹ However, this limitation should not be taken as an indication that natural and semi-natural areas are the only areas where IAS should be managed.

Regulatory and administrative practices in managed areas contribute greatly to the invasive alien species problem. As already indicated, human activities, such as agriculture, aquaculture and suburban gardening, mainly involve the

⁷⁶ M Rejmánek, D Richardson, M Barbour, M Crawley, G Hrusa, P Moyle, J Randall, D Simberloff and M Williamson, above n 51, 132; CBD, Article 8(h); CBD Guiding Principles, definitions in footnote (57); IUCN Guidelines paragraph 3 Definitions.

⁷⁷ CBD, Article 8(h).

⁷⁸ CBD Guiding Principles, definitions in footnote (57), paragraph (ii).

⁷⁹ IUCN Guidelines, paragraph 3 definitions.

⁸⁰ IUCN Guidelines, paragraph 3 paragraph 3 definitions. The guidelines themselves apply to regulation of invasive species where they impact upon biodiversity in areas other than developed areas, such as, for instance, in agriculture, forestry and aquaculture. See paragraph 1, ‘Background’ and paragraph 2 ‘Goals and Objectives.’

⁸¹ Ibid.

use of alien species.⁸² Moreover, an alien species may be integrated into non-natural ecosystems, becoming invasive there before spreading to natural ecosystems. Where the scope of the definition only classifies a species as invasive once it has reached a natural or semi-natural ecosystem, it may mean that the species remains un-regulated in non-natural areas.⁸³ Nevertheless, the two definitions share the concept of threat. The question thus becomes: what constitutes a threat? In particular, does a “threat” equate to actual harm or is the potential for harm sufficient?

To document all the ways in which alien species can threaten or harm biodiversity would require a work of encyclopaedic breadth. Suffice it to say that, apart from direct predation on native species,⁸⁴ alien species may impact adversely upon biodiversity by modifying habitat,⁸⁵ introducing pests and diseases⁸⁶ and hybridising with native species;⁸⁷ all of which raise demanding containment and eradication issues.⁸⁸ Indeed, the impacts of IAS have been

⁸² Tim Low, above n 9, ch 10 and 11.

⁸³ This type of problem has been identified, for example, in Sydney, Australia, where, in the greater Sydney district, it has been estimated that of 400-500 garden escapees colonizing surrounding remnants of bushland approximately 30 endanger that bushland. Although the bushland is theoretically protected, it is still subject to a constant onslaught of invasive alien species from nearby suburban gardens. Marilyn Fox and D Adamson ‘The Ecology of Invasions’ in H Recher, D Lunney and I Dunn (eds), *A Natural Legacy, Ecology in Australia* A S Wilson Inc. printed in Singapore SNP Printing (1996) 235, 250; *Environmental Planning and Assessment Act 1979* (NSW) State Environmental Planning Policy No 19 – Bushland in Urban Areas.

⁸⁴ C Brown ‘Tilapia and the Environment’ (1995) Volume 4 no 2 *TED Case Studies* case no 208 Available <<http://www.american.edu/TED/tilapia.htm>> (November 2007) . The report highlights the fact that Tilapia is a highly carnivorous fish and ‘its continued large-scale introduction contributes to the extinction of less aggressive indigenous fish throughout the world’.

⁸⁵ For example, yellow-eyed penguins are under threat from introduced sheep, which alter their habitat, making it inviting for rabbits and rabbit predators, which subsequently prey on the penguin chicks. See United Nations Environment Programme Fact-sheet on ‘Yellow-eyed Penguin.’ <http://www.unep-wcmc.org/species/data/species_sheets/yellowey.htm> (March 2007) and BirdLife International 2005. *Megadyptes antipodes*. In: IUCN 2006. *2006 IUCN Red List of Threatened Species* <www.iucnredlist.org> (March 2007).

⁸⁶ Clare Shine, Nattley Williams and Lothar Gundling, above n 2, 10 paragraph 1.4. Cholera that causes paralytic shellfish poisoning has been carried to Australia via ballast water.

⁸⁷ CBD, Subsidiary Body on Scientific Technical and Technocological Advice, ‘Pilot Assessments: The Ecological and Socio-Economic Impact of Invasive Alien Species on Island Ecosystems’ UNEP/CBD/SBSTTA/9/INF/33, (5 November 2003) paragraphs 32-34.

⁸⁸ J Caughtley V Monamy and K Heiden. *Impact of 1993 Mouse Plague* GRDC Occasional Paper No 7 GRDC Bureau of Resource Science, Australia, (1994) ch 6, paragraph 28, ix. A

described as being as serious a threat to biodiversity as loss of habitat.⁸⁹ Alien species are unpredictable and when they do become invasive, the effects are often insidious, perhaps going unnoticed for many years.⁹⁰ Their effects are therefore potentially catastrophic.⁹¹ Studies undertaken of the impact of IAS on native biodiversity indicate that the pressures of IAS are propelling some species to extinction.⁹²

study undertaken on the use of poisonings to eliminate introduced mice in the 1993 mouse plague has shown that at least one side-effect was non-target deaths of native species.

⁸⁹ IUCN Guidelines for the Prevention of Biodiversity Loss Caused by Alien Invasive Species, paragraph 1.

⁹⁰ Tim Low, above n 9, 216-217, where he details 'lag times' between introduction and weed status for plants as being up to 170 years.

⁹¹ Q Cronk and J Fuller, above n 57, paragraphs 1.2.1 and 1.2.2; Convention on Biological Diversity SBSTTA 15 August 1997 'Priority Questions for Consideration by SBSTTA 3', at 3 where it is stated at 3 'Our present state of knowledge is that many if not all introductions are irreversible. When making decisions about deliberate introductions of non-native species the concept that there are empty niches that can be safely filled by the introduction of a non-native species should be abandoned.' UNEP/CBD/SBSTTA/3/Inf.18 (September 1997).

⁹² See, for example, R Wittenberg (ed) *An Inventory of Alien Species and Their Threat to Biodiversity and Economy in Switzerland*. CABI Bioscience Switzerland Centre report to the Swiss Agency for Environment, Forests and Landscape (SAEFL) (2005) 27; K Stokes, K O'Neill and R McDonald, *Invasive Species in Ireland at Report to Environment and Heritage Service and National Parks and Wildlife Service* Quercus, Queens University (2004) paragraph 1.6. An example taken from the latter is the American grey squirrel that has been introduced into a number of locations including the United Kingdom of Great Britain and Northern Ireland (the UK), Ireland and Continental Europe. The squirrel was introduced to Ireland in 1911 from the UK for recreational and aesthetic reasons. By 1921 it was considered a pest and implicated in the decline of the native red squirrel. Studies undertaken in Ireland on the grey squirrel indicate that its spread could have been averted, but that this would have required very early interception and an intense and unified effort to eradicate the species. Once the grey squirrel had started to spread, it became impossible to eradicate, leaving containment and control measures as the only viable options. Kakadu National Park, in the north of Australia in the Northern Territory, is under threat from introduced buffalos and pigs. Department of Environment and Heritage Fact sheet *Management Programmes, Management of Feral Animals* 2006 available <<http://www.deh.gov.au/parks/kakadu/parkjointmang/mangprograms/natheritage/feralanimals.html>> (March 2007); see also R Van Dam, D Walden and G Begg, *A Preliminary Risk Assessment of Cane Toads in Kakadu National Park* Scientist Report Supervising Scientist Darwin NT Commonwealth Department of Environment and Heritage (2002) 164. Available <<http://www.deh.gov.au/ssd/publications/ssr/pubs/ssr164-contents.pdf>> (March 2007). The Australian Nature Conservation Agency has pointed out that even though introduced species have fulfilled an essential role in Australia's financial growth, this needs to be balanced against the environmental harm that several of these introduced species have caused. Environment Australia – Biodiversity Group Information Sheet *Introduced Animals* published by ANCA (Now Department of Environment and Heritage) (1996). Department of Environment and Heritage Fact sheet *Invasive Species in Australia* Department of the Environment and Heritage (2004). Available from <<http://www.deh.gov.au/biodiversity/invasive/publications/species/part-1.html#what>> (March 2007). The Australian Department of the Environment and Heritage has identified numerous species that have become invasive; with introduced rabbits, goats, cattle, buffalo,

Another principal problem caused by IAS is that they have the capacity to dominate species and ecosystems. This reduces the variety and variability amongst species, leading to loss of biodiversity and towards a “relatively homogenous world”.⁹³ Consequently, avoiding the destructive effects of IAS represents one facet of the preservation of biodiversity.

While it is clear that actual harm may be sufficient for the purposes of the definition of invasiveness, it is less clear whether a potential threat of harm will suffice. The CBD definition does not specifically refer to the mere potential of a species to become invasive, or to the relevance or effect of previous human intervention on ecosystems as relevant to the question of invasiveness. These issues are, however, addressed in the Guiding Principles, where the concept of threat is interpreted to include both actual and potential harm.⁹⁴ Thus, we can say that the key feature of invasiveness is the existence, threat, or potential for harm seen in terms of “threat” or “risk” for potential harm and “harm” for actual damage caused by invasive alien species.⁹⁵

donkeys, horses and pigs selected as noteworthy for additional discussion. These species have impacted upon native biodiversity by destroying native vegetation and habitat used by native species. Indeed, the adverse effects of introductions can be found in almost every region of the globe. Environmental audits conducted in the South Pacific Region, for example, have identified several alien plant species that are causing concern. One of these, the introduced guava, is showing preliminary signs of invasiveness on the island of Tonga and is already invasive in the Galapagos Islands, French Polynesia, New Caledonia and Fiji. Jim Space, *Notes on Survey of Invasive Plant Species in Tonga* IUCN report <http://www.issg.org/features/invasives_on_tonga.html> (January 2004). Additionally, species such as pigs, cattle and goats, initially introduced as food sources, are having adverse impacts on several South Pacific ecosystems. Greg Sherley and Sarah Lowe, ‘Towards a regional invasive species strategy for the South Pacific: issues and options’ in G Sherley (ed) *Invasive species in the Pacific: A Technical Review and Draft Regional Strategy* SPREP Samoa (2000) 7-8.

⁹³ Jeffrey A McNeely, Harold A Mooney, Laurie E Neville, Peter Johan Schei and Jeffrey K Waage (ed), *A Global Strategy on Invasive Alien Species* IUCN Gland Switzerland and Cambridge UK, in collaboration with the Global Invasive Species Programme (GISP) (2001) paragraph 2.1.

⁹⁴ CBD Guiding Principles, 2, 7, 10, 11 and 12.

⁹⁵ See further discussion in section 5.2.4 of Chapter 5 of this study.

This interpretation is consistent with definitions found in domestic law. The United States *Executive Order No 13112 on Invasive Alien Species*,⁹⁶ (Executive Order), for example, defines an invasive alien species as an alien species whose “introduction does or is likely to cause economic or environmental harm or harm to human health”.⁹⁷ The *Japanese Invasive Alien Species Act* (Japanese IAS Act) defines invasive aliens as: “those individuals that are.... recognized or feared to cause adverse effects on ecosystems because of their different properties from organisms having original habitats in Japan.”⁹⁸ The concept of “adverse effects” is supplemented by an inclusive reference to adverse effects on ecosystems, human safety or agriculture forestry and fisheries.⁹⁹ The Australian Environment Protection and Biodiversity Conservation Amendment (Invasive Species) Bill 2002 (Invasive Species Bill)¹⁰⁰ defines an invasive alien as one that “....directly or indirectly threatens, will threaten or is likely to threaten the survival, abundance or evolutionary development of a native species, ecological community, ecosystem or agricultural commodity”.¹⁰¹ These definitions are all consistent, in that a variety of detrimental impacts, whether relating to the environment, human health or economics, may be taken into account. Moreover, while they do not provide details regarding the required threshold

⁹⁶ *Executive Order no 13112 on Invasive Alien Species*. An executive order, in this instance, is a legally binding order issued by the president of the United States of America directing federal agencies in their execution of existing laws. In the case of Executive Order No 13112, the authority to make the order is vested in the President by virtue of: the National Environmental Policy Act of 1969, as amended (42 U.S.C. 4321 et seq.), the Non-indigenous Aquatic Nuisance Prevention and Control Act of 1990, as amended (16 U.S.C. 4701 et seq.), the Lacey Act, as amended (18 U.S.C. 42), the Federal Plant Pest Act (7 U.S.C. 150aa et seq.), the Federal Noxious Weed Act of 1974, as amended (7 U.S.C. 2801 et seq.), and the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.). See preamble to Executive Order No 13112.

⁹⁷ *Ibid* Section 1(f).

⁹⁸ Japanese IAS Act, Article 2.1.

⁹⁹ *Ibid*, Article 2.2.

¹⁰⁰ Environment Protection and Biodiversity Conservation Amendment (Invasive Species) Bill 2002. The Bill was introduced into the Parliament of Australia as a private members’ Bill by Senator Andrew Bartlett of the Australian Democrats but was not passed by the Senate and has never become law. Nevertheless, the Invasive Species Bill is examined as an illustration of the potential of legislation to take into account the potential for harm.

¹⁰¹ Invasive Species Bill Section 226AB.

of harm, they do refer to the potential, as opposed to the actuality, of a species to be invasive.

To summarize, the working definition of an IAS adopted for the purposes of this study is based on the definition used in the CBD Guiding Principles: an alien species whose introduction and spread threatens biological diversity.¹⁰² The use of the word “threaten” encompasses both the potential for harm, as well as actual harm. Further, the concept of an “alien” species is a species that has been introduced, either directly, or indirectly, by a human agency outside its natural past or present distribution.¹⁰³ This part of the definition underpins regulation based on naturally-occurring or ecological parameters, rather than regulation based on political borders and is thus well-suited to the protection of biodiversity.¹⁰⁴

1.2 METHODS AND MEANS OF INTRODUCING IAS

Ingress by species without human intervention is a normal component of ecological development¹⁰⁵ and is not the focus of this study. Indeed, the definition of an “alien” species found in the CBD Guiding Principles and the IUCN Guidelines turns on the importance of human intervention. Therefore, the focus of this study also centres on the involvement of humans in the introduction of species to new locations. Such involvement may be direct, by

¹⁰² CBD Guiding Principles, definitions in footnote (57), paragraph (ii).

¹⁰³ CBD Guiding Principles, definitions in footnote (57) paragraph (i).

¹⁰⁴ For a discussion of the problems of political borders see later in section 1.3.2 of this Chapter.

¹⁰⁵ Tim Low, above n 9, 263-5; See also discussion in John Mumford, ‘Economic Issues Related to Quarantine in International Trade’ (2002) 29 *European Review of Agricultural Economics* 329, 330, where he documents the cotton boll weevil that has been extending its range south from Mexico since 1900. In addition, other studies on the distribution of alien species in China indicate that nine alien species have migrated naturally into China, representing 3.1% of the total alien species identified in the study. See H Xu, H Ding, M Li, S Qiang, J Guo, Z Han, Z Huang, H Sun, S He, H Wu, F Wan, ‘The Distribution and Economic Losses of Alien Species Invasion to China’ (2006) 8 *Biological Invasions* 1495, 1497.

way of transport of species, goods and commodities, or indirect, as in the case of a subsequent transmission of a directly introduced species.¹⁰⁶ In addition, introductions may be intentional or unintentional.

1.2.1 Deliberate vs Accidental Introductions

While it is seemingly self-evident that intentional introductions are ones made deliberately, and that unintentional introductions are those made accidentally, from a regulatory point of view, it is important to distinguish between these two methods of introduction, because each needs to be regulated by different means. A deliberately introduced species can be evaluated prior to introduction, whereas an accidentally introduced species cannot. At best, states might be able to predict which species accompany certain activities or commodities, but it is unlikely that states will be able to identify and assess accidentally introduced species to the same degree of accuracy as they can for deliberately introduced species. A state can never be certain, for example, of the variety and number of accidentally introduced species that may accompany deliberate introductions and will in addition to any other measures, need to rely on methods of detection and interception to deal with these species.¹⁰⁷

An early recorded example of deliberate introduction of species was the release of goats on the island of St Helena some time after 1502; this resulted in ruination of many species of plants that were “not adapted to grazing by

¹⁰⁶ The insect *Cactoblastis cactorum*, for example, is a well-known biocontrol agent for prickly pear. *Cactoblastis* was introduced into the Caribbean for this purpose, from whence it accidentally spread to the United States of America and is threatening a native species of cactus pear, called *Opuntia (Platyopuntia)*. IUCN Policy Recommendations on the Sixth meeting of the Conference of the Parties to the Convention on Biological Diversity (COP6) at 5, April, 2002, IUCN. Available <http://www.iucn.org/themes/pbia/wl/docs/biodiversity/cop6/final_invasives.doc> (March 2007).

¹⁰⁷ See discussion in section 5.2.2 of Chapter 5 of this study for difficulties identified by the Global Invasive Species Programme of multiple hitchhikers in commodities, such as nursery stock and cut flowers.

vertebrates”.¹⁰⁸ In Australia, deliberate introductions occurred both before and after the arrival of the First Fleet in 1788. It is believed that the earliest introductions were made approximately 4,000 years ago when aboriginal inhabitants introduced the dingo.¹⁰⁹ A second wave of introductions commenced in the late eighteenth century, after the voyage to the continent by Captain James Cook. In 1770 Captain Cook released animals to be used as a future food supply¹¹⁰ while records of the first fleet in 1788 indicate that cattle, sheep, goats, horses, chickens, ducks and turkeys were transported¹¹¹ – some of which escaped and became feral.¹¹²

With the advent of “acclimatization societies”, the practice of deliberate introductions achieved an element of scientific and government approval.¹¹³ These societies were non-governmental organizations, although often subsidized by governments, which were set up in the second half of the nineteenth century to transfer plants and animals between the colonies and the mother country.¹¹⁴ They were active in many states with colonial links including the United States, Canada, Australia, New Zealand, Great Britain and France. One purpose of these groups was to introduce European plants and animals that were regarded as aesthetically worthwhile to the colonies.¹¹⁵

¹⁰⁸ Q Cronk and J Fuller, above n 57, paragraph 1.3.1.

¹⁰⁹ The exact date is in dispute amongst ecologists. David Smith estimates that the dingo was introduced approximately 8,000 years ago. David Smith *Continent in Crisis* Penguin Books, Maryborough, Victoria (1990) 19; Tim Low, above n 9, 7 where he estimates that the dingo was introduced approximately 4,000 years ago.

¹¹⁰ In 1770, Captain Cook recorded that he released pigs at the location of what is now Cooktown. Phillip Toyne, *The Reluctant Nation. Environment, Law and Politics in Australia* ABC Books Sydney (1994) 68.

¹¹¹ Tim Low, above n 9, 24-5.

¹¹² D Choquenot, J McIlroy and T Korn, *Managing Vertebrate Pests: Feral Pigs* Bureau of Resources Sciences Australian Government Publishing Service Canberra (1996) paragraphs 1.1-1.2; Tim Low, above n 9, 24-5.

¹¹³ See generally, Michael Osborne ‘Collaborative Dimension of the European Empires: Australian and French Acclimatization Societies and Intercolonial Scientific Cooperation’, in R Home and S Kohstedt (eds), *International Science and National Scientific Identity: Australia Between Britain and America* Kluwer, Academic Publishers (1991) 98-106.

¹¹⁴ See generally, Thomas R Dunlap, ‘Remaking the Land: The Acclimatization Movement and Anglo Ideas of Nature’ (1997) 8 *Journal of World History* 303.

¹¹⁵ Ted Center, J Howard Frank and F Allen Dray, ‘Biological Invasions: Stemming the Tide in Florida’ (1995) 78(1) *Florida Entomologist* 45, 47; See also publications by Native Fish

Another purpose was economically based, as the groups sought ways of reproducing industries in Europe by using species found in the new world.¹¹⁶ A quick glance at the mercantile policies of Great Britain in the eighteenth and nineteenth centuries illustrates the importance of the acclimatization societies to imperial economies.

Protectionist commercial and trade policies instigated by Great Britain from 1650 onwards encouraged Britain's colonies to ship raw materials to England, where they were manufactured into goods that were then sold back to the colonies. This stimulated the acclimatization societies to source raw materials, which could include invasive alien species, such as live plants, from the colonies for British industry. The societies generally offered substantial prizes for a successful acclimatization although, one such prize, offered by the Paris Acclimatization Society for the acclimatization of kangaroos in Algeria¹¹⁷ appears never to have been won. The societies attained a degree of economic success; however, this often came at the expense of native biodiversity.¹¹⁸

Although we may scoff at these nineteenth century acclimatisers, the underlying reasons for those introductions are not so very different from the reasons that species continue to be introduced in more recent times. In China, for example, 39.6% of all invasive alien species are believed to have been

Australia (a volunteer organization concerned with maintaining the ecological health of Australia's freshwater systems) 'Exotic Fish in Australia' that detail a number of introduced fish that have become invasive. In particular, the organisation has stated that 'Many fish introduced into Australia appear to have been introduced in the attempt to reproduce angling opportunities with little or no thought to the consequences for native fish.' Available at <www.nativefish.asn.au/exotics.html> (February 2005)

¹¹⁶ See generally, Michael Osborne, above n 113, 100.

¹¹⁷ Ibid, 110-111.

¹¹⁸ Ted Center, J Howard Frank and F Allen Dray, above n 115; Native Fish Australia 'Exotic Fish in Australia', above n 115.

deliberately introduced as pasture, animal feed, ornamental plants, or textile and medicinal plants.¹¹⁹ Similarly, in Switzerland, 75% of plants that are now prohibited were originally introduced as ornamentals. An analogous situation exists in that country with a number of prohibited vertebrates, such as waterfowl, that were originally introduced to improve the landscape.¹²⁰ Even today, garden clubs, horticultural societies and seed exchanges transfer seed and bulbs across great distances.¹²¹

In addition to deliberate introductions, accidental introductions can happen in many ways.¹²² For example, where plants, vertebrates and other commodities are deliberately introduced, these imports can also introduce “hitchhikers”, such as terrestrial invertebrates, pests and diseases.¹²³ The grain borer, *Prostephanus truncates*, is thought to have been accidentally introduced into Africa in this way. Evidence on the way that the grain borer was introduced is inconclusive, but it appears to originate from Central America and the southern part of the United States of America, from where it was first accidentally introduced into Tanzania and Togo. From there it quickly spread throughout sub-Saharan Africa, where it is now regarded as a major pest of maize.¹²⁴ Significantly for the protection of biodiversity, the species also has potential to damage the natural environment. It is capable of flying many kilometres and in Kenya it has been demonstrated that the insect can breed and survive in savannah trees. Some predict that it could do likewise

¹¹⁹ H Xu, et al, above n 105, 1496-7.

¹²⁰ R Wittenberg above n 92, 13-14.

¹²¹ GISP Media Statement ‘Tackling The Growing Spread Of Invasive Species Across The Globe: Renewed Commitment From Key International Organisations’ under the heading ‘The Internet an Invasive Superhighway’ 19th April 2005, available <<http://www.gisp.org/whatsnew/shownews.asp?id=288>> (March 2007).

¹²² Q Cronk and J Fuller *Plant Invaders the Threat to Natural Ecosystems* above n 57, paragraph 2.2.1.

¹²³ R Wittenberg, above n 92, 13-14.

¹²⁴ Review of Australian Quarantine Inspection Service, Australian Academy of Science, ‘Submission to the review of the Australian Quarantine Inspection Service, (March 1996) paragraph 3.1.1 <<http://www.science.org.au/reports/aqiscont.htm>> (February 2007).

elsewhere and cause damage to other species and ecosystems, such as those comprising Australian acacias.¹²⁵

Thus, in addition to deliberate introductions, accidental introductions can be a significant source of IAS. Yet, by their very nature, accidental introductions are more difficult to regulate. A level of scrutiny that would detect every accidental introduction in advance is simply unrealistic. To narrow the odds it is therefore necessary to identify the various means by which IAS might be introduced.

1.2.2 Pathways and Vectors of Introduction for Invasive Alien Species

The roads or paths by which alien species are introduced are known as “pathways”, while the means by which alien species gain entry are called “vectors”.¹²⁶ So, for example, if a consignment of fruit is being exported using containerised bulk shipping and the consignment contains fruit fly, the pathways for the introduction are trade, shipping, and the use of containers. The vector is the particular item in the consignment that contains the fruit fly, such as the fruit, or even the packing material.

Transportation of alien species from one part of the globe to another is a phenomenon as old as civilization itself, with agriculture originally having provided the impetus for the deliberate introduction of alien plants.¹²⁷ Moreover, then, as now, unintended introductions of species often accompanied deliberate introductions.¹²⁸ With the passage of time, the reasons for introducing species and the pathways and vectors by which species are introduced have become multitudinous. Well-documented

¹²⁵ Ibid at paragraph 3.1.1.

¹²⁶ K Stokes, K O'Neill and R McDonald, above n 92, paragraph 2.2; Convention on Biological Diversity SBSTTA 'Invasive Alien Species, Status, Impacts and Trends of Alien Species that Threaten Ecosystems, Habitats and Species' UNEP/CBD/SBSTTA/6/INF/11(26 February 2001) 6.

¹²⁷ Q Cronk and J Fuller *Plant Invaders the Threat to Natural Ecosystems* above n 57, paragraph 2.2.1.

¹²⁸ Ibid paragraph 2.2.1; Department for Environment Food and Rural Affairs (DEFRA), above n 58, 8.

methods include human activities related to trade¹²⁹ and transport,¹³⁰ while less well-documented pathways relate to consumer Internet sales, aid efforts,¹³¹ canal construction¹³² and troop movement.¹³³ Consumer sales over the Internet, for instance, have been responsible for introducing invasive plants, such as wild mimosa.¹³⁴ Aid efforts have unwittingly contributed to the introduction of the grain borer into a number of African countries.¹³⁵ Similarly, canal constructions, such as the Welland Canal between Lake Ontario and Lake Erie, have facilitated the introduction of alien species such as the sea lamprey into the lakes,¹³⁶ while troop movements have introduced species, such as the yellow crazy ant into the Seychelles, Zanzibar and Christmas Island,¹³⁷ and the brown tree snake into Guam.¹³⁸ Tourism, too, is a

¹²⁹ B Moore *Alien Invasive Species: Impacts on Forests and Forestry*, chapter 3 at 1-3. Forestry Resources Division FAO, Rome (2005) Forest Health and Biosecurity Working Paper No 8 (hereafter called B Moore) <<http://www.fao.org/docrep/008/j6854e/J6854E00.HTM>>, (February 2007) chapter 3, available from <<http://www.fao.org/docrep/008/j6854e/J6854E03.htm>> (February 2007); for a discussion on trade in horticulture, see S Reichard and P White, 'Horticulture as a Pathway of Invasive Plant Introductions in the United States' (2001) 51 2, *BioScience* 103, 106; for a discussion on the trade in fish and aquaculture products, see also generally Matthews and K Brandt, *Africa Invaded: The Growing Danger of Invasive Alien Species* Global Invasive Species Programme (2004).

¹³⁰ B Moore above n 129.

¹³¹ Ibid, 4.

¹³² C Kolar and D Lodge 'Freshwater Nonindigenous Species: Interactions with Other Global Changes' in Harold A Mooney and Richard Hobbs (eds), *Invasive Species in a Changing World*, Island Press, Washington DC, Covelo, California (2000)3-29; Charles F Bouderesque 'The Red Sea-Mediterranean Link: Unwanted Effects of Canals' in O Sandlund, P Schel, A Viken (eds) *Proceedings of the Norway/UN Conference on Alien Species* Trondheim July 1995 Directorate for Nature Management Trondheim (1996) 107.

¹³³ G and S Lowe 'Towards a regional invasive species strategy for the South Pacific: issues and options' above n 92 at 14; B Moore above n 129 at 5.

¹³⁴ GISP Media Statement 'Tackling The Growing Spread Of Invasive Species Across The Globe: Renewed Commitment From Key International Organisations', under the heading 'The Internet an Invasive Superhighway', 19th April, 2005, available <<http://www.gisp.org/whatsnew/shownews.asp?id=288>> (February 2007) ; S Reichard and P White 'Horticulture as a Pathway of Invasive Plant Introductions in the United States' above n 129 at 106. Global Invasive Species Data Base Fact Sheet on Wild mimosa <<http://www.issg.org/database/species/ecology.asp?si=23&fr=1&sts>> (February 2007)

¹³⁵ B Moore above n 129 at 4.

¹³⁶ GISP *Online Toolkit* Paragraph 3.24 <http://www.cabi-bioscience.ch/wwwgisp/gtc3_2d.htm>

¹³⁷ Global Invasive Species Data Base Fact Sheet on yellow crazy ant <<http://www.issg.org/database/species/ecology.asp?si=110&fr=1&sts>> The Global Invasive Species Data Base includes a list of '100 of the World's Worst Invasive Alien Species'. The data base is maintained by Invasive Species Specialist Group (ISSG) of the IUCN Species Survival Commission. It was developed as part of the global initiative on invasive species led

well-known pathway for unintentional, as well as intentional, introductions of alien species as, for example, seeds and other material are transported on tourists' shoes, bags and souvenirs.¹³⁹ Even Antarctica is not immune to the impacts of IAS and the fact that 40,000 tourists visit Antarctic every year, bringing with them alien microbes and fungi, has led the Scientific Committee on Antarctic Research¹⁴⁰ to initiate a study that will assess tourism as a pathway for introducing alien species into the Antarctic region.¹⁴¹

Indeed, there are almost as many methods and means of introducing IAS as there are species that are potential IAS. Yet, increasingly, a common link for introductions – and the one that will be focused on in this study – is through the various media associated with international trade.

The trade in live food, for example, has been implicated in the introduction and spread of the Giant African Snail, the European Shore Crab and the Chinese Mitten Crab.¹⁴² The yellow crazy ant, the Asian long-horned beetle and the tamarisk have all been introduced to new locations as by-products of the nursery trade.¹⁴³ The nursery and agricultural trade are particularly

by the Global Invasive Species Programme (GISP). Available from: <http://www.issg.org/database/welcome/> (February 2007).

¹³⁸ Global Invasive Species Data Base Fact Sheet on brown tree snake <http://www.issg.org/database/species/ecology.asp?si=54&fr=1&sts> (February 2007).

¹³⁹ Greg Sherley and Sarah Lowe, above n 92, paragraph 5.2; Tim Low, above n 9, 280, 285.

¹⁴⁰ The Scientific Committee on Antarctic Research develops and coordinates scientific research on the Antarctic region. <http://www.scar.org/> (January 2005).

¹⁴¹ Information paper submitted by Australia and SCAR 'IPY Aliens in Antarctica' IP 49 Agenda Item ATCM 10 CEP 5, CEP8(a).XXX Antarctic Treaty Consultative Meeting, 2007. http://www.scar.org/treaty/atcmxxx/Atcm30_ip049_e.pdf (August 2007).

¹⁴² Global Invasive Species Data Base Fact Sheets on the Giant African Snail <http://www.issg.org/database/species/ecology.asp?si=64&fr=1&sts> (February 2007); the European Shore Crab <http://www.issg.org/database/species/ecology.asp?si=114&fr=1&sts> (February 2007) and the Chinese Mitten Crab <http://www.issg.org/database/species/ecology.asp?si=38&fr=1&sts> (February 2007)

¹⁴³ For example, the yellow crazy ant, the Asian long-horned beetle and the tamarisk. Global Invasive Species Data Base Fact Sheet on the yellow crazy ant above n 137; Global Invasive Species Data Base Fact Sheet on the Asian long-horned beetle, <http://www.issg.org/database/species/ecology.asp?si=111&fr=1&sts> (February 2008);

common sources of introductions of IAS. In China, for example, 49.3% of invasive alien species were unintentionally introduced in timber, seedlings and soil used in the nursery trade.¹⁴⁴ In Thailand, bacterial wilt, which affects crop plants, such as potato and ginger, is thought to have been accidentally introduced on potato tubers that were imported as planting material.¹⁴⁵ In Australia, the Australian Academy of Science has highlighted the dangers associated with trade in cut flowers. As the Academy points out, flowers have evolved to attract insects and the perishable nature of the commodity means that cut flowers are often not subject to as rigorous an examination as other products.¹⁴⁶ Both of these features increase the likelihood of introducing insect pests to Australia.

In other instances, trade in commodities such as grains and seeds can increase the risk of weeds and plant pests and diseases being introduced.¹⁴⁷ One particular insect of concern, the khapra beetle, is the subject of constant vigilance by the Australian Quarantine Inspection Service (AQIS),¹⁴⁸ and is listed by the IUCN as one of the 100 worst IAS in the world.¹⁴⁹ The trade in pet and aquarium products can also act as a pathway for the introduction and spread of many IAS and is implicated in the introduction of Chytrid frog fungus,¹⁵⁰ killer alga¹⁵¹ and the walking catfish.¹⁵²

Global Invasive Species Data Base Fact Sheet on the tamarisk, <<http://www.issg.org/database/species/ecology.asp?si=72&fr=1&sts=>> (February 2008).

¹⁴⁴ H Xu, et al, above n 105, 1496-7.

¹⁴⁵ Food & Fertilizer Technology Center, (Information Centre in the Asia Pacific Region) *The Problem of Invasive Species* FAO 2003-11-01, (2003) 2. <<http://www.ffc.agnet.org/library/article/ac2003c.html>> (July 2005).

¹⁴⁶ Review of Australian Quarantine Inspection Service, Australian Academy of Science, above n 124 at paragraph 3.3; see also, Shirley Bethune, Mike Griffin, Dave Joubert, *National Review of Invasive Alien Species Namibia* Prepared for the Directorate of Environmental Affairs, Ministry of Environment and Tourism Windhoek (2004) 42.

¹⁴⁷ Review of Australian Quarantine Inspection Service, Australian Academy of Science, above n 124, paragraph 3.1.1.

¹⁴⁸ Ibid. In June 2006, Public Quarantine Alert PQA0479 was issued with respect to cut flowers and the chances of introducing *Phytophthora* insects.

¹⁴⁹ Global Invasive Species Data Base Fact Sheet the Khapra beetle <<http://www.issg.org/database/species/ecology.asp?si=142&fr=1&sts=>> (February 2007).

¹⁵⁰ Global Invasive Species Data Base Fact Sheet on Chytrid frog fungus <<http://www.issg.org/database/species/ecology.asp?si=123&fr=1&sts=>> (February 2007).

Ballast water discharges are another notable pathway for introducing IAS. Discharges of ballast water have been responsible for introducing the Asian bivalve, a voracious feeder, into the United States of America, where it is particularly implicated in ecological changes occurring in the San Francisco Bay region.¹⁵³ Ballast water discharges from vessels engaged in ocean-going trade were also responsible for the introduction of Zebra mussels into the North American Great Lakes. The zebra mussel feeds by filtering water and in doing so removes material such as other organisms and algae that “supply food for larval fish and other invertebrates”,¹⁵⁴ leading to a decline in populations of some native species. In the Pacific region, ballast water problems have been described as a “time bomb”,¹⁵⁵ with evidence that ships may inadvertently be disgorging potentially ecologically-devastating organisms in proximity to Pacific Island states.¹⁵⁶

With an increasing number of invasive species being introduced by trade there is growing recognition that the link between trade and IAS needs to be addressed. It is an issue that has been considered in numerous studies on IAS,¹⁵⁷ as well as in reports from international treaty bodies, such as the COP

¹⁵¹ Global Invasive Species Data Base Fact Sheet on Killer Alga
<<http://www.issg.org/database/species/ecology.asp?si=115&fr=1&sts>> (February 2007).

¹⁵² Global Invasive Species Data Base Fact Sheet on Walking catfish
<<http://www.issg.org/database/species/ecology.asp?si=62&fr=1&sts>> (February 2007).

¹⁵³ Global Invasive Species Data Base Fact Sheets on Asian Bivalve.
<<http://www.issg.org/database/species/ecology.asp?si=136&fr=1&sts>> (February 2007).

¹⁵⁴ Great Lakes Information Network *Zebra Mussels in the Great Lakes Region*
<<http://www.great-lakes.net/envt/flora-fauna/invasive/zebra.html>> (February 2007).

¹⁵⁵ Ballast Water News. Global Ballast Water Management Programme ‘*Preventing Pests in Paradise*’ (2001) Issue 6 July-September, 11. Link available from
<<http://globalballast.imo.org/index.asp?page=newsletter.asp>> (February 2007).

¹⁵⁶ *Ibid.* See also, S Coles, and L Eldredge, ‘Nonindigenous Species Introductions on Coral Reefs: A Need for Information’ (2002) 56 *Pacific Science* 191.

¹⁵⁷ K Stokes, K O’Neill and R McDonald, above n 92, paragraph 2.1; Department for Environment Food and Rural Affairs (DEFRA), *Review of Non-Native Species Policy* above n 58, 107; Jeffrey A McNeely, Harold A Mooney, Laurie E Neville, Peter Johan Schei and Jeffrey K Waage (ed), *Global Strategy on Invasive Alien Species* above n 93, paragraph 2.2; John Mumford, above n 105, 330; Generally, A Perrault, M Bennett, S Burgiel, A Delach and C Muffett, *Invasive Species, Agriculture and Trade: Case Studies from the NAFTA Context*.

to the CBD.¹⁵⁸ The growing volume of literature on this topic particularly emphasizes that globalisation and free trade are breaking down natural barriers, such as oceans, mountains and deserts,¹⁵⁹ thus facilitating the transport of goods and people from one part of the globe to another. Statistics from Europe¹⁶⁰ and China¹⁶¹ demonstrate that populations of IAS are linked to humans and their international trade activities. In Europe, it is estimated that 70% of insect pests came from North America;¹⁶² while in China, researchers calculate that 76.3% of invasive animal species have been introduced either deliberately or accidentally via the transport of commodities.¹⁶³ In the United Kingdom, a review of IAS policy conducted in 2003 categorizes the introduction of terrestrial organisms by way of trade as a high risk.¹⁶⁴

Moreover, it is inevitable that the introduction of species will occur more frequently, because the rate at which species are being transported is accelerating. To begin with, the overall volume of trade is increasing.¹⁶⁵ In the United States of America imports grew from US\$192 billion in 1965 to US\$2.2 trillion (seasonally adjusted) in 2006.¹⁶⁶ It is also significant that the

(Paper presented at the Second North American Symposium on Assessing the Environmental Effects of Trade, Mexico City, March 25-26, 2003).

¹⁵⁸ Convention on Biological Diversity SBSTTA 'Invasive Alien Species, Status, Impacts and Trends of Alien Species that Threaten Ecosystems, Habitats and Species' above n 126, at 8.

¹⁵⁹ K Stokes, K O'Neill and R McDonald, above n 92, paragraph 2.1.

¹⁶⁰ John Mumford, above n 105 at 331.

¹⁶¹ H Xu, et al above n 105, 1496-7.

¹⁶² John Mumford, above n 105, 331.

¹⁶³ H Xu, et al, above n 106, 1496-7.

¹⁶⁴ Department for Environment Food and Rural Affairs (DEFRA), above n 58, Annex 5 of the report that sets out a table classifying pathways of introduction for alien species as low risk, medium risk and high risk. A high risk is designated as one where there is a large chance of more than one IAS per year being introduced and established. See also page 107.

¹⁶⁵ WTO Trade Statistics Chart 11.2 World Merchandise Trade by major product group 1950-2005.<http://www.wto.org/english/res_e/statistics_e/its2006_e/its06_longterm_e.pdf> (August 2007).

¹⁶⁶ 1965 statistics from Jeffrey A McNeely, Harold A Mooney, Laurie E Neville, Peter Johan Schei and Jeffrey K Waage (ed), *Global Strategy on Invasive Alien Species* above n 93, paragraph 2.2; 2006 statistics from U.S. Census Bureau, Bureau of Economic Analysis Foreign Trade Statistics, *U.S. International Trade in Goods and Services August 2007*, released 11 October 2007 CB07-143, BEA07-49, FT-900 (07-08), 4.

trade in agricultural products is increasing, because these types of products have the greatest potential to introduce species accidentally, both in packaging material and on the agricultural products themselves.¹⁶⁷

Taken together, these trends and developments mean that the chances of introducing IAS to new locations are ever-increasing, especially to locations where regulatory regimes may be totally unprepared for these introductions. This complexity poses a number of serious challenges for national regulators attempting to protect biodiversity from the deleterious effects of IAS.

1.3 THE CHALLENGE OF REGULATING IAS

The intricate nature of the IAS problem, including the vast diversity of possible species that may be introduced, the infinite number and variety of mediums into which they may be introduced, and the increasing number of potential methods of introduction, makes regulating introductions a complex and difficult task.

1.3.1 Invasive Alien Species or Useful Resource?

The first challenge lies in the definitional quandary and the fact that a species regarded as a useful resource by one sector may be considered harmful by another. As already discussed the impacts of IAS have the potential to drive native species to extinction.¹⁶⁸ However, where the alien species is viewed as a resource the protection of biodiversity necessitates bringing together environmental and resource issues, such as occurs in agricultural and farming practices. The lack of specific definition of IAS means that competing claims may often have to be balanced and possibly compromised. Thus, implementing a regulatory regime that adequately protects biodiversity as well as sectoral interests can be problematic. Indeed, inconsistencies are often

¹⁶⁷ Jeffrey A McNeely, Harold A Mooney, Laurie E Neville, Peter Johan Schei and Jeffrey K Waage (ed), *Global Strategy on Invasive Alien Species* above n 93.

¹⁶⁸ See generally above n 92.

not easily resolved in favour of the protection of biodiversity,¹⁶⁹ as illustrated by a series of cases litigated in Hawaii in the 1980s involving protection of a bird, a honey-creeper called the *Palila*.¹⁷⁰

The *Palila* was listed as endangered in 1967 and by 1977 the ten per cent of its original habitat that remained became designated as “critical habitat.”¹⁷¹ This critical habitat was also occupied by herds of introduced sheep and goats that were instrumental in the decline of the *Palila*’s habitat and hence the *Palila* itself.¹⁷² The Federal government of the United States, acting under the *Endangered Species Act*, advised that the sheep and goats ought to be eradicated.¹⁷³ However, the Hawaiian government, acting via their Game Management Authority, refused to eradicate the sheep and goats mainly because the hunting lobby wanted the herds maintained for recreational shooting.¹⁷⁴ The Sierra Club¹⁷⁵ commenced a series of actions in the name of the *Palila*¹⁷⁶ and eventually succeeded. However, following this, legislation was introduced by the state of Hawaii that would have reversed the court’s

¹⁶⁹ Biodiversity is defined in Article 2 of the CBD as ‘the variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.’ At the national level there are difficulties experienced where an IAS is viewed as a resource. See generally: B J Ramsay, *Commercial Use of Wild Animals* Bureau of Rural Sciences Canberra (1994); D Choquenot, J Caughley and S McLeod *Scientific, Economic and Social Issues of Commercial Use of Wild Animals in Australia* above n 112; M Bomford & J Caughley (eds) *Sustainable Use of Wildlife by Aboriginal Peoples and Torres Strait Islanders* Bureau of Resource Sciences, Canberra 1996.

¹⁷⁰ *Palila v Hawaii Department of Land and Natural Resources* 471F. Supp 985 999 Hawaii 1979. Affirmed 639 F 2d 495 9th Cir 1981. These cases involved feral sheep and goats. *Palila v Hawaii Department of Land and Natural Resources* 832 F. 2d 1106 (9th Cir 1988) involved the mouflon sheep. For discussion of the case see E Smith, ‘The Endangered species Act and Biological Conservation’ (1984) 57 *Southern California Law Review* 361 and George Coggins and Irma Russell, ‘Beyond Shooting Snail Darters in Pork Barrels: Endangered Species and Land Use in America’, (1982) 70 *Georgetown Law Journal* 1433.

¹⁷¹ George Coggins and Irma Russell, above n 170, 1474.

¹⁷² E Smith, above n 170 at 390.

¹⁷³ George Coggins and Irma Russell, above n 170, 1474.

¹⁷⁴ *Ibid.*

¹⁷⁵ The Sierra Club is an environmental non-profit organization that was founded in 1892. <<http://www.sierraclub.org/>> (February 2004).

¹⁷⁶ *Palila v Hawaii Department of Land and Natural Resources*. These cases involved feral sheep and goats. 832 F. 2d 1106 (9th Cir 1988). See general discussion George Coggins and Irma Russell, above n 170, 1474.

decision,¹⁷⁷ with the offending legislation only being revised after public condemnation of its introduction.¹⁷⁸

In Australia, a similar situation exists with feral pigs, goats and foxes. Although these feral animals compete with native animals for food and habitat, transmit diseases and are responsible for land degradation,¹⁷⁹ pigs, goats and foxes are seen as both a pest and a resource.¹⁸⁰ Pigs, in particular, are hunted both commercially and recreationally¹⁸¹ and attempts to eradicate this type of invasive alien may bring environmentalists into conflict with those who regard the species as an economically valuable resource.¹⁸²

1.3.2 The Problem of Borders

Another challenge results from the limitations imposed by states acting as political entities. Alien species are often identified by reference to a state's political boundary and by a determination whether the species is native or indigenous to that boundary.¹⁸³ However, this approach underscores a number

¹⁷⁷ *Palila v Hawaii Department of Land and Natural Resources* footnote 50, at 1109.

¹⁷⁸ *Palila v Hawaii Department of Land and Natural Resources* at 1108. Nowadays, the government of Hawaii is proactive in dealing with invasive species. See 'Hawaiian Ecosystems at Risk Project' <<http://www.hear.org/>> (July 2005); general discussion Alan Holt 'An Alliance of Biodiversity, agriculture, Health and Business Interests for Improved Alien Species Management in Hawaii' in O Sandlund, P Schel, A Viken (eds) *Proceedings of the Norway/UN Conference on Alien Species* Trondheim July 1995 Directorate for Nature Management Trondheim (1996) 155.

¹⁷⁹ Ben Reddiex, and David Forsyth, *Review of Existing Red Fox, Feral Cat, Feral Rabbit, Feral Pig and Feral Goat In Australia. II. Information Gaps*. Arthur Rylah Institute for Environmental Research, Department of Sustainability and Environment, Melbourne, (2004).

¹⁸⁰ Environment Protection Authority NSW State of the Environment Report 1997 above n 33 at paragraph 2.6 3.

¹⁸¹ D Choquenot J McIlroy and T Korn, *Managing Vertebrate Pests: Feral Pig*, above n 112, 2.

¹⁸² See generally, Douglas O Linder, 'Are All Species Created Equal? And Other Questions Shaping Wildlife Law' (1988) 12 *Harvard Environmental Law Review* 157, 163 where he discusses the *Free-Roaming Horses and Burros Act* of 1971 16 USC 1331-40 (1982). The legislation has many parallels with legislation that seeks to conserve threatened and endangered species and yet the species it actually deals with are alien species.

¹⁸³ In Australia, for example, both the *Endangered Species Protection Act 1992* (Cth) and its successor the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) regard a species as native if it is indigenous to any part of Australia. A similar strategy is taken in the Nigerian *Endangered Species (Control of International Trade and Traffic) Act*, where wildlife is defined according to whether it is indigenous to Nigeria.

of weaknesses characteristic of using political borders in environmental management.

A first weakness stems from political realities and the need for transboundary and international cooperation and collaboration in the identification, assessment and control of introductions.¹⁸⁴ By their very nature, invasive alien species cross international boundaries and a purely national solution is unlikely to resolve an international problem. If a state is to prevent entry of IAS, international cooperation and collaboration is essential.¹⁸⁵ In addition, states may need to consider whether species that are not invasive in their own territory may nevertheless be invasive in adjoining states. For example, the ruddy duck which was introduced into the United Kingdom is not invasive in that territory, yet it has spread from the United Kingdom to Spain, where it poses a threat to the endangered white-headed duck.¹⁸⁶ Measures by Spain to regulate the ruddy duck may be ineffective without cooperation from the United Kingdom. In addition, the fact that species can react differently in new locations should also signal that states ought to be wary of moving species from one part of their territory to another. A species may become invasive in a new location and escape early detection, because incorrect assumptions were made concerning the invasive capabilities of the species.¹⁸⁷

An alternative to regulation in accordance with political boundaries is to recognise ecological needs and classify species by reference to their ecosystem or range. The ecosystem approach is employed by the United States in *Executive Order No 13112 on Invasive Alien Species*, where an alien

¹⁸⁴ Jeffrey A McNeely, Harold A Mooney, Laurie E Neville, Peter Johan Schei and Jeffrey K Waage (ed), *Global Strategy on Invasive Alien Species* above n 93, paragraph 6.4.

¹⁸⁵ See discussion in sections 3.2.2 and 3.3.3 and 3.5.1 of Chapter 3 of this study.

¹⁸⁶ IUCN Policy Recommendations on the Sixth meeting of the Conference of the Parties to the Convention on Biological Diversity (COP6) at 5, April 2002 IUCN. Available <http://www.iucn.org/themes/pbia/wl/docs/biodiversity/cop6/final_invasives.doc> (March 2007).

¹⁸⁷ *Wilkins v Dovuro Pty Ltd*, [1999] FCA 1816. Seeds contaminated with cleavers weeds were planted in the Australian state of Western Australia where the weed caused considerable harm, necessitating government intervention. This occurred despite the fact that cleavers is present in the eastern states of Australia and the state of South Australia without ill effects.

species is defined as any species not native to an ecosystem.¹⁸⁸ Another classification, based on a species' range has proved popular with some management organizations, such as the Australian Murray-Darling Basin Commission,¹⁸⁹ which use the term “natural range” to describe the natural spread and location of a species. As the Commission points out, this definition not only includes alien species introduced from another country, but also indigenous species “which have been transplanted or translocated to areas within the country, but outside their natural range”.¹⁹⁰

The natural range or ecosystem of a species will roughly coincide with a species' area of origin and evolution, irrespective of jurisdictional borders.¹⁹¹ Thus, using ecosystem or natural-range parameters overcomes some of the difficulties associated with using political parameters. Nevertheless, this approach depends on the identification of the relevant ecosystem. Since an ecosystem may be as large as the atmosphere, or the oceans, or as small as a “temporary pond”¹⁹² and smaller ecosystems are found within larger ones, determining the species' natural range will entail undertaking widespread historical examinations and surveys, which can be time-consuming and expensive.

The use of national borders can also compound sectoral and jurisdictional problems flowing from systems of government comprising more than one level. In a federal system, for instance, power is shared between states, or

¹⁸⁸ *Executive Order No 13112 on Invasive Alien Species* Section 1(a).

¹⁸⁹ The Murray-Darling Basin Commission is an Australian organization that represents a partnership between government and the community. The aim of the commission is to use the Murray-Darling river systems in a sustainable manner. <http://www.mdbc.gov.au/about/murraydarling_basin_initiative_overview> (April 2006).

¹⁹⁰ A Morrison *Management of Introduced Species in the Murray-Darling Basin – A Discussion Paper* Murray-Darling Basin Commission Proceedings of the Workshop on Native Fish Management Murray-Darling Basin Commission Canberra (1989), 149; see also, Department of the Environment and Heritage, National Strategy for the Conservation of Australia's Biological Diversity, paragraph 3.3 Alien species and genetically modified organisms. <<http://www.deh.gov.au/biodiversity/publications/strategy/chap3.html>> (April 2005); P L Shafland and W M Lewis. ‘Terminology Associated With Introduced Organisms’ (1984). 9(4) *Fisheries* 17, 18.

¹⁹¹ Clare Shine, Nattley Williams and Lothar Gundling, above n 2, 1.

¹⁹² See also P L Shafland and W M Lewis, above n 190.

provinces, and a central government.¹⁹³ Depending on the constitution, each level of government may have legislative and jurisdictional limitations.¹⁹⁴ In addition, each level of government may also take differing views regarding the classification of an IAS. This can result in the same species being classified differently depending on where it is located, leading to inconsistencies in the management regime.¹⁹⁵ As Shine, Williams and Gundling point out¹⁹⁶ effective regulation of IAS is principally contingent upon good coordination of those activities undertaken by various agencies and instrumentalities. They suggest three possibilities to effect this coordination: a “unitary legislative framework”¹⁹⁷ where one piece of legislation covers all IAS; the use of a coordinating body, with authority to harmonise objectives and processes across the sectors, government departments and agencies that deal with IAS; and, as the least intrusive option, a coordinating body that harmonises sufficient laws to ensure that there are no conflicts between the sectors and which encourages harmonization in processes and practices, but without the authority to impose harmonization of processes legally.¹⁹⁸

1.3.3 Evaluating the Existence of a ‘Threat’

A further challenge arises from the need to identify potentially harmful introductions and the threat they pose. Extensive knowledge may be required

¹⁹³ Examples of federal systems of government include Argentina, Australia, and the United States of America. For a discussion of the operation of federal systems of government see H Kelsall, P Robinson and G Howse, ‘Public Health and Quarantine in a Federal System’ (1999) 7 *Journal of Law and Medicine* 87.

¹⁹⁴ For an example of the limitations in Australia see Robert Fowler, ‘New National Directions in Environmental Protection and Conservation’ in Ben Boer, Robert Fowler and Neil Gunningham (eds), *Environmental Outlook* Federation Press (1994) 113.

¹⁹⁵ In Australia, for example, section 9 of the Northern Territory of Australia, the *Territory Parks and Wildlife Conservation Act 1996* (NT) defines wildlife as animals and plants indigenous to Australia and the sea or sea-bed, including migratory birds and animals and plants ‘introduced into Australia, directly or indirectly, by Aborigines before the year 1788’, while section 528 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) considers species native if that they are indigenous to Australia, or an external Territory, or were ‘present in Australia or an external Territory before 1400’.

¹⁹⁶ Clare Shine, Nattley Williams and Lothar Gundling, above n 2, paragraph 4.3.4.

¹⁹⁷ Ibid.

¹⁹⁸ Ibid.

to predict adequately which species will become invasive and to assess how and to what extent they will threaten or impact upon biodiversity. As already noted, not all introduced species will necessarily be harmful,¹⁹⁹ or they may only be harmful in certain locations to which they are introduced, or harmful to certain organisms and not to others.²⁰⁰ However, it is the potential to harm biodiversity which makes introduced species invasive alien species.

As a factual matter, differentiating between those seemingly beneficial alien species which will become invasive, and those which will not, can be a difficult task.²⁰¹ One of the biggest problems is the time-lag between introductions and manifestation of a species' invasive qualities. Studies indicate that average lag times of 147 years are not unusual,²⁰² with other studies increasing this figure to 170 years.²⁰³ The difficulty is compounded by the usual manner of determining invasiveness, which is to resolve whether a species has been invasive elsewhere.²⁰⁴ Often, insufficient information exists to make that kind of assessment²⁰⁵ and obtaining statistics and data on precise figures of alien species' introductions is difficult. The information may not be known, or the data may not be made public.²⁰⁶ Even if researchers know the number of alien species being introduced, the rate at which species become invasive is not settled. For example, it has been suggested that globally "one-third of bird species and two-thirds of mammal species released into new

¹⁹⁹ Jeffrey A McNeely, 'The Great Reshuffling: How Alien Species Help Feed the Global Economy' above n 65, 55.

²⁰⁰ D Choquenot, J McIlroy and T Korn, *Managing Vertebrate Pests: Feral Pigs*, above n 112.

²⁰¹ Peter Johan Schei 'Introductory Notes' O Sandlund, P Schel, A Viken (eds) *Proceedings of the Norway/UN Conference on Alien Species* Trondheim July 1995 Directorate for Nature Management Trondheim (1996)17.

²⁰² R Wittenberg, above n 92, 26.

²⁰³ Tim Low, above n 9, 216-17.

²⁰⁴ Convention on Biological Diversity SBSTTA 'Invasive Alien Species, Status, Impacts and Trends of Alien Species that Threaten Ecosystems, Habitats and Species' above n 126, at 5.

²⁰⁵ R Wittenberg, above n 92, 132.

²⁰⁶ Andreas Glanzing, *Closing Australia's Quarantine Loophole to New Weeds*, WWF Australia, Sydney (2005) 8.

environments establish exotic wild populations”.²⁰⁷ What is not known with certainty is what proportion of these species that establish will also become invasive. One estimate is that as many as 10% “of the world’s 300,000 vascular plants”²⁰⁸ have the capacity to become invasive. Other estimates are that two to three out of every 100 alien species will become invasive.²⁰⁹ Still other studies indicate lower levels of invasive potential with percentages in the order of .01% of all introductions.²¹⁰ The lack of certainty in these figures indicates the difficulties inherent in predicting invasiveness in species. This, in turn, makes it difficult to decide which pathways and vectors of introduction should be targeted for detecting and intercepting introductions. The only comment that can be made with certainty is that the more alien species are introduced, the more likely that invasive alien species will also be introduced.²¹¹

Effective regulation of IAS, therefore, depends on the creation and maintenance of adequate data bases on alien species. Information needs to include knowledge and inventories of native species, alien species, the origin of alien species, how the alien species came to be in its new location, and what effect the alien species has had on native biodiversity.²¹² Details on the spread and abundance of alien species may be particularly useful in detecting species that may not be causing apparent problems, but may be slowly “expanding their range and/or building up populations, and may become a problem at a later date”.²¹³ The breadth of knowledge needed is exemplified

²⁰⁷ M Bomford, *Risk Assessment for the Import and Keeping of Exotic Vertebrates in Australia* at 23 Bureau of Rural Sciences, Canberra, (2003).

²⁰⁸ Jeffrey A McNeely, Harold A Mooney, Laurie E Neville, Peter Johan Schei and Jeffrey K Waage (ed), *Global Strategy on Invasive Alien Species* above n 93 paragraph 2.1.

²⁰⁹ See discussion M Davis, K Thompson and J Grime, ‘Charles S Elton and the Dissociation of Invasion Ecology from the Rest of Ecology’ (2001) 7 *Diversity and Distributions* 97, 100.

²¹⁰ K Stokes, K O’Neill and R McDonald, above n 92, paragraph 1.1; R Callaway, S Miao, Q Guo, ‘Are Trans-Pacific Invasions the New Wave?’ (2006) 8 *Biological Invasions* 1435.

²¹¹ M Bomford, *Risk Assessment for the Import and Keeping of Exotic Vertebrates in Australia* above n 207; Petr Pyšek ‘Alien and Native Species in Central European Urban Floras: a quantitative comparison’ (1998) 25 *Journal of Biogeography* 155, 159.

²¹² R Wittenberg, above n 92, 132.

²¹³ K Stokes, K O’Neill and R McDonald, above n 92, paragraph 1.2.

by an effect described as the “domino effect”.²¹⁴ The domino effect can occur where native species adapt to IAS and implementing eradication measures for IAS may also impact upon native species that have become dependent on the alien invader. In Australia, for example, wedge-tailed eagles, barn owls and other raptors feed on alien species, such as rabbits and house mice. Similarly, native mammals have come to exploit alien plants for habitat.²¹⁵ Consequently, plans to eradicate rabbits, house mice and alien plants need to take into account these associated dependencies, highlighting the degree of knowledge required to underpin IAS regulation.

In addition, a prediction of invasiveness requires a determination of a threat or potential threat to biodiversity, which itself requires not only an extensive and sophisticated knowledge base, but also definition of the word ‘threat’. At issue is how potential harm can be measured and what level of injurious threshold needs to be reached before a species is designated “invasive”.²¹⁶ As already noted in this section, neither the CBD nor the IUCN Guidelines provides a definition of ‘threat’. The concept is, however, explored in domestic laws, such as the Australian *Environment Protection and Biodiversity Conservation Act 1999* (Cth), enacted to implement Australia’s obligations under the CBD and to assess and regulate, amongst other things, matters of national environmental significance. Biodiversity is protected by a number of mechanisms, including the identification of “threatening processes” and “key threatening processes”. A “threatening process” is defined as one that threatens the survival, abundance, or evolutionary

²¹⁴ Ibid, paragraph 1.5.

²¹⁵ Australian Bureau of Statistics, *Supplementary Commentary on Invasive Species* 1370.0 Measuring Australia’s Progress (2002). The commentary refers to species such as the Black-Breasted Button Quail living in lantana thickets and the Northern Hairy-nosed Wombats which now feed on *Buffel* Grass. Available from <<http://www.abs.gov.au/Ausstats/abs@.nsf/94713ad445ff1425ca25682000192af2/0542A2BDF511788BCA256BDC00122411?opendocument>> (April 2005).

²¹⁶ See generally Lyle Glowka, Cyril de Klemm, ‘International Instrument, Processes and Non-indigenous Species Introductions – Is a Protocol Necessary?’ [1996] *Environmental Policy and Law* 247.

development of a native species or ecological community;²¹⁷ while a “key threatening process” is a threatening process that further endangers a listed threatened species, or ecological community, or adversely affects two or more listed threatened species, or ecological communities.²¹⁸ Although the two definitions differ with respect to the impact of a threat, the concept itself is similar in both definitions and a “key threatening process” will be examined as a common example of a provision referring to a threat.

Applications to list a “key threatening process” are made to the Threatened Species Scientific Committee (the Scientific Committee),²¹⁹ which recommends whether or not the process should be listed. As of November 2007, the Scientific Committee had received seventeen²²⁰ applications to have key threatening processes listed that involve invasive alien species. Of these, ten applications have been successful,²²¹ four have been rejected²²² and three

²¹⁷ *Environment Protection and Biodiversity Conservation Act 1999* (Cth) Section 528 Definitions and section 188(3) definition of threatening process.

²¹⁸ *Environment Protection and Biodiversity Conservation Act 1999* (Cth) Section 188(4).

²¹⁹ *Environment Protection and Biodiversity Conservation Act 1999* (Cth) establishes the Threatened Species Scientific Committee pursuant to Sections 502 and 503.

²²⁰ The numbers cited in this part of the study do not include the application for ‘Infection of amphibians with chytrid fungus resulting in chytridiomycosis’ because it is not known whether this fungus is native to Australia. Nor do the numbers include the application: ‘Psittacine Circoviral (beak and feather) Disease affecting endangered psittacine species’, because the disease is believed to have evolved in the wild. The lists are available from <<http://www.deh.gov.au/biodiversity/threatened/nominations/index.html>> (August 2007).

²²¹ The ten successful applications are: ‘Competition and land degradation by feral goats’; ‘Competition and land degradation by feral rabbits’; ‘Dieback caused by the root-rot fungus (*Phytophthora cinnamomi*)’; ‘Loss of biodiversity and ecosystem integrity following invasion by the Yellow Crazy Ant (*Anoplolepis gracilipes*) on Christmas Island, Indian Ocean’; ‘Predation by exotic rats on Australian offshore islands of less than 1000 km² (100,000 ha)’; ‘Predation by feral Cats’; ‘Predation by the European Red Fox (*Vulpes vulpes*)’; ‘Predation, Habitat Degradation, Competition and Disease Transmission by Feral Pigs’; ‘The biological effects, including lethal toxic ingestion, caused by Cane Toads (*Bufo marinus*)’; ‘The reduction in the biodiversity of Australian native fauna and flora, due to the red imported fire ant, *Solenopsis invicta* (fire ant)’. Available from <<http://www.environment.gov.au/cgi-bin/sprat/public/publicgetkeythreats.pl>> (August 2007).

²²² The four unsuccessful applications are: ‘*Cinnamomum camphora* (Camphor Laurel) most toxic chemotypes’; ‘Six key threatening processes of rivers and streams’; ‘Changes to plant-pollinator associations, caused by bumblebees, *Bombus* spp’; ‘The introduction of marine pests into the Australian marine environment via shipping including the discharge of ballast water and/or hull fouling’. Available from <<http://www.environment.gov.au/biodiversity/threatened/unsuccessful-ktp.html>> (August 2007).

are under consideration for determination by September 2009.²²³ An examination of two successful applications, “Predation by Feral Cats”,²²⁴ and “the Reduction in the Biodiversity of Australian Native Fauna and Flora, due to the Red Imported Fire Ant, *Solenopsis invicta* (fire ant)”,²²⁵ shows that applications need to be supported by comprehensive information. In the first application, detailed information was available on the actual impact of feral cats on numerous threatened native species; while in the latter application, a mixture of actual impacts in Australia and potential impacts extrapolated from experiences in the United States of America were available. One unsuccessful application – the nomination with respect to “Introduction of Live Fish into Waters Outside their Natural Range after 1770” (Live Fish Nomination)²²⁶ – failed due to the lack of detail in the information presented. In particular, the Scientific Committee stated that evidence was required on the level of impact on specific threatened species, or ecological communities. The level and amount of evidence required comes close to proof of actual harm.

This has significant implications for determining whether a species is presently invasive, or has the potential to become invasive. Although none of the definitions of invasive alien species refers to the need to adduce information or evidence showing a minimum threat, some evidence of threat needs to be cited, otherwise the species would not be “invasive”. However, if

²²³ The three applications to be determined are: ‘Ecosystem degradation, habitat loss and species decline due to invasion of Northern Australia by introduced Gamba Grass (*Andropogon gayanus*) and other introduced grasses’; ‘Loss and degradation of native plants and animal habitats by invasion of escaped garden plants’; ‘The introduction of live native or non-native fish into Australian watercourses that are outside their natural geographic distribution’. Available from

<<http://www.environment.gov.au/biodiversity/threatened/publications/pubs/priority-assessment-list.pdf>>(August 2007).

²²⁴ ‘Predation by Feral Cats’ <<http://www.deh.gov.au/cgi-bin/sprat/public/publicshowkeythreat.pl?id=3>>(August 2007).

²²⁵ ‘Reduction in the Biodiversity of Australian Native Fauna and Flora, due to the Red Imported Fire Ant, *Solenopsis invicta* (fire ant)’ <<http://www.deh.gov.au/cgi-bin/sprat/public/publicshowkeythreat.pl?id=13>>(August 2007).

²²⁶ ‘Introduction of Live Fish into Waters Outside their Natural Range after 1770’ (Live Fish Nomination) <<http://www.deh.gov.au/biodiversity/threatened/nominations/streams.html>>(August 2007).

the extent of “threat” needed to prove a species’ invasive qualities is equated to the type of “harm” associated with the identification of key threatening processes, the threshold will be set at a high level. This means that if a species is not already invasive and information is otherwise hard to obtain, the species will escape classification and hence regulation as an IAS.

This approach also makes it hard to predict how the ‘potential’ of a species to be invasive will be judged. Indeed, if the potential of a species to become invasive is in issue, the problems are magnified, since the need to provide verification of invasive qualities by way of harm may render it almost impossible to prove the potential for invasiveness. Thus, the magnitude of information needed to determine the type and extent of threat to classify a species as actually or potentially “invasive” comes close to providing evidence of actual harm. For all intents and purposes, it is a considerable amount of information.

The most popular means of evaluating species is the use of a risk assessment.²²⁷ There are two main types of risk assessment – qualitative and quantitative. A quantitative risk assessment describes in numerical terms the “probability of an event occurring” and its likely impacts. The problem with using quantitative data to determine the impact of IAS on biodiversity is that there are so many gaps and uncertainties in the information set that it makes these types of assessments untenable in full quantitative terms.²²⁸ A qualitative assessment is an assessment that may have some quantitative elements, but is largely based on “scoring responses” to obtain a comparative view of the risk. Thus, the score is scaled across a range from very low, through to low, moderate, high or extreme.²²⁹

²²⁷ See, for example discussion in sections 3.5.3 of Chapter 3, 4.3.9 of Chapter 4 and 6.1 of Chapter 6 of this study.

²²⁸ Department for Environment Food and Rural Affairs (DEFRA), above n 58, 39.

²²⁹ Ibid.

Both quantitative and qualitative determinations of risk need a sound knowledge base. To build this knowledge base, regulators need to compile inventories and studies to determine the number, diversity and location of native and alien species.²³⁰ In addition, data needs to be gathered to determine what thresholds and extent of risk will have an impact on native biodiversity. Of necessity, it also means that monitoring and surveillance are required to gather and maintain information. One issue relates to the length of time that these procedures need to be undertaken. Given that lag times can be enormous, this not an easy issue to address;²³¹ although one suggestion has been made that risk assessments should be revised every 5 to 10 years.²³²

1.3.4 Detecting and Intercepting Introductions

Yet another challenge is presented by the additional and unique difficulties inherent in detecting introductions, particularly accidental introductions. By their very nature accidental introductions cannot be assessed on a species-by-species basis, although pathways, such as tourism or container traffic, and vectors, such as souvenirs and packaging material, can be targeted for preventative measures. However, this involves gathering adequate data to know which activities and practices should be targeted by regulatory measures and what types of measures are likely to succeed.

In the context of international trade, regulation is complicated by the fact that modes of transport increasingly facilitate the accidental transport of IAS. For

²³⁰ Shirley Bethune, Mike Griffin, Dave Joubert, *National Review of Invasive Alien Species Namibia* above n 146, 60.

²³¹ Jeffrey A McNeely, Harold A Mooney, Laurie E Neville, Peter Johan Schei and Jeffrey K Waage (ed), *Global Strategy on Invasive Alien Species* above n 93, paragraph 6.2.

²³² British Ecological Society, Response to DEFRA's Response to the Review of Non-native Species Policy. March 2004
<http://www.britishecologicalsociety.org/articles/publicaffairs/consultations/BES%20Defra%20Non-Native%20Species.pdf> (March 2007); see also Senate Rural and Regional Affairs and Transport Legislation Committee, Parliament of Australia, *Administration of Biosecurity Australia – Revised draft import risk analysis for bananas from the Philippines* Senate Printing Unit, Department of the Senate, parliament House, Canberra (2005). Recommendation 1, paragraph 2.16, where, in the context of monitoring for pests and diseases of imported bananas, the recommendation was made that monitoring and surveillance activities should be undertaken over a minimum of ten years.

example, air transport and containerisation have significantly altered both the range of commodities deliberately transported and the types of alien species accidentally transported. Air freight, in particular, allows perishable goods to be transported to new locations “within the span of a single life stage of an insect pest”.²³³ Not only does the nature of the air freight industry make it impractical to inspect all shipments, but aircraft themselves often become infested with pests that are difficult to detect, intercept and eradicate.²³⁴ Since they do not die in transit, the possibility of these hitchhikers taking up new residence on arrival in a destination is very real.

The use of containers in sea freight similarly raises difficult issues regarding the practicality, frequency and efficacy of inspections. Not only are the containers sealed, making inspection difficult,²³⁵ but increases in volume of container traffic puts further strain on inspection facilities,²³⁶ assuming such facilities even exist.²³⁷ The situation is further complicated by the global nature of trade which sees trade, and the consequent possibility of IAS hitchhikers, being conducted not just between immediately neighbouring states, but between distant states, providing an unlimited number of possibilities and combinations for the accidental introduction of IAS.

Of course, international trade is not the only means through which accidental introductions may occur. As already noted, any activity which crosses international borders may result in an accidental introduction of alien species.

²³³ John Mumford, above n 105, 330.

²³⁴ Ibid at 331.

²³⁵ Ibid at 330; it is thought that IAS such as the Argentine ant arrived by means of containerized shipping. See Global Invasive Species Data Base Fact Sheet on Argentine Ant. <<http://www.issg.org/database/species/ecology.asp?si=127&fr=1&sts>>(February 2007). In addition, the trade in services such as the transport of machinery has also introduced invasive species such as the brown house ant to new locations. See Global Invasive Species Data Base Fact Sheet on the brown house ant. <<http://www.issg.org/database/species/ecology.asp?si=132&fr=1&sts>>(February 2007).

²³⁶ A Perrault, M Bennett, S Burgiel, A Delach and C Muffett, *Invasive Species, Agriculture and Trade: Case Studies from the NAFTA Context*, above n 157, 6.

²³⁷ Ibid. The authors point out that between ‘1990 and 2001 container traffic in U.S. and Canadian ports nearly doubled, from 17.7 million twenty-foot equivalent units (TEUs) in 1990, to 33.3 million TEUs in 2001’.

The point here is simply to highlight the challenge that the potential for accidental introductions poses for effective regulation of IAS.

1.3.5 Prevention vs Cure

Yet another challenge relates to the relationship between the concepts of prevention and cure – the problem being that, once a species becomes invasive, for all practical purposes there is no cure. Hence, proactive measures that prevent entry of IAS are the cheapest and most effective means of regulating these species.²³⁸ Constant vigilance, encompassing continuous monitoring and assessment of pathways, vectors and species is essential to the design and implementation of preventative mechanisms. However, the question arises whether prevention refers to preventing the introduction of species *per se*, or to preventing the introduction *and* establishment of species.

Preventing entry *per se* will often require less effort than stopping a species from entering *and* establishing itself. In that respect, preventative measures *per se* may be the preferred management option. Nevertheless, particularly in view of the potential for accidental introductions, this approach will never be sufficient. Prevention must therefore also be considered to include measures to arrest the spread of a species once it is introduced. This will involve continuous monitoring and surveillance and, ultimately, it may also include eradication measures. The challenge here is for states to adopt effective measures without compromising their domestic needs and interests or their international obligations.

1.3.6 The Cost of Prediction, Detection and Eradication

A final challenge relates to the question of cost. Clearly, the information demands required to predict actual and potential invasiveness are great. Collection, collation and analysis of data require expertise and continuous

²³⁸ Jeffrey A McNeely, Harold A Mooney, Laurie E Neville, Peter Johan Schei and Jeffrey K Waage (ed), *Global Strategy on Invasive Alien Species*, above n 93, paragraph 6.2.

monitoring and assessment, all of which is costly. Detection of identified IAS at or before point of entry similarly requires expenditure of significant resources, particularly given the multitudinous pathways and vectors of entry. Moreover, costs of eradication in situations where IAS have gained entry may be high.²³⁹ Weighed against these costs are the costs which may accrue as a result of the damage inflicted by an IAS.²⁴⁰

The costs of addressing an IAS problem may be prohibitively high, particularly for developing countries.²⁴¹ Even in the wealthiest of states, however, governments must consistently make policy choices with respect to the allocation and spending of resources. As many different parties vie for the available pool of funds, environmental interests compete with other interests, such as farming and agriculture. These latter interests may appear to be more pressing than the public interest in protection of biodiversity as a whole. Even where a species is already present and causing harm and reasons may exist for expending resources to eradicate or control the species, the resources may not be available or the countervailing interests may prevail. While, admittedly, always a fine balancing act, considerations of cost may therefore result in inadequate protection of biodiversity.

1.4 CONCLUSION

The deleterious impacts of IAS on biodiversity are now recognised as a world-wide phenomenon, predicted to increase rapidly in extent and severity in the 21st century.²⁴² These impacts include not only the effect on individual species, but the broader potential to lead to permanent loss of biodiversity and

²³⁹ Clare Shine, Nattley Williams and Lothar Gundling, above n 2, 8-10; See generally Ross McLeod, *Counting the Cost: Impact of Invasive Animals in Australia* Cooperative Research Centre for Pest Animal Control. Canberra (2004).

²⁴⁰ Ross McLeod, above n 239.

²⁴¹ Clare Shine, Nattley Williams and Lothar Gundling, above n 2, 1-4.

²⁴² Convention on Biological Diversity SBSTTA 'Invasive Alien Species, Status, Impacts and Trends of Alien Species that Threaten Ecosystems, Habitats and Species' above n 126, 8.

the emergence of a world increasingly dominated by a smaller number of species. As Tim Low has said in his book, *Feral Future*:

Ignore the warnings and [Australia] will end up as pest-infested as some of the worst places overseas – southern Florida, for instance. A couple of years ago on the edge of a Florida swamp I caught a clear glimpse of the future. Indian mynas and South American monk parakeets were frolicking among wild Australian paperbarks. Here were four continents in collision, a hybrid world not yet imagined, the new ecology – our feral future.²⁴³

It is clear that in the case of IAS, prevention is the best cure.²⁴⁴ In this respect, a better understanding of how to identify IAS as well as the pathways and vectors for their entry can lead to better preventative regulation and a corresponding increased protection of biodiversity.

This chapter has identified a range of challenges posed by IAS. From this discussion, a number of elements crucial for the effective regulation of IAS can be distilled. First, a three-stage hierarchical approach towards IAS regulation is needed. Such an approach would emphasise prevention of introduction, followed by eradication and control.²⁴⁵ Second, it is clear that only those alien species that are an actual or potential threat to biodiversity need to be regulated.²⁴⁶ States, therefore, need to implement measures that evaluate species and pathways of entry for their capabilities to introduce IAS. Third, effective regulation of IAS requires a strong legal and institutional framework for the measures adopted, and this framework must be supported by adequate resources.²⁴⁷ In constructing that framework, states need to have regard to their international legal obligations, particularly those rules relating to the protection of biodiversity. These rules are discussed in Chapter 2.

²⁴³ Tim Low, above n 9, xviii (introduction).

²⁴⁴ CBD Guiding Principles, principle 2.

²⁴⁵ Ibid. Guiding Principle 2 states that prevention is the preferred management followed by eradication. Where eradication is not feasible, states should consider implementing long-term control measures.

²⁴⁶ CBD, Article 8(h); CBD Guiding Principles.

²⁴⁷ CBD Guiding Principles, Introduction.

CHAPTER 2

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CHAPTER 2

INVASIVE ALIEN SPECIES AND INTERNATIONAL ENVIRONMENTAL LAW

2.0 INTRODUCTION

The problems of invasive alien species (IAS) in the domestic arena are compounded by the fact that a single state, acting under its own initiative, will rarely be in a position to design and implement regulation that is sufficiently effective to prevent the entry of IAS across international borders.¹ The transboundary nature of IAS, in that they are living beings capable of generating large population numbers and spreading beyond the point of initial introduction,² means that a coordinated and international solution is needed to the problems these species create. The purposes of this Chapter are to determine what obligations international environmental law instruments impose on states with respect to IAS, and to gauge whether states are achieving effective regulation within the parameters set by international environmental law.

The Chapter commences with a discussion of states' obligations, found in treaties and customary international law, to protect biodiversity. The discussion represents the first stage towards determining more specific obligations and objectives with respect to the protection of biodiversity from IAS. These objectives and obligations are found in treaties and soft law instruments, such as guiding principles, guidelines, declarations and

¹ It is precisely for this reason that international agreements were negotiated to deal with epidemics of human disease and to stop the introduction of agricultural and farming pests, such as *phylloxera*. See discussion in section 3.2 of Chapter 3 of this study. In addition, in quarantine systems, collaboration may comprise off-shore inspection of species, goods and commodities to be shipped, thus 'pushing back the border'. See discussion in section 3.5.1 of Chapter 3 of this study.

² For example, the introduction of ruddy duck into the United Kingdom, discussed in section 1.3.2 of Chapter 1 of this study.

codes of conduct. While soft law instruments are non-binding they are still important as they often operate in conjunction with hard law, providing detail to framework provisions of hard law.

Overall, the instruments emphasize the importance of preventing the entry and establishment of IAS. Mechanisms to achieve these objectives include evaluating species and pathways for their potential to introduce IAS and the application of the precautionary principle and the ecosystem approach. An important point to keep in mind, however, is that the most detailed provisions with respect to IAS come from non-binding instruments; and it is questionable whether the preponderance of soft law instruments provides an appropriate foundation for states to establish their IAS regimes. The Chapter concludes with an examination of state practice in accordance with the regime constituted pursuant to the Convention on Biological Diversity (CBD)³ to determine whether states are complying with obligations, recommendations and guidelines to protect biodiversity from IAS.

The conclusion is reached that although the bulk of states have started constructing and implementing IAS regimes, these regimes do not necessarily embrace the protection of biodiversity. Consequently, current practice in accordance with international environmental law is found wanting.

2.1 INTERNATIONAL LAW AND THE OBLIGATION TO PROTECT BIODIVERSITY

2.1.1 What is Biodiversity?

³ *Convention on Biological Diversity* 1992, adopted 5 June 1992, [1993] ATS no 32 (entered into force 29 December 1993). The convention had 190 Parties as of November 2007. In addition the World Summit on Sustainable Development (WSSD), held in 2002, made a number of recommendations with respect to sustainable development and achievement of the objectives of Agenda 21. *Report of the World Summit on Sustainable Development* (26 August- 4 September 2002) UN Doc A/CONF.199/20 (2002),

Article 2 of the Convention on Biological Diversity (CBD)⁴ defines biological diversity or biodiversity as

the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.

In order to protect biodiversity, it is therefore necessary not only to protect individual species, but also to protect the variability amongst species, their genetic diversity, the interrelationship of species to each other and also the interrelationship of species to their ecosystems and to other ecosystems.

2.1.2 Rationale for Protection of Biodiversity

Legal rules for the protection of biodiversity are not new. They have long been adopted at national, regional and international levels. In the ancient world, for example, national laws recognized the importance of preservation of natural resources⁵ and the creation of nature reserves.⁶ Historically, the impetus for these laws centred on human related needs.⁷ However, while the use of nature and natural resources may have had its origins in domestic laws, the need for international regulation often stemmed from the transboundary nature of shared resources and the need for collaborative action to conserve and sustain the resource.⁸ In turn, the importance of

⁴ *Convention on Biological Diversity 1992*, adopted 5 June 1992, [1993] ATS no 32 (entered into force 29 December 1993). The convention had 190 Parties as of November 2007. In addition the World Summit on Sustainable Development (WSSD), held in 2002, made a number of recommendations with respect to sustainable development and achievement of the objectives of Agenda 21. *Report of the World Summit on Sustainable Development* (26 August- 4 September 2002) UN Doc A/CONF.199/20 (2002),

⁵ In 1900 BC, the state of Babylon promulgated laws with regard to conservation of forestry materials. Michael Bowman, 'The Nature, Development and Philosophical Foundations of the Biodiversity Concept in International Law' in Michael Bowman and Catherine Redgwell (eds), *International Law and the Conservation of Biological Diversity*, Kluwer Law International London (1996) 7.

⁶ The kingdom of Egypt created what may have been the world's first nature reserve in 1370 BC. Ibid.

⁷ Ibid, 19.

⁸ See, for example, Article XXVII of the Convention between Bale and France,

biodiversity evolved beyond its pragmatic value to humans as a resource,⁹ and extended to its intrinsic value as a component of the “natural world”.¹⁰

2.1.3 Historical Development of International Law and Biodiversity

Prior to 1972, a host of bilateral and multilateral treaties recognized the need to protect biodiversity.¹¹ However, in a global and holistic sense, the need to protect biodiversity was first articulated in the 1972 Stockholm Declaration of the United Nations Conference on the Human Environment (Stockholm Declaration).¹² This was followed by similar calls for protection found in instruments such as the UN General Assembly Resolution 37/7 on a World Charter for Nature 1982,¹³ the Rio Declaration on Environment and Development (Rio Declaration)¹⁴ and Agenda 21.¹⁵ The ideas advocated by these instruments were eventually drawn together in the 1992 Convention on Biological Diversity (CBD)¹⁶

Strasbourg/Porrentrui 1781, that created an offence for taking nests or eggs of quails, partridges or pheasants from forests, warrens and thickets. The convention was ratified by Strasbourg on 16th December 1781 and ratified by Porrentrui on 19th December 1781. 48 CTS 49.

⁹ UNEP estimates that 40% of the global economy is based on biodiversity, UNEP *Annual Report 2004* UNEP (2004), 68.

¹⁰ M Bowman, ‘The Nature, Development and Philosophical Foundations of the Biodiversity Concept in International Law’ above n 6, 12-28.

¹¹ See discussion P van Heijnsbergen *International Legal Protection of Wild Fauna and Flora* at 9-23 IOS Press Amsterdam, The Netherlands, 1997; S Johnston ‘Sustainability, Biodiversity and International Law’ in Michael Bowman and Catherine Redgwell (eds), *International Law and the Conservation of Biological Diversity*, Kluwer Law International London (1996) 51.

¹² 1972 Stockholm Declaration of the United Nations Conference on the Human Environment (Stockholm Declaration) preamble and principles 2-4. P Sands and P Galizzi, *Documents in International Environmental Law* Cambridge (2003) 3.

¹³ UN General Assembly Resolution 37/7 on a World Charter for Nature 1982, paragraphs 1 and 2 ‘General principles’ P Sands and P Galizzi, above n 12, 11.

¹⁴ Rio Declaration on Environment and Development (Rio Declaration), P Sands and P Galizzi, above n 12, 17.

¹⁵ Agenda 21 was adopted at the United Nations Conference on Environment and Development, Rio de Janeiro 3-14 June 1992. Printed in: *Agenda 21 and the UNCED Proceedings*, Nicholas A Robinson (ed) *International Protection of the Environment*, Oceania New York (1993) 3rd Series, Volume 4.

¹⁶ *Convention on Biological Diversity 1992*, adopted 5 June 1992, [1993] ATS no 32 (entered into force 29 December 1993). The convention had 190 Parties as of November 2007. In addition the World Summit on Sustainable Development (WSSD), held in 2002, made a number of recommendations with respect to sustainable development and

and the 2000 Cartagena Protocol on Biosafety to the Convention on Biological Diversity (Cartagena Protocol).¹⁷

2.1.4 Current International Law and the Protection of Biodiversity

International obligations to protect biodiversity derive from a number of sources including customary international law and treaty law. As these are binding areas of international law they are dealt with first. Customary international law provides general principles that include the duty to prevent, reduce and control environmental harm¹⁸ and the duty to cooperate to mitigate transboundary environmental risks.¹⁹ The foundations of the duty to prevent, reduce and control environmental harm were largely established by the 1941 *Trail Smelter* arbitration (*United States v Canada*);²⁰ and further developed in cases, such as, *Corfu Channel* (*United Kingdom v Albania*).²¹ The latter case, in particular, specifies that no state has the right to use or permit the use of its territory in such a manner as to cause serious injury to the territory of another state.²² The notion of environmental harm has expanded to encompass all types of environmental harm.²³

achievement of the objectives of Agenda 21. *Report of the World Summit on Sustainable Development* (26 August- 4 September 2002) UN Doc A/CONF.199/20 (2002),

¹⁷ 2000 *Cartagena Protocol on Biosafety to the Convention on Biological Diversity* (Cartagena Protocol), adopted January 2000, 39 ILM 1027 (entered into on 11 September 2003). The convention had 143 parties as of November 2007.

¹⁸ See *Trail Smelter* arbitration (*United States v Canada*) Initial Decision 16 April 1938 (1939) 33 *AJIL* 182; Final Decision 11 March 1941 (1941) 35 *AJIL* 684. See discussion Patricia Birnie and Alan E Boyle, *International Law and the Environment* Clarendon Press Oxford (1992) 89-102.

¹⁹ See *Affaire du Lac Lanoux* arbitration (*Spain v France*) 24 ILR 1957. See discussion Patricia Birnie and Alan E Boyle, above n 18, 102-109.

²⁰ *Trail Smelter* arbitration (*United States v Canada*) above n 18.

²¹ *Corfu Channel* (*United Kingdom v Albania*) Judgment, Merits [1949] *ICJ Reports* 4.

²² *Corfu Channel* at 22; Patricia Birnie and Alan E Boyle, above n 18, 89; see also Advisory Opinion on *The Legality of the Threat of Use of Nuclear Weapon* [1996] *ICJ Reports* 226 Paragraph 29: 'The existence of the general obligation of States to ensure that activities within their jurisdiction and control respect the environment of other States or of areas beyond national control is now part of the corpus of international law relating to the environment.'

²³ See Xue Hanquin, *Transboundary Damage in International Law* Cambridge University Press (2003) 3-10.

The duty also finds expression in Article 3 of the CBD that specifies:

States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.²⁴

Customary international law duties to prevent transboundary harm are therefore formulated in a more categorical sense within the CBD, specifically targeting the protection of biodiversity. Consequently, states need to consider the effect, or impact of their activities on the biodiversity of other states, or on areas beyond the limits of their national jurisdiction, whether or not they are parties to the CBD.

A similar comment may be made with respect to the customary international law obligation to cooperate with respect to environmental matters.²⁵ This duty is related to the duty to prevent environmental harm, but is different from it.²⁶ The concept of cooperation initially sprang from the need for collaboration with respect to the “use of shared resources”.²⁷ The principle was enunciated in the *Lac Lanoux* arbitration (*Spain v France*)²⁸ which specified that states must negotiate in good faith with respect to shared resources; and, although the actual consent of the other party may not be needed before one state undertakes an activity, prior notification is needed to allow time for deliberations between the states.

As with the duty to prevent environmental harm, the duty to cooperate also finds expression in the CBD:

Each Contracting Party shall, as far as possible and as appropriate, cooperate with other Contracting Parties, directly or, where appropriate, through competent international organizations, in respect of areas beyond

²⁴ See also the Stockholm Declaration, Principle 21 and the Rio Declaration, Principle 2.

²⁵ See discussion Patricia Birnie and Alan E Boyle, above n 18, 102-9.

²⁶ Ibid, 109.

²⁷ Ibid.

²⁸ *Affaire du Lac Lanoux* arbitration (*Spain v France*) 24 ILR 1957.

national jurisdiction and on other matters of mutual interest, for the conservation and sustainable use of biological diversity²⁹

In the CBD, the formulation of the duty to cooperate is directly linked to the protection of biodiversity. Consequently, where national activities may impact on biodiversity, especially in areas beyond national jurisdiction, states need to collaborate and cooperate to conserve biodiversity.

The CBD further calls for the protection of biodiversity by the application of mechanisms, such as *in-situ* and *ex-situ* conservation. *In-situ* conservation can be implemented by designating and maintaining protected areas³⁰ and by the rehabilitation and restoration of degraded ecosystems.³¹ Ex-situ conservation can be effected by the establishment of facilities for research on plants, animals and micro-organisms.³² These methods are to be supplemented by the identification and monitoring of components of and threats to biodiversity.³³ In addition, state activities that could have significant adverse effects on biodiversity should also be underpinned by environmental impact assessment.³⁴ Importantly, the CBD fosters the use of two overarching environmental concepts, the precautionary principle³⁵ and the ecosystem approach.³⁶

The precautionary principle predates the CBD by at least some twenty years. It is thought to have originated from the 1970's German precept of "Vorsorgeprinzip"³⁷ (or the principle of prior consideration). The preamble to the CBD refers to the 'precautionary principle' and specifies

²⁹ CBD, Article 5; see also Stockholm Declaration, Principle 24 and Rio Declaration, Principle 7.

³⁰ CBD, Articles 8(a)-8(e).

³¹ CBD, Article 8(f).

³² CBD, Article 9(b).

³³ CBD, Article 7.

³⁴ CBD, Article 14(1)(a).

³⁵ CBD, the preamble. See discussion in section 6.2.3 of Chapter 6 of this study.

³⁶ CBD, Articles 8(d), 8(f) and 8(h). The Ecosystem Approach was adopted by the Conference of the Parties to the CBD in decision V/6 set out in Report of the Fifth Meeting of the Conference of the Parties to the Convention on Biological Diversity UNEP/CBD/COP/5/23 (22 June 2000) 103. See discussion in section 6.2.4 of Chapter 6 of this study.

³⁷ Justice Paul Stein, 'Are Decision-makers too Cautious with the Precautionary Principle?' (2000) 17 *Environmental and Planning Law Journal* 3, 4.

that where there is a threat of “significant reduction or loss of biological diversity, lack of full certainty should not be used as a reason for postponing measures to avoid or minimize such a threat”. The principle, therefore, does not impose specific obligations on states to take measures, but facilitates the implementation of measures in the absence of scientific certainty.³⁸ There are, however, serious differences of opinion regarding the status and application of the precautionary principle.³⁹ While some commentators consider that the precautionary principle is now a principle of customary international law,⁴⁰ others do not agree, pointing to the fact that the meaning and scope of the precautionary principle is yet to be settled.⁴¹

The ecosystem approach had its origins in scientific literature of the 1930s that emphasized management approaches extending beyond protection of individual species. The literature stressed the importance of protecting the inter-relationship of species to each other⁴² and also to their physical environment.⁴³ As an environmental management tool, it is referred to in a number of international instruments, including the 1980 Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR),⁴⁴

³⁸ Rosie Cooney *The Precautionary Principle in Biodiversity Conservation and Natural Resource Management: An Issues Paper for Policy-Makers, Researchers and Practitioners* IUCN Gland, Switzerland and Cambridge UK (2004) 7-8.

³⁹ Principle 15 of the RIO Declaration, for example, adopts a ‘precautionary approach; while more recently, a new version of the precautionary principle the ‘Wingspread Statement’ has emerged. Although this statement is not binding, it is formulated in terms that impose obligations on states to act. See discussion.

⁴⁰ Theofanis Christoforou, ‘The Precautionary Principle in EC Law and Science,’ in Joel Tickner (ed), *Precaution, Environmental Science and Preventive Public Policy*, Island Press (2003) Chapter 16.

⁴¹ Patricia Birnie and Alan E Boyle, *International Law and the Environment* Clarendon Press Oxford (1992) 98; Owen McIntyre and Thomas Mosedale ‘The Precautionary Principle as a Norm of Customary International Law’ (1997) 9 *Journal of Environmental Law* 221, 223-235; generally Arie Trouwborst *Evolution and Status of the Precautionary Principle in International Law (International Environmental Law and Policy*, 62) Kluwer Law International (2002).

⁴² Owen McIntyre, ‘The Emergence of an “Ecosystem Approach” to the Protection of International Watercourses under International Law’ (2004) 13 *Review of European Community and International Environmental Law* 1, 1.

⁴³ Jutta Brunée and Stephen J Toope, ‘Environmental Security and Freshwater Resources: A Case for International Ecosystem Law’ (1994) 5 *Yearbook of International Environmental Law* 41, 54.

⁴⁴ 1980 *Convention on the Conservation of Antarctic Marine Living Resources* (CCAMLR) adopted 20 May 1980, [1982] ATS No 9 Article 1(3) (entered into force 7 April 1982). As at November 2007 the Convention had 27 parties.

and the 1991 Protocol on Environmental Protection to the Antarctic Treaty Area.⁴⁵

The FAO has described the ecosystem approach as a strategy “for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way”.⁴⁶ An ecosystem itself is defined in the CBD as a “dynamic complex of plant, animal and micro-organism communities and their non-living environment, interacting as a functional unit”.⁴⁷ Several sections of the CBD mark out protection of biodiversity in the context of ecosystem functioning.⁴⁸ As a regulatory process, the approach has been described and adopted in decision V/6 of the conference of the parties to the CBD.⁴⁹ The ecosystem approach consists of an integrated style of management, combining principles of conservation, sustainable use and economic management.⁵⁰

It should be kept in mind that although the protection of biodiversity encompasses obligations that stem from treaties such as the CBD, many of these obligations are manifestations of more general customary international law duties. Consequently, general obligations in the CBD, especially those that relate to transboundary aspects of harm to biodiversity, are binding on states as part of customary international law,

⁴⁵ 1991 *Protocol on Environmental Protection to the Antarctic Treaty*, (*Madrid Protocol*) adopted 4 October 1991, [1998] ATS 6, Article 2 (entered into force 14 January 1998). As at November 2007 the Protocol had 27 parties. *Antarctic Treaty*, adopted on 1 December 1959 [1961] ATS 12 (entered into force 23 June 1961). As at November 2007 the *Antarctic Treaty* had 46 members. Only 28 of these, as consultative members, have the right to vote. A general analysis of the Protocol is found in Catherine Redgwell ‘Protection of the Antarctic Environment and the Ecosystem Approach’ in Michael Bowman and Catherine Redgwell (eds), *International Law and the Conservation of Biological Diversity*, Kluwer Law International London (1996) 109-128.

⁴⁶ FAO, FAO Fisheries Department Glossary taken from J Alcamo, N Rashid and E Hassan (ed) *Ecosystem and Human Well-being: A framework for Assessment*. Millennium Ecosystem Assessment (2003). <<http://www.fao.org/fi/glossary/default.asp>>(March 2007). For a discussion on the origins of the ecosystem approach, see Owen McIntyre ‘The Emergence of an ‘Ecosystem Approach’ to the Protection of International Watercourses under International Law’ above n 42.

⁴⁷ CBD, Article 2.

⁴⁸ CBD, Articles 8(d), 8(f) and 8(h).

⁴⁹ Convention on Biological Diversity ‘Decisions Adopted by the Conference of the Parties to the Convention on Biological Diversity at its Fifth Meeting’ Decision V/6 UNEP/CBD/COP/5/23 (22 June 2000).

⁵⁰ Ecosystem Approach Paragraph A (1). – Description of the Ecosystem Approach.

whether or not states are parties to the CBD.⁵¹ Perhaps somewhat less clear is the scope and nature of obligations on states with respect to specific obligations, such as the protection of biodiversity from the impacts of invasive alien species.

2.2 INTERNATIONAL LAW AND THE PROTECTION OF BIODIVERSITY FROM INVASIVE ALIEN SPECIES

2.2.1 Customary International Law and Invasive Alien Species

As noted above, international law has long recognised the need to protect biodiversity. Moreover, IAS have been recognised as a significant threat to the protection of biodiversity.⁵² In as far as biodiversity is part of the environment the principles applicable to the protection of the environment also apply to the protection of biodiversity. To that extent, the regulation of IAS can, therefore, be considered a part of customary international environmental law.

The duty to prevent transboundary harm, for example, could potentially be breached where one state allows IAS to be exported from its jurisdiction to the territory of another state,⁵³ or where states share ecosystems and IAS are introduced by one state that spread across the ecosystem into the territory of an adjacent state; or, even where a species has been introduced by one state into its own territory where it is not invasive, yet from there has spread into the territory of other states where the species becomes invasive.⁵⁴ The duty to cooperate could be breached where states do not

⁵¹ For example, the United States of America is not a party to the CBD. Nevertheless, as many of the principles found in the CBD derive from customary international law, the United States would be bound by them. However, for a contrary approach in the context of a dispute arising out of the Cartagena Protocol and brought within the World Trade Organization, see discussion later in section 7.1.6 of Chapter 7 of this study.

⁵² See discussion in section 1.1.2 of Chapter 1 of this study.

⁵³ For example, there is a free flow of trade between Canada and the United States. This had led to fruit fly being introduced into the United States from Canada. In Canada, fruit fly is not considered a problem because it does not establish, but the species is a problem in the United States. Anne Perrault, Morgan Bennett, Stas Burgiel, Aimee Delach and William Carroll Muffett, 'Invasive Species, Agriculture and Trade: Case Studies from the NAFTA Context'. (Paper presented at the Second North American Symposium on Assessing the Environmental Effects of Trade, Mexico City, March 25-26, 2003) 8, 37.

⁵⁴ See discussion in section 1.3.2 of Chapter 1 of this study on the Ruddy Duck.

collaborate and cooperate in circumstances where one state introduces species into its territory or undertakes activities within its territory that could facilitate the introduction and spread of IAS into neighbouring states. In particular, where neighbouring states have implemented measures to prevent and control the introduction of IAS, their regulatory regimes will be compromised by the failure of others to cooperate.⁵⁵

2.2.2 Historical Development of the Regulation of IAS to Protect Biodiversity

In similarity with international instruments to protect biodiversity, initially the usefulness of nature and species to humans provided the foundation in international law for regulation of what would now be known as invasive alien species. One of the earliest of these treaties was the 1900 Convention Designed to Ensure the Conservation of Various Species of Wild Animals in Africa, which are Useful to Man or Inoffensive.⁵⁶ Article 12 of the convention required the parties to prevent contagious diseases of domestic animals being transmitted to wild animals.⁵⁷ The Convention failed to enter into force⁵⁸ and the notion of protecting species from the impacts of IAS was not embraced again for several decades⁵⁹ until it appeared once again in two instruments relating to Africa: the 1933 Convention Relative to the Preservation of Fauna and Flora in their Natural State⁶⁰ and its successor, the African Convention on the Conservation of Nature and

⁵⁵ See discussion in section 1.1.2 of Chapter 1 of this study.

⁵⁶ 1900 *Convention Designed to Ensure the Conservation of Various Species of Wild Animals in Africa, which are Useful to Man or Inoffensive*, adopted 19 May 1900, Volume IV *International Protection of the Environment*, B Rüster and B Simma (eds), Oceana New York (1975) 1605. The convention never entered into force) as it was not ratified by all the parties as required by Article VIII.

⁵⁷ 1900 *Convention Designed to Ensure the Conservation of Various Species of Wild Animals in Africa, which are Useful to Man or Inoffensive*, Article 12.

⁵⁸ The convention was not ratified by all the parties as required by Article VIII.

⁵⁹ International quarantine treaties did, of course, regulate the spread of diseases and pests relevant to farming and agriculture. Therefore, to the extent that these types of diseases and pests impacted upon other species international quarantine regulation could protect other species. However the main purpose of international quarantine treaties was to protect farm and agricultural interests and to facilitate trade in these commodities. This is discussed further in section 3.2.2 of Chapter 3 of this study.

⁶⁰ 1933 *Convention Relative to the Preservation of Fauna and Flora in their Natural State*, adopted 8 November 1933, 172 UNTS 241 (entered into force on 14 January 1936). As at November 2007 the Convention had 10 parties

Natural Resources 1968.⁶¹ These conventions were both designed to protect nature in Africa by setting up strict nature reserves, where “the introduction of any species of fauna and flora, whether indigenous ... or domesticated, shall be strictly forbidden”.⁶² By the 1960s, a trend towards including IAS provisions in treaties and other international instruments had emerged. This trend could be seen as providing a foundation for one aspect of what is now described as sustainable development.

2.2.3 Sustainable Use of Biodiversity and IAS

Sustainable use of biodiversity is an element of the larger web of sustainable development, which itself may be defined as, “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”.⁶³ In the context of the protection of biodiversity, the CBD defines sustainable use of biodiversity as a use that “does not lead to the long-term decline of biological diversity thereby maintaining its potential to meet the needs and aspirations of present and future generations”.⁶⁴ The concept of “sustainability” therefore connotes a present use that takes into account future needs. Moreover, to the extent that introduction of IAS can reduce biodiversity, such introductions potentially infringe upon the ideals of sustainable development.

The concept of sustainable development can be traced to the 1950s,⁶⁵ although with respect to the protection of biodiversity the premier international instrument is the 1992 CBD. By way of background it should be kept in mind that the connection between ‘sustainable development’ and IAS started gaining momentum in the 1970s with recognition that the

⁶¹ 1968 *African Convention on Nature and Natural Resources*, adopted 15 September 1968 1001 UNTS 3 (entered into force on 16 June 1969). As at November 2007 the Convention had 27 parties).

⁶² 1933 Convention Relative to the Preservation of Fauna and Flora in their Natural State Article 2; 1968 African Convention on Nature and Natural Resources Article 3.4(a).

⁶³ Gro Brundtland, *Report of the World Commission on Environment and Development: Our Common Future*, transmitted to the General Assembly as an Annex to UN Doc A/42/427 Part 2.1 (1987).

⁶⁴ CBD, Article 2.

⁶⁵ See generally Charles Kidd ‘The Evolution of Sustainability’ (1992) 5 *Journal of Agricultural and Environmental Ethics* 1.

introduction of alien species would often be relevant to development practices, such as, the use of alien species in agriculture and farming. Consequently, during the 1970s a number of regional conferences⁶⁶ were held under the aegis of the IUCN,⁶⁷ UNEP⁶⁸ and FAO.⁶⁹ These conferences evinced awareness of the problems that alien species pose to the conservation of biodiversity and also recognised that regulation of IAS needed to be included as part of development practices. The overall importance of the outcomes of these conferences was that they emphasised regulation of species as potential IAS, even if the species provided economic benefits, such as occurs in farming and aquaculture.⁷⁰ Moreover, the conferences underscored the need to evaluate species for

⁶⁶ The guidelines include the 1974 Ecological Guidelines for Development in the Tropical Forest Areas of South East Asia, adopted by a regional meeting convened by IUCN in Collaboration with the Government of India, Bandung, Indonesia (1981) (XXIII) *International Protection of the Environment* Ed B Rüster, B Simma and M Bock Oceana New York, (1981) 106; 1974 IUCN Ecological Guidelines for the Development in the American Humid Tropics, adopted by an international meeting, Sponsored by IUCN and UNEP, Caracas, Venezuela (1981) (XXIII) *International Protection of the Environment* Ed B Rüster, B Simma and M Bock Oceana New York, (1981) 86; 1974 IUCN Ecological Guidelines for the use of Natural Resources in the Middle East and South West Asia (1981) (XXIII) *International Protection of the Environment* Ed B Rüster, B Simma and M Bock Oceana New York, (1981) 116. For discussion of these guidelines, see generally Duncan Poore, 'Ecological Guidelines' (1975) 27 *Unasylva No 110 An International Journal of forestry and forestry studies* FAO Available <http://www.fao.org/documents/show_cdr.asp?url_file=/docrep/f9645e/f9645e03.htm> (March 2006) The catalyst for the conferences was a book published in 1973, called 'Ecological Principles for Economic Development.' R F Dasmann, J P Milton and P H Freeman *Ecological Principles for Economic Development* Published in London: John Wiley, 1973. The book was published under the auspices of the IUCN and the Conservation Foundation and it led to a series of ecological conferences held throughout the 1970s that were designed to bring together scientists, land users and decision-makers to provide a more comprehensive set of criteria that could be used whenever development was planned. The Conservation Foundation was founded in the United States of America in the late 1940s by Fairfield Osborn and it later merged with World Wildlife Fund-U.S.

⁶⁷ See footnote 10 in the Introduction to this study.

⁶⁸ UNEP is the United Nations Environment Programme. It was established in 1972 and provides a forum for environmental issues within the United Nations. See short discussion Elli Louka, *International Environmental Law Fairness Effectiveness and World Order* Cambridge University Press (2006) 12,14.

⁶⁹ FAO is the Food and Agriculture Organization of the United Nations. It was established in 1945. For a discussion on the origins of the FAO from the Australian standpoint, see John O'Brien, 'F.L. McDougall and the Origins of the FAO' (2000) 46 *Australian Journal of Politics and History* 164.

⁷⁰ 1974 IUCN Ecological Guidelines for the Development in the Tropical Forest Areas of South East Asia 1974, paragraphs 46 and 45; Ecological Guidelines for the Development in the American Humid Tropics 1974, paragraph 7; Ecological Guidelines for the use of Natural Resources in the Middle East and South West Asia Guideline 33.

their invasive potential prior to entry.⁷¹ While the outcomes of these conferences were non-binding guidelines, the principles and practices needed for regulating IAS in the international context were beginning to take shape. These included the need to regulate IAS as part of development practices and the desirability of evaluating alien species for their invasive potential prior to entry.

These principles were subsequently adopted in a range of outputs at the United Nations Conference on Environment and Development (UNCED) 1992.⁷² Agenda 21,⁷³ for example, specifically notes that inappropriate animal and plant introductions have contributed to biodiversity loss and that, consequently, states need to prevent introduction of alien species that threaten biodiversity.⁷⁴ The Rio Declaration, similarly, also underscores the need for states to implement sustainable development practices.⁷⁵

Subsequent to UNCED, the Santiago Declaration 1995⁷⁶ echoed similar concerns in the context of the forestry industry, stressing that the goal of attaining sustainable management should include the regulation of exotic species.⁷⁷ Comparable provisions are also found in The South Pacific Regional Environment Program – (SPREP) Regional Invasive Species

⁷¹ Ecological Guidelines for the use of Natural Resources in the Middle East and South West Asia, Guideline 33.

⁷² United Nations Conference on Environment and Development (UNCED) was held in Rio de Janeiro in June 1992 and it led to the adoption of environmental instruments, such as, the Rio Declaration, Agenda 21 and the CBD. See discussion Elli Louka, above n 68, 32-5.

⁷³ For a short discussion on Agenda 21 and IAS, see Lyle Glowka and Cyril de Klemm, 'International Instrument, Processes and Non-indigenous Species Introductions – Is a Protocol Necessary?' [1996] *Environmental Policy and Law* 247, 247.

⁷⁴ Agenda 21 - examples include - Paragraph 11.13(g) that refers to the need for states to protect forests from the introduction of exotic plant and animal species, paragraph 17.83, that refers to the need for coastal states to apply safeguards with respect to introductions of new species and paragraph 8.40(E)(iv), that calls upon coastal states to control noxious aquatic species.

⁷⁵ Rio Declaration, for example, Principles 1, 3 and 27 that specifically address sustainable development.

⁷⁶ 1995 The Santiago Declaration deals with the conservation and sustainable management of temperate and boreal forests. *International Protection Of The Environment: Conservation in Sustainable Development*, Wolfgang Burhenne and Nicholas Robinson (eds), (2) 02-02-95/1. The Santiago Declaration has been adopted by Australia, Canada, Chile, China, Japan, Mexico, New Zealand, the Republic of Korea, the Russian Federation and the United States of America.

⁷⁷ 1995 The Santiago Declaration, paragraph 3.3.

Strategy for the Pacific Islands Region⁷⁸ and the Programme of Action for the Sustainable Development of Small Island Developing States.⁷⁹ The latter instrument, in particular, identifies two matters regarding IAS that need to be addressed. First, that policies for dealing with IAS should be incorporated in national biodiversity strategies;⁸⁰ and second, that quarantine measures need to be tightened.⁸¹

A number of codes of conduct operating in the fisheries sector also provide important environmental safeguards with respect to fisheries practices and IAS. The FAO Code of Conduct for Responsible Fisheries 1995⁸² (the FAO Code of Conduct) and the ICES Code of Practice on the Introductions and Transfers of Marine Organisms 2004 (ICES Code)⁸³ both include provisions detailing pre-release and pre-introduction procedures. These provisions are designed to minimize the possibility and extent of IAS causing harm. For example, the FAO Code of Conduct requires the parties

⁷⁸ The South Pacific Regional Environment Program is a regional organization established in 1982 and is designed to promote sustainable development in the Pacific Region. See fact sheet SPREP *What is SPREP?* Available <<http://www.sidsnet.org/pacific/sprep/whatsprep.htm>> (March 2006) ; see also web site for SPREP <<http://www.sprep.org.ws/>> (March 2006). The text of the Regional Invasive Species Strategy for the Pacific Islands Region was drafted at a regional conference and is available from Greg Sherley, Susan Timmins and Sarah Lowe, 'Draft Invasive Species Strategy for the Pacific Islands Region' in Greg Sherley (ed) *Invasive species in the Pacific: A Technical Review and Draft Regional Strategy*. SPREP Samoa (2000) 1.

⁷⁹ United Nations General Assembly *Programme of Action for the Sustainable Development of Small Island Developing States* A/CONF.167/9 (October 1994). Also known as the Barbados Programme of Action and available from <<http://www.sidsnet.org/docshare/other/BPOA.pdf>> (January 2005) . For a general discussion of soft law and Small Island Developing States, see I Fry 'Small Island Developing States: Becalmed in a Sea of Soft Law' (2005) 14 (2) *Review of European Community and International Environmental Law* 89.

⁸⁰ Barbados Programme of Action paragraph 45A(i).

⁸¹ Measures need to be tightened at the national level (Barbados Programme of Action paragraph 55A(iii)) based on regional and international co-operation (Barbados Programme of Action paragraph 55 (C)(ii) and generally 55A-C).

⁸² The code was adopted at the 28th session of the Food and Agriculture Organization (FAO) 31 October 1995 and is supported by 9 Technical Guidelines and 4 Plans of Action. Published by the FAO, Rome, 1995. Available <<http://www.fao.org/DOCREP/005/v9878e/v9878e00.htm>> (March 2006) . See discussion in P Mace and Gabriel *Evolution, Scope and Current Applications of the Precautionary Approach in Fisheries* in Proceedings 5th NMFS NSAW Tech. Mem. NMFS-F/SPO-40 (1999) 65.

⁸³ ICES is the International Council for the Exploration of the Sea. It promotes and coordinates marine research in the North Atlantic Ocean. The Code applies to intentionally introduced species, including genetically modified ones that are used for trade and commercial practice. Available at <<http://www.ices.dk/reports/general/2004/ICESCOP2004.pdf>> (April 2006).

to lessen harmful effects of introducing non-native or genetically altered stocks, both into their own waters, as well as waters under the jurisdiction of other states,⁸⁴ while the ICES Code contains detailed Appendices with respect to risk assessment,⁸⁵ quarantine⁸⁶ and monitoring.⁸⁷

These instruments are important because they provide specific references to IAS and biodiversity. Consequently, while these instruments are not binding, taken as a whole these declarations, guidelines and codes show a range of principles that include recognition of: the need to evaluate species prior to an introduction; the significance of transboundary effects of IAS; the role in that regard of border controls in quarantine regulation; and, finally, the importance of subsequent surveillance and monitoring activities.⁸⁸ These principles have been adopted or are reflected in the treaties.

2.2.4 IAS in Regional, Species-Specific and Global Treaties

Obligations with respect to IAS are found in a range of treaties. Regional treaties applying to Europe,⁸⁹ Asia,⁹⁰ East Africa⁹¹ and Central America⁹²

⁸⁴ FAO Code of Conduct, Article 9.3.1.

⁸⁵ ICES Code, Appendix B.

⁸⁶ ICES Code, Appendix C.

⁸⁷ ICES Code, Appendix D.

⁸⁸ See also the European Strategy on Invasive Alien Species that was developed pursuant to the 1979 *Convention on the Conservation of European Wildlife and Natural Habitats* 1979 (Berne Convention) adopted 19 September 1979 (1982) UKTS 56 (entered into force 1 June 1982). As at November 2007 the Berne Convention has 46 parties. The European Strategy on Invasive Alien Species is available at http://www.ecolex.org/en/treaties/treaties_fulltext.php?docnr=2333&language=en The strategy points out that there is a need to establish mechanisms to control and eradicate all exotic species which threaten ecosystems inhabited by wild species and contains particularly detailed provisions on monitoring in paragraphs 2.2 and 6.1, and sharing of information in paragraph 2.3. For the importance of monitoring see Clare Shine, Nattley Williams and Lothar Gundling, *A Guide to Designing Legal and Institutional Frameworks on Alien Invasive Species* IUCN Gland Switzerland Cambridge and Bonn (2000) paragraph 5.4; CBD Note By The Executive Secretary, 'Invasive Alien Species, a Review of the Efficiency and Efficacy of Existing Legal Instruments Applicable to Invasive Alien Species' UNEP/CBD/SBSTTA/6/INF/5 (26 February 2001) paragraphs 73-76.

⁸⁹ 1994 *Protocol for the implementation of the Alpine Convention in the Field of Nature Protection and Landscape Conservation* Chambery (Chambery Protocol), adopted 20 December 1994, available <http://www.ecolex.org/en/treaties/treaties_fulltext.php?docnr=3134&language=en&fulltextlanguage=fr> (November 2007) (entered into force 18 December 2002). As at November 2007 the protocol had 9 parties.

⁹⁰ 1985 *Asean Agreement on the Conservation of Nature and Natural Resources* (Asean Agreement), adopted 9 June 1985, *International Protection Of The Environment*:

focus on the introduction phase of alien species and present a range of obligations, varying from a careful consideration of the consequences of introductions,⁹³ to more rigorous calls requiring prohibitions, or strict control.⁹⁴ Other matters, such as monitoring, eradication and control, are also addressed in some instruments.⁹⁵

Antarctica has been the subject of exceptionally detailed measures relating to IAS. As early as 1964 the Agreed Measures for the Conservation of Antarctic Fauna and Flora⁹⁶ prohibited the introduction of non-indigenous animals or plants into the Antarctic Treaty Area, except in accordance with a permit.⁹⁷ The 1991 Protocol on Environmental Protection to the Antarctic Treaty (the Madrid Protocol), which entered into force in 1998 and largely supplants the Agreed Measures, identifies Antarctica as a

Conservation in Sustainable Development, Wolfgang Burhenne and Nicholas Robinson (eds), (2) 1/A/9-7-85 (not yet in force – by virtue of Article 33 6 instruments of ratification are needed before the Agreement comes into force and as at November 2007 there have been 5 instruments of ratification deposited. For a general critique of environmental law in the Asia Pacific Region, see B Preston ‘The Role of Law in the Protection of Biological Diversity in the Asia-Pacific Region’ (1995) *Environmental and Planning Law Journal* 264; B Boer (ed) *Environmental Law in the South Pacific* South Pacific Regional Environment Programme IUCN Environmental Law Centre IUCN 1996, see also Koh Khen Lian and Nicholas A Robinson ‘Regional Environmental Governance: Examining the Association of Southeast Asian Nations (ASEAN) Model’ in Daniel Esty and Marla Ivanova (eds), *Global Environmental Governance, Options and Opportunities* Yale School of Forestry and Environmental Studies (2002) 101.

⁹¹ 1985 *Protocol Concerning Protected Areas and Wild Life Fauna and Flora in the Eastern African Region (East African Protocol)*, adopted 21 June 1985, *International Protection Of The Environment: Conservation in Sustainable Development*, Wolfgang Burhenne and Nicholas Robinson (eds) (2) 11/A/21-06-85-b, 109 (entered into force 30 May 1996). As at November 2007 the Protocol had 6 parties.

⁹² 1992 *Convention for the Conservation of the Biodiversity and the Protection of Wilderness areas in Central America* adopted 5 June 1992, text available via Ecollex http://www.ecollex.org/en/treaties/treaties_fulltext.php?docnr=3084&language=en, (has not yet entered into force).

⁹³ 1976 *Convention on Conservation of Nature in the South Pacific*, Article V(4) that provides ‘ Each contracting party shall carefully consider the consequences of the deliberate introduction into ecosystems of species which have not previously occurred therein’.

⁹⁴ 1979 *Convention on the Conservation of European Wildlife and Natural Habitats*, Article 11(2)(b); *Chambery Protocol*, Article 17; 1985 *Protocol Concerning Protected Areas and Wild Life Fauna and Flora in the Eastern African Region*, Article 10.

⁹⁵ *Convention for the Conservation of the Biodiversity and the Protection of Wilderness areas in Central America* 1992, Article 24.

⁹⁶ 1964 *Agreed Measures for the Conservation of Antarctic Fauna and Flora (Agreed Measures)* reprinted in W M Bush (ed) *Handbook of the Antarctic Treaty System* (1992) in *Antarctica and International Law* Volume 1 Oceana Publications (1992).

⁹⁷ *Ibid*, *Agreed Measures*, Article IX.

“natural reserve, devoted to peace and science”⁹⁸ and sets out a number of environmental principles designed to achieve these objectives.⁹⁹ These principles include prior assessment of activities for their environmental impacts¹⁰⁰ and monitoring key environmental parameters and ecosystem components.¹⁰¹ The Madrid Protocol is supplemented by a number of Annexes that specify more detailed procedures with respect to environmental impact assessment¹⁰² and conservation of Antarctic Fauna and Flora,¹⁰³ including comprehensive stipulations with respect to non-native species.¹⁰⁴

Provisions relating to the protection of the aquatic environment from IAS are found in treaties dealing with both freshwater and marine environments.¹⁰⁵ In the freshwater context, the 1955 United States – Canada Convention on the Great Lakes Fisheries¹⁰⁶ established the joint Great Lakes Fishery Commission charged with formulating and implementing a comprehensive program to eradicate or minimize the occurrence of sea lamprey in the Great Lakes. The Lake Victoria Fisheries Organization¹⁰⁷ was similarly established to consider and advise on effects

⁹⁸ *Madrid Protocol*, Article 2.

⁹⁹ *Madrid Protocol*, Article 3.

¹⁰⁰ *Madrid Protocol*, Article 3(2).

¹⁰¹ *Madrid Protocol*, Article 3(2)(C)(v).

¹⁰² *Madrid Protocol*, Annex I.

¹⁰³ *Madrid Protocol*, Annex II.

¹⁰⁴ *Madrid Protocol*, Annex II Article 4, which led to the removal of all dogs from the Antarctic region by 1 April 1994.

¹⁰⁵ See for example Article 22 of the *1997 Convention on the Law of Non-Navigable Uses of International Watercourses* that calls upon contracting parties to take all necessary measures to prevent the introduction of alien species that may be detrimental to the ecosystem of other states. The Convention was adopted 21 May 1997, 36 *ILM* 700, but has not yet entered into force; see discussion of the convention in Owen McIntyre above n 42 at 6-13. For a short discussion see Clare Shine, Nattley Williams and Lothar Gundling, above n 88, paragraph 2.2.2.1.

¹⁰⁶ *1955 Convention on the Great Lakes Fisheries Between the United States and Canada*, signed 10 September 10 1954, 6 UST 2836 (entered into force 11 October 1955).

¹⁰⁷ The *1994 Convention for the Establishment of the Lake Victoria Fisheries Organization*, was adopted 30 June 1994, 36 *ILM* 667 (entered into force 24 May 1996). As at November 2007 the convention had 3 parties. For a discussion of some of the problems in the Lake Victoria region see C Brown ‘Tilapia and the Environment’ (1995) Volume 4 no 2 *Trade and Environment Database Case Studies* case no 208 Available <<http://www.american.edu/TED/tilapia.htm>> (November 2007) At page 5 the report documents the detrimental impacts of introduced Nile perch in Lake Victoria that have reduced the number of algae-eating fish, allowing algae to bloom unchecked and contributing to the ‘choking’ of the lake. For a discussion of the work off the Lake Victoria Fisheries Organization see E Grossman ‘Nile Perch and Lake Victoria

of introduced species and to adopt measures regarding the introduction, monitoring, control or elimination of any such animals or plants.¹⁰⁸ It is noteworthy that in both these cases, a co-ordinating body was expressly established to oversee the administration of measures. Such an arrangement tacitly recognizes that co-operation and harmonization of activities is essential in the campaign against IAS.

With respect to the marine environment regional seas agreements dealing with the Mediterranean Region, the South-East Pacific Region and the Wider Caribbean Region incorporate an IAS provision. Article 6(d) of the Protocol Concerning Mediterranean Specially Protected Areas and Biological Diversity in the Mediterranean (1995)¹⁰⁹ to the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean,¹¹⁰ provides that the parties should regulate “the introduction of any species not indigenous to the specially protected area in question”. Article VII of the Protocol for the Conservation and Management of Protected Marine and Coastal Areas of the South-East Pacific (1989)¹¹¹ to the Convention for the Protection of the Marine

Infestation Problem’ (1995) 4 (2) *Trade and Environment Database Case Studies* No 206 online journal, available at <<http://www.american.edu/TED/perch.htm>> (November 2007).

¹⁰⁸ 1994 *Convention for the Establishment of the Lake Victoria Fisheries Organization*, Article 11.3 (f).

¹⁰⁹ 1995 *Protocol Concerning Mediterranean Specially Protected Areas and Biological Diversity in the Mediterranean to the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean*, adopted 10 June 1995, (1999) *Official Journal of the European Community* L 322/3, Article 6(d) (entered into force 12 December 1999). As at November 2007 the protocol had 18 parties. The 1995 Protocol replaced the 1982 *Protocol Concerning Mediterranean Protected Areas* (1982) to the *Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean*; adopted 3 April 1982, (1982) *Official Journal of the European Community* 278/5, Article 7 (entered into force on 23 March 1986). As at November 2007 the Protocol had 22 parties.

¹¹⁰ 1976 *Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean* adopted 16 February 1976, P Sands and P Galizzi, above n 12, 378, (entered into force 12 February 1978). The text was revised in 1995 as the *Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean* and entered into force on 9 July 2004. As at November 2007 the 1995 Convention had 22 parties.

¹¹¹ *Protocol for the Conservation and Management of Protected Marine and Coastal Areas of the South-East Pacific* (1989) to the *Convention for the Protection of the Marine Environment and Coastal Area of the South-East Pacific*, adopted 21 September 1989, text available www.ecolex.org, Article VII (entered into force 17 October 1994). As at November 2007 the Protocol had 5 parties.

Environment and Coastal Area of the South-East Pacific,¹¹² provides that the parties are to take measures either individually or jointly to prevent, reduce and control environmental deterioration of marine areas of the South-East Pacific, including regulating the introduction of exotic species of flora and fauna.¹¹³ Article 5(2)(f) of the Protocol Concerning Specially Protected Areas and Wildlife (1990)¹¹⁴ to the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region,¹¹⁵ provides that the parties should, in conformity with their national laws and with international law, take measures as appropriate to regulate or prohibit the “introduction of non-indigenous species”.¹¹⁶

The 1980 Convention on the Conservation of Antarctic Marine Living Resources (CCAMLR) also imposes an obligation on parties to minimize “changes” to the marine ecosystem that are not potentially reversible over two or three decades. One potential change that is specifically mentioned is the introduction of alien species.¹¹⁷ However, given the difficulties with lack of information of IAS and the possibly lengthy time between a species’ introduction and manifestation of its invasive qualities,¹¹⁸

¹¹² *Convention for the Protection of the Marine Environment and Coastal Area of the South-East Pacific* adopted 12 November 1981, IELMT 981:85 (entered into force on 19 May 1986). As at November 2007 the Convention had 5 parties.

¹¹³ *Protocol for the Conservation and Management of Protected Marine and Coastal Areas of the South-East Pacific (1989) to the Convention for the Protection of the Marine Environment and Coastal Area of the South-East Pacific*, Article VII(2)(c).

¹¹⁴ *Protocol Concerning Specially Protected Areas and Wildlife (1990) to the Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region*, adopted 18 January 1990, Ecollex <http://www.ecolex.org/en/treaties/treaties_fulltext.php?docnr=2959&language=en> (November 2007) Article 5.2(f) (entered into force 18 June 2000). As at November 2007 the Protocol had 17 parties. See Charlotte de Fontaubert and Tundi Agardy, ‘Critical Analysis of the SPAW Protocol: The Dilemma of Regional Cooperation’ (1998-1999) 30 *Miami Inter-American Law Review* 85; Alessandra Vanzella-Khoury, ‘Implementation of the Protocol Concerning Specially Protected Areas and Wildlife (SPAW) in the Wider Caribbean Region’ (1998-1999) 30 *Miami Inter-American Law Review* 53.

¹¹⁵ *Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region*, adopted 24 March 1983 (1983) 22 ILM 221 (entered into force 11 October 1986). As at November 2007, the Convention had 28 parties.

¹¹⁶ For a short discussion on the other instruments see Clare Shine, Nattley Williams and Lothar Gundling, above n 88, paragraph 2.2.2.1.

¹¹⁷ CCAMLR, Article II 3 (c).

¹¹⁸ See discussion in section 1.3.3 of Chapter 1 of this study.

predicting whether a change can be reversible within two to three decades might be difficult.

In addition, a number of species-specific treaties, particularly those dealing with migratory species, contain provisions relating to IAS. Article III(4)(c) of the Convention for the Conservation of Migratory Species of Wild Animals (the Bonn Convention)¹¹⁹ provides that, to the extent feasible and appropriate, the parties should control strictly the introduction of exotic species and eliminate or control already introduced exotic species that are endangering or are likely further to endanger the species listed as protected in Appendix 1 of the Convention.¹²⁰ Two agreements negotiated under the auspices of the Bonn convention, the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA)¹²¹ and the Agreement on the Conservation of Albatrosses and Petrels¹²² contain provisions relating to the eradication and control of IAS. Article III(1)(g) of the AEWA prohibits “the deliberate introduction of non-native waterbirds species into the environment” and obliges the parties to take all appropriate measures to prevent the unintentional release of such species, if this introduction or release would prejudice the conservation status of wild flora and fauna. The action plan annexed to the Agreement on the Conservation of Albatrosses and Petrels obliges the parties to take all feasible action to prevent the deliberate or other introduction of non-native

¹¹⁹ 1979 *Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention)*, adopted on 23 June 1979 [1991] ATS 32, Articles II, III(4) and V(4) (entered into force 1 November 1983). As at November 2007 the Convention had 107 parties. For a general discussion on the Bonn Convention see Richard Caddell ‘International Law and the Protection of Migratory Wildlife: An Appraisal of Twenty-Five Years of the Bonn Convention’ (2005) 16 *Colorado Journal of International Environmental Law and Policy* 113; Simon Lyster ‘The Convention on the Conservation of Migratory Species of Wild Animals (The ‘Bonn Convention’)’ (1989) 29 *Natural Resources Journal* 979.

¹²⁰ Bonn Convention Article III(4)(c).

¹²¹ *Agreement on the Conservation of African-Eurasian Migratory Waterbirds* adopted on 16 June 1995 M Austen and T Richards (eds) *Basic Legal Documents on International Animal Welfare and Wildlife Conservation*. Kluwer (2000) 617, Article III(1)(g), (entered into force 1 November 1999). As at November 2007 the Agreement had 61 parties. For discussion generally on the AEWA see Richard Caddell, above n 119, 132-4.

¹²² *Agreement on the Conservation of Albatrosses and Petrels*, adopted on 19 June 2001, [2004] ATS 5, Article III (1)(b) and Annex 2 (Action Plan) Article 1.4 (entered into force 1 February 2004). As at November 2007 it had 11 parties.

species that may be detrimental to albatrosses and petrels and to control and eradicate any non-native species already introduced.¹²³

Provisions calling for the control of importation of plants and animals that may be hazardous to nominated migratory birds and the introduction of animals and plants that could disturb the ecological balance of those same birds are also found in a number of treaties negotiated outside the umbrella of the Bonn Convention.¹²⁴ These include the 1972 Convention for the Protection of Migratory Birds and Birds in Danger of Extinction and their Environment between the United States and Japan;¹²⁵ the 1974 Agreement between the Government of Australia and the Government of Japan for the Protection of Migratory Birds in Danger of Extinction and their Environment;¹²⁶ the 1974 Convention for the Protection of Migratory Birds and their Environment between the United States and USSR;¹²⁷ and the 1988 Agreement Between the Government of Australia and the Government of the People's Republic of China for the Protection of Migratory Birds and their Environment.¹²⁸

In three cases, the parties' actions are tempered by the words "endeavour" or "try",¹²⁹ while in a fourth, the parties' actions are limited by the phrase "to

¹²³ *Agreement on the Conservation of Albatrosses and Petrels*, Article III (1)(b) and Annex 2 (Action Plan) Articles 1.4.1 and 1.4.2.

¹²⁴ For a short discussion of these treaties see P van Heijnsbergen *International Legal Protection of Wild Fauna and Flora* above n 11 at 131-132.

¹²⁵ *1972 Convention for the Protection of Migratory Birds and Birds in Danger of Extinction and their Environment between the United States and Japan* adopted 4 March 1972, 25 (3) UST 3329, Articles VI (b) and (c) (entered into force 19 September 1974).

¹²⁶ *1974 Agreement between the Government of Australia and the Government of Japan for the Protection of Migratory Birds in Danger of Extinction and their Environment*, adopted 6 February 1974, [1981] ATS 6, Articles VI (b) and VI(c) (entered into force 30 April 1981).

¹²⁷ *1974 Convention for the Protection of Migratory Birds and their Environment between the United States and USSR*, adopted 19 November 1976, 29 Part 4 UST 4647, Article IV 2(b) (entered into force 31 October 1978).

¹²⁸ *1988 Agreement Between the Government of Australia and the Government of the People's Republic of China for the Protection of Migratory Birds and their Environment*, adopted 20 October 1986, [1988] ATS 22, Article IV (entered into force 1 September 1988).

¹²⁹ *1972 Convention for the Protection of Migratory Birds and Birds in Danger of Extinction and their Environment between the United States and Japan*, Article IV(c); *1974 Agreement between the Government of Australia and the Government of Japan for*

the extent possible”.¹³⁰ The use of phrases such as “to the extent possible”,¹³¹ “endeavour” or “try” can involve taking responsive action by way of reducing and controlling the damage once it has occurred.¹³² Yet, the obligation in reality is a soft one.

Provisions relating to the control of IAS are also found in treaties of global application. Article 196 of the United Nations Convention on the Law of the Sea (LOSC)¹³³ requires states to control the intentional or accidental introduction of alien or new species that may cause significant harm to the environment. One of the most recognised pathways for introduction of alien aquatic species has been through ballast water discharges.¹³⁴ Indeed, the Global Ballast Water Management Programme¹³⁵ (GloBallast) has described invasive aquatic species as one of the greatest threats to the world’s oceans pointing out that unlike “other forms of marine pollution, such as oil spills, where ameliorative action can be taken and from which the environment will eventually recover, the impacts of invasive marine species are most often irreversible”.¹³⁶ The International Convention for the Control and Management of Ships’

the Protection of Migratory Birds in Danger of Extinction and their Environment, Article IV(b); 1974 *Convention for the Protection of Migratory Birds and their Environment between the United States and USSR*, Article IV 2(b); 1988 *Agreement Between the Government of Australia and the Government of the People’s Republic of China for the Protection of Migratory Birds and their Environment* Article IV.

¹³⁰ 1974 *Convention for the Protection of Migratory Birds and their Environment between the United States and USSR*, Article IV(2)(b).

¹³¹ The same phrase is also used in the *Protocol for the Conservation and Management of Protected Marine and Coastal Areas of the South-East Pacific*, Article VII 2(c).

¹³² Lada Šoljan, ‘The General Obligation to Prevent Transboundary Harm and its Relation to Four Key Environmental Principles.’ (1998) 3 *Austrian Review of International & European Law* 209, 217-2; see also Phoebe Okowa *State Responsibility for Transboundary Air Pollution in International Law* Oxford University Press (2000) 180.

¹³³ 1982 *Law of the Sea Convention*, adopted 10 December 1982, [1994] ATS 31 (entered into force 16 November 1994). As at November, 2007 the Convention had 150 parties.

¹³⁴ IMO Background Fact sheet to the International Convention for the Control and Management of Ships’ Ballast Water and Sediment <http://www.imo.org/Environment/mainframe.asp?topic_id=548> (March 2006).

¹³⁵ The Global Ballast Water Management Programme (GloBallast) is a combined initiative of the Global Environmental Facility, the United Nations Development Programme and the International Maritime Organization (IMO). GloBallast assists developing states to reduce the introduction of alien species by ballast water discharges and also to implement the IMO ballast water guidelines. <<http://globallast.imo.org/index.asp>> (March 2006).

¹³⁶ GloBallast Fact Sheet *The Problem* 2007 <http://globallast.imo.org/index.asp?page=problem.htm&menu=true> (August 2007).

Ballast Water and Sediment¹³⁷ places a strong emphasis on preventing introduction of alien species and encourages the development of international standards such as those contained in a range of previously non-binding international guidelines¹³⁸ to prevent ballast water transferring aquatic IAS around the globe.¹³⁹

Despite this plethora of treaties, however, a number of shortcomings exist. For example, many treaties fail to stipulate whether their prohibitions on introductions of “exotic species” apply both to deliberate and accidental introductions.¹⁴⁰ In addition, international instruments are not always clear whether it is all alien species that require regulation, or only those alien species that are actually, or potentially invasive.¹⁴¹ Other shortcomings

¹³⁷ Copy kindly provided by IMO Secretariat (Eileen Kee). Available by subscription from www.imo.org IMO Doc BWMCNF/36. The convention was adopted under the auspices of the International Maritime Organization on 13 February 2004. It will come into force 12 months after ratification by 30 States, representing 35 per cent of world merchant shipping tonnage.

¹³⁸ 1991 by the Marine Environment Protection Committee of the International Maritime Organization. Guidelines for Preventing the Introduction of Unwanted Organisms and Pathogens from Ships' Ballast Water and Sediment Discharges; Adopted by Resolution 50(31). These guidelines have since been superseded and until the new International Convention for the Control and Management of Ships' Ballast Water and Sediment (Ballast Water Convention) enters into force, the current guidelines are the 'Guidelines for the control and management of ships' ballast water, to minimise the transfer of harmful aquatic organisms and pathogens'. These Guidelines were adopted by the IMO Assembly in 1997, by resolution A.868(20).

¹³⁹ *International Convention for the Control and Management of Ships' Ballast Water and Sediment*, Article 2

¹⁴⁰ Shortcomings of the current international legal regime governing IAS have been extensively analysed in numerous reports conducted under the auspices of the CBD, the IUCN, and by academic commentators. For instance: Lyle Glowka and Cyril de Klemm, above n 73; Clare Shine, Nattley Williams and Lothar Gundling, above n 88; CBD Note By The Executive Secretary, Invasive Alien Species, a Review of the Efficiency and Efficacy of Existing Legal Instruments Applicable to Invasive Alien Species above n 36. Other specific examples include: Article V(4) of the *Convention on Conservation of Nature in the South Pacific 1976 (Apia Convention)* only refers to deliberate introductions. *Convention on Conservation of Nature in the South Pacific 1976 (Apia Convention)* adopted on 12 June 1976 [1990] ATS 4, (entered into force on 26 June 1990). As at November 2007, the Convention had 6 parties. For general discussion of Apia convention, see Peter Lawrence, 'Regional Strategies or the Implementation of Environmental Conventions: Lessons from the South Pacific?' (1994) 15 *Australian Yearbook of International Law* 203, 213-214; Article 3 (c) of the *Asean Agreement on the Conservation of Nature and Natural Resources* 1985; Article 24 of the *Convention for the Conservation of the Biodiversity and the Protection of Wilderness areas in Central America* 1992, that does not specify whether the article refers to deliberate, or accidental introductions.

¹⁴¹ Article V of the *Apia Convention* refers to the regulation of exotic species generally; Article 3(c) of the *Asean Agreement* specifies that the parties should 'regulate and where necessary prohibit the introduction of exotic species.' In other instances, the fact that it is

stem from the inconsistent level of commitment and obligation of the IAS regime. Not all states, for example, have ratified relevant treaties¹⁴² and the treaties themselves vary in the degree of obligation required of member states. While some forbid introductions entirely,¹⁴³ others use prohibition, not as an end in itself, but as a regulatory tool.¹⁴⁴ Still others allow introductions, following further study or assessment.¹⁴⁵ Indeed, this latter requirement, in the form of risk assessments and environmental impact assessments, has evolved to become a crucial feature of effective IAS regimes.¹⁴⁶

The instruments are also largely sectoral or regional in nature. Consequently, they only apply to a particular part of the IAS problem, such as migratory species, or the aquatic region. Moreover, in many cases treaties lack guidance on how to make IAS provisions operational. Some of the most detailed provisions are found in soft law instruments, which are not binding. In general, these shortcomings have contributed to an ineffective international IAS regime and inadequate national implementation of measures to protect biodiversity from IAS.¹⁴⁷

invasive alien species that are sought to be regulated is somewhat clearer. Article 17 of the 1994 *Protocol for the Implementation of the Alpine Convention in the Field of Nature Protection and Landscape Conservation* stipulates that parties must not introduce species not native to the region ‘in the recorded past.’ However, exceptions are permitted where the introduction would not be detrimental to the region. A similar provision is found in Article 10 of the *Protocol to the Convention for the Protection, management and Development of the Marine and Coastal Environment of the Eastern African Region* 1985 that specifies the parties should prohibit the introduction of alien or new species where the species could cause significant or harmful changes to the Eastern African region.

¹⁴² The United States of America, for example, has not ratified the 1979 *Convention on the Conservation of Migratory Species of Wild Animals*, although it is a signatory to a memorandum of understanding negotiated pursuant to the Convention to protect turtles in the Indian Ocean and South-East Asia. Additionally, the United States has not ratified the CBD although it has signed it.

¹⁴³ 1968 *African Convention on Nature and Natural Resources*, Article 3.4(a).

¹⁴⁴ 1985 *Asean Agreement on the Conservation of Nature and Natural Resources*, Article 3(c).

¹⁴⁵ 1979 *Convention on the Conservation of European Wildlife and Natural Habitats*, Article II(2).

¹⁴⁶ See later discussion on risk analysis and environmental impact assessment in section 6.1 of Chapter 6 of this study.

¹⁴⁷ See discussion in section 2.4 of this Chapter..

2.2.5 The Convention on Biological Diversity and IAS

The Convention on Biological Diversity seeks to overcome some of the piecemeal and fragmented characteristics of the international legal regime for the protection of biodiversity that existed prior to 1992.¹⁴⁸ The CBD has a global application with respect to protection of biodiversity¹⁴⁹ including the protection of biodiversity from IAS. Given the focus of the CBD, the issue of IAS has always been a significant one. During the negotiation of the CBD strenuous efforts were made to achieve inclusion of strong provisions for dealing with exotic and introduced species. However, the final version of Article 8(h) was not as strong as initially anticipated. On this point, Jenkins has said:

Initial drafts of the CBD included a relatively strong exotics provision. It would have established a scientific authority styled after CITES and a listing process focusing attention on high priority exotic species threats to biodiversity. However, the finally adopted watered down article 8(h) language lacks specificity, lacks a listing process and lacks enforceability due to its vagueness.¹⁵⁰

Article 8(h) of the CBD thus requires the contracting parties to “prevent the introduction of or control or eradicate those alien species that threaten ecosystems, habitats or species”, without providing specific guidance as to how these obligations should become operational.

Details relating to the implementation of Article 8(h) have, however, been negotiated within the COP.¹⁵¹ In 1999, in response to a request by the

¹⁴⁸ See generally Alan E Boyle ‘The Rio Convention on Biological Diversity’ in Michael Bowman and Catherine Redgwell (eds), *International Law and the Conservation of Biological Diversity*, Kluwer Law International London (1996) 33.

¹⁴⁹ The CBD is a widely-accepted treaty, with a membership of 190 states (November 2007). A notable exception, as noted above, is the United States. However, with respect to the protection of biodiversity from IAS, the United States has established a National Invasive Species Council that provides a regulatory regime for the problem of IAS. See report of the council National Invasive Species Council *Progress Report on the Meeting the Invasive Species Challenge: National Invasive Species Management Plan. FY 2004* National Invasive Species Council (2005).

¹⁵⁰ Peter Jenkins, ‘Free Trade and Exotic Species Introductions’ in O Sandlund, P Schel, A Viken (eds) *Proceedings of the Norway/UN Conference on Alien Species* Trondheim July 1995 Directorate for Nature Management Trondheim (1996) 145, 146.

¹⁵¹ See discussion Jacob Werksman ‘The Conferences of the Parties to Environmental Treaties’ in Jacob Werksman (ed), *Greening International Institutions* Earthscan Publications Ltd UK (1996) 57-58; see also generally Jutta Bruneé ‘COPing with

Conference of the Parties, the Subsidiary Body on Scientific Technical and Technological Advice (SBSTTA)¹⁵² of the CBD produced a draft set of guiding principles for the prevention of impacts of alien species in isolated ecosystems.¹⁵³ This draft was considered,¹⁵⁴ amended¹⁵⁵ and eventually adopted by the conference of the parties as the CBD Guiding Principles for the Prevention, Introduction and Mitigation of Impacts of Alien Species that Threaten Ecosystems Habitats or Species (CBD Guiding Principles).¹⁵⁶

The CBD Guiding Principles comprise 15 principles designed to enhance and harmonize state practice with respect to IAS regulation. The Guiding Principles are underpinned by three important concepts all articulated in the CBD: the application of the precautionary principle,¹⁵⁷ the application

Consent: Law-Making Under Multilateral Environmental Agreements' (2002) 15 *Leiden Journal of International Law* 1.

¹⁵² The Subsidiary Body on Scientific Technical and Technological Advice is an open-ended intergovernmental scientific advisory body established pursuant to Article 25 of the CBD. It provides advice to the COP, and undertakes assessments of the status of biological diversity. <<http://www.dbd.int/convention/sbstta.shtml>> (June 2006).

¹⁵³ Development of Guiding Principles for the Prevention of Impacts of Alien Species by Identifying Priority Areas of Work on Isolated Ecosystems and by Evaluating and Giving Recommendations for the Further Development of the Global Invasive Species Programme. UNEP/CBD/SBSTTA/4/8 (15 February 1999). For a short discussion on history of negotiation of the CBD Guiding Principles, see Marc Miller 'Biological and Cultural Camouflage: The Challenges of Seeing the Harmful Invasive Species Problem and Doing Something About it' in Marc Miller and R Fabian (eds), *Harmful Invasive Species: Legal Responses* Environmental Law Institute Washington (2004) 1, 7.

¹⁵⁴ See, for example, paragraph 3.4 of the Reports of the Fifth meeting of the Subsidiary Body on Scientific, Technical and Technological Advice UNEP/CBD/COP/5/3 (25 February 2000); Progress Report on the Implementation of the Programmes of Work on the Biological Diversity of Inland Water Ecosystems, Marine and Coastal Biological Diversity, and Forest Biological Diversity (Gaps in measures taken to prevent the introduction of, or the adverse effects from, alien invasive species and genotypes that threaten marine and coastal ecosystems, habitats or species. UNEP/CBD/COP/5/INF/9 (20 April 2000) and Decision V/8 'Alien Species that Threaten Ecosystems, Habitats or Species' UNEP/CBD/COP/5/23 (22 June 2000).

¹⁵⁵ For example the current CBD Guiding Principles adopted pursuant to decision VI/23 of the COPs (UNEP/CBD/COP/6/20) (23 September 2002) are not limited in their application to isolated areas, whereas in an earlier version of the principles considered in May 2000 as part of decision V/8 (UNEP/CBD/COP/5/23), (the document is dated 22 June 2000, however the meeting occurred 15-16 Ma 2000) paragraph 8 of the recital to the principles urged the parties to give priority to geographically and evolutionarily isolated ecosystems.

¹⁵⁶ Guiding Principles for the Prevention, Introduction and Mitigation of Impacts of Alien Species that Threaten Ecosystems, Habitats or Species. Adopted April 2002 as part of Decision VI/23 of the Conference of the Parties. Report of the Sixth Meeting of the Conference of the Parties to the Convention on Biological Diversity, UNEP/CBD/COP/6/20 (23 September 2002).

¹⁵⁷ The CBD Guiding Principles, Principle 1.

of the ecosystem approach¹⁵⁸ and the application of a three-tiered approach that emphasizes preventing introductions, followed by eradication and control measures.¹⁵⁹

As already noted in section 2.1.4 above, the precautionary principle requires 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. The precautionary principle is not only designed to deal with gaps in scientific knowledge, and the impact of these gaps on an ill-protected environment,¹⁶⁰ but is also designed to ensure that unexpected risks are diminished.¹⁶¹ In essence the unpredictability of the invasion process means that introductions should be prohibited, unless they can be shown to be harmless. This is especially significant to IAS regulation, where scientific knowledge is often incomplete and the effects of an introduction gone wrong can be catastrophic and irreversible.

The ecosystem approach which has also been referred to above, describes a functional unit of interactions between species and their living and non-living environment, characterized in terms of naturally-occurring parameters. This classification coincides with the definition of an IAS formulated by the CBD Guiding Principles. It will be recalled that this definition determines whether or not a species is alien by reference to its natural range.¹⁶² As the natural range of a species corresponds with the species' area of evolution and development without human interference, this is consistent with implementing management principles in accordance with the ecosystem approach.

The three-tiered approach of the CBD Guiding Principles is designed to emphasise the importance of preventing introduction of IAS. Indeed,

¹⁵⁸ The CBD Guiding Principles, Principle 3.

¹⁵⁹ CBD Guiding Principles, Principle 2.

¹⁶⁰ Owen McIntyre and Thomas Mosedale 'The Precautionary Principle as a Norm of Customary International Law' above n 41, 222.

¹⁶¹ Ibid, 237.

¹⁶² See discussion in part 1.1.2 of Chapter 1 of this study.

prevention is seen as the most cost-effective means of designing and implementing regulatory regimes to deal with the problem of IAS. Consequently, the CBD Guiding Principles highlight the importance of border controls and quarantine measures¹⁶³ in evaluating deliberate introductions¹⁶⁴ and detecting accidental ones.¹⁶⁵ As part of preventative mechanisms, states are also obliged to carry out risk analyses¹⁶⁶ and ensure that no first-time introductions are made without authorization by a competent national institution in the recipient state.¹⁶⁷

The principles also recommend that states carry out regular monitoring activities.¹⁶⁸ Although monitoring will not prevent introductions, it does assist in early detection of invasions, helps to identify pathways of invasion, helps to detect human-made introductions and also helps with effectual decision-making, with regard to eradication and containment of IAS.¹⁶⁹ The principles also recommend that states cooperate to prevent introduction of IAS, especially between trading partners.¹⁷⁰ This recommendation can be particularly important in helping prevent accidental introductions.

The CBD Guiding Principles, therefore, provide detail to the framework of article 8(h) of the CBD and expressly advocate the use of the precautionary principle, which is an important principle that deals directly with gaps in information. While the CBD Guiding Principles are not binding,¹⁷¹ they do provide a foundation upon which states may build harmonised IAS regimes. In addition, it gives the Conference of the Parties flexibility to amend and expand the principles in accordance with increases in knowledge and experience with respect to the regulation of

¹⁶³ CBD Guiding Principles, Principle 7.

¹⁶⁴ CBD Guiding Principles, Principle 10.

¹⁶⁵ CBD Guiding Principles, Principle 11.

¹⁶⁶ CBD Guiding Principles, Principles 7(3), 10(2) and footnote 57(vii).

¹⁶⁷ CBD Guiding Principles, Principle 10(1).

¹⁶⁸ CBD Guiding Principles, Principle 5.

¹⁶⁹ CBD Note By The Executive Secretary, Invasive Alien Species, a Review of the Efficiency and Efficacy of Existing Legal Instruments Applicable to Invasive Alien Species above n 36.

¹⁷⁰ CBD Guiding Principles, Principle 9.

¹⁷¹ See introduction to the Guiding Principles decision VI/23.

IAS.¹⁷² The principles are there to guide CBD members, who at least must consider them. This can be seen as imposing more significant obligations for states which are party to the CBD than for states that are not party to the CBD.

For example, Article 26 of the CBD obliges parties to file reports about their activities under the Convention at intervals determined by the COP.¹⁷³ These reports include information on activities implementing article 8(h), as well as information on the use of the CBD Guiding Principles.¹⁷⁴ These reports fulfil a number of important roles, including identifying gaps in domestic legislation and helping states to formulate policy.¹⁷⁵ The reports also serve as a compliance mechanism¹⁷⁶ providing public scrutiny and oversight of adherence to the CBD in the public arena.¹⁷⁷ Thus, the CBD Guiding Principles, while non-binding, are nevertheless a potentially powerful influence on domestic regulatory regimes that deal with IAS. Moreover, given the substantial number of states which are parties to the CBD,¹⁷⁸ the CBD Guiding Principles can also, potentially, be a source of powerful influence in the regulation of IAS from a global perspective.

2.2.6 The Cartagena Protocol

The Cartagena Protocol deals with living modified organisms.¹⁷⁹ These are human-engineered organisms¹⁸⁰ possessing ‘a novel combination of genetic material obtained through the use of modern biotechnology’.¹⁸¹ As such, they are alien species because they have not previously existed

¹⁷² Introduction to Guiding Principles.

¹⁷³ Article 26, *Convention on Biological Diversity*.

¹⁷⁴ See discussion in section 2.4 of this Chapter.

¹⁷⁵ CBD Fact sheet ‘National Reporting’ <http://www.biodiv.org/reports/default.aspx>

¹⁷⁶ Abram Chayes and Antonia H Chayes, ‘Compliance Without Enforcement: State Behavior Under Regulatory Treaties’ (1991) 7 *Negotiation Journal* 311, 321-5.

¹⁷⁷ Ibid.

¹⁷⁸ 190 parties as at November 2007.

¹⁷⁹ Cartagena Protocol, Article 3.

¹⁸⁰ Cartagena Protocol, Article 3(i). The phrase ‘modern biotechnology’ includes human made organisms that overcome ‘natural physiological reproductive or recombination barriers’ and that do not otherwise employ techniques used in ‘traditional breeding and selection.’

¹⁸¹ Cartagena Protocol, Article 3(g).

within a 'natural range'.¹⁸² Moreover, living modified organisms, in common with any other alien species, have the potential to become invasive.¹⁸³ In particular, concern has been expressed at the fact that genetically modified species may interbreed with native species, thus endangering the genetic diversity of native species.¹⁸⁴

While obligations with respect to living modified organisms would be included within the ambit of Article 8(h) of the CBD, the CBD does not specifically refer to these organisms and the protection of biodiversity. Indeed, although the latter point was a matter of concern to states during the negotiation of the CBD, controversy over these species became so contentious¹⁸⁵ that apart from Article 19(3) of the CBD that deals with access to and transfer of technology, the regulation of living modified organisms was left to the negotiation of a protocol.¹⁸⁶ During the negotiation of the protocol, debate with respect to the safety of genetically modified organisms continued. Some groups pointed to the fact that there is little or no evidence of major environmental damage having occurred from the release of living modified organisms;¹⁸⁷ while other groups, such as environmentalists and some scientists, still remained concerned.¹⁸⁸

¹⁸² See discussion part 1.1.2 of this study.

¹⁸³ J McNeely, H Mooney L Neville and J Waage (ed) *A Global Strategy on Invasive Alien Species* IUCN Gland Switzerland and Cambridge UK 2001 at 23

¹⁸⁴ F Klingenstein and T Diwani, 'Invasive alien species from a nature conservation point of view in Germany' Germany' in *Identification of Risks and Management of Invasive Alien Species Using the IPPC Framework*, Proceedings of a workshop in Braunschweig, Germany 22-26 September 2003, Secretariat of the IPPC FAO (2005) 137

¹⁸⁵ Stas Burgiel, 'The Cartagena Protocol on Biosafety: Taking the Steps from Negotiation to Implementation' (2002) 11 No 1 *Review of European Community and International Environmental Law* 53; in relation to food products, see generally L Frewer, J Lassen, B Kettlitz, J Scholderer, V Beekman and K Berdal, 'Societal Aspects of Genetically Modified Foods' (2004) 42 *Food and Chemical Toxicology* 1181.

¹⁸⁶ R Mackenzie, F Burhenne-Guilmin, A La Viña and J Werksman *An Explanatory Guide to the Cartagena Protocol on Biosafety* IUCN Thanet Press Ltd UK (2003).

¹⁸⁷ J Nap, P Metz, M Excaler and A Conner he Release of Genetically Modified Crops into the Environment' (2003) 33 *The Plant Journal* 1.

¹⁸⁸ For a discussion of the arguments for and against genetically modified products and their potential impact on the environment, see R Millstein 'Natural Selection, Genetically Modified Food and the Environment'; D Moodie 'The Cautious 'Frankenfish': Environmental Protection and Other Canadian Regulatory Issues Relating to Transgenic Fish' [2004] *Macquarie Journal of International and Comparative International Law* <<http://www.austlii.edu.au/au/journals/MqJICEL/2004/3.html>> 3 (November 2007); Peter Sand 'Labelling Genetically Modified Food: The Right to Know' (2006) 15 *Review of European Community and International Environmental Law* 185.

The Cartagena Protocol contains 40 Articles and three annexes that aim to create a high degree of safety with respect to the safe transfer, handling and use of living modified organisms.¹⁸⁹ The primary mechanism of the Protocol is the implementation of an “advanced informed agreement procedure” designed to ensure that states have adequate information at their disposal before making decisions on living modified organisms.¹⁹⁰ Significantly, the Protocol provides that states should undertake a risk analysis prior to proposed introductions,¹⁹¹ and that the risk analysis process should also incorporate the precautionary principle.¹⁹²

Should living modified organisms accidentally gain entry, or be accidentally released into the environment, Article 17 of the Cartagena Protocol specifies that all states potentially affected by the accidental release of the organism need to be notified in order to implement emergency procedures. In addition, the “advanced informed agreement procedures”, under Articles 7-10, have an in-built mechanism for opening dialogue between states and often that will be a precursor to collaboration and cooperation.

To the extent that the Protocol calls for risk analysis,¹⁹³ the application of the precautionary principle¹⁹⁴ and collaboration and cooperation between states¹⁹⁵ there are a number of parallels between the Protocol and the CBD Guiding Principles. These parallels signpost important principles, relevant to the protection of biodiversity from IAS.

¹⁸⁹ *Cartagena Protocol*, Article 1.

¹⁹⁰ *Cartagena Protocol*, Articles 7-10.

¹⁹¹ *Cartagena Protocol*, Articles 15, 16 and Annex III. ¹⁹¹ For a comprehensive discussion of the operations of the *Cartagena Protocol*, see R Mackenzie, F Burhenne-Guilmin, A La Viña and J Werksman, above n 186.

¹⁹² *Cartagena Protocol*, Annex III Risk Assessment, paragraph 4. See discussion later in chapters 6 and 9 of this study.

¹⁹³ *Cartagena Protocol*, Articles 7-10, and Articles 15, 16 and Annex III; the CBD Article 14.

¹⁹⁴ CBD Preamble; *Cartagena Protocol*, Article 1.

¹⁹⁵ *Cartagena Protocol*, Articles 7, 8, 9 and 20; the CBD Articles 5 and 18.

2.3 THE PRINCIPLES APPLICABLE TO THE PROTECTION OF BIODIVERSITY FROM IAS

From the general customary principles of the duty to cooperate and the duty to prevent transboundary harm, we can now discern certain more specific obligations which have emerged on states with respect to the protection of biodiversity from the deleterious effects of IAS.

The primary obligation on states appears to be one of prevention and precaution and this is manifested in the requirement to proceed in a three-tiered hierarchical manner, with preventative measures given first priority, followed by eradication and control measures.¹⁹⁶ This three-tiered approach reflects the fact that preventing introductions of IAS is the most cost effective way of regulating them. Adoption of preventative measures should also be consistent with both the precautionary principle¹⁹⁷ and the ecosystem approach.¹⁹⁸ In addition, to enhance preventative mechanisms and minimize the chances of states accidentally introducing species international cooperation and coordination of activities is needed.¹⁹⁹ In particular, Guiding Principle 4 of the Guiding Principles highlights the fact that states need to be vigilant about introducing IAS to other jurisdictions even where those species may not be invasive in their own jurisdiction. Although the principle itself is not binding, it can be seen as a specific articulation of the more general customary international law obligation to prevent transboundary harm. As such, the substance of Guiding Principle 4 can give rise to state responsibility, but through the medium of customary international law.

Furthermore, because cooperative efforts are not fool-proof, states are also often called upon to engage in monitoring activities that not only assist in

¹⁹⁶ CBD Guiding Principles, Principle 2; See also Article 22 of the Convention on the Law of Non-navigational uses of International Watercourses.

¹⁹⁷ Preamble of CBD, CBD Guiding Principles, Principle 1.

¹⁹⁸ CBD Guiding Principles, Principle 3.

¹⁹⁹ CBD Guiding Principles, Principle 9, SPREP Barbados Programme of Action paragraph 55A-C.

detecting unauthorized introductions but also help evaluate whether authorized introductions are functioning as planned.²⁰⁰

Another important feature of international obligations with respect to IAS can be detected from the many references in international instruments to the need for evaluations of species to determine whether a species is likely to be invasive, or whether a pathway can introduce IAS. These references range from descriptions concerning broad studies and investigations,²⁰¹ to more specific references calling for environmental impact assessment and risk analysis.²⁰² For example, Article 8 of the Protocol on Environmental Protection to the Antarctic Treaty 1991 requires assessment of all activities, including those that have more than a minor or transient impact on the Antarctic environment and this could easily include an assessment of alien species.²⁰³ As a potentially harmful activity, the introduction of alien species²⁰⁴ triggers a permit system which includes consideration of the cumulative impacts of introductions.²⁰⁵ The need to assess species prior to their introduction is also set out in some of the strategies negotiated under the auspices of the Bonn Convention. The action plan made pursuant to the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (AEWA) states that prior to undertaking re-establishment programmes, species must be assessed for their impact on the environment. Moreover, the basis for re-establishment must be

²⁰⁰ CBD Guiding Principles, Principle 5; *Madrid Protocol*, Article 3(2)(C)(v); ICES Code Appendix B.

²⁰¹ See, for instance, Ecological Guidelines for the Development in the American Humid Tropics 1974 and Ecological Guidelines for the use of Natural Resources in the Middle East and South West Asia 1974 discussed in part 2.2.3 of this chapter of the study.

²⁰² 1991 *Protocol on Environmental Protection to the Antarctic Treaty*, Article 8; CBD Article 14. See further discussion of environmental impact assessment and risk analysis see section 6.1 of Chapter 6 of this Study.

²⁰³ It should also be kept in mind that in any event Article 4 of Annex II has strict prohibitions regarding introductions of non-native species otherwise than in accordance with a permit.

²⁰⁴ 1991 *Protocol on Environmental Protection to the Antarctic Treaty*, Annex II Article 1(h).

²⁰⁵ 1991 *Protocol on Environmental Protection to the Antarctic Treaty*, Article 3 subparagraph (c)(ii). See short discussion in Lyle Glowka and Cyrill de Klemm, above n 73, 248; D Lyons 'Environmental impact assessment in Antarctica under the Protocol on Environmental Protection' (1993) 29 (169) *Polar Rec* 111; Catherine Redgwell, 'Environmental Protection in Antarctica: The 1991 Protocol' (1994) 43 *International and Comparative Law Quarterly* 599.

underpinned by appropriate scientific studies and an integration of re-establishment programmes with national and international action plans.²⁰⁶

Environmental impact assessment and risk analysis that directly target IAS are also found in the Cartagena Protocol and the CBD Guiding Principles. The Cartagena Protocol favours using risk analysis,²⁰⁷ while the CBD Guiding Principles favour environmental impact assessments within a risk analysis framework.²⁰⁸ In addition, both instruments introduce the precautionary principle and/or the ecosystem approach into the assessment process.²⁰⁹ It is also significant that Guiding Principle 2 of the CBD Guiding Principles emphasizes that decisions on whether or not to permit species entry should be made on a long-term basis and include environmental, economic and social concerns. One aspect of evaluation of species and pathways connects directly to preventative elements by way of border controls. Therefore, an increasing number of instruments are calling for tighter quarantine regulations.²¹⁰ In particular, where introductions are to be made deliberately, quarantine systems should have mechanisms in place to assess or evaluate species for their IAS potential.

2.4 STATE PRACTICE IN THE PROTECTION OF BIODIVERSITY FROM IAS PURSUANT TO THE CONVENTION ON BIOLOGICAL DIVERSITY

Having identified the relevant principles, it is then instructive to examine state practice to ascertain the extent to which states are implementing these principles, and what problems or difficulties they have encountered.

²⁰⁶ *Agreement on the Conservation of African-Eurasian Migratory Waterbirds*, Articles II and III.

²⁰⁷ *Cartagena Protocol*, Article 15.

²⁰⁸ CBD Guiding Principles, Principle 10. See further discussion in section 6.1 of Chapter 6 of this study.

²⁰⁹ CBD Guiding Principles, Principles 1 and 3. *Cartagena Protocol* Article 1.

²¹⁰ CBD Guiding Principles, Principle 7; ICES Code Appendix C; SPREP Barbados Programme of Action paragraph 55A(iii).

Two means of gathering the information have been chosen for this part of the study: first, a consideration of the third national reports submitted by member states to the COP of the CBD (*Third National Report*),²¹¹ and second, an examination of national reviews of IAS measures.²¹² With respect to the *Third National Report* two sets of questions have been analysed. The first set comprises a selection of questions taken from the section “Challenges and Obstacles to Implementation” in which states are required to indicate on a scale of 0-3 the extent to which the matters set out in the questions represent challenges in implementing the provisions *inter alia* of article 8(h) of CBD.²¹³ The second set of questions utilized are those designed to elicit responses on both general and specific state practice, with respect to the implementation of Article 8(h) and the regulation of IAS.²¹⁴

The statistics that have been assembled are based on the number of states that provided information for the part of the report being studied. This means that the data is not solely based on the number of states that lodged reports. Where a state did not provide an answer to a question, this is indicated in the statistics as “no answer”. Where a report was not lodged in standard format the questions and responses were only used where they could correlate with a question in the standard format. Occasionally, states

²¹¹ *Convention on Biological Diversity Third National Report to the Convention on Biological Diversity*. The reports are all available from <<http://www.biodiv.org/reports/list.aspx?type=nr-03>> (November 2007).

²¹² For example, Shirley Bethune, Mike Griffin, Dave Joubert, *National Review of Invasive Alien Species Namibia* Prepared for the Directorate of Environmental Affairs, Ministry of Environment and Tourism Windhoek (2004); K Stokes, K O'Neill and R McDonald *Invasive Species in Ireland*. Report to Environment and Heritage Service and National Parks and Wildlife Service by Quercus Queens University, Environment & Heritage Service, Belfast and National Parks & Wildlife Service, Dublin (2006). Department for Environment Food and Rural Affairs (DEFRA) *Review of Non-Native Species Policy* Report of the Working Group. DEFRA Publications London (2003).

²¹³ This part of the report relates to Articles 5, 6, 7, 8, 8(h), 8(j) 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20.

²¹⁴ The questions incorporate questions 45-56 inclusive of the *Third National Report*. As at November 2007, these reports provide the most up-to-date information that is available for a large number of states. The National reports are not lodged annually, but rather, as required by the Conference of the Parties of the CBD. As the name of the reports indicates this is the third one lodged since the CBD entered into force in 1993. See Fact sheet ‘National Reporting’ <<http://www.biodiv.org/reports/default.aspx>> (February 2007).

indicated more than one answer to a question and where possible the most responsive of these was taken into account.

By way of introduction, the level of implementation of the CBD regime is canvassed in Question 52 which asks whether states are implementing the CBD Guiding Principles. The responses to this question are set out in Table 1 and show that 41% of states have not used the CBD Guiding Principles while 28.5% of states are in the process of reviewing their activities in the light of the CBD Guiding Principles. The balance of states have either used the Principles, or intend to use them. The large percentage of states at 41% that have not used the CBD Guiding Principles is significant, since the Principles provide the building blocks for constructing effective legal and institutional regimes.

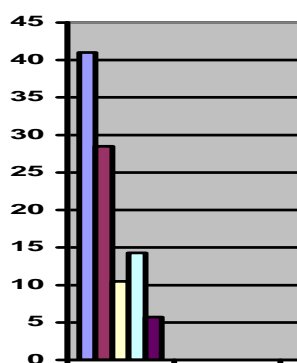
Table 1
Implementation of the CBD Guiding Principles

QUESTION 52

Has your country reviewed relevant policies, legislation and institutions in the light of the Guiding Principles, and adjusted or developed policies, legislation and institutions? (decision VI/23)

- a No
- b No, but review under way
- c Yes, review completed and adjustment proposed
- d Yes, adjustment and development ongoing
- e Yes, some adjustment and development completed

a	b	c	d	e	Total responses to this question	No response to this question
43	30	11	15	6	105	9
41%	28.5%	10.5%	14.3%	5.7%	100%	



Source: compiled from information obtained from the Third National Reports to the Convention on Biological Diversity 2006.

Even if states are not using the Guiding Principles, their practice is still reviewed. Accordingly, Question 47 poses the question: Has your country undertaken measures to prevent the introduction of, control, or eradicate, those alien species which threaten ecosystems, habitats or species? It is a general question, designed to provide an

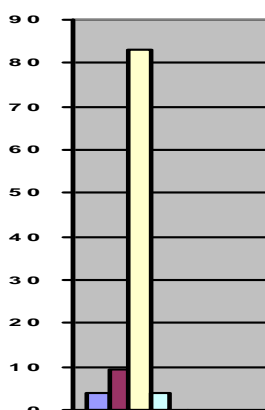
Table 2
Prevention, Eradication and Control of IAS

QUESTION 47

Has your country undertaken measures to prevent the introduction of, control, or eradicate, those alien species which threaten ecosystems, habitats or species?

- (a) No
- (b) No, but potential measures are under consideration
- (c) Yes, some measures are in place
- (d) Yes, comprehensive measures are in place

a	b	c	d	Total responses to this question	No response to this question
4	10	88	4	106	8
3.8%	9.4%	83%	3.8%	100%	



Source: compiled from information obtained from the Third National Reports to the Convention on Biological Diversity 2006.

overall picture of state practice. The results in Table 2 show that 3.8% of states have comprehensive measures in place and 83% of states²¹⁵ have some measures in place. Of the remainder, 9.4% of states have no measures, but are considering the implementation of measures, and 3.8% of states have no measures in place.

Australia, Japan, Latvia and Samoa, indicated that they have comprehensive measures in place. Of the latter two, Latvia reported that, apart from one or two plants, such as giant hogweed, which are in any event subject to eradication and control programmes, alien species are not generally considered a problem.²¹⁶ In Samoa, IAS are a problem and Samoa has indicated that it is in the process of building a strong IAS regime, supported by incrementally stronger quarantine laws, contingency plans and measures to eradicate insects and other plant and animal pests.²¹⁷

Australia provided extensive detail on its activities,²¹⁸ which include listing the effects of IAS as threatening processes under the *Environment Protection and Biodiversity Conservation Act, 1999* (Cth),²¹⁹ and the incorporation of IAS provisions in mechanisms, such as the National Strategy for the Conservation of Australia's Biological Diversity²²⁰ and the National Weeds Strategy.²²¹ While these efforts are commendable, a commissioned review of these practices found that there is still room for

²¹⁵ Mauritania and the Netherlands answered 'c'/'d' and their answers were catalogued as 'c' due to the comparative amount of legislation and implementation undertaken. Mauritania, *Third National Report to the Convention on Biological Diversity* undated; the Netherlands, *Third National Report to the Convention on Biological Diversity* undated.

²¹⁶ Latvia, *Third National Report to the Convention on Biological Diversity* 2005, 84.

²¹⁷ Samoa, *Third National Report to the Convention on Biological Diversity* 2006, 72-73.

²¹⁸ Australia, *Third National Report to the Convention on Biological Diversity* 2006, 127-134.

²¹⁹ *Environment Protection and Biodiversity Conservation Act, 1999* (Cth), section 183.

²²⁰ Department of the Environment and Water Resources, *National Strategy for the Conservation of Australia's Biological Diversity* 1996. Available <<http://www.environment.gov.au/biodiversity/publications/strategy/index.html>> (February 2007).

²²¹ Weeds Australia, the *National Weeds Strategy* is available from <<http://www.weeds.org.au/>> (February 2007).

improvement.²²² Gaps that were identified include the fact that Australia does not have a “national policy for pest and disease surveillance”²²³ and that environmental interests are not being integrated properly into “decision-making processes for some issues such as plant health”.²²⁴

Japan has a dedicated piece of legislation, the *Invasive Alien Species Act* that is designed to deal with the problems of IAS in an holistic way;²²⁵ Article 7 of the Act prohibits the importation of IAS without a permit. In addition, a Cabinet order made pursuant to the Act provides for the regulation of 37 nominated IAS.²²⁶ The Act is comparatively recent and gives all the indications of being comprehensive, however its effectiveness does not yet appear to have been assessed.

Other states have also enacted measures with varying degrees of comprehensiveness.²²⁷ Norway²²⁸ is in the process of establishing cross-cutting measures that draw together land and water use regimes with

²²² Noel Dawson, *Review of Progress on Invasive Species Final Report to Department of Environment and Heritage*, Agtrans Research Department of Environment and Heritage Canberra (2005) 129-30.

²²³ Ibid.

²²⁴ Ibid.

²²⁵ Japan, *Third National Report to the Convention on Biological Diversity* (2006) 73-4. The *Invasive Alien Species Act 2005* (Japan) came into force on 1 June 2005 Available <<http://www.env.go.jp/en/nature/as/040427.pdf>> (June 2007)

²²⁶ Cabinet Order for the Enforcement of the Invasive Alien Species Act (Cabinet order no 169 (April 27, 2005)). Available from <http://www.env.go.jp/en/nature/as/co050613_details.pdf> (June 2007)

²²⁷ Some states have indicated that while they do not have formal IAS programmes in place, they have set up laws to deal with species in an *ad hoc* manner. For example, Jordan does not have a comprehensive IAS regime, although it has undertaken some studies on invasive fish species in the Jordan River and some regulations have been enacted for the Marine Aqaba Park. Regulation for the Marine Aqaba Park No 22 for 2001 (Article 12-B-6) prohibits the introduction of ‘exotic (alien) animal or plant species into the Park’s area’. These laws and regulations are referred to in the *Third National Report to the Convention on Biological Diversity* (July 2006) at 116-17. Likewise, in Pakistan there are no effective mechanisms in place to address the IAS issue as such, but laws do exist banning the planting of eucalyptus and mesquite in natural forests. See the *Third National Report to the Convention on Biological Diversity* (November 2006) at 75. Yet again, in the Former Yugoslav Republic of Macedonia, while there are no comprehensive IAS provisions in place, there is a general prohibition on the introduction of species into nature under the Law on the Protection of Nature (Article 25). This law, however, is not being implemented effectively. See report by the Former Yugoslav Republic of Macedonia, *Third National Report to the Convention on Biological Diversity* (November 2005), 72.

²²⁸ Norway, *Third National Report to the Convention on Biological Diversity* (undated), 68.

environmental concerns. As an example, the import and introduction of live freshwater organisms into nature is prohibited without permission from the Ministry of the Environment.²²⁹

Canada is also constructing a comprehensive IAS regime²³⁰ found in “An Invasive Alien Species Strategy for Canada”.²³¹ The strategy was introduced in September 2004 and involves federal, provincial and territorial governments in five areas of IAS regulation: risk analysis, science and technology, legislation and regulations, engaging Canadians and international cooperation.

However, a random sampling of nine countries from the 83% which reported that some measures are in place²³² indicates that, for the most part, measures tend to form clusters around three types of laws. The first group concentrates on laws with respect to limited areas, such as protected areas, nature reserves or some capital regions;²³³ the second group focuses on eradication and containment measures that centre on one or two species causing major damage to agriculture, farming or aquaculture;²³⁴ and the third group concentrates on quarantine regulation that, in similarity with eradication and containment measures, leans towards protecting

²²⁹ See discussion in Norway, *Third National Report to the Convention on Biological Diversity* (undated) 68 *Act Relating to Freshwater Fish and Salmonids*.

²³⁰ Canada, *Third National Report to the Convention on Biological Diversity* (undated), 52-54.

²³¹ Environment Canada, ‘An Invasive Alien Species Strategy for Canada’ September (2004). Available from <<http://www.cbin.ec.gc.ca/issues/ias.cfm?lang=e>> (March 2006).

²³² The countries are the Bahamas, the Czech Republic, Lebanon, Lesotho, Malaysia, Rwanda, Uganda, the United Kingdom of Great Britain and Northern Ireland and Zimbabwe.

²³³ In Belgium, for example, IAS regulation deals mainly with protected areas. A major piece of legislation, the *Forest Decree*, prohibits the introduction of plants and animals in public forests and forest reserves of the Flemish region without a permit; in a similar vein, it is prohibited to introduce non-indigenous bird species into the wild in the Brussels Capital Region. However, implementation and monitoring activities are limited and apply to the most noticeable IAS, such as the Nile goose and the Canadian goose. Belgium, *Third National Report to the Convention on Biological Diversity* (September 2005) 94.

²³⁴ Ibid with respect to the Nile Goose and Canadian Goose. Also in Lebanon, little legislation has been enacted that relates to IAS, but one law does prohibit the import of Cedar seeds, saplings and plants. Lebanon, *Third National Report to the Convention on Biological Diversity* (2005) 133.

agriculture, farming and aquaculture.²³⁵ Moreover, a number of states have not yet introduced any formal measures with respect to IAS, although, informal measures may be being implemented locally by interested private parties.²³⁶

Pragmatic targeting of specific species and regions where there is an urgent need for regulation is understandable, particularly in light of potential resource constraints and the need to accommodate multiple economic and other sectoral interests. Nevertheless, care must be taken to avoid stagnation or complacency of effort to control IAS, particularly given the potential costs involved in eradication or remediation.

The problems of implementing an holistic and comprehensive approach to IAS regulation and the protection of biodiversity are underscored by the responses given by states to questions 45, 46 and 53. Some difficulties stem from complexities involved in implementing the cross-cutting approaches that are so necessary to effective IAS regulation. Table 3 shows that only 30.8% of states have measures in place to enhance cooperation between the sectors, 19.2% have no measures in place, while 50% are considering measures.²³⁷

Table 4 shows that only 12.4% of states have identified alien species of concern and have put in place tracking systems; 65.7% of states have identified species of concern, without implementing tracking systems; while 16.2% of states have identified some species and have tracking systems in place. This means that the knowledge base so vital for effective regulation is not being built up.

²³⁵ The law in Lebanon, Ibid.

²³⁶ In Nepal for example there are no specific laws dealing with IAS, although local people are encouraged to use indigenous plants and NGOs have been involved in assisting in the removal of a number of invasive species such as water hyacinth around the regions of Phew Lake, Begnas and Rupatal around the Pokara Valley. Nepal, *Third National Report to the Convention on Biological Diversity* (March 2006) 102.

²³⁷ By way of example, Mozambique indicated that there is sectoral collaboration on this matter. A survey was carried out in agriculture sector, but there is not sufficient financial capacity to meet the demand related to the control of alien invasive species. Mozambique, *Third National Report to the Convention on Biological Diversity* (September 2006) 74.

With respect to assessments and evaluations, Table 5 indicates that 19.2% of states have not assessed the risks that alien species pose to ecosystems, habitats or other species; although 67.4% of states have undertaken this task for alien species of concern. Only 13.4% of states have undertaken this assessment for most alien species.

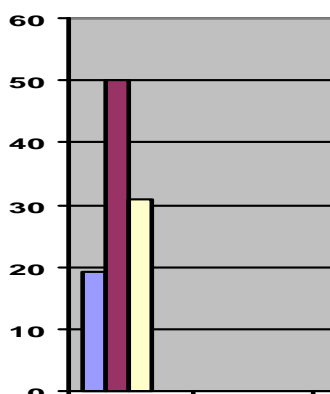
Table 3
Sectoral Cooperation

QUESTION 53

Is your country enhancing cooperation between various sectors in order to improve prevention, early detection, eradication and/or control of invasive alien species? (decision VI/23)

- (a) No
- (b) No, but potential coordination mechanisms are under consideration
- (c) Yes, mechanisms are in place

a	b	c	Total responses to this question	No response to this question
20	52	32	104	10
19.2%	50%	30.8%	100%	



Source: compiled from information obtained from the Third National Reports to the Convention on Biological Diversity 2006.

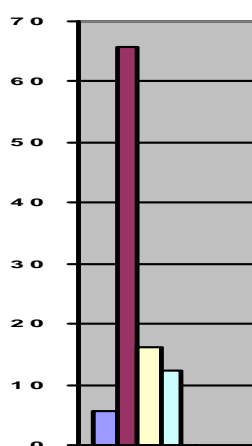
Table 4
Identification and Tracking of IAS

QUESTION 45

Has your country identified alien species introduced into its territory and established a system for tracking the introduction of alien species?

- (a) No
- (b) Yes, some alien species identified but a tracking system not yet established
- (c) Yes, some alien species identified and tracking system in Place
- (d) Yes, alien species of major concern identified and tracking system in place

a	b	c	d	Total responses to this question	No response to this question
6	69	17	13	105	9
5.7%	65.7%	16.2%	12.4%	100%	



Source: compiled from information obtained from the Third National Reports to the Convention on Biological Diversity 2006.

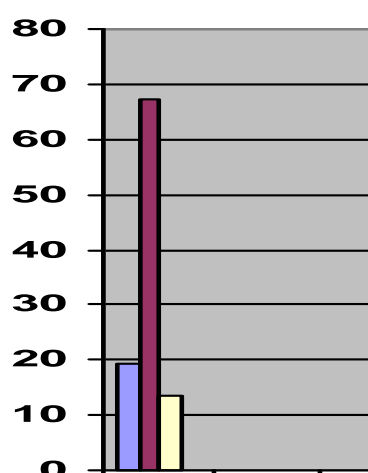
Table 5
Assessment of Risks Posed by IAS

QUESTION 46

Has your country assessed the risks posed to ecosystems, habitats or species by the introduction of those alien species?

- (a) No
- (b) Yes but only for some alien species of concern
- (c) Yes, for most alien species

a	b	c	Total responses to this question	No response to this question
20	70	14	104	10
19.2%	67.4%	13.4%	100%	



Source: compiled from information obtained from the Third National Reports to the Convention on Biological Diversity 2006.

In Armenia, for example, activities mainly concentrate on agro ecosystems,²³⁸ while in Mauritius, where risk assessment is carried out for imported plants and animals, the emphasis is on preventing the introduction of pests and disease, without protocols being “in place for

²³⁸ Armenia, *Third National Report to the Convention on Biological Diversity* (April 2006) 110.

evaluating risks to biodiversity".²³⁹ Practices in Kenya also follow this pattern, with risk assessment being undertaken only for major species having economic implications, such as the water hyacinth in Lake Victoria.²⁴⁰ Otherwise, no risk assessments are carried out for other species. State practice, therefore, evinces both lack of adequate information-gathering and lack of adequate evaluation processes. This combination not only contributes to gaps in the knowledge-base, but can also lead to ineffective regulation which fails adequately to incorporate important management cornerstones, such as the ecosystem approach. The latter in particular is dependent on sufficient knowledge and information to make it operational.

The implications of this are confirmed by Table 6 which shows that while 24% of states consider the application of the ecosystem approach is a low challenge, fully 76% of states consider it to be a medium or high challenge. Indeed, 33% of all states consider the ecosystem approach to be a high challenge.

The acknowledgment of difficulties in implementing the ecosystem approach is not surprising, given the answers to questions 45 and 46 that demonstrate lack of knowledge of IAS and the invasion process. However, it is worrisome that, in spite of lack of knowledge, states are not making use of the precautionary principle. Indeed, as Table 7 shows, 49% of states consider that the lack of application of the precautionary principle represents a high challenge to the implementation of a proactive IAS regime. Only 1% of states consider that they have met the challenge of using the precautionary principle appropriately. Given the lack of comprehensive knowledge of IAS and their impacts, the lack of application of the precautionary principle has serious implications for the efficacy of national IAS regimes.

²³⁹ Mauritius, *Third National Report to the Convention on Biological Diversity* (October 2006) 100.

²⁴⁰ Kenya, *Third National Report to the Convention on Biological Diversity* (December 2005) 71-72. Uganda has also studied the water hyacinth Uganda, *Third National Report to the Convention on Biological Diversity* (January 2006) 91.

Table 6
The Ecosystem Approach

QUESTION Y

Lack of knowledge and practice of ecosystem-based approaches to management

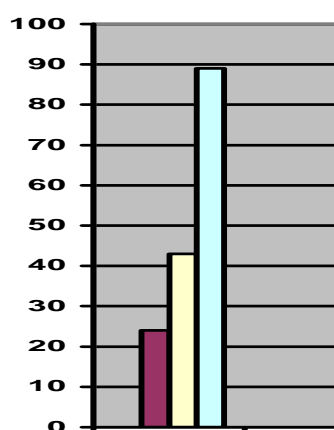
0=Challenge has been successfully overcome

1=Low Challenge

2=Medium Challenge

3= High Challenge

0	1	2	3	Total responses to this question	No response to this question
0	21	38	30	89	25
0%	24%	43%	33%	100%	



Source: compiled from information obtained from the Third National Reports to the Convention on Biological Diversity 2006.

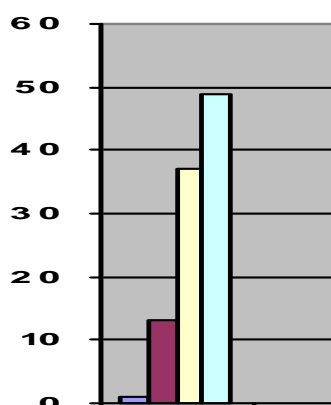
Table 7
Precautionary Principle

QUESTION D

The Lack of precautionary and proactive measures

0=Challenge has been successfully overcome
1=Low Challenge
2=Medium Challenge
3= High Challenge

0	1	2	3	Total responses to this question	No response to this question
1	12	34	45	92	22
1%	13%	37%	49%	100%	



Source: compiled from information obtained from the Third National Reports to the Convention on Biological Diversity 2006

Ultimately, however, it must be acknowledged that there is also the ever-present spectre of lack of resources that affects every facet of IAS regulation, from the gathering of information, to the instigation of regimes, to the implementation of measures. As indicated by Table 8, lack of resources was identified by most states as being problematic. Only 2.1% of states considered that they had overcome issues associated with lack of resources; while more than half the states, 56.4% in fact,

considered that lack of resources represented a high challenge. In addition, 36.2% of states said the lack of resources represented a medium challenge. This means that a

Table 8
Financial, Human and Technical Resources

QUESTION M

Lack of financial, human, technical resources

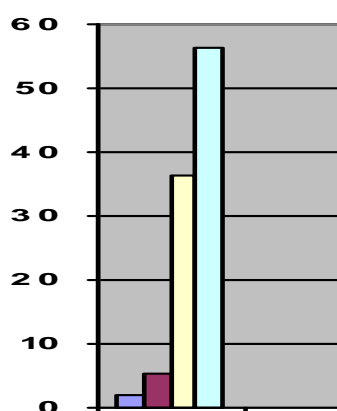
0=Challenge has been successfully overcome

1=Low Challenge

2=Medium Challenge

3= High Challenge

0	1	2	3	Total responses to this question	No response to this question
2	5	34	53	94	20
2.1%	5.3%	36.2	56.4	100%	



Source: compiled from information obtained from the Third National Reports to the Convention on Biological Diversity 2006

staggering 96.2% of states consider that a lack of resources, including lack of technological capacity and trained personnel as much as lack of finances, represents a high or medium challenge to the implementation of effective national IAS regimes.

Clearly, finding a workable solution to protect biodiversity from IAS that effectively implements international environmental legal obligations is not easy. Currently, many states focus on the most pressing problems and target measures on high-profile species that impact on economic interests. However, the irony is that by following this course of action, states may unwittingly allow new species to gain entry and establish, thereby perpetuating a cycle where scarce resources are expended on eradication and containment measures, rather than on preventing introductions.

2.5 CONCLUSION

International environmental law imposes obligations on states to protect biodiversity. In particular, Convention on Biological Diversity imposes an obligation on states to protect biodiversity including from the deleterious effects of IAS. In this respect, article 8(h) of the CBD clearly requires parties to prevent and control alien species that threaten biodiversity. The manner in which this obligation is to be met is detailed in the CBD Guiding Principles, which incorporate important concepts such as the ecosystem approach and the precautionary principle. These developments are pro-active in the sense that they emphasize preventing harm or detecting and dealing with the harm as early as possible. As well, the application of both the precautionary principle and the ecosystem approach strengthen the application of preventative measures by taking into account gaps in the knowledge base and the fact that IAS regulation requires a multi-jurisdictional approach.

In the context of prevention of harm, national quarantine systems have an important role to play. In truth, quarantine systems often represent a state's first line of defence against entry of IAS. It is hardly surprising,

therefore, that an increasing number of international instruments call for tighter quarantine regulations.²⁴¹ Enhanced border controls supplemented by monitoring activities are an essential step to ensure that as few IAS as possible gain entry. The next chapter examines the nature and role of national quarantine systems in the protection of biodiversity from IAS.

²⁴¹ CBD Guiding Principles, Principle 7; ICES Code Appendix C; SPREP Barbados Programme of Action paragraph 55A(iii).

CHAPTER 3

QUARANTINE AND INVASIVE ALIEN SPECIES

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CHAPTER 3

QUARANTINE AND INVASIVE ALIEN SPECIES

3.0 INTRODUCTION

Thus far it has been argued that the introduction of invasive alien species (IAS) can result in harm to biodiversity and that prevention is the best management option.¹ To prevent introductions, states need to design and implement effective mechanisms to prevent the entry and establishment of IAS. From this perspective, quarantine regulation has an important role to play.

This Chapter examines the potential for the use of quarantine regulation as a means of protecting biodiversity from the deleterious effects of IAS. It commences with a brief discussion of the definition of quarantine and then moves to an historical account of the development and evolution of quarantine. Although quarantine regulation initially was introduced to prevent the entry and spread of disease and pestilence, it was also often used to achieve unrelated political objectives, some of which were regarded as a misuse of quarantine. This meant that by the time quarantine regulation attained international prominence in the mid-to-late nineteenth century its potential for misuse complicated and delayed the negotiation and implementation of international instruments to halt the introduction and spread of disease and pestilence. In particular, attempts to harmonize and standardize national regimes were often met with resistance. This is perhaps best exemplified by the negotiation of the 1892 International Sanitary Convention between Austria-Hungary, Denmark, France, Germany, Great Britain, Italy, the Netherlands, Portugal, Russia, Spain,

¹ See section 1.3.5 of Chapter 1 of this study.

Sweden-Norway and Turkey, one of the earliest treaties to deal with quarantine in human health, which took some four decades to conclude.²

By the twentieth century, however, the need for cooperative efforts set the pattern for international collaboration and harmonization of measures. For the purposes of this study, the focus is on whether quarantine regimes have a useful role in protecting biodiversity from IAS. This partly depends on whether states are prepared to use quarantine to its full potential in the protection of biodiversity; and whether there are limitations on the ability of states to do so, imposed for example, by other areas of international law. In addressing these issues, the discussion concentrates on the 1997 International Plant Protection Convention (1997 IPPC)³ and the 1924 International Agreement for the Creation at Paris of an International Office for Dealing with Contagious Diseases of Animals, and Annex (OIE).⁴ These two premier treaty systems deal respectively with quarantine in relation to plants and animals. The discussion also examines state practice in quarantine, using Australia as a case study to demonstrate how quarantine can be used to protect biodiversity from IAS.

3.1 THE MEANING OF “QUARANTINE”

The word “quarantine” has traditionally been used to describe measures dealing with human diseases, plant and animal pests and diseases. The term has also been used variously to describe a blockade⁵ and a way of

² 1892 *International Sanitary Convention between Austria-Hungary, Denmark, France, Germany, Great Britain, Italy, the Netherlands, Portugal, Russia, Spain, Sweden-Norway and Turkey* adopted 30 January 1892, (1892) 176 CTS 396 (entered into force on 18 November 1893). As at November 2007 it had 12 parties.

³ *International Plant Protection Convention 1997*, adopted 17 November 1997, [2005] ATS No 23 (entered into force 2 October 2005). As at November 2007, the *International Plant Protection Convention 1997* (IPPC) has 166 parties.

⁴ *International Agreement for the Creation at Paris of an International Office for Dealing with Contagious Diseases of Animals, and Annex 1924*, adopted 25 January 1924 [1925] ATS No 15, (entered into force 12 January 1925). The organization is known as the OIE and as at November 2007 had 173 members.

⁵ The phrase ‘defensive quarantine’ has been used by the United States of America (USA), to describe a blockade such as occurred during the Cuban missile crisis of 1962, when the USA used defensive quarantine measures to stop the entry of missiles into

isolating infected computer files.⁶ As defined in the Oxford English Dictionary,⁷ “quarantine” means:

1. (as a noun) (a period of) isolation imposed on persons or animals that have arrived from elsewhere or been exposed to and might spread, infectious or contagious disease;
2. (as a verb) to impose such isolation on, put in quarantine.

The word is derived from the Latin “*quarantina*”, which means “forty days”. The reference to forty days originated during the plagues of the Middle Ages. In 1377, for example, repeated outbreaks of Black Death led to the city of Ragusa⁸ introducing quarantine legislation,⁹ with Venice following suit in 1432.¹⁰ People who were ill, or suspected of being ill, were detained and segregated from the citizens of the city initially for thirty days, but then for forty days, which ultimately became the standard.¹¹ Importantly, segregation was not only imposed on those who were ill and therefore very likely to infect others, but also on those suspected of being ill and hence potentially able to infect others.

In a strict sense, the segregation of those who are already ill is more aptly described as “isolation”,¹² while quarantine is a preventative measure to stop the introduction or spread of disease by those who are suspected of being ill. However, in so far as systems of isolation and quarantine involve a process of segregation and an outcome geared towards preventing the introduction and spread of disease, the two systems are

Cuba.

⁶ See generally J Boase and B Wellman, ‘A Plague of Viruses: Biological, Computer and Marketing’ (2001) 49 (6) *Current Sociology* 39.

⁷ *Concise Oxford English Dictionary* New Ed 1977.

⁸ The city of Ragusa is now known as Dubrovnik.

⁹ G Gensubu, M Yacoub and A Conti, ‘The Concept of Quarantine in History: from Plague to SARS’ (2004) 49 *Journal of Infection* 257,258; P. Sehdev, ‘The Origin of Quarantine’ (2002) 35 *Clinical Infectious Diseases* 1071. McNeill sets the date at 1346. W McNeill *Plagues and Peoples*, Bantam, Doubleday Dell Publishing Group, Inc., New York, NY (1976) 170.

¹⁰ G Gensubu, M Yacoub and A Conti, above n 9, 259; For a different date (1465) see W McNeill *Plagues and Peoples* above n 9, 1071.

¹¹ W McNeill, above n 9. McNeill says that ‘the idea of quarantine ... stemmed from biblical pages preaching the ostracism of lepers and by treating plague sufferers as though they were temporary lepers – forty days’ quarantine eventually became a standard.’

¹² G Gensubu, M Yacoub and A Conti, above n 9, 257-8.

similar.¹³ In this study, no distinction is drawn between the two and when the term “quarantine” is used it includes isolation measures.

A related issue is whether quarantine extends to eradication and containment measures. In other words, is the concept of quarantine limited to preventing entry of IAS by way of border controls; or does the concept extend to implementing measures to stop a species from establishing and spreading? A glossary of phytosanitary terms issued under the auspices of the 1997 IPPC¹⁴ defines quarantine of plants as the official confinement for “ observation and research or for further inspection, testing and/or treatment of any plant, plant product, packaging, container soil or object or material capable of harbouring or spreading a pest”.¹⁵ While the definition refers to preventing the spread of a pest, it does not specifically refer to the establishment of a pest. However, provisions of the 1997 IPPC itself envisage that national plant protection organizations¹⁶ will implement eradication and containment measures, an obligation which is consistent with preventing the spread and establishment of pests as part of “quarantine”.¹⁷ At the national level, it is clearer that quarantine includes eradication and containment measures.

Section 4 of the Australian *Quarantine Act 1908* (Cth) describes quarantine in terms of processes and outcomes that include measures to prevent or control “the introduction, establishment or spread of diseases or pests”.¹⁸ Additionally, section 5D of the *Quarantine Act 1908* (Cth) refers to the level of quarantine risk as incorporating the probability of “a disease or pest being introduced established or spread in Australia”.¹⁹

¹³ Ibid.

¹⁴ International Plant Protection Convention ISPM No 5 Glossary of Phytosanitary Terms (2007) FAO (2007).

¹⁵ Ibid, 15.

¹⁶ A national plant protection is defined as an ‘Official service established by a government to discharge the functions specified by the IPPC’. See International Plant Protection Convention ISPM No 5 Glossary of Phytosanitary Terms above n 14.

¹⁷ 1997 IPPC Article IV(2)(e) for example that provides that the responsibilities of states incorporate ‘the protection of endangered areas and the designation, maintenance and surveillance of pest free areas and areas of low pest prevalence’.

¹⁸ *Quarantine Act 1908* (Cth) section 4(1)(b).

¹⁹ See discussion on this point in *Australian Pork Ltd v Director of Animal and Plant*

Article 1 of Chapter 1 of *The Law of the People's Republic of China on the Entry and Exit Animal and Plant Quarantine* describes quarantine as a law:

formulated for the purpose of preventing infectious or parasitic diseases of animals, diseases, insect pests and weeds dangerous to plants, and other harmful organisms (hereinafter referred to, for short, as diseases, insect pests and harmful organisms) from spreading into or out of the country

The use of words and phrases such as “introduction, establishment or spread” in the *Quarantine Act 1908* (Cth) and “spreading into or out of the country” in the *Law of the People's Republic of China on the Entry and Exit Animal and Plant Quarantine* clearly indicate that states themselves regard quarantine as a means of preventing the establishment and spread of species once the species has gained entry. Consequently, for the purposes of this study, “quarantine” is used in this broader sense, as set out in section 4 of the *Quarantine Act 1908* (Cth), to describe procedures or measures and outcomes aimed at preventing species' establishment and spread in addition to preventing their introduction.

3.2 THE DEVELOPMENT OF QUARANTINE AS A REGULATORY TOOL

3.2.1 Quarantine and Domestic Law

The concept of “quarantine” as a regulatory tool derives from the proscriptive measures referred to section 3.1 above which were implemented in fourteenth-century European ports to stop the spread of disease and pestilence. Examples of early quarantine measures popular during the Middle Ages included the formation of “sanitary cordons” and the institution of “lazarets”. Sanitary cordons consisted of rows of guards stationed at close intervals along land borders. The cordons themselves were traditionally formed to isolate states that had not suffered an outbreak of disease from states that had. Guards that were positioned along the cordons monitored land borders to prevent people breaking

Quarantine [2005] FCA 671 at paragraph 23.

through the cordons and bringing disease with them.²⁰ The “lazarets” were quarantine stations initially set up at seaports, but later also set up inland. They segregated travellers from the population of the city and housed not only those who were ill, but also those who could be ill because they had come from areas of infection.²¹

The content, process and implementation of measures along the sanitary cordons, and within the lazarets, were solely controlled by whichever state had initiated the measures.²² Thus, states could impose whatever quarantine regulation they thought fit.²³ Indeed, quarantine measures were often implemented for reasons unconnected with health concerns. Often, other equally important issues were regarded as legitimate quarantine matters, including protecting “the quality and safety” of trade routes upon which these fourteenth-century cities depended.²⁴ Consequently, quarantine laws, could serve many purposes, one of which was to foster international trade.²⁵

The multiplicity of roles played by quarantine regulation eventually became a source of political conflict,²⁶ with quarantine being regarded as much of an opportunity for lobbying and favouritism as an exercise involving health regulations. In the resulting struggles those promoting quarantine regulation were sometimes deprived of satisfaction, as in the case of the mid-nineteenth century attempts to introduce quarantine measures in the Australian colony of New South Wales, which were hindered by the Acclimatization Societies and their intention of

²⁰ Oleg Schepin and Waldemar Yermakov, *International Quarantine*, International Universities Press Inc Connecticut (1991) 10.

²¹ Ibid, 11.

²² Skjerve Eystein and Wasteson Yngvild ‘Ecological Consequences of the Spreading of Pathogens and Genes Through an Increasing Trade in Foods’ in O Sandlund, P Schel, A Viken (eds) *Proceedings of the Norway/UN Conference on Alien Species* Trondheim July 1995 Directorate for Nature Management Trondheim (1996) 141.

²³ Mark Harrison, ‘Disease, Diplomacy and International Commerce: the Origins of International Sanitary Regulation in the Nineteenth Century’ [2006] *Journal of Global History* 197, 198.

²⁴ G Gensubu, M Yacoub and A Conti, above n 9, 258.

²⁵ See discussion in section 3.2.2 of this Chapter.

²⁶ G Gensubu, M Yacoub, A Conti, above n 9, 258; see also generally, Mark Harrison above n 23; see generally Oleg Schepin and Waldemar Yermakov, above n 20.

introducing species across the globe.²⁷ Even after quarantine regulation was implemented, it did not necessarily escape criticism. For example, in the nineteenth century, quarantine laws operating in the United States were criticized for requiring masters of ships to complete comprehensive questionnaires that were not only designed to gather information on pests and diseases, but also to collect data relating to population, racial and ethnic demographics of the passengers.²⁸

In Europe, the relative stability that followed the end of the Napoleonic wars in 1815 led to a consequential increase in trade that brought the domestic application of quarantine measures squarely into the international spotlight²⁹ Quarantine regulation was often imposed by eastern Mediterranean states on travellers and merchants travelling through the “Levant”, or eastern Mediterranean region. Yet merchants travelling through the Levant complained that quarantine procedures could be costly and a source of unnecessary delays when goods were examined and treated in “quarantine houses”.³⁰ By the mid-nineteenth century, Turkey had set up 60 inland quarantines and 102 quarantines at seaports which, in the eyes of the European powers, effectively placed insurmountable barriers in the way of trade.³¹ Discontent with national quarantine regimes crystallized into two distinct approaches, represented by those who wanted quarantine laws made more flexible and those who wanted them to remain strict.

Those who wanted quarantine laws relaxed often had objectives aimed at freeing up international trade.³² Indeed, some states unilaterally reduced the strictness of their quarantine regulation in order to stimulate trade. In

²⁷ J R Fisher, ‘Origins of Animal Quarantine in Australia’ (2000) 78 *Australian Veterinary Journal* 478. See section 1.2.1 of Chapter One for discussion of Acclimatization Societies.

²⁸ See Discussion William Novak, *The People’s Welfare*, The University of North Carolina Press Chapel Hill and London (1996) 208-211.

²⁹ One example is the trade between Europe and Egypt in cotton. Harrison ‘Disease, Diplomacy and International Commerce: the Origins of International Sanitary Regulation in the Nineteenth Century’ above n 23 at 205.

³⁰ *Ibid* at 199.

³¹ Oleg Schepin and Waldemar Yermakov, above n 20, 52.

³² Mark Harrison, above n 23, 205.

the 1840s, for example, France's involvement in Algeria and its growing trade with the Levant led to the relaxation of French quarantine laws applying in the Mediterranean.³³ In Great Britain, there were also many who criticized quarantine regimes as costly to trade and called for reform.³⁴ On the other hand, those who wanted quarantine laws to remain stringent were concerned that relaxing quarantine regulation would expose Europe to the threat of epidemics from the east.³⁵

Indeed, epidemics of cholera, yellow fever and plague continued unabated even while these diseases were subject to domestic quarantine measures. This last factor called into question the value of measures co-ordinated solely at the national level. One problem stemmed from the fact that domestic quarantine regimes were not internationally standardized.³⁶ This meant that strict quarantine measures in one state could be nullified by substandard measures in another state. Indeed, the regime internationally was only as good as the weakest domestic measure and where states did not have measures, or had ineffectual measures, these deficiencies facilitated the introduction and spread of disease across international boundaries.

3.2.2 Quarantine and International Law

It was against this dual backdrop of discontent with the arbitrariness of national quarantine regimes and the realization that individual state action could not resolve widespread epidemics that calls were made for reform. These calls materialized in the form of a series of International Sanitary Conferences, held in the mid to late nineteenth-century, at which states came together to find international solutions to the problems of cholera, yellow fever and plague epidemics. Negotiations during the Conferences were punctuated by dissension over the impact of domestic policies on matters relating to harmonisation of quarantine regimes and the extent to

³³ Ibid, 213.

³⁴ Mark Harrison above n 23, 213.

³⁵ Ibid, 205.

³⁶ Oleg Schepin and Waldemar Yermakov, above n 20, 63.

which international law could provide solutions to what were then considered essentially matters of national concern.

The first Conference, held in Paris in 1851, resulted in the negotiation of the 1852 Sanitary Convention between France, Portugal, Sardinia, Tuscany and Turkey,³⁷ the first international convention to deal with quarantine matters. The Convention was designed to protect the Mediterranean from plague, yellow fever and cholera by the use of international standards in quarantine. The standards were provided by an Appendix to the Convention and comprised 137 articles that provided uniform and internationally-agreed quarantine rules that states were to implement. However, due to disputes amongst the negotiating states, the convention never entered into force.³⁸ Indeed, so contentious was the idea of international regulation of quarantine laws that it was not until some forty-one years later that states agreed on a convention that entered into force, in the form of the seventh International Sanitary Conference held in Venice in 1892.³⁹ Part of the reason for this delay stemmed from disagreement amongst medical experts on how diseases such as cholera and yellow fever were transmitted. However, a greater reason for the delay arose from the fact that, while states such as Greece, Portugal and Serbia opted for strong and internationally-standardized quarantine laws, Britain and France were more willing to countenance weaker quarantine regulation in order to facilitate trading activities.⁴⁰

The question as to how far international law could regulate quarantine matters appears to have been less contentious in the context of protection of viticulture, agriculture and farming. Indeed, the negotiation of

³⁷ 1852 *Sanitary Convention between France, Portugal, Sardinia, Tuscany and Turkey*, concluded 3 February 1852 (1851-1852) 107 CTS 345 (the convention never entered into force).

³⁸ See Discussion in Valeska Huber 'The Unification of the Globe by Disease? The International Sanitary Conferences on Cholera 1851-1894' (2006) 49 *The Historical Journal* 453, 461.

³⁹ Oleg Schepin and Waldemar Yermakov, above n 20, 70-134. The treaty was the 1892 International Sanitary Convention between Austria-Hungary, Denmark, France, Germany, Great Britain, Italy, the Netherlands, Portugal, Russia, Spain, Sweden-Norway and Turkey, above n 2.

⁴⁰ Mark Harrison, above n 23, 215.

quarantine treaties⁴¹ to protect viticulture and other agricultural activities swiftly followed outbreaks of pestilence⁴² and epizootic diseases.⁴³ One of the earliest conventions to be negotiated was the 1878 Convention on Measures to be Taken Against *Phylloxera Vastatrix*⁴⁴ that was designed to protect European vineyards from the *phylloxera* insect. From the late nineteenth century an increasing number of animal and plant protection treaties contained provisions requiring harmonisation and standardization of quarantine measures with numerous treaties having been negotiated to deal with either plant or animal quarantine matters.⁴⁵

⁴¹ See for example the 1887 *Convention Designed to Remove the Danger of Epizootic Diseases in the Territories of Two Countries, entered into between Austria-Hungary and Italy*, concluded 7 December 1887, Volume IV *International Protection of the Environment*, B Rüster and B Simma Oceana (eds) New York (1975), 1586 (the convention was ratified by the parties on 2 May 1888); *Germany, Austria-Hungary, Spain, France, Italy, Portugal and Switzerland: Convention on Measures to be Taken Against Phylloxera Vastatrix*, adopted 17 September 1878, Volume IV *International Protection of the Environment*, B Rüster and B Simma Oceana (eds) New York (1975), 1565 (entered into force 31 December 1879). As at November 2007 the convention had 8 parties. For a discussion on the social and cultural issues that the early conventions raised see Valeska Huber, above n 38; O Aginam 'The Nineteenth Century Colonial Fingerprints on Public Health Diplomacy: A Postcolonial View' (2003) *Electronic Law Journals LGD* 2003(1)- Obijfor Aginam available from <http://www2.warwick.ac.uk/fac/soc/law/elj/lgd/2003_1/aginam/> (March 2007).

⁴² See discussion in section 3.2.2 of this Chapter.

⁴³ An Epizootic disease is a parasitic disease that affects a large number of animals in much the same way as an epidemic affects a large number of humans.

⁴⁴ 1878 *Germany, Austria-Hungary, Spain, France, Italy, Portugal and Switzerland: Convention on Measures to be Taken Against Phylloxera Vastatrix*. This convention was amended in 1881 by the *International Phylloxera Convention with a Final Protocol between Germany, Austria-Hungary, France, Portugal and Switzerland* adopted 3 November 1881, Volume IV *International Protection of the Environment*, B Rüster and B Simma Oceana (eds) New York (1975), 1571, (instruments of ratification were deposited on 29 April 1882 and 8 June 1882). As at November 2007 the convention had 7 parties.

⁴⁵ These include the 1924 *International Agreement for the Creation at Paris of an International Office for Dealing with Contagious Diseases of Animals*, and Annex; 1959 *Agreement Concerning Co-Operation in the Quarantine of Plants and Their Protection Against Pests and Diseases* adopted 14 December 1959, (1962) 422 UNTS 42 (entered into force 19 October 1960). As at November 2007 the Agreement had 9 parties.; 1956 *Convention Between the Kingdom of Greece and the people's Republic of Bulgaria for the protection of Plants* adopted 19 April 1956, 594 UNTS 133 (entered into force on 5 February 1965); *Exchange of Notes Constituting an Agreement between the Government of Australia and the Government of the Federation of Malaya on the Exchange of Planting Material between Malaya and Papua and New Guinea*, signed 26 November 1962 [1962] ATS 14 (entered into force 26 November 1962); 1966 *Agreement Between the Government of the Czechoslovak Socialist Republic and the Government of the Mongolian People's Republic on Co-Operation with Regard to the Quarantine of Plants and their Protection Against Pests Diseases and Weeds*, adopted 9 December 1966, (1968) 637 UNTS 302 (entered into force 10 November 1967); 1997 *International Plant Protection Convention*.

Yet, although many treaties dealt with “plants” and “animals”, treaty provisions concentrated on pests and diseases of farm animals, agriculture and forestry. Thus, these treaties were primarily concerned with the use of quarantine as a means of protecting economic activities, such as agriculture and farming, which also included the trade that these industries generated.

Consider, for example, the 1887 Convention Designed to Remove the Danger of Epizootic Diseases in the Territories of the Two Countries (Austria-Hungary and Italy). While the convention uses the word “animals”, Article 2 of the Convention makes it clear that “animals” refers to cattle and pigs. Similarly, the title of the 1935 International Convention for the Campaign Against Contagious Diseases of Animals⁴⁶ suggests a wide application, but Articles 5 and 6 refer to diseases only in terms of livestock diseases.⁴⁷ This pattern is repeated in the 1977 Cooperative Agreement Between Guatemala and the United States of America on Prevention of Animal Diseases,⁴⁸ where the preamble specifies objectives such as preventing the introduction and spread of foot and mouth disease, *rinderpest* and other exotic diseases of the livestock industry. In other cases, the treaties are unmistakable in the fact that they only deal with diseases of farm animals. The Prevention of Diseases in Livestock Agreement of 1928,⁴⁹ for example, specifies that one of the purposes of the convention is “...to safeguard more effectually the livestock interests

⁴⁶ 1935 *International Convention for the Campaign Against Contagious Diseases of Animals*, adopted 20 February 1935 Volume IV *International Protection of the Environment*, B Rüster and B Simma Oceana (eds) New York (1975), 1705 (entered into force 23 March 1938). As at November 2007 the convention had 7 parties.

⁴⁷ 1935 *International Convention for the Campaign Against Contagious Diseases of Animals*, Article 6 where the diseases referred to are: cattle plague, foot-and-mouth disease, contagious peri-pneumonia, anthrax fever, sheep-pox, rabies, glanders, dourine and swine fever.

⁴⁸ 1977 *Cooperative Agreement Between Guatemala and the United States of America on Prevention of Animal Disease*, adopted 3 March 1977, Volume XX *International Protection of the Environment* Ed B Rüster, B Simma and M Bock Oceana New York (1979) 10374 (entered into force 3 March 1977).

⁴⁹ 1928 *Convention between the United States of America and the United Mexican States for the Prevention of Diseases of Livestock*, signed 16 March 1928, Volume IV *International Protection of the Environment*, B Rüster and B Simma Oceana (eds) New York (1975), 1665 (entered into force 18 January 1930).

of their respective countries through the prevention of the introduction of infectious and contagious diseases.”

The situation is similar in plant protection treaties, where objectives were often stipulated in economic terms and specifically aimed at the protection of agricultural plants and harvests. The 1949 Convention Between the Polish Republic and the Czechoslovak Republic Concerning the Protection of Agricultural Plants from Pests and Diseases⁵⁰ is indicative of treaties entered into in the years 1948-1949 by a number of (then) communist states, including Poland, USSR, Czechoslovakia and Hungary. These conventions directly referred to the fact they were negotiated for the purpose of protecting “agricultural plants”.⁵¹ Moreover, the economic aspects of these treaties are reinforced by references to the desirability of increasing harvests and yields. The preamble of the 1969 agreement between Czechoslovakia and Hungary,⁵² for example, identifies the dual purposes of protecting plants and increasing crop yields. A similar approach was taken in the 1973 Memorandum of Understanding between Mexico and the United States of America,⁵³ where the preamble specifies

⁵⁰ 1949 *Convention Between the Polish Republic and the Czechoslovak Republic Concerning the Protection of Agricultural Plants from Pests and Diseases*, signed 22 January 1949, Volume IV *International Protection of the Environment*, B Rüster and B Simma Oceana (eds) New York (1975), 1766 (entered into force 1 September 1949).

⁵¹ Examples include the 1948 *Convention between the Government of the Polish Republic and the Government of the Union of Soviet Socialist Republics Concerning the Quarantine of Agricultural Plants and their Protection from Pests and Diseases*, signed 8 April, 1948, Volume IV *International Protection of the Environment*, B Rüster and B Simma Oceana (eds) New York (1975), 1761 (entered into force 22 October 1948). the 1949 *Convention between the Polish Republic and the Hungarian People's Republic Concerning the Protection of Agricultural Plants from Pests and Diseases*, signed 29 October 1949, Volume IV *International Protection of the Environment*, B Rüster and B Simma Oceana (eds) New York (1975), 1778 (entered into force 18 September 1950); the 1958 *Convention between the Governments of the Romanian People's Republic, the People's Republic of Bulgaria and the Union of Soviet Socialist Republics Concerning Fishing in the Waters of the Danube*, signed 29 January 1958, (1959) 339 UNTS 58 (entered into force on 20 December 1958). As at November 2007 the Convention had 4 parties.

⁵² 1969 *Agreement between the Government of the Hungarian People's Republic and the Government of the Czechoslovak Socialist Republic Concerning Co-operation in the Matter of Plant Protection*, signed 25 October 1969, (1971) 777 UNTS 248 (entered into force 9 October 1970).

⁵³ 1973 *Memorandum of Understanding between Mexico and the United States of America*, negotiated 8 February 1973, Volume XX *International Protection of the Environment*, B Rüster, B Simma and M Bock (eds), Oceana New York (1979) 10327 (entered into force 9 October 1973).

that quarantine measures were directed towards saving crops and harvests in Mexico and the United States. Treaties of broader application, such as the 1929 International Convention for the Protection of Plants⁵⁴ and the 1951 International Plant Convention,⁵⁵ also focused on agriculture and commercially important plants.⁵⁶

3.2.3 Quarantine, Harmonization of Measures and Co-Operation

One benefit that the treaties did bring was to achieve a measure of harmonization in quarantine regulation. This was accomplished by a system of certifications in standard form verifying that goods, species and commodities being traded and transported were free of disease or pestilence.

An early example of certification requirements is provided by the 1878 Convention on Measures to be Taken Against Phylloxera Vastatrix. Pursuant to this convention exporting states had to verify that vine products had come from *phylloxera*-free regions.⁵⁷ Similar requirements with respect to animal diseases were found in the 1887 Convention Designed to Remove the Danger of Epizootic Diseases in the Territories of the Two Countries. Article 2(1) of the Convention obliged exporting states to certify that traded animals had “come from an area which is free from all contagious diseases in that species of animal”. The certificates were valid for 10 days.

In some instances treaties stipulated that certificates had to be issued in a

⁵⁴ 1929 *International Convention for the Protection of Plants*, adopted 16 April 1929, (1931-32) CXXVI *League of Nations Treaty Series* 315 (entered into force on 15 January 1932). As at November 2007 the convention had 28 parties.

⁵⁵ *International Plant Protection Convention 1951* adopted on 6 December 1951, [1952] ATS No 5 (entered into force 3 April 1952). As at November 2007 127 governments had adhered to this convention.

⁵⁶ Article II of the 1929 *International Convention for the Protection of Plants* for example, focussed on cultivated plants such as those in nurseries, farms, gardens and hot houses. Although Article II of 1951 IPPC was not limited to cultivated plants, the convention did focus on plants in trade and there was no mention of the environment or endangered areas, as there is in the preamble and Article IV(2)(e) of the 1997 IPPC.

⁵⁷ 1878 *Convention on Measures to be Taken Against Phylloxera Vastatrix*, Articles 3, 4 and 5.

uniform manner and provided model certificates for use by the parties. This was the case with the 1951 International Plant Protection Convention and the annexed Model Phytosanitary Certificate.⁵⁸ This certification included confirmation that “the consignment is believed to conform with the current phytosanitary regulations of the importing country”,⁵⁹ a requirement that, in essence, encouraged the exporter to observe the importing party’s laws which further assisted in harmonizing quarantine measures.⁶⁰

Of necessity, the certifications were required to be underpinned by appropriate national legal and institutional mechanisms, such as the setting up of national plant protection organizations and the use of notifications and exchange of information with respect to outbreaks of disease and pestilence. For example, Article 1 of the 1929 International Convention for the Protection of Plants required states to implement national legislation to oversee export and import of plants and their products; while Article 2 obliged states to set up institutional frameworks in the form of a national organization responsible for the protection of plants.

Similarly, Article 1(1) of the 1951 International Plant Protection Convention required states to adopt legislative, technical and administrative measures to control and prevent the introduction and spread of pests and diseases. Article IV of the same convention stipulated that

⁵⁸ 1951 *International Plant Protection Convention*, Article V and Annex.

⁵⁹ 1951 *International Plant Protection Convention*, Annex.

⁶⁰ See also the 1965 *Agreement Between the Government of the Czechoslovak Socialist Republic and the Government of the Socialist Federal Republic of Yugoslavia Concerning Co-Operation in the Matter of Plant Protection*, signed 16 June 1965, Volume IV *International Protection of the Environment* B Rüster and B Simma Oceana (eds) New York (1975), 1985, Article 1(a) (entered into force 2 December 1965). Preamble to the 1977 *Memorandum of Understanding between Guatemala and the United States of America Relative to Cooperative Efforts to protect Crops from Plant and Pest Damage and Pest Diseases*, signed 21 February 1977, Volume XX *International Protection of the Environment*, B Rüster, B Simma and M Bock (eds), Oceana New York (1979) 10368, Preamble, (entered into force 21 February 1977); Article 3 of the 1968 *Convention between the Government of the Polish People’s Republic and the Government of the People’s Republic of Bulgaria Concerning Co-operation in the Matter of Plant Protection and Quarantine*, signed 6 December 1968, (1971) 769 UNTS 20, Article 1(1)(c) (entered into force on 21 January 1970).

each contracting party needed to set up a national organization dealing with matters such as inspection of consignment of plants,⁶¹ disinfection of consignments⁶² and issuing of certificates.⁶³ In some instances, member states were specifically required to harmonise their quarantine measures. The 1959 Agreement Concerning Co-Operation in the Quarantine of Plants and Their Protection Against Pests and Diseases 1959⁶⁴ not only stipulated that members should have an adequate legal base for measures, but also that national measures should be harmonised by the application of uniform laws.⁶⁵ Similar provisions were found in the 1959 Agreement Concerning Co-Operation in the Field of Veterinary Science⁶⁶ where Article III specified that the “contracting parties shall take steps to draft co-ordinated bilateral regulations for the import export and transit of animals, products and raw materials capable of transmitting infection”.

Another way of facilitating harmonization of quarantine measures was afforded by notifications and exchanges of information that also served a dual purpose of providing a base for international cooperation. Notifications of outbreaks of pestilence, changes to each others’ laws and advances in science and technology, potentially increase the efficiency of quarantine regulation by coordinating and targeting resources where they were most needed. For example, the 1878 Convention on Measures to be Taken Against Phylloxera Vastatrix contained detailed requirements on notifications and exchanges of information that covered: exchanging information on each others’ laws and activities in implementing laws;⁶⁷

⁶¹ 1951 *International Plant Protection Convention*, Article IV(ii).

⁶² 1951 *International Plant Protection Convention*, Article IV(iii).

⁶³ 1951 *International Plant Protection Convention*, Article IV(iv). There were other treaties that had similar provisions. See for example Article 5 of the 1949 *Convention Between the Polish Republic and the Czechoslovak Republic Concerning the Protection of Agricultural Plants from Pests and Diseases*.

⁶⁴ Preamble to the 1959 *Agreement Concerning Co-Operation in the Quarantine of Plants and Their Protection Against Pests and Diseases* adopted 14 December 1959, (1962) 422 UNTS 42 (entered into force 19 October 1960). As at November 2007 the Agreement had 9 parties.

⁶⁵ 1959 *Agreement Concerning Co-Operation in the Quarantine of Plants and Their Protection Against Pests and Diseases*, Articles V and VIII.

⁶⁶ 1959 *Agreement Concerning Co-Operation in the Field of Veterinary Science*, adopted 14 December 1959 (1962) 422 UNTS 64 (entered into force on 12 September 1960). As at November 2007 it has 9 parties.

⁶⁷ 1878 *Convention on Measures to be Taken Against Phylloxera Vastatrix*, Article 5.1 and 5.2.

notifying other parties where an exporting state had issued a clear certificate and the importing state detected the presence of *phylloxera*;⁶⁸ providing information on outbreaks of pestilence;⁶⁹ and exchanging of scientific and technical information.⁷⁰

Article VII of the 1951 International Plant Protection Convention also set up a system of reports and exchange of information that was coordinated by the FAO.⁷¹ The importance of notifications and exchanges of information is perhaps best summarised by the provisions of Article 4(c) of the 1977 Memorandum of Understanding between Guatemala and the United States of America Relative to Cooperative Efforts to protect Crops from Plant and Pest Damage and Pest Diseases. That agreement emphasized that the experiences of each party could be used to modify existing laws and regulations or to promulgate new laws to control and/or eradicate pests and diseases. In other words, the experience and expertise of particular members could be used to make quarantine regulation more effective for all parties.⁷²

At least three conclusions can be drawn from the examination of these treaties. First, that quarantine regulation was not regarded as a static form of regulation. It is inherent in the obligation to exchange scientific and technical information that quarantine regulation should be constantly refined, coordinated and updated to meet new challenges. Consequently, while quarantine regulation may have had its origins as a mechanism to prevent the introduction and spread of human diseases and the protection of agriculture and farming, there was nothing inherent in its processes to indicate that quarantine regulation should remain limited to these purposes for ever more. Second, the provisions of many international quarantine

⁶⁸ 1878 *Convention on Measures to be Taken Against Phylloxera Vastatrix*, Article 5.4.

⁶⁹ 1878 *Convention on Measures to be Taken Against Phylloxera Vastatrix*, Article 5.5.

⁷⁰ 1878 *Convention on Measures to be Taken Against Phylloxera Vastatrix*, Article 5.7 and 5.8.

⁷¹ 1951 *International Plant Protection Convention*, Article VIII.

⁷² Another example with similar stipulations is Article 7.1 of the 1948 *Convention Between the Government of the Polish Republic and the Government of the Union of Soviet Socialist Republics Concerning the Quarantine of Agricultural Plants*.

instruments⁷³ required harmonization and standardization of national regimes. The need to exchange information, provide details on new developments and comply with the regulations of other states all contributed to this process. Third, the same objectives that facilitated harmonization and standardization of measures also fostered international collaboration and cooperation. Indeed, the current international quarantine regime is strongly predicated on collaborative and cooperative efforts.

3/3 THE CURRENT INTERNATIONAL QUARANTINE REGIME

There is no single overarching international quarantine regime and the phrase “international quarantine” does not itself appear to be defined in international instruments.⁷⁴ However, the phrase refers to the collection of instruments, dealing with human health, and plant and animal health and protection, that constitute a quarantine system based on international collaboration, cooperation and harmonization designed to prevent the spread of pests and diseases across international boundaries. Moreover, the term “international quarantine” also encompasses the whole complex of international and domestic instruments, laws and measures. Although quarantine laws are domestic laws; international law is relevant to establishing what these laws should be.

⁷³ Above n 58, 59, 60, 64, 65, 66 and 70. The term ‘international quarantine’ is defined for the purposes of this study at the beginning of the next section, section 3.3.

⁷⁴ The concept of ‘international quarantine’ has been used by international organizations such as the World Health Organization. The World Health Organization (WHO) was established as a United Nations Agency. Its objective is the attainment of the highest level of health by all peoples. WHO is set up by the Constitution of the World Health Organization, adopted on 22 July 1946, [1948] ATS 7, (entered into force 7 April 1948). As at November 2007 WHO had 193 members. WHO had a Committee on International Quarantine that is now known as the Committee on International Surveillance on Communicable Diseases. The work of the committee is referred to, and discussed, in a number of publications including: WHO, ‘World Health Organization’ (1952) 6 *International Organization* 652, and WHO, *The First Ten Years, of the World Health Organization*, WHO Geneva (1958) 264. WHO has not defined the term “international quarantine”, however, Chapter 18 of *The First Ten Years, of the World Health Organization* is titled “International Quarantine” and the chapter discusses international treaties and regulations on communicable diseases. See also generally the material and commentary in WHO, *Global Crises – Global Solutions* WHO Geneva (2002).

Of the current international treaty regimes regulating quarantine,⁷⁵ the 1997 International Plant Protection Convention (1997 IPPC) that regulates plant quarantine and the World Organization for Animal Health (OIE)⁷⁶ that regulates animal quarantine enjoy the most extensive membership. For this reason they form the focal point of this part of the study.

3.3.1 The 1997 IPPC

The 1997 IPPC evolved from one of the earliest treaties dealing with quarantine, the 1878 Convention on Measures to be Taken Against Phylloxera Vastatrix. This treaty which was negotiated to stop the introduction and spread of a particular pest of plants, the phylloxera insect, eventually gave way to the more general 1929 International Convention for the Protection of Plants.⁷⁷ This latter convention itself was ultimately subsumed into the 1951 International Plant Protection Convention, which was amended in 1979 and more recently in 1997.⁷⁸ The amendments to the 1997 IPPC introduced major institutional changes to the functioning of the IPPC as well as changes to the text of the convention designed to highlight environmental objectives and to bring the convention in line with developments in the international trade regime.⁷⁹

⁷⁵ See, for example, discussion in section 3.2.3 of this Chapter. It should also be noted that many quarantine instruments are bilateral in nature; see above n 45 and 51.

⁷⁶ The name of the OIE was originally the Office International des Epizooties. In May 2003 the name was changed to the World Organisation for Animal Health, with retention of the OIE acronym. See <http://www.oie.int/eng/OIE/en_about.htm?eld1> (March 2007).

⁷⁷ 1929 *International Convention for the Protection of Plants*. See general discussion Lee Ling, 'International Plant Protection Convention: Its History, Objectives and Present Status' (1953) 1(5) *FAO Plant Protection Bulletin* 65. Copy kindly provided by Ricardo Guillermo Muñoz Ossandon, of the FAO David Lubin Memorial Library.

⁷⁸ 1997 *International Plant Protection Convention*, Article XIV. The 1951 version of the *International Plant Protection Convention* was submitted to states for acceptance at the Sixth Session of the FAO in November 1951; the revised text was approved by the FAO conference by Resolution 14/79 at the Twentieth Session in November 1979 and the second revised text was approved by Resolution 12/97 at the Twenty-ninth Session in November 1997. For adoption of the 1997 Amendments see Report of the Conference of the FAO Twenty-Ninth Session 1997 W7475/E. Available at <<http://www.fao.org/docrep/W7475E/W7475E00.htm>> (April 2006). For general discussion see <http://www.fao.org/UNFAO/about/index_en.html> (April 2006). .

⁷⁹ FAO, *Independent Evaluation of the Workings of the International Plant Protection Convention and its Institutional Arrangements* PC 98/3 FAO June (2007) paragraph 19.

Institutional changes include more formalized arrangements for the establishment of a secretariat which had formerly commenced operation in 1992 as part of the FAO's Plant Protection Service⁸⁰ and the establishment of a Commission on Phytosanitary Measures (the Commission).⁸¹ The secretariat is charged with responsibility for administrative functions for both the Commission and the Convention⁸² and undertakes activities such as disseminating international standards⁸³ and compiling lists of regulated pests, whose entry is prohibited under the terms of the 1997 IPPC.⁸⁴

The Commission on Phytosanitary Measures is established within the framework of the FAO⁸⁵ and meets once a year.⁸⁶ Membership of the Commission is open to all members of the IPPC,⁸⁷ who each have one vote.⁸⁸ The functions of the Commission are to “promote full implementation of the objectives of the Convention”,⁸⁹ including the development of international standards in plant protection. Nine regional plant protection organizations complement the work of the Commission.⁹⁰ The regional organizations undertake co-ordination of localized activities and they can also initiate proposals for standards to be adopted and issued

⁸⁰ The 1951 IPPC did not make provisions for a secretariat and hence the 1951 IPPC functioned as a treaty, rather than an organization. FAO *Independent Evaluation of the Workings of the International Plant Protection Convention and its Institutional Arrangements*, *ibid*, paragraph 160.

⁸¹ 1997 IPPC Article XI(2)(b). Until 2 October 2005, and the commencement of the 1997 IPPC the Commission operated as an Interim Commission. The formal establishment of the Commission also provides official recognition for standard-setting procedures of the commission.

⁸² 1997 IPPC, Article XII.

⁸³ 1997 IPPC, Article XII(4)(a).

⁸⁴ 1997 IPPC, Article XII(4)(c).

⁸⁵ 1997 IPPC, Article XI

⁸⁶ 1997 IPPC, Article XI(8). If additional meetings are required these can be convened in accordance with Article XI(9).

⁸⁷ 1997 IPPC, Article XI(3).

⁸⁸ 1997 IPPC, Article XI(4).

⁸⁹ 1997 IPPC, Article XI(2).

⁹⁰ Initially established under Article VIII of the 1951 *International Plant Protection Convention*, see now Article IX 1997 *International Plant Protection Convention*: Asia and Pacific Plant Protection Commission, Caribbean Plant Protection Commission, Comité Regional de Sanidad Vegetal para el Cono Sur Comunidad Andina, European and Mediterranean Plant Protection Organization, Inter-African Phytosanitary Council, North American Plant Protection Organization, Organismo Interacional Regional de Sanidad Agropecuaria, Pacific Plant Protection Organization.

by the Commission. To date, the Commission has set 29 standards.⁹¹ The use of standards provides a way for states to examine and evaluate scientific evidence in plant quarantine in accordance with internationally agreed methods.⁹² However, the standards are not binding on IPPC members. While members are encouraged to take the standards into account, the wording of the convention with regard to their use is not one of compulsion.⁹³

The specific objectives of the 1997 IPPC are to secure “common and effective action to prevent the introduction and spread of pests and diseases of plants and plant products and to promote appropriate measures for their control”.⁹⁴ In addition, the preamble to the convention incorporates an acknowledgement by the contracting parties of the significance of approved principles governing the protection of the environment for the purposes of the IPPC.

States party to the IPPC, undertake to adopt appropriate legislative, technical, institutional and administrative measures in order to implement the objectives of the convention.⁹⁵ As a core obligation, states are expected to establish an official plant protection organization, with responsibilities *inter alia* for issuing certificates relating to

⁹¹ Figure correct as at March 2007.

⁹² Standards also include guidelines dealing with Risk Analysis such as ISPM number 2 ‘Guidelines for Pest Risk Analysis’, ISPM no 11 ‘Pest Risk Analysis for Quarantine Pests Including Analysis of Environmental Risks and Living Modified Organisms’. Produced by the Secretariat of the International Plant Protection Convention FAO Rome 2006.

⁹³ For example, in reference to certification of goods and commodities being transported in international trade, 1997 IPPC, Article V(2)(b) provides that certificates should be completed and issued ‘taking into account’ relevant international standards. Similarly, 1997 IPPC, Article X(4) in dealing generally with standards provides that the contracting parties should ‘take into account’ international standards when undertaking activities related to the IPPC. Nevertheless, the standards are important in promoting inter-regional cooperation in standardizing quarantine measures. See for example Article X(4)(b) of the 1997 IPPC, that refers to ‘harmonized phytosanitary measures’ that link to measures based on international standards.

⁹⁴ 1997 IPPC, Article 1. For a discussion of the work of the IPPC see David Wilson ‘International Reference Organisations and Standards’ in Quarantine and Market Access Forum Proceedings 6-7 September 2000. Department of Agriculture & Forestry-Canberra Australia (2000) 31, 35-7; David G Victor ‘The Sanitary and Phytosanitary Agreement of the World Trade Organization: An Assessment After Five Years’ (2000) 32 *International Law and Politics* 865, 893-5.

⁹⁵ 1997 IPPC, Article 1(1).

consignments;⁹⁶ undertaking risk analyses,⁹⁷ and inspections⁹⁸ as well as undertaking surveillance.⁹⁹ The national plant protection organizations are also responsible for providing information to the IPPC Secretariat on national quarantine regulations and status of pests within the member state.¹⁰⁰

Reporting obligations are characterized by a means of cooperation with respect to provision of information on the occurrence, outbreak or spread of pests.¹⁰¹ The IPPC has set up a web-based system, known as the International Phytosanitary Portal, to facilitate reporting.¹⁰² Yet, one survey has revealed that as few as 20% of states are using the portal.¹⁰³ Reasons for this lack of use include the fact that states are reporting directly to trading partners,¹⁰⁴ or reporting *via* regional plant protections organizations.¹⁰⁵ As the IPPC does not follow up on whether states have complied or provided accurate information,¹⁰⁶ it means that reporting and information exchange activities might not be undertaken effectively by states.

The Convention emphasises preventing the entry, establishment and spread of pests and diseases of plants and to achieve these objectives states have at their disposal a range of quarantine measures,¹⁰⁷ including border controls and certifications of products and commodities for export,¹⁰⁸ inspections, treatments and prohibitions.¹⁰⁹ The convention does not deal separately with deliberate and accidental introductions; however, many of its mechanisms can apply to prevent both types of introductions.

⁹⁶ 1997 IPPC, Article IV(2)(a).

⁹⁷ 1997 IPPC, Article IV(2)(f).

⁹⁸ 1997 IPPC, Article IV(2)(c).

⁹⁹ 1997 IPPC, Article IV(2)(b).

¹⁰⁰ 1997 IPPC, Article IV(2)(b).

¹⁰¹ 1997 IPPC, Article VIII(1)(a).

¹⁰² IPPC – web site is available from <<https://www.ippc.int/IPP/En/default.jsp>> (March 2007)

¹⁰³ *FAO Independent Evaluation of the Workings of the International Plant Protection Convention and its Institutional Arrangements* above n 79, paragraphs 83-107.

¹⁰⁴ *Ibid*, paragraphs 92-94.

¹⁰⁵ *Ibid*.

¹⁰⁶ *Ibid*, paragraph 95.

¹⁰⁷ 1997 IPPC, Article VII(1)(b).

¹⁰⁸ 1997 IPPC, Article V.

¹⁰⁹ 1997 IPPC, Article VII (1)(a)-(d).

For example, risk analysis is a popular way of evaluating deliberate introduction of species, but can also be used to evaluate pathways for their potential to facilitate unauthorized introductions. In the context of the IPPC, risk analysis is known as “pest risk analysis” This is defined as “the process of evaluating biological or other scientific and economic evidence to determine whether a pest should be regulated and the strength of any phytosanitary measures to be taken against it”. A number of standards developed by the Commission on Phytosanitary Measures are devoted to elaborating the processes of pest risk analysis.¹¹⁰ Importantly, these standards apportion risk analysis into its traditional components of risk assessment, risk management and risk communication.¹¹¹ Risk assessment is essentially a scientific process, while risk management can involve consideration of non-scientific elements, such as social value judgments. This gives states flexibility to choose quarantine or phytosanitary measures for a range of reasons, including science or social and policy considerations.¹¹²

Article VII(1) affords states wide latitude to prevent or restrict entry of “regulated pests” into their territories. A pest is defined in the 1997 IPPC as any species or biotype of plants animals or pathogenic agents injurious to plants or plant products.¹¹³ A regulated pest encompasses both “a quarantine pest”, or a “regulated non-quarantine pest”. A quarantine pest is a pest of potential economic importance that is already present, but not

¹¹⁰ These include ISPM number 2 ‘Guidelines for Pest Risk Analysis’, ISPM no 11 ‘Pest Risk Analysis for Quarantine Pests Including Analysis of Environmental Risks and Living Modified Organisms’ above n 92.

¹¹¹ See for example, definition of ‘pest risk assessment’ and ‘pest risk management’ in International Plant Protection Convention ISPM No 5 Glossary of Phytosanitary Terms above n 14; section 2 dealing with ‘Pest Risk Assessment’ and section 3 dealing with ‘Pest Risk Management’ of ISPM no 11 ‘Pest Risk Analysis for Quarantine Pests Including Analysis of Environmental Risks and Living Modified Organisms’. See also discussion Mike Nunn ‘The analytical foundation of quarantine risk analysis’ in Kym Anderson, Cheryl McRae and David Wilson (eds), *The Economics of Quarantine and the SPS Agreement* Centre for International Economic Studies Adelaide and AFFA Biosecurity Australia. (2001)29, 30; Piero Genovesi and Clare Shine, ‘European Strategy on Invasive Alien Species’, Standing Committee of the Convention on the Conservation of European Wildlife and Natural Habitats at Box 1. T-PVS (2003) 7 revised (5 December 2003).

¹¹² The differences between risk assessment and risk management and the ramifications that flow from these differences are discussed further in sections 6.1.2 and 6.1.3 of Chapter 6 of this study.

¹¹³ 1997 IPPC, Article II.

widely distributed and under official control. A regulated non-quarantine pest is a pest other than a quarantine pest that is present on plants for planting and affects the intended use of those plants in an economically unacceptable way.¹¹⁴

In effect, these definitions mean that states may implement measures against species injurious to plants in two situations. First, where those species are already present in the territory of the member, but not widely distributed (quarantine pest); or second, where an injurious species is present on propagating material and has not yet established, but if the pest were to establish would impact detrimentally upon plants or propagating material. It is important to note that in both the definition of a quarantine pest and a regulated non-quarantine pest the impact needs to be economically measurable.¹¹⁵

States are limited in the exercise of these rights by implementing measures that are technically justified,¹¹⁶ that are the least restrictive measures available¹¹⁷ and are applied in a non-discriminatory manner.¹¹⁸ The requirement for technical justification is satisfied where measures are based on risk analysis, or other “comparable examination and evaluation of available scientific information”.¹¹⁹ The latter provision would encompass measures based on international standards and would not appear to be limited to standards developed by the Commission on Phytosanitary Measures. This opens the possibility of using standards and guidelines developed by other organizations, such as the Guiding Principles for the Prevention, Introduction and Mitigation of Impacts of Alien Species that Threaten Ecosystems, Habitats or Species (CBD Guiding Principles).¹²⁰ The requirement for the least restrictive measures

¹¹⁴ 1997 IPPC, Article II.

¹¹⁵ See discussion on this point later in section 6.2.2 of Chapter 6 of this study.

¹¹⁶ 1997 IPPC, Articles VII(2)(a) and VII(3).

¹¹⁷ 1997 IPPC, Article VII(2)(g).

¹¹⁸ 1997 IPPC, Article VI.

¹¹⁹ 1997 IPPC, Article II.

¹²⁰ Guiding Principles for the Prevention, Introduction and Mitigation of Impacts of Alien Species that Threaten Ecosystems, Habitats or Species, adopted April 2003 as part of Decision VI/23 of the Conference of the Parties. Report of the Sixth Meeting of the

reflects the fact that the negotiators of the 1997 IPPC sought to bring the provisions of the IPPC into alignment with developments in international trade.¹²¹ Therefore, concepts such as the non-discriminatory nature of measures have also been incorporated into the IPPC.¹²²

3.3.2 The OIE

Animal regulation is dealt with under the auspices of the Office International des Epizooties (OIE), or the World Organisation for Animal Health. The catalyst for the establishment of the OIE was an outbreak of *rinderpest* in Belgium in 1920. The devastation that this outbreak caused encouraged states to devise a means of preventing the introduction and spread of animal diseases across international boundaries. In 1924, twenty-eight states came together to sign the International Agreement for the Creation of an Office International des Epizooties¹²³ and the OIE, as it is commonly known, was created. The Agreement was posited on two initiatives: first, the need to inform members of outbreaks of disease enabling them to take preventative action; and second, the desirability of having “information on the most effective methods of controlling ... animal diseases”.¹²⁴ Consequently, to this day the OIE focuses on collecting and disseminating information on outbreaks of animal diseases and providing members with guidance on how best to maintain animal health and safety.¹²⁵

Conference of the Parties to the Convention on Biological Diversity, UNEP/CBD/COP/6/20 (23 September 2002).

¹²¹ See website IPPC ‘1997 Revision of the IPPC’. <<https://www.ippc.int/servlet/CDSServlet?status=ND0yNzk4MSY2PWVuJjMzPSomMz c9a29z>> (March 2006). At the time of negotiation of the 1997 IPPC, states recognised that trade in agricultural commodities was becoming freer. Hence, states were keen to bring the convention in line with developments in international trade law. The relationship of the 1997 IPPC to other treaty systems is broached under Article I (2) that provides the implementation of the 1997 IPPC is ‘without prejudice to obligations assumed under other international agreements’.

¹²² 1997 IPPC, Article VI(1)(a).

¹²³ For discussion of role of OIE see M Cooper and Alison Rosser, ‘International Regulation of Wildlife Trade: Relevant Legislation and Organizations’ (2002) 21 *Scientific and Technical Review Office International des Epizooties* 103; D Wilson *International Reference Organisations and Standards* above n 94, 32-35; David G Victor, above n 94, 892-3.

¹²⁴ Today the mandate of the OIE extends to providing information on animal diseases that can be transmitted to humans B Vallat, ‘Welcome to the OIE’. <http://www.oie.int/eng/oie/organisation/anc-en_welcome.htm> (June 2007). .

¹²⁵ Article 4 of the *Organic Statute of the International Office for Dealing with Contagious Diseases of Animals*. The organic statute is an Annex to the 1924 International Agreement for the Creation at Paris of an International Office for Dealing

The apex of the institutional arrangement of the OIE is the International Committee of the OIE (the OIE Committee).¹²⁶ The OIE Committee comprises all members of the OIE¹²⁷ and meets at least once a year.¹²⁸ Its functions include the adoption of international standards for animal health¹²⁹ and its operations are supported by a number of commissions, including specialist technical commissions¹³⁰ and five regional commissions.¹³¹ The latter focus on local needs, with the aim of strengthening “surveillance and control of animal diseases” in localized areas.¹³²

The role of the OIE as a repository and transmitter of information on animal diseases¹³³ is reinforced by obligations on states to notify the OIE of outbreaks of specified animal diseases.¹³⁴ By their very nature, these requirements mean that states need to monitor their territory for outbreaks

with Contagious Diseases of Animals; see discussion FAO *Multilateral Trade Negotiations on Agriculture, A Resource Manual* FAO Rome (2000) section 6.6. Available <<http://www.fao.org/docrep/003/x7354e/x7354e00.HTM>> (June 2007).

¹²⁶ 1924 *International Agreement for the Creation at Paris of an International Office for Dealing with Contagious Diseases of Animals, and Annex*, Article 6.

¹²⁷ See FAO *Multilateral Trade Negotiations on Agriculture, A Resource Manual* above n 127 generally section 6.2

¹²⁸ 1924 *International Agreement for the Creation at Paris of an International Office for Dealing with Contagious Diseases of Animals, and Annex*, Article 7. See FAO *Multilateral Trade Negotiations on Agriculture, A Resource Manual* above n 127.

¹²⁹ These functions especially relate to international trade in animals and animal products. See OIE ‘The International Committee’ <http://www.oie.int/eng/oie/organisation/en_CI.htm> (July 2006).

¹³⁰ These include The Terrestrial Animal Health Standards Commission (‘Code Commission’), the Scientific Commission for Animal Diseases (‘Scientific Commission’), the Biological Standards Commission (‘Laboratories Commission’), and the Aquatic Animal Health Standards Commission (Aquatic Animals Commission). These specialist commissions use current scientific information to revise the OIE’s international standards. For a short discussion on the operation of these commissions see OIE Fact sheet ‘Specialist Commissions’ 18-Oct-2006 Available <http://www.oie.int/eng/oie/organisation/en_CS.htm> (July 2007).

¹³¹ The regional offices are for the areas of: Africa, The Americas, Asia, The Far East, Oceania, Europe and the Middle East.

¹³² See explanation OIE web site <http://www.oie.int/eng/OIE/organisation/en_RR.htm> (July 2007).

¹³³ 1924 *International Agreement for the Creation at Paris of an International Office for Dealing with Contagious Diseases of Animals, and Annex* Article, 4(a).

¹³⁴ This role of the OIE is set out in Article 5 of the Annex to the 1924 *International Agreement for the Creation at Paris of an International Office for Dealing with Contagious Diseases of Animals*. A list of animal diseases is maintained by OIE and at the time of writing available from <http://www.oie.int/eng/maladies/en_classification2007.htm?e1d7> (July 2007). Lists of diseases are also found in the *Terrestrial Animal Health Code 2007* 16th Edition OIE Paris (2007) Article 2; and the *Aquatic Animal Health Code 2007* 10th Edition OIE Paris (2007) Article 2. These lists may be revised from time to time by the OIE Committee.

of disease and pestilence.¹³⁵ The approach of the OIE is very much a “hands-on” one designed to facilitate rapid response to an outbreak of disease or pestilence.¹³⁶ Where necessary, the OIE has authority to contact state veterinary authorities directly.¹³⁷ Information gathered by the OIE is distributed by a number of means, including a weekly publication called “*Disease Information*”. This is available every Thursday afternoon from the web site of the OIE¹³⁸ and contains information on emergency notifications as well as declarations of disease-free status by states. In addition, a quarterly Bulletin provides further information on the progress of contagious diseases of animals and statistics concerning the disease position among domestic animals throughout the world.¹³⁹

The second major role of the OIE is to formulate guidelines for the control of animal diseases. These functions are affected by way of instruments such as the *Aquatic Animal Health Code 2007* and the *Terrestrial Animal Health Code 2007*. The Codes themselves are in the form of standards, guidelines and recommendations formulated by consensus of the OIE Committee. In essence, the use of these codes standardizes health and quarantine regulations for animals and animal products for OIE member states.¹⁴⁰

¹³⁵ For discussion on monitoring and surveillance see K Ben Jebara, ‘Surveillance, Detection and Response: managing emerging diseases at national and international levels’ (2004) 23 *Scientific and Technical Review Office International des Epizooties* 709.

¹³⁶ Ibid, 710, 712.

¹³⁷ See generally Chapter 1.2.1 *Aquatic Animal Health Code 2007*, above n 134 and *Terrestrial Animal Health Code 2007*, above n 134, Chapter 1.2.1.1.

¹³⁸ At the time of writing this was available from <http://www.oie.int/eng/info/hebdo/A_INFO.HTM?e1d11> (July 2007)

¹³⁹ Article 10 of the Annex to the 1924 Agreement establishing the OIE provides for the establishment of the Bulletin. Until 2003 the bulletin was published once a month. However, in 2003 the format and style of the Bulletin was modernized and it commenced publication quarterly and in three languages. See B Vallat, Editorial comment on the New OIE Bulletin February 2003 <http://www.oie.int/eng/edito/en_edito_feb03.htm> (July 2007) Bulletins are available online <http://www.oie.int/eng/publicat/en_bulletins.htm> (July 2007), Additional means of providing information include the *World Animal Health* an annual publication based on written reports submitted by states and the journal *Scientific and Technical Review* published quarterly. See discussion on the latter in *FAO Multilateral Trade Negotiations on Agriculture, A Resource Manual* above n 127, section 6.7.

¹⁴⁰ *FAO Multilateral Trade Negotiations on Agriculture, A Resource Manual*, above n 127, section 6.9.

The Codes commence with a definition section¹⁴¹ and then move to a chapter on general obligations for exporting and importing states.¹⁴² Importing states are encouraged to use OIE standards, although higher standards may be adopted where these are based on risk analysis.¹⁴³ In addition, the codes provide detailed procedures for implementing risk analyses.¹⁴⁴ Risk analysis is defined in the Codes as a process composed of hazard identification, risk assessment, risk management and risk communication.¹⁴⁵ The importation of animals brings with it the likelihood of introducing diseases, therefore risk analysis is crucial to the design and implementation of measures preventing entry of disease.¹⁴⁶ An important point with respect to quarantine measures is that they should not discriminate against imports. Therefore, where a disease or pathogen is already present in the importing state and not subject to an official control programme, the importing state should neither require the disease or pathogen to be excluded, nor should the shipment to be treated for that disease or pathogen.¹⁴⁷ For its part, an exporting state should provide details on diseases and pests in its territory and have sufficient institutional and technical expertise to be able to issue export certificates in accordance with the importing state's requirements.¹⁴⁸ Indeed, the need to have adequate legal, institutional and resource facilities is generally implicit in member's obligations to carry out inspections and gather information to be remitted to the OIE.¹⁴⁹

¹⁴¹ *Terrestrial Animal Health Code 2007*, above n 134, Chapter 1.1.1; *Aquatic Animal Health Code 2007*, above n 134 Article 1.1.

¹⁴² *Terrestrial Animal Health Code 2007*, above n 134, Article 1.2.1; *Aquatic Animal Health Code 2007*, above n 134, Article 1.3.1.

¹⁴³ *Terrestrial Animal Health Code 2007*, above n 134, Article 1.2.1.2. *Aquatic Animal Health Code 2007*, above n 134, Article 1.3.1.2.

¹⁴⁴ *Terrestrial Animal Health Code 2007*, above n 134, Article 1.3; *Aquatic Animal Health Code 2007*, above n 134, Article 1.4.

¹⁴⁵ *Terrestrial Animal Health Code 2007*, above n 134, Article 1.1.1.1. *Aquatic Animal Health Code 2007*, above n 134, Article 1.1.1.1.

¹⁴⁶ *Terrestrial Animal Health Code 2007*, above n 134, Article 13.1.; *Aquatic Animal Health Code 2007*, above n 134, Article 1.4.1.1.

¹⁴⁷ *Terrestrial Animal Health Code 2007*, above n 134, Article 1.2.1.2.(2). In addition if a disease is not OIE listed then its exclusion needs to be based on risk analysis. *Aquatic Animal Health Code 2007*, above n 134, Article 1.3.1.2. (2).

¹⁴⁸ *Terrestrial Animal Health Code 2007*, above n 134, Article 12.1.3; *Aquatic Animal Health Code 2007*, above n 134, Article 1.3.1.3.

¹⁴⁹ See generally *Terrestrial Animal Health Code 2007*, above n 134, Articles 1.2.1.2(4), 12.1.3(2) and 1.2.1.3(3); *Aquatic Animal Health Code 2007*, above n 134, Articles

The codes also recommend procedures that both exporting and importing states are advised to implement, such as examining animals for signs of diseases and the issue of health certificates by the “Veterinary Administrations” of each state.¹⁵⁰ Moreover, the codes provide model certificates to assist states in achieving uniform regulation.¹⁵¹ In case of outbreaks of disease, the codes also recommend that states formulate contingency plans in readiness for rapid response.¹⁵²

3.3.3 Commonalities in the 1997 IPPC and OIE

The provisions of the 1997 IPPC, the *Aquatic Animal Health Code 2007* and the *Terrestrial Animal Health Code 2007* (the OIE Codes) have much in common. To start with they essentially aim at avoiding the introduction of pests and diseases from one state to another especially via international trade.¹⁵³ Preventative mechanisms include certifications by the exporting state that a shipment is free of pests and diseases, border controls involving inspections, treatment and prohibitions, all undertaken in a framework of international collaboration and cooperation.

Another important feature of the IPPC and the OIE Codes is that states need to justify their measures. Without making any particular method mandatory, justification may be provided by the use of standards, or by conducting risk analysis. Risk analysis will be warranted where states wish to implement measures higher than those found in standards or Codes. In this respect, states are given a relatively high degree of freedom and discretion to choose what matters they wish to take into account. The

1.3.1.2(3), 1.3.1.3(3) and 1.3.1.3(4) 1.6.1.2.

¹⁵⁰ *Aquatic Animal Health Code 2007*, above n 134, Articles 1.3.1 and 1.3.2; *Terrestrial Animal Health Code 2007*, above n 134, Article 1.2.2. See also standard form certificates Aquatic Animal Health Certificates of *Aquatic Animal Health Code 2007*, above n 134, Part 4. Also *Terrestrial Animal Health Code 2007*, above n 134, Part 4.

¹⁵¹ *Aquatic Animal Health Code 2007*, above n 134, Articles 1.3.1 and 1.3.2; *Terrestrial Animal Health Code 2007*, above n 134, Article 1.2.2. See also standard form certificates Aquatic Animal Health Certificates *Aquatic Animal Health Code 2007*, above n 134, Part 4. Also *Terrestrial Animal Health Code 2007*, above n 134, Part 4.

¹⁵² *Aquatic Animal Health Code 2007*, above n 134, Article 1.6.

¹⁵³ See for example, the introductory explanation to the *Terrestrial Animal Health Code 2007* above n 134 available at <http://www.oie.int/eng/normes/en_mcode.htm?e1d10> (July 2007).

strongest restrictions stem from the fact that measures should not discriminate against imported products merely because these products can introduce pests and diseases that are already present and not regulated in the importing states.

Under both the IPPC¹⁵⁴ and the OIE¹⁵⁵ states are obliged to provide and exchange information including pest and disease status within the territory of the member. To detect outbreaks of disease and pestilence and provide this information states need to undertake monitoring and surveillance. Monitoring includes field inspections and surveys carried out at varying geographical locations and can in fact serve a two-fold purpose. First, it may be regarded as a precautionary measure, to be carried out regularly to determine the nature and extent of existing pests. Second, once an outbreak has occurred, it is essential in determining the magnitude of infestation, so that appropriate eradication and containment measures may be implemented. In general, monitoring and surveillance are important because even in the most stringent of quarantine regimes, and even with the best of intentions, unwanted species will still gain entry. People may try to smuggle goods, inappropriate decisions may be made with respect to deliberate introductions, and accidental introductions may accompany deliberate ones.

Finally, the practical operation of the IPPC and OIE depends on states having adequate institutional and legislative arrangements to give effect to each treaty. This requirement is doubly important because neither the IPPC nor the OIE directly enforce the provisions of the treaties, codes or standards.¹⁵⁶ It means that states also need to have adequate resources to monitor, provide information and implement appropriate measures – all of which are essential to effective quarantine regulation.

¹⁵⁴ For example, 1997 IPPC, Articles IV(2)(b), IV(2)(c) and IV(2)(d) indicate that a state's national plant protection organisation needs to carry out inspections with the aim of reporting and controlling outbreaks of plant diseases and pests.

¹⁵⁵ The OIE has set up an international alert mechanism whereby a notifiable incident is reported to the OIE and the information is then disseminated. This enables member countries to act immediately. <http://www.oie.int/overview/A_obj.htm> (July 2007).

¹⁵⁶ FAO *Multilateral Trade Negotiations on Agriculture, A Resource Manual*, above n 127, section 6.3.

3.3.4 The Essential Elements of Quarantine

From the foregoing discussion we can draw out the essential elements of quarantine. First and foremost, the emphasis should centre on measures to prevent the entry and establishment of pests and diseases. Importing states need to be clear about those pests and diseases they wish to exclude and also need to have clear strategies in place to assist in the decision-making process. Part of this process should include consideration of the fact that introductions may be made deliberately and/or accidentally.

For example, standards can be developed that target individual species or commodities as well as pathways of introduction. The latter could include activities such as tourism and the trade in pets and live food. Where appropriate, states should base their measures on international standards. Otherwise, states can carry out their own evaluations, based on methods such as risk analysis.¹⁵⁷ As with standards, risk analysis can assist in making decisions on deliberate and accidental introductions, which in the latter case would involve targeting pathways most likely to introduce unauthorized species.¹⁵⁸

A preventative quarantine regime is most effective when implemented along a “continuum of quarantine”.¹⁵⁹ This is a concept that expands the notion of quarantine from border controls in the importing state to inspections and certifications by the exporting state and post-import monitoring and surveillance by the importing state.

The first stage in this continuum of quarantine commences with activities in the exporting state. There, inspections, treatments and certifications at

¹⁵⁷ The use of risk analysis can also be augmented by additional evaluation methods, including environmental impact assessment. See discussion later in section 6.1 of Chapter 6 of this study.

¹⁵⁸ Jeffrey A McNeely, Harold A Mooney, Laurie E Neville, Peter Johan Schei and Jeffrey K Waage, (ed) *Global Strategy on Invasive Alien Species* IUCN Gland Switzerland and Cambridge UK in collaboration with the Global Invasive Species Programme (GISP) (2001) paragraph 6.1.

¹⁵⁹ Department of Primary Industries and Energy, Australian Quarantine – A Shared Responsibility- The Government Response. August-July (1997) <www.dpie.gov.au/dpie/committee/quarantine/report/govtrp1.html> (November 2007) 3-4.

points of transport¹⁶⁰ help to ensure that shipments and consignments comply with the quarantine regimes of the importing state. For example, where the importing state has undertaken a risk analysis, part of the conditions for allowing importations would include compliance with risk management measures. Although inspections and testing can be carried out at the border of the importing state, executing pre-export inspections, treatments and certifications has the advantage of pushing back the quarantine border and lessening the chances of accidental introductions.¹⁶¹ However, pushing back the quarantine border calls for international collaboration and cooperation, as states cannot enact quarantine legislation to apply in the jurisdiction of another state.¹⁶² The design and implementation of international standards are, in fact, manifestations of international collaboration and cooperation in quarantine regulation.

The second stage in the continuum of quarantine relates to border controls applied by the importing state. Effective border controls should ensure that shipments comply with conditions imposed by prior evaluations and assessments and should also detect and intercept those introductions that breach quarantine regulations. This means that evaluations, whether by way of international standards, or risk analysis, are a vital foundation of quarantine regimes. For it is at this stage of regulation that decisions are made on what species, commodities and goods will be permitted entry; and what type of pathways and shipments will be targeted for inspection and treatment. It is also important to bear in mind that importing states have a range of measures at their disposal, including inspections, treatments and prohibition on importation.¹⁶³

¹⁶⁰ 1997 IPPC, Article V; *Terrestrial Animal Health Code 2007*, above n 134, Article 12.1.3; *Aquatic Animal Health Code 2007*, above n 134, Article 1.3.1.3; see also the example of Article 1, The Law of the People's Republic of China on the Entry and Exit Animal and Plant Quarantine.

¹⁶¹ Carolyn Tanner and Mike Nunn, 'Australian Quarantine Post the Nairn Review' (1998) 42 *Australian Journal of Agricultural and Resource Economics* 451, 452.

¹⁶² Joint Committee of Public Accounts and Audit, Parliament of Australia, *Report 394, Review of Australia's Quarantine Function 2003*, Commonwealth of Australia Canberra (2003) paragraph 3.51.

¹⁶³ 1997 IPPC, Article VII(1)(a).

The third stage in the continuum of quarantine extends to post-importation activities, such as monitoring, surveillance containment and eradication. The preventative component of quarantine regimes not only incorporates preventing unwanted species from gaining entry, but also extends to preventing unwanted species from establishing. Therefore, monitoring and surveillance are important to assist in tracking the establishment and spread of unwanted species. In addition, monitoring and surveillance facilitate the collection of information on whether deliberate introductions have gone wrong, whether species have established/become invasive and whether species are gaining entry accidentally. This information is not only essential for compliance with treaty obligations,¹⁶⁴ but also helps to build a data base on the harmful characteristics of unwanted species. In addition, monitoring and surveillance helps regulators make decisions about where to direct measures and resources. In this respect, it is important to keep in mind that it is a practical impossibility for quarantine regimes to prevent all introductions. Therefore, the use of monitoring and surveillance assists regulators to target eradication, containment and control measures once a source of disease or pestilence has been detected.¹⁶⁵

Nevertheless, prevention is still considered the optimal management option. In effect, it allows time for states to “catch up”. By reducing introductions, states can ultimately reduce continuous expenditure on eradication and containment measures and allocate resources more beneficially between eradication and preventative mechanisms. This in turn fosters the development of a proactive quarantine regime that is not confined to dealing with disease and pestilence once they have entered and established.

¹⁶⁴ 1997 IPPC, Articles IV 2(b) and VIII(1)(a).

¹⁶⁵ However, preventing introductions is still considered the best management option. See, for instance, the CBD Guiding Principles, above n 120, Guiding Principle 7 that advocates the use of quarantine laws as a means of stopping the introduction and spread of IAS

Finally it ought to be noted that no state would be able to put the continuum of quarantine into practice without adequate legal, administrative and financial resources. An appropriate legislative base is essential for implementing treaty obligations and providing a foundation for effective regulation. Likewise, without administrative and financial resources states would not be able to gather information, build data bases of knowledge, carry out risk analyses, impose border controls and undertake post-import monitoring, eradication and control measures.

3.4 QUARANTINE AND THE PROTECTION OF BIODIVERSITY FROM IAS

Thus far, quarantine has been discussed in the context of its traditional role, the need to protect farm animals, crops, plants, human health and various economic interests. However, as discussed in Chapter 2, international law now imposes obligations on states to protect biodiversity at large, including from the deleterious effects of invasive alien species.¹⁶⁶ Quarantine regulation, with its emphasis on preventing introductions of unwanted or harmful species, clearly has an essential role to play in the protection of biodiversity from IAS. The question is whether international and national quarantine regimes are equal to this task.

3.4.1 Current International Quarantine Regimes and the Protection of Biodiversity from IAS

While tight quarantine regimes would have prevented many of the problems that states currently face with respect to IAS, quarantine regimes largely represent a reservoir of unfulfilled potential. The discussion may be conveniently organized into two topics: the coverage of these regimes and the use of standards.

¹⁶⁶ See Section 2.3 of Chapter 2 of this study.

To start with, the international regime does not cover all species. The OIE *Terrestrial Animal Health Code 2007*, for example, defines animals as “a mammal, bird or bee”.¹⁶⁷ This definition does not include terrestrial species such as snakes, turtles, frogs and other reptiles. Similarly, the OIE *Aquatic Animal Health Code 2007* does not cover all aquatic animals. It covers “fish, molluscs and crustaceans originating from aquaculture establishments or removed from the wild, for farming purposes, for release into the aquatic environment or for human consumption”.¹⁶⁸ Hence species such as sponges, jellyfish and coral are not part of the purview of the OIE. Moreover, an aquatic animal is also limited to species being farmed, or intended for human consumption, and does not otherwise include species naturally found in the wild. Finally, the OIE codes emphasise prevention of disease in terrestrial and aquatic animals, but do not broach the situation where an animal could be healthy but itself be the IAS.¹⁶⁹

The coverage of the IPPC is broader and generally incorporates all pests and diseases of the plant kingdom. The provisions of the convention, for example, are not limited to cultivated plants and also include plants growing naturally in the wild. In addition, the IPPC countenances that one plant may be a pest of other plants and that an animal may also be a pest of plants. However, the IPPC does not deal with invasive plants such as Paterson’s curse that might not be a pest to plants, but might be a pest to animals; nor does the IPPC deal with the fact that plants and plant products might introduce insects and pests, such the red fire ant, that could

¹⁶⁷ *Terrestrial Animal Health Code 2007*, above n 134, Article 1.1.1.1. Some portions of the standard however can be adapted for other uses. Australia, for example, has adapted procedures designed for birds, to use on crocodiles. Consequently, the Animal Health Certificate of the *Terrestrial Animal Health Code 2007* designed for birds (*Animal Health Certificate for Day-Old Chicks, Turkey Poults, other Newly-Hatched Avian Species and Eggs*) has been used by Australia to impose risk management measures on crocodiles. See AQIS, *Import Risk Analysis Paper for Live Crocodilians and their Eggs*, AQIS Canberra Australia (2000) 42.

¹⁶⁸ *Aquatic Animal Health Code 2007*, above n 134, Article 1.1.1.1.

¹⁶⁹ CBD Note By the Executive Secretary, ‘Invasive Alien Species, a Review of the Efficiency and Efficacy of Existing Legal Instruments Applicable to Invasive Alien Species’ UNEP/CBD/SBSTTA/6/INF/5 (26 February 2001) paragraph 66. Many examples of these can be found including rabbits, goats, foxes, pigs, buffaloes and feral cats. See discussion generally in sections 1.1.1 of Chapter 1 of this study.

be injurious to other insects or animals. These gaps in coverage mean that the current international regime does not focus on all species that are potential IAS. Consequently, there are many species that may go unregulated.

Other likely problems stem from the standards generated by the regimes. Although the use of standards can bring important benefits by way of harmonization of quarantine measures, the protection of the environment and native biodiversity are not the subject of specific standards. International Standard on Phytosanitary Measures number 11, (ISPM 11) *Pest Risk Analysis for Quarantine Pests Including Analysis of Environmental Risks and Living Modified Organisms* issued by the IPPC, sets standards for pest risk analysis and contains three annexes that clarify the use of ISPM 11 for environmental protection. Annex 1 makes it clear that the provisions of the IPPC extend to the protection of wild flora against direct and indirect pests and that ISPM can be adapted for analysing environmental risks posed by pests of plants. Annexes 2 and 3 deal with risk analyses for living modified organisms. ISPM 11 is being used by some members to develop risk analysis for environmental protection.¹⁷⁰ However, the environment is not the focus of ISPM 11 and the danger is that for some states environmental matters will only be taken into consideration, if at all, as a by-product of pest risk analysis conducted for other reasons. In addition, although ISPM 11 covers the evaluation of indirect pests of plants, these “secondary pests” can be problematic to assess because many national plant protection organizations lack the expertise and knowledge to undertake evaluation of secondary pests.¹⁷¹

¹⁷⁰ See generally Gritt Schrader, ‘Adaptation of Regional Pest Risk Assessment to the Revised ISPM 11’ in *Identification of Risks and Management of Invasive Alien Species Using the IPPC Framework*. Proceedings of a workshop in Braunschweig, Germany 22-26 September 2003, Secretariat of the IPPC FAO (2005) 110.

¹⁷¹ FAO ‘Information Digest on section 4’ in *Identification of Risks and Management of Invasive Alien Species Using the IPPC Framework* Proceedings of a workshop in Braunschweig, Germany 22-26 September 2003, Secretariat of the IPPC FAO (2005) 89; see generally Carolyn Harper and David Zilberman, ‘Pest Externalities from Agricultural Inputs’ (1989) 71 *American Journal of Agricultural Economics* 692.

Another feature of standards is that they do not adequately cover pathways of introduction responsible for accidental introductions. At present standards deal with a few pathways, such as wood packaging,¹⁷² but do not regulate other pathways, such as the trade in tourism, pets and live food that are notorious for introducing some of the worst invasive species.¹⁷³ Additionally, by their nature standards are formulated in broad terms and may not necessarily be suitable for local conditions. Australia, for instance, has indicated a number of concerns with regard to classification of fish diseases within the OIE. In some instances, diseases that may be significant to Australia are not regarded as a serious threat elsewhere, because the diseases are endemic to Europe and/or North America.¹⁷⁴ This means that standards that exist for these diseases will not be totally appropriate to protection of Australian biodiversity.

States can of course conduct their own risk analyses that take local conditions and biodiversity considerations into account. The standards set by the OIE and IPPC are not mandatory and both organizations afford states flexibility in the way that risk analysis is carried out and in the choice of measures.¹⁷⁵ However, the effectiveness of risk analysis, as with other areas of quarantine regulation, depends on states and how and whether they use quarantine to protect biodiversity.¹⁷⁶

3.4.2 State Practice in Quarantine Regulation for the Protection of Biodiversity from IAS

¹⁷²International Standards for Phytosanitary Measures ISPM No. 15 (2002) Guidelines for regulating wood packaging material in international trade (with Modifications to Annex 1 2006) FAO (2006).

¹⁷³ See discussion in section 1.2.2 of Chapter One of this study; see also C Shine 'Invasive Species in an International Context: IPPC, CBD, European Strategy on Invasive Alien Species and Other Legal Instruments' (2007) 37 *OEPP/EPPO Bulletin* 103, 108.

¹⁷⁴ Senate Standing Committee on Rural and Regional Affairs and Transport, Parliament of Australia, *An Appropriate Level of Protection. The Importation of Salmon Products* 2000, Commonwealth of Australia (2000) paragraph 6.34.

¹⁷⁵ 1997 IPPC, Article VI.

¹⁷⁶ It also depends on the rules of international trade law regime. These are discussed in Chapters 4, 5 and 6 of this study.

An examination of state practice in quarantine regulation reveals at least four trends that demonstrate wide variations in the use of quarantine regulation to protect biodiversity from IAS. Equally, the examination reveals varying degrees of efficacy in the implementation of those quarantine regimes.¹⁷⁷

3.4.2.1 Trend one: the focus on economic interests

The first trend is the tendency to focus quarantine measures on species that damage economic interests and activities.¹⁷⁸ Although most states have some quarantine laws in place,¹⁷⁹ in many cases these laws are largely geared towards detecting and intercepting species harmful to agriculture and farming.¹⁸⁰ In Armenia, for instance, regulation is limited to the agricultural sector and is implemented against agricultural pests by the State Agency on Plant Quarantine of the Ministry of Agriculture at customs points. Eradication and control activities are also limited to agro-ecosystems in conjunction with normal pest control mechanisms.¹⁸¹ A similar situation occurs in Tajikistan,¹⁸² where, rather than preventing entry of the full range of IAS, quarantine laws focus on imported seeds and nursery stock. As IAS are varied and found in all ecosystems, regimes

¹⁷⁷ See discussion, Convention on Biological Diversity SBSTTA 'Note By The Executive Secretary, Invasive Alien Species, a Review of the Efficiency and Efficacy of Existing Legal Instruments Applicable to Invasive Alien Species' above n 169 at paragraph 55.

¹⁷⁸ Ibid.

¹⁷⁹ See for example, Article 4 of the *Law of the Kyrgyz Republic on 'Plant Quarantine'*, Article 9 of the *Law of the Kyrgyz Republic on 'Animal Kingdom'* and Article 17 of the *Law of the Kyrgyz Republic on 'Fishery'*. These articles prohibit the import, export, release accommodate and acclimatize animals able to cause damage to the wildlife objects inhabiting the territory of the republic. *Third National Report to the Convention on Biological Diversity* 2005 at 41-42.

¹⁸⁰ In Cambodia, see for example Notification no 5938 dated December 25 2003 on Prohibition of Introduction for farming of *Trey Chap* into the country. Cambodia, *Third National Report to the Convention on Biological Diversity* (May 2006), 89. *Trey Chap* is a turbot-like fish species; the Sub-Decree on Phytosanitary Inspection (2003) Number 15 OR NOR KROR BOR KOR targets the protection of crops. The decree is available from: <https://www.ippc.int/cds_upload/1115267545020_PQ_S.Decree_English_.pdf>

(March 2007) ; In Uganda, the crop protection department under Ministry of Agriculture, Animal Industry and Fisheries has developed the *Plant Protection Act*. In furtherance of the objectives of this legislation the crop protection department has plant inspectors located at over 25 entry points throughout the country. See Uganda, *Third National Report to the Convention on Biological Diversity* (January 2006) 92.

¹⁸¹ Armenia, *Third National Report to the Convention on Biological Diversity* (April 2006) 110.

¹⁸² Tajikistan, *Third National Report to the Convention on Biological Diversity* (2006) 80-81.

that focus on one or two sectors cannot detect and regulate IAS that impact on biodiversity in general.

3.4.2.2 Trend two: lack of legal and institutional mechanisms

The second trend is the lack of well-developed legal and institutional mechanisms. This deficiency limits the effective implementation of policy and operational components of quarantine practice. As a practical matter, the Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA) of the CBD has pointed out that part of the reason for difficulties in applying quarantine regulation to the environment at large stems from the fact that quarantine systems are usually located in ministries dealing with agriculture, forestry, fisheries, or comparable industries.¹⁸³ In Armenia, for instance, quarantine systems are located within the Ministry of Agriculture.¹⁸⁴ In Uganda, plant protection mainly refers to protection of crops and is carried out under aegis of the Ministry of Agriculture, Animal Industry and Fisheries.¹⁸⁵ Malaysia has established an Alien Invasive Species Committee within the Department of Agriculture and the Department of Fisheries. The functions of the committee concentrate on the identification and management of invasive species that threaten domestic crops and fisheries.¹⁸⁶ The emphasis on quarantine regulation will often reflect the focus of the department charged with its adoption and implementation. Where that department focuses on agriculture and farming quarantine, regulation may emphasise agriculture and farming at the expense of protecting biodiversity in general.¹⁸⁷

¹⁸³ Convention on Biological Diversity SBSTTA 'Note By The Executive Secretary, Invasive Alien Species, a Review of the Efficiency and Efficacy of Existing Legal Instruments Applicable to Invasive Alien Species' above n 169 at paragraph 106

¹⁸⁴ Armenia, *Third National Report to the Convention on Biological Diversity* (April 2006) 110.

¹⁸⁵ Uganda, *Third National Report to the Convention on Biological Diversity* (January 2006) 92.

¹⁸⁶ Malaysia, *Third National Report to the Convention on Biological Diversity*, (undated) 88.

¹⁸⁷ This may not always be the case. In Australia, for example, Biosecurity Australia and AQIS, the Australian Quarantine Inspection Service are located within the Department of Agriculture, Fisheries and Forestry, yet Australia's quarantine system can protect biodiversity. See Discussion in section 3.5.1 of this Chapter.

As a legal matter, laws establishing quarantine regimes are not always clear that quarantine can also be used to protect the general environment. In China, for example, *The Law of the People's Republic of China on the Entry and Exit Animal and Plant Quarantine* states:

This law is formulated for the purpose of preventing infectious or parasitic diseases of animals, diseases, insect pests and weeds dangerous to plants, and other harmful organisms (hereinafter referred to, for short, as diseases, insect pests and harmful organisms) from spreading into or out of the country, protecting the production of agriculture, forestry, animal husbandry and fishery as well as human health, and promoting the development of foreign economic relations and trade.¹⁸⁸

This description refers to quarantine in terms of outcomes which include the prevention of the spread of diseases, insect pests and harmful organisms, yet there is no specific reference to the environment, or biodiversity. Indeed, the reference to the “development of foreign economic relations and trade” may be seen as a limiting factor that excludes the environment, unless it is seen in terms of foreign economics and/or trade.

Laws may also be vague, inadequate, implemented ineffectually, or not well enforced. Many states, for example, lack the legal framework and knowledge base with which to identify actual or potential IAS. Sweden, for example, reports that it does not have the protocols needed to implement “enhanced risk assessments of certain taxonomic groups, [and] pathways of introduction”.¹⁸⁹ Similarly, in the Bahamas, evidence suggests that while laws have been enacted requiring permits for importation of plants and animals, these laws require strengthening.¹⁹⁰ By way of illustration, major land developments must undergo an environmental impact assessment including obtaining a permit for plants

¹⁸⁸ Chapter 1, Article 1 *Law of the People's Republic of China on the Entry and Exit Animal and Plant Quarantine*. 1991 Available <<http://www.mfa.gov.cn/eng/wjb/zzjg/jks/jkxw/t208625.htm>> (March 2007).

¹⁸⁹ Sweden's concern at the action of IAS led it to commission three reports in 1994, 1997 and 1999, which have been published by the Swedish Environmental Protection Agency. See discussion Sweden, - country report *Third National Report to the Convention on Biological Diversity* (undated) 114.

¹⁹⁰ The Bahamas, *Third National Report to the Convention on Biological Diversity* (undated) 90.

used in landscaping. Yet landscaping and/or importation of plants are carried out by local landscapers, with a number of unauthorized species having gained entry in these states.¹⁹¹ Moreover, with no inspections being carried out at either Nassau, or Freeport Container Port,¹⁹² many “hitchhikers” are accidentally introduced by way of transport in container traffic. In other states, such as the Philippines,¹⁹³ practical difficulties in controlling unauthorized introduction of species may arise because of the geographic configuration of the state. As an archipelago, the sheer number of islands and length of coastline make it impractical to police and enforce border controls in every location.

Reviews of alien species undertaken in Namibia¹⁹⁴ and the United Kingdom¹⁹⁵ also note that lack of legal and institutional mechanisms in quarantine laws is problematic in IAS regulation.¹⁹⁶ The *Review from Namibia* notes that until 1984 Namibia had neither a national policy with respect to IAS, nor quarantine regulation to prevent the entry of IAS. “Anything that was permissible in the Republic of South Africa was also acceptable in the then, South West Africa”.¹⁹⁷ Although some import permits were necessary, little thought or evaluation was given before permits were issued. Despite general agreement that import mechanisms needed strengthening, this has yet to be reflected in subsequent practice.¹⁹⁸ The threat to biodiversity that inadequate quarantine can bring is

¹⁹¹ Ibid.

¹⁹² Ibid.

¹⁹³ Philippines, *Third National Report to the Convention on Biological Diversity* (undated), 97.

¹⁹⁴ Shirley Bethune, Mike Griffin and Dave Joubert, *National Review of Invasive Alien Species Namibia* Prepared for the Directorate of Environmental Affairs, Ministry of Environment and Tourism Windhoek (2004).

¹⁹⁵ Department for Environment Food and Rural Affairs (DEFRA) ‘*Review of Non-Native Species Policy*’ Report of the Working Group. DEFRA Publications London (2003). Available

¹⁹⁶ See also other reviews, K Stokes, K O’Neill and R McDonald, *Invasive Species in Ireland* Report to Environment and Heritage Service and National Parks and Wildlife Service by Quercus, Queens University, Environment & Heritage Service, Belfast and National Parks & Wildlife Service, Dublin (2006); Rüdiger Wittenberg (ed) *An Inventory of Alien Species and Their Threat to Biodiversity and Economy in Switzerland* CABI Bioscience Switzerland Centre report to the Swiss Agency for Environment, Forests and Landscape (SAEFL) (2005).

¹⁹⁷ Shirley Bethune, Mike Griffin and Dave Joubert, above n 194, 42.

¹⁹⁸ Ibid.

illustrated by the importation into Namibia of the South African impala, also known as the common impala. The common impala interbreeds with the Namibian black-faced impala and the importation of the common impala has been described as a “well-known conservation disaster”.¹⁹⁹ Had the common impala been evaluated appropriately, a robust quarantine system would have denied the species entry.

In the United Kingdom, most imported species are not evaluated for their potential to threaten biodiversity and do not undergo risk analysis.²⁰⁰ Yet a risk analysis is vital to preventing entry of IAS, for it is at this point that quarantine systems exercise a choice as to whether or not a species will be permitted entry. It is also at this point that environmental concerns, such as the invasive qualities of a species and its impact on biodiversity, are factored in.²⁰¹

3.4.2.3 Trend three: partial implementation of the continuum of quarantine

The third trend is that the implementation of strong preventative mechanisms by using a continuum of quarantine is often only partially adopted. As noted above, the continuum of quarantine involves not only border controls, but also pre-import controls; and, post-import monitoring and surveillance. Post-import monitoring and surveillance are vital in assisting decision-makers to assess the quality and efficacy of their decisions and in providing information on whether unauthorized species are gaining entry. Overall, they help to improve the risk analysis process and also help to build the information base on IAS. Nevertheless, post-import measures are often lacking. In Malaysia, for example, border controls feature prominently in quarantine procedures by the use of permits supplemented by inspections at the border. However, post import

¹⁹⁹ Ibid, 43.

²⁰⁰ Department for Environment Food and Rural Affairs (DEFRA) ‘Review of Non-Native Species Policy’ above n 195, 35.

²⁰¹ See discussion in section 3.5.3 of this Chapter on Australia’s Weed Risk Assessment.

surveillance and monitoring is very minimal.²⁰² Similarly, in Zimbabwe, although legislation is in place to control the importation of alien species,²⁰³ monitoring and surveillance are not undertaken post-importation, which signifies that once a species has gained entry, it is freely transferred around the country.²⁰⁴ In both cases, this means that if unauthorized introductions occur, they will be difficult to detect unless infestations reach noticeable proportions.²⁰⁵ By this time it may be too late to eradicate the species, or to collect data to determine the effectiveness of evaluation and permit systems.

Evaluation and permit systems themselves link to pre-importation activities that can be conducted offshore in an effort to “push back the border”.²⁰⁶ However, quarantine inspections and related activities cannot take place extra-territorially without the collaboration and cooperation of the state of export.²⁰⁷

3.4.2.4 Trend four: the need for international collaboration and cooperation

The fourth trend identified is the need for international collaboration and cooperation, which have already been discussed in part 3.3.3 above as important elements of quarantine. Two examples, one involving trade between the United States America (USA) and Canada, and the other involving movement of people and goods between Namibia and its neighbours, are instructive.

²⁰² Malaysia, *Third National Report to the Convention on Biological Diversity* (undated) 87.

²⁰³ Zimbabwe, *Third National Report to the Convention on Biological Diversity* (September 2005) 55-58. See references to *Control of Goods – import and export, wildlife regulations Act* (Chapter 14:05) that requires a permit for import of goods.

²⁰⁴ Ibid

²⁰⁵ Joint Committee of Public Accounts and Audit, Parliament of Australia, *Report 394, Review of Australia’s Quarantine Function* 2003 above n 162, paragraph 4.39.

²⁰⁶ M E Nairn, P G Allen, A R Inglis and C Tanner, *Australian Quarantine: A Shared Responsibility* Department of Primary Industries and Energy, Canberra (1996) paragraph 2.3.2.

²⁰⁷ Joint Committee of Public Accounts and Audit, Parliament of Australia, *Report 394, Review of Australia’s Quarantine Function* 2003 above n 165, paragraph 3.51.

With respect to the first example, the USA and Canada have for many years enjoyed a “free flow of traffic” and trade between their respective territories.²⁰⁸ However, the two states do not have harmonised quarantine regimes. Species prohibited in one state may therefore gain entry because they are not prohibited in the other. Within the USA, there is a prohibition on the importation of any material that can act as a vector for fruit flies, but this prohibition does not apply to material imported from Canada. In Canada, there are no concerns relating to the importation of fruit fly because, while fruit flies might enter Canada, they will not establish, due to the climate.²⁰⁹ Material that can act as vectors for fruit fly, such as packaging material, can therefore enter the USA via Canada.²¹⁰

The second example, from Namibia, further illustrates the need for cooperation. In Namibia, local nurseries are careful not to sell known IAS.²¹¹ Even so, their efforts are hampered both by a lack of effective national laws in Namibia and the fact that neighbouring states still sell plants that in Namibia are considered invasive. Namibia does not have a list of invasive plants and as most plants are imported from nearby South Africa, the importing Namibian nurseries largely rely on laws and certificates issued from South Africa. Furthermore, due to climate and ecosystem similarities, a species declared as invasive in South Africa is also likely to be invasive in Namibia. However, problems arise where regulations in South Africa declare a species a weed and the species is nevertheless available in other neighbouring states. Often these states do not have regulations as strict as South Africa, and Namibian residents purchase the plant in these states and import it back to Namibia.²¹²

²⁰⁸ A Perrault, M Bennett, S Burgiel, A Delach and C Muffett, ‘Invasive Species, Agriculture and Trade: Case Studies from the NAFTA Context’. (Paper presented at the Second North American Symposium on Assessing the Environmental Effects of Trade, Mexico City, March 25-26, 2003).8, 37.

²⁰⁹ Ibid, 8.

²¹⁰ Ibid.

²¹¹ Shirley Bethune, Mike Griffin and Dave Joubert, above n 194, 77.

²¹² Ibid.

Nonetheless, some states are developing comprehensive quarantine regimes. Samoa, for example, is engaged in strengthening its institutional arrangements to provide for an enhanced quarantine system, including, border controls and import risk analysis.²¹³ New Zealand too, has a very strict quarantine regime.²¹⁴ Its *Biosecurity Act* (1993) prevents entry of unwanted organisms,²¹⁵ which cannot be imported without a permit.²¹⁶ The Act also makes provision for monitoring and surveillance of unwanted organisms.²¹⁷ The *Hazardous Substances and New Organisms Act 1997* (NZ) deals with risk assessments and licensing²¹⁸ of imports of “new organisms.”²¹⁹ The legislation is administered by a combination of departments, including the Ministry of Agriculture and Forestry and the Ministry of the Environment. One of the strongest quarantine regimes, in terms of its ability to protect biodiversity from IAS, is that of Australia.

3.5 THE AUSTRALIAN QUARANTINE REGIME – A CASE STUDY

The use of a case study serves at least two purposes. First it shows how treaty obligations with respect to legal and institutional mechanisms of quarantine regulation might be implemented; and, second it illustrates the operational aspects of state practice highlighting both the potential and limitations of quarantine as a means of protecting biodiversity from IAS. Australia’s quarantine regime has been chosen for the case study as

²¹³ Samoa, *Third National Report to the Convention on Biological Diversity* (April 2006), 4, 23. The quarantine Division of Samoa have received grant through AUSAID to strengthen their quarantine and border controls.

²¹⁴ There is still room for improvement in these regimes. For a general critique of the Australian quarantine system, see Joint Committee of Public Accounts and Audit, Parliament of Australia, *Report 394, Review of Australia’s Quarantine Function* 2003, above n 162. For a critique of the New Zealand system, see Mark Christensen ‘Invasive Species Legislation and Administration: New Zealand’ in Marc Miller and Robert Fabian (eds), *Harmful Invasive Species* Environmental Law Institute Washington DC (2004) 23.

²¹⁵ *Biosecurity Act 1993* (NZ), section 2 ‘Unwanted organism’ means any organism that is capable or potentially capable of causing unwanted harm to any natural resources: The term ‘natural resources’ also includes the environment.

²¹⁶ Importation of Risk Goods, *Biosecurity Act 1993* (NZ), part III..

²¹⁷ Surveillance and Prevention *Biosecurity Act 1993* (NZ), part IV.

²¹⁸ *Hazardous Substances and New Organisms Act 1996* (NZ), parts IV and V.

²¹⁹ *Hazardous Substances and New Organisms Act 1996* (NZ), section 2 defines a new organism to include genetically modified ones.

Australia has implemented comparatively tight quarantine measures. While some may see Australia's quarantine laws as unduly restrictive,²²⁰ it is perhaps somewhat ironic that those same measures have not always been effective in stopping the introduction of IAS.²²¹

Indeed, Australia has produced some of the worst examples of introductions gone wrong, including rabbits, cane toads and prickly pear. However, Australia's quarantine regime is under constant review, refinement and improvement making it useful for a case study. In 1996, for example, Australia's quarantine regulation underwent a comprehensive review under the leadership of Professor Nairn. The resulting report titled *Australian Quarantine: a shared responsibility (Nairn Report)*²²² has been influential in strengthening Australia's quarantine regulation particularly with respect to environmental concerns and the protection of biodiversity.²²³

3.5.1 The Origins and Institutional Basis of Quarantine Regulation in Australia

Before Federation in 1901, quarantine regulation was a distinct state matter. The states were individually responsible for all aspects of quarantine, including policy decisions and implementation of border controls. Regulation followed the familiar pattern of initial formulation to stop the introduction and spread of disease and pestilence. The first quarantine laws were promulgated in 1832 by the Governor of the Colony of NSW in response to a cholera epidemic in Europe amidst fears that the epidemic would spread to Australia.²²⁴ In other states, laws also dealt with

²²⁰ WTO 'Trade Policy Review, Report by the Secretariat, Australia' WT/TPR/S/178, 29 January 2007, (viii) and 29.

²²¹ This is exemplified by the recent outbreak of equine influenza in Australia, which is now the subject of an official inquiry by Mr Ian Callinan AC. <<http://www.equineinfluenza inquiry.gov.au/>> (November 2007).

²²² M E Nairn, P G Allen, A R Inglis and C Tanner, *Australian Quarantine: A Shared Responsibility*, above n 206.

²²³ Ibid Recommendation 45.

²²⁴ 3 WM IV No 1. The regulation stipulated that vessels, goods and passengers arriving from infected areas would be subject to quarantine. The regulation was amended in 1841 by 5 Victoria No 12; it was amended again in 1949 by 13 Victoria No 35; it was further amended in 1853 by 17 Victoria No 29. In 1897 A statute was passed – the Act to consolidate the Laws relating to Quarantine 61 Victoria No 25.

human diseases and the regulation of weeds and plant and animal diseases.²²⁵ With the advent of federation in 1901, quarantine regulation became a matter of federal concern.

To understand how quarantine regulation operates in Australia it is necessary to say a preliminary word about Australia's federal system of government.²²⁶ Under section 51(ix) of the *Commonwealth of Australia Constitution Act 1900* (IMP), Federal and State governments have concurrent powers with respect to quarantine matters.²²⁷ Nevertheless, the Federal government plays a leading role in implementing quarantine regulation; in particular, implementing border controls to supervise the movement of goods and people into and out of Australia.²²⁸ Moreover, in an emergency situation, federal quarantine laws can override state laws.²²⁹ The evolution of this predominance of federal laws over state laws has taken place over the course of the twentieth century.

In 1908, the Federal parliament enacted the *Quarantine Act 1908*. Yet, for almost eight decades after this date the states still continued to play an active role in quarantine matters. The states, for instance, continued to provide contracted services to the Federal government for inspections and

²²⁵ For example, *The Vegetation Diseases Act 1896* (Vic); *The Vine Fruit and Vegetable Protection Act 1885* (SA); and in New South Wales, Act number XLVIII of 1897 *For the Better Prevention of the Spread of Diseases* 1897 (NSW).

²²⁶ The federal system of government in Australia is established by the *Commonwealth of Australia Constitution Act 1900* (IMP). Pursuant to this Act, legislative powers are divided between the Federal government and the six state governments. Section 51 of the Act sets out the concurrent powers which provide the basis for much of the legislation enacted by the Federal government.

²²⁷ The mechanism of concurrent powers can lead to inconsistency between federal and state laws. section 109 of the *Commonwealth of Australia Constitution Act 1900* (IMP) specifies that where there is an inconsistency between a valid federal law and a state law, the state law will give way to the extent of the inconsistency. Nevertheless, the concurrent jurisdiction in section 51 is a fertile source of disputes between the states and the Commonwealth government. For a discussion of some of these issues in a quarantine context see J Kline, 'Australian Federalism Confronts Globalisation: A New Challenge at the Centenary' (2002) 61 (3) *Australian Journal of Public Administration* 27; for a much earlier discussion of analogous issues in the United States of America, which also has a federal system of government, see Lee H Blewett, 'Limitations Imposed by the Federal Constitution on the Right of the States to Enact Quarantine Laws' (1889) 2 *Harvard Law Review* 267.

²²⁸ *Quarantine Act 1908* (Cth).

²²⁹ *Quarantine Act 1908* (Cth), section 2A.

treatment with respect to animal and plant quarantine.²³⁰ This was the case, even though in 1921 the Federal government had established the Commonwealth Department of Health, which also looked after animal²³¹ and plant²³² health. In fact, it was not until 1986, that the majority of operational functions were transferred to the Federal government. However, in Western Australia, the Northern Territory and Tasmania, the operational functions of quarantine continue to be sub-contracted to state and territory agricultural departments.²³³

In the meantime, the Federal government decided to separate the administration of human health from the administration of plant and animal health. Consequently, in 1984, the task of regulating animal and plant health was transferred out of the Department of Health and into the Department of Primary Industry (DPI).²³⁴ AQIS, the Australian Quarantine Inspection Service, was established within the DPI as a federal agency to carry out import and export inspection services, a function it carries out to the present day.²³⁵ In 1998, the DPI became the Department of Agriculture, Fisheries and Forestry (DAFF),²³⁶ hence today AQIS is part of DAFF.

As already noted, in the mid 1990s, one of the most comprehensive reviews of Australia's quarantine laws was conducted under the chair of

²³⁰ M E Nairn, P G Allen, A R Inglis and C Tanner, *Australian Quarantine: A Shared Responsibility* above n 206, paragraph 1.6.

²³¹ Animal health was administered under the supervision of the Division of Veterinary Hygiene. See Discussion Australian Academy of Science *Submission to the review of the Australian Quarantine Inspection Service*, March 1996 at paragraph 2.1.1 <<http://www.science.org.au/reports/aqiscont.htm>> (March 2007)

²³² Plant health was administered by the Director of Plant Quarantine See Discussion Australian Academy of Science *Submission to the review of the Australian Quarantine Inspection Service*, March 1996 above n 231 at paragraph 2.1.1.

²³³ Joint Committee of Public Accounts and Audit, Parliament of Australia, *Report 394, Review of Australia's Quarantine Function* 2003, above n 162, paragraph 3.30.

²³⁴ This later became known as the Department of Primary Industries and Energy, before another name change to the Department of Agriculture, Fisheries and Forestry (DAFF), the name by which it is known today.

²³⁵ Australian Academy of Science *Submission to the review of the Australian Quarantine Inspection Service* above n 231 at paragraph 2.1.2.

²³⁶ See web site <http://www.daff.gov.au/>

Professor Malcolm Nairn.²³⁷ The ensuing *Nairn Report* made 109 recommendations that covered a range of quarantine matters emphasising that regulation should be implemented along a “continuum of quarantine”. These matters included offshore activities,²³⁸ border controls in Australia,²³⁹ post quarantine activities²⁴⁰ and the institution of a new quarantine agency, “Quarantine Australia”.²⁴¹

In 2000, this new agency, now called “Biosecurity Australia” was established to separate operational aspects from policy development aspects of quarantine regulation.²⁴² Biosecurity Australia carries out policy development, which includes determinations on the level of risk Australia is prepared to accept with respect to imported goods and commodities. A related function is the conduct of import risk analyses to ensure that the pre-determined level of risk is not breached.

3.5.2 The Legislative Base of Quarantine Regulation in Australia: The Quarantine Act 1908

The legislative base of quarantine regulation in Australia lies with the *Quarantine Act, 1908* (Cth) (the Quarantine Act, or the Act). This Act plays a “critical role in protecting Australia from exotic diseases and pests”.²⁴³ It is divided into eight parts that, amongst other things, deal with Administration,²⁴⁴ the Environment,²⁴⁵ Quarantine of Vessels, Persons and

²³⁷ M E Nairn, P G Allen, A R Inglis and C Tanner, *Australian Quarantine: A Shared Responsibility* above n 206, 208.

²³⁸ *Ibid*, 27-32.

²³⁹ *Ibid*, recommendations 48-87.

²⁴⁰ *Ibid*, recommendations 88-96.

²⁴¹ *Ibid*, recommendations 9-22.

²⁴² *Ibid*, 7-17; Senate Standing Committee on Rural and Regional Affairs and Transport, Parliament of Australia, *Administration of Biosecurity Australia – Revised Draft Import Risk Analysis for Bananas from the Philippines* 2005, Commonwealth of Australia, Senate Printing Unit, Canberra (2005) Paragraph 1.5; see also discussion in Joint Committee of Public Accounts and Audit, Parliament of Australia, *Report 394, Review of Australia’s Quarantine Function* 2003, above n 162, paragraph 1.6 where the report states that Biosecurity Australia has been structured as an independent agency to ensure that its decisions are based on sound science.

²⁴³ *Director of Animal and Plant Quarantine v Australian Pork Limited [2005] FCAFC* 206 at paragraph 100 per Branson J.

²⁴⁴ *Quarantine Act* 1908 (Cth), Part II.

²⁴⁵ *Quarantine Act* 1908 (Cth), Part IIA.

Goods²⁴⁶ and Quarantine of Animals and Plants.²⁴⁷ The Act is also supported by regulations²⁴⁸ and proclamations.²⁴⁹

The Quarantine Act has been amended several times, with some of the most noteworthy changes having being made by the *Quarantine Amendment Act 1999* (Cth).²⁵⁰ These amendments heralded the incorporation of “managed risk” into quarantine regulation. Essentially, this is an approach “based on scientific reasoning ... consistent with international rules and standards”.²⁵¹ This means that Australia does not aim for a zero risk with respect to quarantine, but rather aims for a level of risk that is appropriate in the circumstances.²⁵² At the same time, the *Quarantine Amendment Act 1999* (Cth) put the consideration of environmental matters in quarantine regulation on a more formal basis. This is evident from amendments made both to the description of quarantine in section 4, as well as the definition of level of risk in section 5D. With respect to section 4, the pre-1999 version defined quarantine as regulation incorporating measures:

for the inspection, exclusion, detention, observation, segregation, isolation, protection, treatment, sanitary regulation and disinfection of vessels, installations, persons, goods, things, animals, or plants, and having as their object the prevention of the introduction or spread of diseases or pests affecting human beings, animals, or plants²⁵³

²⁴⁶ *Quarantine Act 1908* (Cth), Part IV.

²⁴⁷ *Quarantine Act 1908* (Cth), Part V.

²⁴⁸ *Quarantine Regulations 2000*, *Quarantine Act 1908* (Cth).

²⁴⁹ Quarantine Proclamation 1998 (as amended).

²⁵⁰ The reasons for the amendment vary from correction of punctuation (for example sections 17(1), 18(1) and 20AA) to the formulation of new provisions with respect to monitoring (sections 66AB-66AD) to ensuring that powers under the legislation extend to all types of pests (section 87(1B)(e) and 87(1)(qa)(ii)). Parliament of the Commonwealth of Australia, House of Representatives, Quarantine Amendment Bill 1998, *Explanatory Memorandum* Items 124, 128, 139 221, 327 and 321 respectively Available

<<http://parlinfoweb.aph.gov.au/piweb/Repository/Legis/oldEms/Linked/15020011.pdf>> (February 2007).

²⁵¹ Parliament of the Commonwealth of Australia, House of Representatives, Quarantine Amendment Bill 1998, *Explanatory Memorandum*, above n 250, 2.

²⁵² This approach is reflected in minor amendments made to sections 44C and 44D of the *Quarantine Act 1980*, but has its foundation in section 5D that defines the level of quarantine risk as a combination of probability of a pest being introduced and the harm that the pest could generate.

²⁵³ M E Nairn, P G Allen, A R Inglis and C Tanner, *Australian Quarantine: A Shared Responsibility* above n 206, paragraph 2.2.

The 1999 amendments extended the scope of quarantine to regulation including, but not limited to measures:

- (a) for or in relation to:
 - (i) the examination, exclusion, detention, observation, segregation, isolation, protection, treatment, and regulation of vessels, installations, human beings, animals, plants or other goods or things; or
 - (ii) the seizure and destruction of animals, plants or other goods or things; or
 - (iii) the destruction of premises comprising buildings or other structures when treatment of these premises is not practicable; and
- (b) having as their object the prevention or control of the introduction, establishment or spread of diseases or pests that will or could cause significant damage to human beings, animals, plants other aspects of the environment or economic activities.²⁵⁴

At first glance, the definitions appear very similar. Both the original and the amended versions of section 4 refer to quarantine regulation in terms of processes and outcomes. Hence, both versions include processes such as, inspections, exclusions, isolation and treatments. Likewise, both versions include outcomes such as preventing the introduction and spread of pests and diseases in order to protect humans, animals and plants.

However, there are also a number of differences. For example, the 1999 amendments added “seizure and destruction of” animals, plants and goods as an additional process, as well as a reference to protection of “the environment” as an outcome. The explanatory memorandum²⁵⁵ indicates that the purpose of the former change was to draft section 4 in a “more modern style”, while the purpose of the latter change was to clarify the use of quarantine laws for environmental objectives. Although it is possible that the phrase “animals, or plants” could apply equally to native species as to species found in agriculture and farming areas, the specific reference to the environment reinforces the importance of quarantine regulation to environmental matters, including, of course, the protection of

²⁵⁴ The ‘environment’ is defined in section 5 of the *Quarantine Act 1908* (Cth) to include ‘all aspects of the surroundings of human beings, whether natural surroundings or surroundings created by human beings themselves, and whether affecting them as individuals or in social groupings.’

²⁵⁵ Parliament of the Commonwealth of Australia, House of Representatives, Quarantine Amendment Bill 1998, *Explanatory Memorandum* above n 250, 2.

native biodiversity.²⁵⁶ Yet another difference between the two versions of section 4 is that the post-1999 version uses the words “will or could cause significant damage” to the environment. This phraseology makes it clearer that quarantine regulation applies to the introduction of actual and potential IAS.

In effect, by providing legislative backing to protection of the environment, the changes to section 4 emphasise the fact that quarantine regulation can present a valuable tool in the fight against IAS. Other provisions, such as section 5D that incorporates a reference to “other aspects of the environment”,²⁵⁷ further strengthens the importance of environmental considerations in quarantine regulation.

An important feature of Australia’s quarantine regime is the maintenance of strict border controls, which includes determinations on whether to permit or deny a species entry. These determinations are made by the Director of Plant and Animal Quarantine who is charged with implementing the Quarantine Act and any regulations or proclamations made pursuant to it.²⁵⁸ At present, the secretary of DAFF is the Director of Plant and Animal Quarantine (the Director of Quarantine).²⁵⁹ In terms of process, sections 13(1)(d)-13(1)(g) of the Act enable the Governor-General to make proclamations that prohibit the importation into Australia of any animals, plants or other goods unless a permit has been granted by the Director of Quarantine.²⁶⁰

²⁵⁶ Ibid. The obligation to protect biodiversity as part of environmental concerns stems from the Convention on Biological Diversity and in particular Article 8(h).

²⁵⁷ References to the environment were added to the *Quarantine Act* after the *Nairn Report* recommended that the scope of quarantine should be extended to the natural environment. See M E Nairn, P G Allen, A R Inglis and C Tanner, *Australian Quarantine: A Shared Responsibility* above n 206 at paragraph 2.2.4.

²⁵⁸ *Quarantine Act 1908* (Cth), section 8B.

²⁵⁹ *Quarantine Act 1908* (Cth), sections 5 and 9AA(1).

²⁶⁰ *Quarantine Act 1908* (Cth), sections 13(2)(A)-13(2)(AA).

Of particular importance is Quarantine Proclamation 1998.²⁶¹ Prior to 1998 it was permissible to import into Australia myriad animals, plants and their products, unless there was “compelling scientific evidence” to indicate that these commodities posed a threat to Australia.²⁶² However, Quarantine Proclamation 1998 set up a proscriptive basis for quarantine regulation based on a series of lists: one containing permitted seeds,²⁶³ while other lists nominate quarantinable diseases²⁶⁴ and prohibit the importation of certain plants and plant products.²⁶⁵ The effect of Quarantine Proclamation 1998 is to prohibit the entry into Australia of animals, plants and their products unless they are already on a permitted list, or they have been assessed and a permit has been granted for their importation.²⁶⁶ In accordance with section 70 of Quarantine Proclamation 1998, in issuing permits, the Director of Quarantine must take into account the level of quarantine risk to Australia if a permit were granted,²⁶⁷ and consideration of conditions that could be imposed upon imports to limit the level of quarantine risk to one that is acceptably low.²⁶⁸

The level of risk is defined in section 5D of the Quarantine Act as the probability of a disease or pest being introduced, established or spread in Australia that causes harm to humans, animals, plants, other aspects of the environment or economic activities, taken into account with the probable extent of the harm. In an IAS scenario, the level of risk incorporates two matters: the probability of an IAS being introduced, established or spread

²⁶¹ The proclamations are available from <http://legislation.gov.au/comlaw/comlaw.nsf/sh/homepage?OpenDocument> (March 2007). The 1998 Proclamation is available from: <http://www.comlaw.gov.au/comlaw/legislation/legislativeinstrumentcompilation1.nsf/current/bytitle/AE38C4F883931ACECA256FC60003F7DB?OpenDocument&mostrecent=1> (March 2007).

²⁶² Samantha Gray, ‘Aquatic Imports in Australia: Quarantine, International Trade and Environmental Protection (2000) 17 *Environmental and Planning Law Journal* 241, 242.

²⁶³ Quarantine Proclamation 1998, Schedule 5.

²⁶⁴ Quarantine Proclamation 1998, Schedules 3 and 4.

²⁶⁵ Quarantine Proclamation 1998, Schedule 6.

²⁶⁶ Essentially, only plant seeds listed in Schedule 5 of Quarantine Proclamation are permitted entry. All other importation of plant and animal products must undergo a risk assessment.

²⁶⁷ Quarantine Proclamation 1998, section 70(a).

²⁶⁸ Quarantine Proclamation 1998, section 70(b).

and the probable extent of harm the IAS could inflict. In terms of thresholds of harm, section 4(1) (b) of the Quarantine Act makes clear that quarantine regulation is concerned with “significant” harm to the environment, although that concept is not defined. In determining whether the harm to biodiversity is “significant”, or sufficiently destructive to amount to a “threat to biodiversity”, the Director of Quarantine relies on evaluations or assessments, known as risk analyses, which are conducted by Biosecurity Australia.

In support of section 5D, Sections 11A-11E²⁶⁹ are designed to ensure that the Director of Quarantine seeks advice from the Minister for the Environment if a decision of the Director can involve a significant risk of environmental harm.²⁷⁰ The advice, however, is not binding, although it needs to be taken into account;²⁷¹ and at this stage it is not clear what weight is given to the advice from the Minister for the Environment. As a matter of administrative law, it is also questionable whether there is a right of appeal from a determination of the Director of Quarantine.

Such a review would need to be commenced in accordance with section 6(1) of the *Administrative Decisions (Judicial Review) Act 1977* (Cth). That legislation provides for review “where a person has engaged, is engaging, or proposes to engage, in conduct for the purpose of making a decision” to which the *Administrative Decisions (Judicial Review) Act 1977* (Cth) applies. Decisions made pursuant to the Quarantine Act, which is a piece of Commonwealth legislation, would normally be amenable for review under the *Administrative Decisions (Judicial Review) Act 1977* (Cth).²⁷² Grounds for review include breach of the rules of natural justice;²⁷³ lack of jurisdiction by the decision-maker;²⁷⁴ an error of law;²⁷⁵ or lack of due process.²⁷⁶

²⁶⁹ These were added to the *Quarantine Act 1908* (Cth) by the *Quarantine Amendment Act 1998* (Cth).

²⁷⁰ *Quarantine Act 1908* (Cth), section 11C.

²⁷¹ *Quarantine Act 1908* (Cth), section 11D.

²⁷² *Administrative Decisions (Judicial Review) Act 1977* (Cth), sections 3 and 6(1).

²⁷³ *Administrative Decisions (Judicial Review) Act 1977* (Cth), section 6(1)(a).

²⁷⁴ *Administrative Decisions (Judicial Review) Act 1977* (Cth), section 6(1)(c).

In *Director of Animal and Plant Quarantine v Australian Pork Ltd*²⁷⁷ Australian Pork Ltd commenced an action against the Director of Quarantine with respect to an Import Risk Analysis completed by Biosecurity Australia that was used by the Director of Quarantine to recommend in favour of the importation of pig meat from the United States of America. In a majority decision in which Heerey and Lander JJ were critical of the Import Risk Analysis process, their Honours decided that a review could not be sustained. Their Honours pointed out that no “decision” had been made by the Director of Quarantine:

The Determination did not ‘authorise’ anything. It did not affect anyone’s rights or impose any obligations. On its face, as already mentioned, it did no more than put forward matters to be taken into account by the Director in granting permits. There was no jurisdictional error because no statute conferred jurisdiction to make the Determination; it was purely an administrative exercise.²⁷⁸

Branson J, who dissented, but agreed with the majority on this point said:

The purpose of the IRA process is described in the IRA Report as:

*‘... to deliver a policy recommendation to the Director of Animal and Plant Quarantine that is characterised by sound science and by transparency, fairness and consistency.’*²⁷⁹

As the above description makes clear, the IRA was not intended to assess the *level of quarantine risk* attending the grant of any particular permit to import pig meat into Australia. Its purpose was to provide a sound basis for the formulation of a policy position on whether the importation of pig meat into Australia should be generally allowed and, if so, on what conditions generally.²⁸⁰

Consequently, determinations of the Director of Quarantine are seen as an administrative exercise, rather than a “decision”. This means that if the

²⁷⁵ *Administrative Decisions (Judicial Review) Act 1977* (Cth), section 6(1)(f).

²⁷⁶ *Administrative Decisions (Judicial Review) Act 1977* (Cth), section 6(1)(b).

²⁷⁷ *Director of Animal and Plant Quarantine v Australian Pork Ltd* [2005] FCAFC 206.

²⁷⁸ *Director of Animal and Plant Quarantine v Australian Pork Ltd* [2005] FCAFC 206 at paragraph 85. At first instance, Wilcox J allowed a review on the basis that the Director of Quarantine had made a decision. See *Australian Pork Ltd v Director of Animal and Plant Quarantine* [2005] FCA 671.

²⁷⁹ *Director of Animal and Plant Quarantine v Australian Pork Ltd* [2005] FCAFC 206 at paragraph 136.

²⁸⁰ *Director of Animal and Plant Quarantine v Australian Pork Ltd* [2005] FCAFC 206 at paragraph 134.

Director of Quarantine ignores or gives little weight to the advice of the Minister for the Environment, a successful application for review is unlikely. It also means that for biodiversity to be adequately protected, environmental concerns need to be built in to the evaluation or risk analysis process in such a way that Biosecurity Australia can take environmental considerations into account.²⁸¹

3.5.3 Biosecurity Australia and Risk Analysis

Risk analysis undertaken by Biodiversity Australia is called an Import Risk Analysis, or IRA. The procedural rules for an IRA are set out in the *Import Risk Analysis Handbook*.²⁸² Once Biosecurity Australia receives notification that a request has been made to import products into Australia, it decides whether an IRA needs to be done. IRAs are complex and lengthy processes. However, where no import protocol exists, or where one does exist but circumstances have changed, Biosecurity Australia will conduct an IRA. At the time of writing, Biosecurity Australia had completed 26 animal IRAs²⁸³ 14 plant IRAs²⁸⁴ with 24 IRAs currently being undertaken on animals²⁸⁵ and 9 on plants.²⁸⁶

An IRA will identify pests and diseases and assess the risks posed by them. If the risk is not acceptable, the IRA will recommend measures to reduce the risk to an acceptable level.²⁸⁷ The actual assessment of risk is

²⁸¹ It should be noted, however, that a review under the *Administrative Decisions (Judicial Review) Act 1977* (Cth) may be successful where AQIS is involved because in undertaking their activities AQIS officers make 'decisions' rather than set policy. See *Re: Hanson And Commonwealth Director of Quarantine and Ors* G357 of 1984 Federal Court of Australia (unreported) and *Pacific Century Production Pty Ltd v Watson* [2001] FCA 1139. Moreover, quarantine issues have generated case-law involving civil suits by plaintiffs seeking damages for economic harm caused by entry of pests. See *Wilkins v Dovuro Pty Ltd* [1999] FCA 1816, and *Perre v Apand Pty Ltd* 198 CLR 180.

²⁸² Biosecurity Australia, *Import Risk Analysis Handbook*, Department of Agriculture Fisheries and Forestry – Australia, Canberra (2003).

²⁸³ 'Animal' IRAs include marine and ornamental finfish, laboratory rats and mice, and zoo pinnipeds. <<http://www.daffa.gov.au/ba/ira/final-animal>> (February 2007).

²⁸⁴ Plant IRAs include a variety of fruits such as limes, mangosteens; the cereal maize and vegetable sweet corn. <<http://www.daffa.gov.au/ba/ira/final-plant>> (February 2007).

²⁸⁵ These IRAs range from Zoo primates, to chicken meat to honeybee semen. <<http://www.daffa.gov.au/ba/ira/current-animal>> (February 2007).

²⁸⁶ These IRAs include fruit, vegetables and flower bulbs. <<http://www.daffa.gov.au/ba/ira/current-plant>> (February 2007).

²⁸⁷ IRA handbook above n 282 paragraph 3.1.

undertaken by specialist scientists and technical experts. An IRA can also be used to assess pathways of introduction or vectors. However, because accidental or unauthorized introductions are not planned, they cannot be assessed in the same way that deliberate introductions are. Rather, accidental or unauthorized introductions can be assessed by targeting and evaluating known pathways and vectors by which species are introduced. Nevertheless, whether it is individual species, pathways or vectors that are being evaluated, the IRA will still consider specific pests or diseases that can cause harm to Australia.²⁸⁸

Importantly, the consideration of environmental factors, such as whether a species will become invasive, is built in to the IRA process. For example, where plants are proposed to be imported, the IRA will include testing under the Weed Risk Assessment system (WRA).²⁸⁹ The WRA is based on a questionnaire involving answers of up to 49 questions covering a wealth of information about the plant, including its distribution,²⁹⁰ whether the plant is toxic to animals,²⁹¹ whether it hybridises naturally,²⁹² and information about its dispersal.²⁹³ The answers to the questions are given a score which is then used to make decisions on whether to accept, reject or further evaluate the species. In the latter case, the species is denied entry until more information is obtained. The WRA has been used by other states such as Ecuador with respect to the Galapagos Islands, although it has been pointed out that the WRA does have limitations because it does not assess pathways of introduction.²⁹⁴ In the case of

²⁸⁸ Biosecurity Australia, *Import Risk Analysis Skins and Hides Draft Report* DAFF August (2001) 4-6

²⁸⁹ DAFF, Fact Sheet on the Weed Risk Assessment System <<http://www.daffa.gov.au/ba/reviews/weeds/system>> (February 2007).

²⁹⁰ Ibid, WRA questions 2.

²⁹¹ Ibid, WRA question 4.05.

²⁹² Ibid, WRA question 6.03.

²⁹³ Ibid, WRA question 7.

²⁹⁴ H Rogg, C Buddenhagen and C Causton, 'Experiences and Limitations with Pest Risk Analysis in the Galapagos Islands' in *Identification of Risks and Management of Invasive Alien Species Using the IPPC Framework*, Proceedings of a workshop in Braunschweig, Germany 22-26 September 2003, Secretariat of the IPPC FAO (2005) 120.

animals, no similar process appears to exist yet, although proposals are being developed.²⁹⁵

The process of risk analysis can also involve other agencies. In 2000, for example, an IRA was conducted with respect to importation of crocodiles and their eggs. The IRA was conducted by AQIS, as it occurred before Biosecurity Australia was set up. Part of the quarantine conditions imposed on the importation of these animals was that additional permission needed to be obtained from Environment Australia (now known as the Department of Environment and Water Resources).²⁹⁶

These activities by Biosecurity Australia indicate that environmental matters can be taken into account as part of risk analysis, as long as environmental criteria are built in to the process. Limitations stem from the fact that the evaluation process may not cover all species, or may not adequately take into consideration pathways of introduction. Some of these limitations may be overcome by operational procedures that detect and intercept unauthorized introductions.

3.5.4 AQIS and Operational Matters – Detecting and Intercepting Unauthorized Introductions

The Quarantine Act provides for a range of measures to control introductions. This “practical” side of quarantine is carried out by AQIS which provides operational services for quarantine in both incoming and outgoing goods and commodities.²⁹⁷ The operations of AQIS can be divided into 8 categories: airports, import clearance, seaports, international mail, detector dogs, Northern Australian Quarantine Strategy, post-import plant quarantine and post-import animal quarantine.²⁹⁸ The range of AQIS activities is evident from some of its

²⁹⁵ See Mary Bomford *Risk Assessment for the Import and Keeping of Exotic Vertebrates in Australia* Bureau of Rural Sciences, Canberra (2003).

²⁹⁶ AQIS, *Import Risk Analysis Paper for Live Crocodilians and their Eggs* AQIS Canberra Australia (2000) 42.

²⁹⁷ AQIS, *About AQIS* fact sheet. <<http://www.daffa.gov.au/aqis/about>> (February 2007).

²⁹⁸ Joint Committee of Public Accounts and Audit, Parliament of Australia, *Report 394, Review of Australia's Quarantine Function* 2003, above n 162, paragraph 3.2.

successful interceptions. For example, in 2005, AQIS intercepted a number of imports that potentially could have devastated Australia's native biodiversity. These included the detection and interception of Avian Influenza in imported pigeons,²⁹⁹ the giant African snail in container traffic³⁰⁰ and the Asian gypsy moth in a bulk coal vessel.³⁰¹

As well as carrying out border controls in Australia AQIS also plays a significant role in off-shore quarantine, the first part of what the *Nairn Report* described as the "continuum of quarantine". For example, AQIS certifies that incoming goods and commodities meet Australia's quarantine standards by assessing and certifying off-shore export processes and inspecting goods off-shore before export.³⁰² AQIS also certifies Australia's products before export ensuring, as far as possible, that Australian products do not become a means of introducing IAS into the territory of other states. This export certification process is significant, as it helps smooth Australia's trade in approximately \$AUS32 billion worth of agricultural and farming products per annum.³⁰³

Operations with respect to post-import activities such as monitoring are also carried out by AQIS, but these appear to be less well-funded and understood than other aspects of quarantine. AQIS does maintain "sentinel herds of domestic animals" and traps feral animals for testing of incidence of pests and diseases; however, existing measures may not provide sufficient information on the status of these pests and diseases.³⁰⁴ The

²⁹⁹ AQIS, Media Release *Quarantine Finds Avian Influenza* 20 October 2005. <http://www.daffa.gov.au/about/media-centre/aqis-releases/2005/quarantine_finds_avian_influenza> (February 2007).

³⁰⁰ AQIS, Media Release *Slimy Suspect No Match for Quarantine* 7 September 2005 <http://www.daffa.gov.au/about/media-centre/aqis-releases/2005/slimy_suspect_no_match_for_quarantine> (February 2007).

³⁰¹ AQIS, Media Release *Quarantine Foils World's Worst Forest Pest* 30 August 2005 <http://www.daffa.gov.au/about/media-centre/aqis-releases/2005/quarantine_foils_worlds_worst_forest_pest> (February 2007).

³⁰² Joint Committee of Public Accounts and Audit, Parliament of Australia, *Report 394, Review of Australia's Quarantine Function* 2003, above n 162, paragraph 3.41.

³⁰³ AQIS, *About AQIS* fact sheet above n 297.

³⁰⁴ Joint Committee of Public Accounts and Audit, Parliament of Australia, *Report 394, Review of Australia's Quarantine Function* 2003, above n 162, paragraphs 4.32-4.38

Australian Society for Parasitology³⁰⁵ has pointed out that many of Australia's marsupials could potentially act as reservoirs for exotic disease which could infect other native species. If surveillance and monitoring activities are inadequate, it means that some native species can become infected with introduced diseases or parasites that spread further afield and remain undetected. The activities of AQIS in this respect are limited by the financial resources available to it and by a decline in recent years of general technical and scientific expertise in Australia.³⁰⁶

Finally, the operational aspects of quarantine intersect with other areas of government, such as the Australian Customs Service and Australia Post.³⁰⁷ In each case, the activities of the relevant agency and AQIS are synchronised by means of a Memorandum of Understanding (MOU).³⁰⁸ These memoranda seek to harmonize measures and avoid duplication of activities. For example, the Australian Customs Service is often the first to make contact when cargo enters Australia, so the Customs Service and AQIS make use of each other's knowledge to alert the other to breaches of regulations.³⁰⁹

Australia has built up a comprehensive quarantine regime that incorporates strong institutional structures, with the emphasis on prevention. Nevertheless, in common with other states, there are gaps in Australia's quarantine regime. In particular, these gaps are generally indicative of limits to the use of quarantine regulation to protect biodiversity.

³⁰⁵ The Australian Society for Parasitology was formed in 1964 to foster research and on parasites that infect humans and animals. <<http://www.parasite.org.au/>> (February 2007).

³⁰⁶ Joint Committee of Public Accounts and Audit, Parliament of Australia, *Report 394, Review of Australia's Quarantine Function* 2003, above n 162, paragraph 4.51.

³⁰⁷ Ibid, 3.6.

³⁰⁸ Ibid, paragraph 3.8-3.13.

³⁰⁹ Ibid.

3.6 THE LIMITS OF QUARANTINE IN PROTECTING BIODIVERSITY FROM IAS

The limitations of quarantine in protecting biodiversity stem from a number of sources. These include lack of legislative clarity, lack of evaluation of the risks associated with IAS, lack of resources to implement quarantine measures and the fact that even in the best of regimes unwanted species will still gain entry.

In order for quarantine regulation to be used to protect biodiversity, quarantine regimes need to be underpinned by a solid and clear legislative base. In Australia, for example, *Quarantine Proclamation* 1998 permitted plant seeds to be imported according to their genus, rather than their species – a form of classification that could lead to unintended consequences. It meant that plant seeds such as those in the genus *Asparagus* and *Rubus*, could be legally imported into Australia. Yet the *Asparagus* genus contains the notorious weed *Asparagus asparagoides*, or bridal creeper, and the *Rubus* genus contains *Rubus fruticosus*, or blackberry.³¹⁰ Although both plants are already present in Australia, both are weeds of national significance³¹¹ and their continued importation would have represented an unacceptable risk to Australia. In 2006, Biosecurity Australia revised their lists and now classifies plants according to species.³¹²

Other limitations stem from lack of adequate evaluation processes, or lack of implementation of adequate processes. Difficulties with respect to international standards and their lack of protection of biodiversity have already been discussed. In addition, states may find implementing the standards difficult. Resource problems may prevent states from using

³¹⁰ Andreas Glanzing, *Closing Australia's Quarantine Loophole to New Weeds*, WWF Australia, Sydney (2005) 6.

³¹¹ See Australian Weeds Committee data base of 'Weeds of National Significance' <<http://www.weeds.org.au/natsig.htm>> (May 2007).

³¹² This was given legislative effect by Quarantine Amendment Proclamation 2006 (no 7).

standards and/or risk analysis to their full potential³¹³ and, undoubtedly, cost factors are likely to be influential.

In the 1980s, for example, a shortage of timber supplies in the United States prompted a number of United States agents to consider importing timber from Russia. Due to phytosanitary concerns, the United States government halted all timber imports until a risk assessment had been concluded. This took one year to complete at a cost of approximately \$US500,000.³¹⁴ Not all states may be in a position to commit this level of technological and financial resources to evaluating species connected with a pathway or vector.³¹⁵ Limitations stemming from financial or technological capabilities will often mean that resources are diverted towards activities regarded as the most pressing, such as the protection of agriculture and farming activities. However, this not only means that IAS potentially go unregulated, making it easier for them to gain entry, but also that a data base is not being built up that would otherwise provide valuable information on IAS and their impact on biodiversity. In essence, these limitations represent a failure of border controls – something that could happen even in the best regimes.

In any quarantine regime, species may breach border controls because wrong decisions have been made with respect to deliberate introductions; or unwanted species may gain entry accidentally. Therefore, appropriate monitoring and surveillance activities can assist by supplementing border controls and assist in detecting accidental introductions and assessing whether deliberate introductions are behaving as intended.. Yet, monitoring and surveillance mechanisms are often under-represented in

³¹³ See discussion in section 2.4 of Chapter 2 of this study, and in particular the discussion on Table 5 that indicates less than 14% of states are using risk analysis effectively.

³¹⁴ Jeffrey A McNeely, 'Invasive Species: a Costly Catastrophe for Native Biodiversity' (2002) 1 (2) *Land Use and Water Resources Research* 1, 7. See also Global Invasive Species Programme, Case Study 3.22- 'Siberian Timber Imports: Analysis of a Potentially High-Risk Pathway' <<http://www.cabi-bioscience.ch/wwwgisp/gtc3cs22.htm>> (April 2006).

³¹⁵ See the discussion in section 2.3 and Table 7 of Chapter 2 of this study. 56.4% of states regard the lack of financial, human and technological resources as a major challenge to effective IAS regulation.

national quarantine regimes. This is particularly the case with respect to the impact of IAS on biodiversity. Fewer than 13% of states have established tracking systems to identify and monitor the introduction of alien species.³¹⁶ This makes it more likely that IAS have well and truly established, spread and caused considerable damage before they are detected. This in turn makes effective eradication and containment measures difficult if not impossible to implement.

Overall, limitations with respect to legislation, evaluation techniques and resource constraints have the tendency to limit the application of quarantine regimes to farming and agricultural pests, or other types of species dealt with once they have become a serious problem. This is a situation that does not assist in realizing the potential of quarantine to be a proactive mechanism preventing the entry, establishment and spread of IAS.

3.7 CONCLUSION

The use of quarantine originated many centuries ago as a unilateral national response to the entry and spread of disease and pestilence. However, by at least the nineteenth century, states realised that a unified response coordinated at the international level was needed. Yet despite the importance of international law to the success of quarantine regimes, the transition from the national to the international arena was not always easily made. Nevertheless, by the end of twentieth century, treaties of wide application sought to prevent the entry and establishment of a broad range of pests and diseases.³¹⁷ Importantly, quarantine regulation developed institutions and techniques specifically tailored towards

³¹⁶ See discussion in section 2.4 of Chapter 2 of this study and in particular the discussion surrounding Table 4.

³¹⁷ For a discussion of an analogous progression at the domestic level see H Kelsall, P Robinson and G Howse, 'Public Health Law and Quarantine in a Federal System' (1999) 7 *Journal of Law and Medicine* 87, 94.

preventing entry of unwanted species. These institutions and techniques are eminently suited to protecting biodiversity from IAS.

For this potential to be fulfilled, quarantine regulation would need to undergo a second major transition so that its processes are used to protect the environment as well as farming and agricultural interests. The *ad hoc* development of quarantine and its historical link to farming and agriculture have made the transition problematic. The transition has also been hindered by financial and technological constraints faced by states.

Nevertheless, some states, such as Australia, have comprehensive quarantine regimes in place, but not all states do. Indeed, in many cases, legislative frameworks, adopted in furtherance of international obligations established under the IPPC and OIE, are largely geared towards detecting and intercepting species that are harmful only to agriculture, farming or economic interests. The potential to use quarantine regulation to stop entry of IAS that impact on biodiversity at large is thus not being realised.

This factor is further complicated by the fact that even where states do have a comprehensive quarantine system in place, they will still be constrained in the implementation and execution of their regimes by the broader corpus of international legal obligations binding on them. One of the main areas of international law with the potential to impact upon the implementation of quarantine regulation is that of international trade law. Therefore, an examination of the relationship between trade, IAS and quarantine is necessary to an understanding of any further limitations on the efficacy of quarantine as a means of protecting biodiversity from the deleterious effects of IAS. The next chapter commences this inquiry by outlining the relationship between international trade law and the regulation of IAS.

CHAPTER 4

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CHAPTER 4

INTERNATIONAL TRADE LAW and INVASIVE ALIEN SPECIES

4.0 INTRODUCTION

International trade represents a major reason why invasive alien species (IAS) are introduced and spread across the globe.¹ This Chapter describes how the rules of international trade law operate with respect to IAS and sets the foundation for the analysis that follows in the next two chapters, which explore the relationship between IAS, quarantine and trade in the protection of biodiversity.

The discussion in this Chapter focuses on the World Trade Organization (WTO)² and two agreements: GATT 1994³ and the Agreement on the Application of Sanitary and Phytosanitary Measures (SPSA).⁴ The former provides members with general rights and obligations, while the latter creates specific rights and obligations, particularly with respect to members' sanitary and phytosanitary measures. Although states have negotiated numerous international trade agreements,⁵ the discussion

¹ See discussion in section 1.2.2 of Chapter 1 of this study.

² The World Trade Organization (WTO) was established on 1st January 1995 by the *Marrakesh Agreement establishing the World Trade Organization*, adopted 15 April 1994, [1995] ATS No 8, 1 (entered into force 1 January 1995). As at November 2007 The WTO has 151 members. States which become members of the WTO automatically become parties to a set of agreements that include the *General Agreement on Tariffs and Trade*, below n 3 and the *Agreement on the Application of Sanitary and Phytosanitary Measures* below n 4.

³ *General Agreement on Tariffs and Trade* (GATT 1994) [1995] ATS No 8, 14.

⁴ *The Agreement on the Application of Sanitary and Phytosanitary Measures* (SPSA) [1995] ATS No 8, 14.

⁵ For example, the *North American Free Trade Agreement* (NAFTA) has three members, these being Canada, Mexico and the United States of America. *North American Free Trade Agreement* adopted on 17 December 1992, 32 I.L.M. 289 (pts. 1-3); 32 I.L.M. 605 (pts. 4-8) (entered into force 1 January 1994); see also the *Mercado Común del Sur* (MERCOSUR, also known as the Common Market of the South). The agreement establishing MERCOSUR creates a customs union, with a free trade area covering South and Central America. As at November 2007 it has five members, five associate members and one observer. The arrangements were initiated when Argentina, Brazil, Uruguay and Paraguay signed the Treaty of Asunción on 26 March 1991. MERCOSUR

examines the WTO regime because of that organization's large membership⁶ and also because the problems faced by WTO members are generally representative of other trade regimes. This is especially the case as many bilateral and other free trade agreements are modeled on the WTO regime.⁷

4.1 The WTO

The WTO describes itself as “the only global international organization dealing with the rules of trade between nations”.⁸ The WTO had its genesis in economists' views that free trade would forestall an event such as the depression of the late 1920's and early 1930's.⁹ The system is, therefore, predicated on the progressive removal of trade barriers including tariffs, quantitative restrictions and technical barriers such as sanitary and phytosanitary measures.

entered into force on 31 December 1994 (1991) 30 ILM 104. Another important agreement to international trade is the agreement establishing the European Union (EU), the Treaty on European Union (The Maastricht Treaty). The Maastricht Treaty was signed on 7 February 1992 and entered into force on 1 November, 1993. 1992 *Official Journal* C 191, 29 July 1992. As at November 2007, the European Community had 27 members. The Maastricht treaty was in fact the successor to the Treaty Establishing the European Economic Community that was signed on 25 March 1957, and entered into force on 1 January, 1958. 298 UNTS 11. The name of the European Economic Community was changed to the ‘European Community’ by the Maastricht Treaty. The EU is a political and economic union that establishes a single market for its members by way of a customs union. ‘The European Communities’ is the name given collectively within the WTO to the European Union and its 27 member states. The European Union is a member of the WTO in its own right, as are individual member states that have applied for WTO membership. This means that the EU has a vote in addition to its member states. Qingjuang Kong, ‘China's WTO Accession and the ASEAN – China Free Trade Area: The Perspective of a Chinese Lawyer’ (2004) 7 (4) *Journal of International Economic Law* 839, 855.

⁶ Above n 5. For example, as at November 2007, NAFTA has three members, MERCOSUR has five members, five associate members and one observer; the European Union (EU) has 27 members, while the WTO has 151 members..

⁷ Robert G Finbow, *The Limits of Regionalism in NAFTA's Labour Accord*, Ashgate Publishing (2006) 5. See for example, *Australia-Thailand Free Trade Agreement* adopted 5 July 2004 [2005] ATS 2 Articles 809-810.

⁸ WTO *Understanding the WTO*. WTO Information and Media Relations Division Lausanne (2007).

⁹ Kenneth Ewing and Richard G Tarasofsky *Trade and Environment Agenda Survey of Major Issues and Proposals* IUCN Environmental Law Centre, Bonn (1997) 7.

The first step towards what would eventually become the WTO¹⁰ began in 1947, when world leaders negotiated the General Agreement on Tariffs and Trade (GATT).¹¹ GATT 1947 was designed as an agreement, rather than an international organization, yet according to one commentator, for almost 50 years GATT 1947 became a *de facto* organization,¹² developing a complex set of rules and procedures regulating the way states conduct international trade.

Since 1947, trade liberalisation has been achieved by rounds of trade negotiations, where all states agree to free up international trade incrementally.¹³ By 1994, the negotiations had culminated in the Marrakesh Agreement establishing the World Trade Organization, which commenced on 1 January 1995. The Marrakesh Agreement itself consists of the agreement to set up the WTO and a number of annexures that include GATT 1994 and the Agreement on the Application of Sanitary and Phytosanitary Measures.

Upon the commencement of the WTO, GATT 1947 became inoperative and its provisions were incorporated into GATT 1994.¹⁴ Therefore, unless otherwise indicated in this study, references to GATT refer to GATT 1994. GATT still provides the basis for implementation of international trade in goods, while more specific agreements, such as the SPSA, deal with aspects of trade such as quarantine.¹⁵

¹⁰ GATT was to have been supported by the International Trade Organization (ITO), but the agreement to set up the ITO was not ratified by the United States.

¹¹ See discussion Ernst-Ulrich Petersmann, *International and European Trade and Environmental Law After the Uruguay Round* Kluwer International London (1996) 1.

¹² Peter Van Den Bossche *The Law and Policy of the World Trade Organization Text, Cases and Materials* Cambridge University Press (2005) 81-2.

¹³ These include the Uruguay Round held between 1986-1994 that, amongst other things, dealt with the creation of the WTO and the Tokyo Round that, amongst other things, dealt with tariff reductions. See generally Richard Steinberg 'In the Shadow of Law or Power? Consensus-Based Bargaining and Outcomes in the GATT/WTO' (2002) 56 *International Organization* 339.

¹⁴ General Agreement on Tariffs and Trade 1994, Article 1(a). See also WTO *Understanding the WTO* above n 8 at 21.

¹⁵ Other specific agreements include Annex 1C (Trade-Related Aspects of Intellectual Property Rights (TRIPS)) and Annex 1B (the General Agreement on Trade in Services (GATS)) [1995] ATS 8.

The specific agreements are designed to ensure that technical standards used in international trade are not used as disguised trade restraints. In addition, since 1995, these agreements provide the primary source of rights and obligations for WTO members, whilst GATT provides a basis of rights and obligations only, where one of the more specific agreements does not apply.¹⁶

4.2 GATT

4.2.1 IAS and Articles I, III and XI of GATT

Several articles of GATT are potentially relevant to the regulation of IAS. These include Articles I, III and XI that provide for substantive obligations, as well as Article XX, which provides for exceptions to these obligations.

Article I of GATT which embodies the guarantee of Most Favoured Nation Treatment specifies that:

With respect to customs duties and charges of any kind imposed on or in connection with importation or exportation or imposed on the international transfer of payments for imports or exports.....any advantage, favour, privilege or immunity granted by any contracting party to any product originating in or destined for any other country shall be accorded immediately and unconditionally to the like product originating in or destined for the territories of all other contracting parties.

Article III deals with the national treatment on Internal Taxation and Regulation and in particular Article III(4) stipulates that:

The products of the territory of any contracting party imported into the territory of any other contracting party shall be accorded treatment no less favourable than that accorded to like products of national origin in respect of all laws, regulations and requirements affecting their internal sale, offering for sale, purchase, transportation, distribution or use. The provisions of this paragraph shall not prevent the application of differential internal transportation charges which are based exclusively on the economic operation of the means of transport and not on the nationality of the product.

¹⁶ See for instance, Article 1A of the Agreement Establishing the WTO. In addition, Article 2.4 of the SPSA provides that where measures comply with the SPSA this amounts to a presumption of compliance with *inter alia* GATT Article XX(b). See discussion in section 4.3.3 of this Chapter.

Read together, Articles I and III form the core of GATT's non-discrimination principles. Concessions given to one member must be given to all GATT members and imported products should receive treatment "no less favourable" than treatment afforded to "like products" produced domestically.¹⁷

Article I.I and Article III both refer to 'like products'. However, in Article I, the term is used with respect to comparable products from different trading partners, whereas in Article III the term is used with respect to imported products contrasted with domestic products. The Appellate Body of the WTO has held that Article 1 is triggered where there is an advantage of the type set out in the article which is not given to all WTO members;¹⁸ while the provisions of Article III signify that parties need to avoid "protectionism in the application of ... regulatory measures", so that comparable domestic products or production are not favoured over imported ones.¹⁹

One indication whether products are "like" is to determine whether the products compete with each other in the market place and/or whether the products can be substituted for each other. In *European Communities – Measures Affecting Asbestos and Asbestos-Containing Products (EC – Asbestos)*,²⁰ the Appellate Body approved the Panel's earlier

¹⁷ For discussion in an environmental context, see Daniel Esty *Greening the GATT: Trade, Environment and the Future* Institute for International Economics, Washington DC (1994) 245-6; see also Peter Van Den Bossche, above n 12, ch 4.

¹⁸ *European Communities – Regime for the Importation, Sale and Distribution of Bananas (EC – Bananas III)* WTO Doc WT/DS27/AB/R, (Report of the Appellate Body, 1997). The issues will turn on whether the products are 'like' products. In *EC – Bananas III* the parties to the dispute had agreed that all bananas are 'like' products, therefore, if the EC imposed different import restrictions for bananas depending on their source, '... the object and purpose of the non-discrimination provisions [of GATT] would be defeated'. *EC – Bananas III*, at paragraph 190.

¹⁹ *Japan-Taxes on Alcoholic Beverages (Japan – Alcoholic Beverages II)* WTO Doc WT/DS10/AB/R, WT/DS11/AB/R, WT/DS8/AB/R, (Report of the Appellate Body, 1996) paragraph F, 'Interpretation of Article III'. See also generally Robert E Hudec, 'Like Product': The Differences in Meaning in GATT Articles I and III' in T Cottier and P Mavroidis (eds) *Regulatory Barriers and the Principle of Non-Discrimination in World Trade Law* University of Michigan Press (2000) 101-23.

²⁰ *European Communities – Measures Affecting Asbestos and Asbestos-Containing Products (EC – Asbestos)* WTO Doc WT/DS135/AB/R (Report of the Appellate Body, 2001).

determination of likeness²¹ embodied in the following four criteria: “(i) the properties, nature and quality of the products; (ii) the end-uses of the products; (iii) consumers' tastes and habits; and, (iv) the tariff classification of the products”.²² In *EC – Asbestos* one of the arguments centred on whether asbestos fibres were “like” products to cellulose and glass fibres. The Appellate Body found that the products were not “like”, because asbestos fibres posed health risks that other fibres did not.²³

One issue that stems from these determinations is whether states are able to implement quarantine measures selectively based on different risks presented by different trading partners. For example, the grain borer *Prostephanus truncates* poses a potentially serious threat to Australia's acacia plants.²⁴ Yet, if Australia were to implement quarantine rules in accordance with different risks represented by the diverse sources of grain products, this could potentially breach Article I.I. In essence, Article I.I does not take into account different risk factors represented by sourcing products from different parts of the world and different trading partners.

Analogous issues stem from the treatment afforded to “like” domestic and imported products. For example, the nursery trade has been implicated in the introduction of many alien species that threaten biodiversity;²⁵ hence states may ban the importation of plants and plant products based on lists of plants permitted or denied entry.²⁶ It is not clear whether plants on these lists are “like products”, or whether, in similarity with carcinogenic and non-carcinogenic fibres, plants can be classified as like or not “like” according to the threat they pose to biodiversity.

²¹ *European Communities – Measures Affecting Asbestos and Products Containing Asbestos* WTO Doc WT/DS135/R (Panel Report, 2000) (*EC – Asbestos Panel*) paragraphs 8.130 and 8.132.

²² *EC – Asbestos* paragraph 85.

²³ *EC – Asbestos* paragraphs 113 and 126.

²⁴ See section 1.2.1 of Chapter 1 of this study.

²⁵ *Ibid.*

²⁶ See discussion in the following sections of Chapter 3 of this study: 3.3.1 for lists maintained by the IPPC and section 3.5.2 for lists maintained by Australia. For information on disease and pests issued by the OIE in respect of animals, see section 3.3.2 of this study.

Article XI deals with the general elimination of quantitative restrictions and provides:

No prohibitions or restrictions other than duties, taxes or other charges, whether made effective through quotas, import or export licences or other measures, shall be instituted or maintained by any contracting party on the importation of any product of the territory of any other contracting party or on the exportation or sale for export of any product destined for the territory of any other contracting party.

In essence, Article XI prohibits measures that restrict or impede trade by the use of quotas, import and export licences, or “other measures.”²⁷ A complete ban will come within the ambit of Article XI,²⁸ but so can less drastic measures, such as the need for licences, certifications and other measures that may hinder trade.

For example, African grasses, such as *Andropogon gayanus*, are favoured in Australia for their abundant growth, and have long been imported as pasture grasses.²⁹ However, these plants also have the propensity towards invasiveness and are responsible for damage in the rainforests of Northern Australia.³⁰ The grasses also fuel forest fires that further help their propagation by spreading “vast loads of seed”.³¹ Yet, if Australia were to ban importation of these grasses, this would arguably amount to a quantitative restriction in breach of Article XI GATT. Even restrictions short of a total trade ban could breach Article XI. For example, there is a correlation between the number of times a species is introduced and the increased likelihood of its becoming invasive – in other words, the more often a species is introduced, the more likely it is to become invasive.³² In view of this, a state might determine an upper quantitative limit for introductions to reduce the likelihood of a species becoming invasive.

²⁷ See discussion Damien Neven and Joseph Weiler, ‘Japan – Measures Affecting the Importation of Apples (AB-2003-4): One Bad Apple? A Comment’ 2005 *American Law Institute Projects* 309 WTO Project 2003 Available from <http://www.ali.org/index.cfm?fuseaction=projects.wto_2003> (April 2006).

²⁸ *Canada – Certain Measures Concerning Periodicals* WTO Doc WT/DS31/R (Panel Report, 1997) paragraph 5.5; *United States – Import Prohibition of Certain Shrimp and Shrimp Products* WTO Doc WT/DS58/R (Panel Report, 1998) paragraph 7.16.

²⁹ Tim Low, *Feral Future* Viking Press (1999) 85-6.

³⁰ *Ibid.*

³¹ *Ibid.*

³² See discussion in section 1.3.3 of Chapter 1 of this study.

While this approach is less restrictive than a total trade ban, it nevertheless sets limits or quotas for that particular species and still probably contravenes Article XI.

The combined effect of Articles I, III and XI is to place a number of limitations upon states' ability to design effective IAS regimes. However, the substantive obligations contained in these articles are also subject to the Article XX GATT exceptions.

4.2.2 IAS and Article XX GATT

The Article XX exceptions and in particular Articles XX(b) and XX(g), specify that:

Subject to the requirement that such measures are not applied in a manner which would constitute a means of arbitrary or unjustifiable discrimination between countries where the same conditions prevail, or a disguised restriction on international trade, nothing in this Agreement shall be construed to prevent the adoption or enforcement by any contracting party of measures:

- (b) necessary to protect human, animal or plant life or health;
- (g) relating to the conservation of exhaustible natural resources if such measures are made effective in conjunction with restrictions on domestic production or consumption;

The proviso to the Article, found in the “Chapeau” provides an overriding discrimination-based test for determining whether measures satisfy the Article XX exceptions.

Under GATT 1947, these exceptions were rarely litigated.³³ At least one commentator has advanced reasons for this, including the weak dispute resolution procedures accompanying GATT 1947; the fact that GATT's discrimination-based principles were seen as hard to challenge; and the

³³ In fact, for over 35 years after the inception of GATT 1947, no issues relevant to the Article XX(b) or XX(g) exceptions were brought before a Panel. See discussion Steve Charnovitz, 'Exploring the Environmental Exceptions in GATT Article XX' (1991) 25 (5) *Journal of World Trade Law* 37, 47.

fact that states recognized that, in quarantine terms, some trade restraints were crucial to the long-term viability of international trade.³⁴

The first case to test the boundaries of these exceptions was the *1982 Tuna and Tuna Products from Canada* decision.³⁵ Ultimately, before 1995, six trade disputes were litigated that involved Article XX(b) and XX(g); five related to animal, or plant health, or exhaustible natural resources, while the sixth involved human health.³⁶ Since 1995, three cases, *United States – Standards for Reformulated and Conventional Gasoline (US – Gasoline)*,³⁷ *United States – Import Prohibition of Certain Shrimp and Shrimp Products (US – Shrimp)*³⁸ and *EC – Asbestos* have involved analysis of Article XX(b) and Article XX(g) and these cases have strongly influenced current understanding of Article XX.³⁹

³⁴ Jacob Werksman, 'Invasive Alien Species and the Multilateral Trading System' Marc Miller and R Fabian (eds), *Harmful Invasive Species* Environmental Law Institute Washington DC (2004)203, 207.

³⁵ GATT Panel Report, *United States – Prohibition of Imports of Tuna and Tuna Products from Canada*, L/5198, adopted 22 February 1982, BISD 29S/91.

³⁶ *United States – Prohibition of Imports of Tuna and Tuna Products from Canada*, L/5198, adopted 22 February 1982, BISD29S/9; *Canada – Measures Affecting Exports of Unprocessed Herring and Salmon* (Panel report adopted March 1988) (BISD 35S/98); *United States – Restrictions on Imports of Tuna (Tuna I)* DS21/R (Panel report circulated September 1991, but not adopted); *United States – Restrictions on Imports of Tuna (Tuna II)* DS29/R (Panel report circulated June 1994 but not adopted); *United States – Taxes on automobiles* (Panel report circulated October 1994 but not adopted); *Thailand – Restrictions on Importation of and Internal Taxes on Cigarettes*, (adopted on 7 November 1990) (BISD 37S/200). For a discussion of the relationship between the *Tuna* decisions and the United Nations Convention on the Law of the Sea, see Richard J McLaughlin 'UNCLOS and the Demise of the United States' Use of Trade Sanctions to Protect Dolphins, Sea Turtles Whales and Other International Marine Living Resources' (1994) 21 (1) *Ecology Law Quarterly* 1. For general commentary on trade disputes see Ernst-Ulrich Petersmann, *The GATT/WTO Dispute Settlement System* Kluwer London (1997).

³⁷ *United States – Standards for Reformulated and Conventional Gasoline* WTO Doc WT/DS2/AB/R (Appellate Body Report 1996).

³⁸ *United States – Import Prohibition of Certain Shrimp and Shrimp Products* WTO Doc WT/DS/58/AB/R (Appellate Body Report, 1998).

³⁹ There have been other cases that looked at other Article XX exceptions, but these are not relevant to the environmental issues under consideration here. These cases include *Korea – Measures Affecting Imports of Fresh, Chilled and Frozen Beef* WTO Doc WT/DS/161/AB/R and WTO Doc WT/DS/169/AB/R. Both involved Article XX(d) GATT. For discussion of *US – Gasoline*, *US – Shrimp* and *EC – Asbestos* see WorldTradeLaw.net *Dispute Settlement Commentary Appellate Body Report United States – Import Prohibition of Certain Shrimp and Shrimp Products* 2001 WorldTradeLaw.net LLC; Robert Howse 'The Appellate Body Rulings in the *Shrimp/Turtle* Case: A New Legal Baseline for the Trade and Environment Debate' (2002) 27 *Columbia Journal of Environmental Law* 491; Joel Trachtman 'Decisions of the Appellate body of the World Trade Organization' (2003) 14 *European Journal of International Law* 379.

The Appellate Body has indicated that the purpose of the Article XX exceptions is to permit:

important state interests – including the protection of human health, as well as the conservation of exhaustible natural resources - to find expression ... WTO Members have a large measure of autonomy to determine their own policies on the environment (including its relationship with trade), their environmental objectives and the environmental legislation they enact and implement... circumscribed only by the need to respect the requirements of the *General Agreement* and other covered agreements.⁴⁰

In *US – Gasoline*, the Appellate Body approved a two-stage test for determining compliance with Article XX.⁴¹ As a matter of procedure, the measures in question must first be tested for a conditional compatibility with a specific exemption under Article XX. To convert this conditional compatibility into an unconditional one, the measure needs to be examined for discriminatory, or disguised, trade impacts in accordance with the Chapeau to Article XX.⁴² One reason for using this two-tiered approach is that the application of the discrimination-based Chapeau tests (the Chapeau tests), could vary in accordance with the sub-paragraphs of Article XX under consideration.⁴³ Table 9 provides a summary of the main decisions of GATT Panels, WTO Panels and the Appellate Body which will be referred to in the discussion of Article XX(b) and Article XX(g).

A state relying on the Article XX(b) exceptions needs to demonstrate two things: first, that the measure falls “within the range of policies designed to protect human, animal or plant life or health”;⁴⁴ and, second, that the

⁴⁰ *US – Gasoline*, part V ‘Findings and Conclusions’.

⁴¹ *US – Gasoline*, Part III with respect to Article XX(g) and then Part IV dealing with the Chapeau.

⁴² *US – Gasoline*, Part IV; see also *US – Shrimp* Paragraphs 118-120; Bradley J Condon, ‘GATT Article XX and Proximity of Interest: Determining the Subject Matter of Paragraphs b and g’ (2004) 9 *University of California Los Angeles Journal of International Law and Foreign Affairs* 137, 143.

⁴³ F Macmillan, *WTO and the Environment*, Sweet and Maxwell London (2001) paragraphs 4.34-4.35.

⁴⁴ *United States- Standards for Reformulated and Conventional Gasoline (United States-Gasoline)* WTO Doc (Panel Report) WT/DS2/R (Panel Report, 1996) paragraph 6.20.

TABLE 9
Summary Of Decisions On Articles XX(b) & XX(g) GATT

Name of Case	Article XX(b)	Article XX(g)	Chapeau
<i>United States – Tuna from Canada</i> 1982 (GATT Panel Report).	Not argued.	Failed this test because there were no domestic restrictions on the consumption of tuna or tuna products (paragraphs 4.9-4.12).	The “preamble” was not breached as there were no unjustified or disguised trade restraints (paragraph 4.8).
<i>Canada – Herring and Salmon</i> 1988 (GATT Panel Report).	Not argued.	Failed this test as the measures were not primarily aimed at the conservation of herring and salmon (paragraphs 4.4-4.7).	Not dealt with by the Panel.
<i>Thailand – Cigarettes</i> 1990 (GATT Panel Report).	Measures were found not to be necessary because there were other more impartial measures available (paragraphs 75, 77, 87).	Not argued.	Not dealt with by the Panel.
<i>United States – Tuna I</i> 1991 (GATT Panel Report).	Failed the “necessary” test. There were other options that could have been explored and moreover the extraterritorial component to the measure was fatal to the validity of the measures (paragraphs 5.27-5.28).	Argument failed; in particular the extraterritorial component was fatal to the validity of the measure (paragraph 5.32).	The Chapeau was not considered separately and specifically, but rather as part of the decision on XX(b) and XX(g) (paragraphs 5.27 and 5.32 respectively). As the measures had failed there was no separate decision on this point.
<i>United States – Tuna II</i> 1994 (GATT Panel Report).	The policy to protect dolphins could fall within the ambit of XX(b) (paragraph 5.33). However, the measures were applied in a way that was designed to force other countries to change their	The policy to protect dolphins could fall within the ambit of XX(g) (paragraph 5.20). However, the measures were not primarily aimed at conservation because they were designed to force other countries to change their environmental policies by the application of unilateral measures	The Panel did not discuss the chapeau because the substantive provisions of neither Article XX(b), nor XX(g) had been complied with (paragraphs 5.39 and 5.27 respectively).

	policies and therefore the measures were not “necessary” (paragraphs 5.37-5.39).	(paragraphs 5.26-5.27).	
<i>United States – Automobile Taxes</i> 1994 (GATT Panel Report).	Not Argued.	Argument failed, as the less favourable treatment given to large imported cars meant that the measure was not primarily aimed at conservation of natural resource (paragraph 5.61).	The Panel did not discuss the chapeau because the substantive provisions of Article XX(g) had not been complied with (paragraph 5.61).
<i>US – Gasoline</i> 1996 WTO Panel and Appellate Body Reports).	The Panel found the measure was not necessary because it could have been implemented in a less trade-restrictive manner (paragraph 6.28). This finding was not appealed by the US.	The measures could fall within the ambit of XX(g), as they related to conservation of an exhaustible natural resource (clean air), and they were also implemented in conjunction with domestic measures.(Appellate Body Paragraph III).	The measures breached the Chapeau as they were unjustifiably discriminatory and a disguised restriction on international trade. The measures did not give foreign refiners the same opportunity to use individual base lines as had been given to domestic refiners (Paragraph IV Appellate Body).
<i>US – Shrimp</i> 1998 (WTO Panel and Appellate Body Reports).	The Appellate Body did not make a decision on this point. The way that the case had been argued meant that XX(b) would only be invoked only if the measures fell outside the ambit of XX(g) (paragraph 146).	The measures would have come within the ambit of XX(g), as sea turtles are an exhaustible natural resource in need of protection (paragraphs 134, 142, 145).	The application of the measures breached the Chapeau. The requirements of the Chapeau were found to be analogous to the exercise of “good faith” and the US should have tried to negotiate treaties with all affected states first. This was especially important where different countries were treated differently where the same conditions prevail (paragraphs 172, 176 184).
<i>EC – Asbestos</i> 2000 (WTO Panel Report), 2001(WTO Appellate Body Report)	The measure was necessary, as there was no alternate measure that could reasonably be applied (Appellate Body paragraphs 170, 172-175).	Not argued.	The measure was not discriminatory, or a disguised restriction on international trade (Panel stage 3 paragraphs 8.228-8.240).

measure is “necessary to fulfil the policy objective”.⁴⁵ GATT Panels and the Appellate Body have tended not to analyse policy objectives in detail under Article XX(b). If we refer to Table 9, for example, we see that determinations were made on Article XX(b) in five cases: *Thailand — Restrictions on Importation of and Internal Taxes on Cigarettes (Thailand Cigarettes)*,⁴⁶ *United States — Restrictions on Imports of Tuna (Tuna I)*,⁴⁷ *United States — Restrictions on Imports of Tuna (Tuna II)*, *US – Gasoline*⁴⁸ and *EC – Asbestos*.⁴⁹ Neither the Panel nor the Appellate Body set out tests in these cases for scrutinizing the content of measures. While a connection needs to be established between national policy goals and the measures themselves, the focus has centred on how the measures were applied.⁵⁰ What can be said is that national policies can serve any number of legitimate goals. For example, GATT Panels and the Appellate Body have held that dolphins and human health could be protected using Article XX(b).⁵¹

The main focus of scrutiny has been on the word “necessary”.⁵² Early GATT cases gave this word a strict reading, so that the least trade-restrictive measure had to be applied.⁵³ However, WTO case law has

⁴⁵ *United States-Gasoline*. (Panel Report) paragraph 6.20.

⁴⁶ *Thailand — Restrictions on Importation of and Internal Taxes on Cigarettes (Thailand Cigarettes)* paragraph 81.

⁴⁷ *United States — Restrictions on Imports of Tuna (Tuna I)*, paragraph 5.27.

⁴⁸ *United States- Gasoline* Panel Report, paragraph 6.28.

⁴⁹ *EC – Asbestos*, Paragraphs 157 and 158.

⁵⁰ For analysis on the policy considerations of Articles XX(b) and XX(g) see Bradely J Condon, ‘GATT Article XX and Proximity of Interest: Determining the Subject Matter of Paragraphs b and g’ above n 42.

⁵¹ *United States – Tuna II* 1994 (GATT Panel Report), paragraph 5.33; *EC – Asbestos* paragraphs 170, 172-175.

⁵² For general discussion of Article XX(b) see M Cadeddu, ‘Turtles in the Soup? An analysis of the GATT Challenge to the United States Endangered Species Act Section 609 Shrimp Harvesting Nation Certification Program for the Conservation of Sea Turtles’ 1998 11 *Georgetown International Environmental Law Review* 179; Stanley Spracker and David Lundsgaard, ‘Dolphins and Tuna: Renewed Attention on the Future of Free Trade and Protection of the Environment’ (1993) 18 *Columbia Journal of Environmental Law* 385; Ted L McDorman, ‘The GATT Consistency of US Fish Import Embargoes to Stop Driftnet Fishing and Save Whales, Dolphins and Turtles’ (1991) 24 *George Washington Journal of International Law and Economics* 479; William Snape III and Naomi Lefkovitz, ‘Searching for GATT’s Environmental Miranda: Are ‘Process Standards’ Getting ‘Due Process?’ (1994) 27 *Cornell International Law Journal* 777, 797.

⁵³ *Thailand-Cigarettes* paragraphs 75, 77 and 87 and *United-States – Tuna I* paragraphs 5.27-5.28.

tempered this stance by introducing a “proportionality” test that considers and balances those factors relevant to each case.⁵⁴ In *EC – Asbestos*, the Appellate Body held that a measure was “necessary” if there was no alternative GATT-consistent measure available to a member which a party could *reasonably* be expected to employ.⁵⁵ In that case, for instance, France could not reasonably be expected to employ any alternative measure to a ban on asbestos and asbestos products if the alternative would involve a continuation of the very risk that they were seeking to halt.⁵⁶ Additionally, the genre of the measure is a relevant factor in determining whether it is necessary.⁵⁷ The preservation of human life and health would appear to categorize measures as “necessary” in circumstances where measures might not be “necessary” if they relate to non-human concerns.⁵⁸

In the regulation of IAS, a trade ban would prevent entry of pests, diseases and IAS generally. However, if on balance the same result could be achieved by a less restrictive trade method, then that method should be used. Australia, for example, is concerned that importation of bananas could introduce pests and diseases such as mealybugs, black sigatoka and moko.⁵⁹ Although a trade ban on bananas would stop these pests and

⁵⁴ See, for example, *EC – Asbestos* paragraphs 164-175.

⁵⁵ *EC – Asbestos*, paragraph 174.

⁵⁶ *EC – Asbestos*, paragraph 174.

⁵⁷ *EC – Asbestos*, paragraph 172; See also discussion of *EC-Asbestos* in WorldTradeLaw.Net ‘Dispute Settlement Commentary (DSC) *EC-Asbestos*’ page 17 <www.worldtradelaw.net> (June 2006).

⁵⁸ *EC – Asbestos*, paragraph 172; See also discussion of *EC – Asbestos* in WorldTradeLaw.Net ‘Dispute Settlement Commentary (DSC) *EC – Asbestos*’ page 17 <www.worldtradelaw.net> (June 2006) ;

⁵⁹ See Biosecurity Australia, *Revised Draft Import Analysis Report for the Importation of Cavendish Bananas from the Philippines issued in February 2007*. Biosecurity Australia, *Revised Draft Import Analysis Report for the Importation of Cavendish Bananas from the Philippines* Biosecurity Australia 2007.(Released in parts A, B and C), available <<http://www.daffa.gov.au/ba/ira/current-plant/banana-philippines>> (March 2007) Mealybugs are sap-sucking insects that damage plants: see H Hoffman and J Botha, Fact sheet no 51 Series ‘Gardennote’ Aphids, Mealybugs and Scales; Common Sapsuckers in the Home Garden. Government of Western Australia Department of Agriculture 1584-11/05-5000-ID5189 <<http://www.agric.wa.gov.au/pls/portal30/docs/FOLDER/IKMP/PW/INS/PP/HORT/GR EGARIOUSSAPSUCKERS.PDF>> (March 2007); Black Sigatoka is a fungal disease that causes leaf spots and lower yields of fruit. See the State of Queensland, Exotic Plants – Black Sigatoka Queensland Department of Primary Industries and Fisheries and Forestry, 1995-2007 <<http://www2.dpi.qld.gov.au/health/4025.html>>. (March 2007); Moko is a

diseases from being introduced, alternative measures, such as the use of fungicidal spray,⁶⁰ would effectively stop the introduction of mealybugs, black sigatoka and moko and hence not make a trade ban “necessary”.

Article XX(b) has a potentially broad scope. References to human, animal and plant life are not limited to nominated sectors, such as, agriculture or farming. The article could, therefore, apply to the regulation of wider environmental concerns, such as protecting biodiversity from the threat of alien species. However, the lack of adjudication upon the article in a quarantine context makes it difficult to predict how quarantine laws protecting the environment would be viewed.

The second possible exception to GATT obligations is found in Article XX(g). Article XX(g) stipulates that states may enact measures “relating to the conservation of exhaustible natural resources, if such measures are made effective in conjunction with restrictions on domestic production or consumption”. Three criteria need to be met to satisfy Article XX(g): first, the protection of an exhaustible natural resource; second, a conservation measure that is primarily aimed at conserving the natural resource; and third, a conservation measure that is implemented in conjunction with domestic restrictions.

In *US – Shrimp* the Appellate Body said that although living species are in principle renewable, they could also be susceptible to depletion and thus could be termed an exhaustible natural resource.⁶¹ Therefore, policy objectives aimed at regulating pests, diseases and other IAS in order to protect against depletion of natural resources would come within the ambit of Article XX(g). With respect to the second element of Article

bacterial wilt disease. See Australian Government, Department of Agriculture, Fisheries and Forestry, PaDiI (plant and diseases images library) <<http://www.padil.gov.au/viewPestDiagnosticImages.aspx?id=485>> (March 2007).

⁶⁰ Biosecurity Australia, *Revised Draft Import Analysis Report for the Importation of Cavendish Bananas from the Philippines* Part B Biosecurity Australia 2007. (Released in parts A, B and C) above n 59, paragraph 1 Overview and Part B.

⁶¹ *US – Shrimp*, paragraph 142. See M Cadeddu ‘above n 52, 191.

XX(g),⁶² in *Canada — Measures Affecting Exports of Unprocessed Herring and Salmon*, the Panel stated that “relating to” denotes that the measure needs to be primarily aimed at the conservation policy under review.⁶³ However, in *US — Shrimp*, the Appellate Body took a different approach and developed a means-and-ends test that depends on balance and proportionality in the application of measures. The Appellate Body said that the measure should not be:

“...disproportionately wide in its scope and reach in relation to the policy objective of protection and conservation of sea turtle species. The means are in principle reasonably related to the ends.”⁶⁴

In practice, this means that the conservation objectives of measures must be legitimate and the relationship between the measures and the objective sufficiently close. If the scope of measures is “disproportionately wide”, the means-and-ends test may not be fulfilled.

Yet, the meaning of proportionality still remains unclear where international trade issues intersect with the regulation of IAS. As discussed in Chapter 1, invasive alien species are propelling native species towards extinction and are regarded as the second most serious threat to loss of biodiversity after habitat destruction.⁶⁵ How is this serious problem and the preservation of biodiversity to be balanced against trade restraints? It may be that a trade ban is the only means of ensuring that certain species do not gain entry.⁶⁶ However, if a trade ban were judged to be disproportionate to the achievement of environmental objectives, the

⁶² Ted L McDorman, above n 52, 516-3 and especially 519; M Cadeddu, above n 52, 199.

⁶³ *Canada — Measures Affecting Exports of Unprocessed Herring and Salmon* paragraph 4.6. This approach was also favoured by the Appellate Body in *US — Gasoline*, although, in the latter case, they did point out that the phrase ‘primarily aimed at’ is not treaty language and hence should not be used as the sole determinant of whether measures comply with Article XX(g). *US — Gasoline* (Appellate Body) paragraph III B.

⁶⁴ *US — Shrimp*, paragraph 141.

⁶⁵ See discussion in section 1.1.3 of Chapter 1 of this study.

⁶⁶ For example species may be placed on lists prohibiting their importation; see above n 26.

trade ban could be struck down.⁶⁷ Much depends on the value placed upon the “natural resources” or biodiversity under consideration.

The final element of Article XX(g) is the need to implement conservation measures “made effective with restrictions on domestic production or consumption.” The use of the phrase “made effective” does not indicate that measures need to achieve a degree of effectiveness, or a specified result. In *US – Gasoline*, the Appellate Body pointed out that to require this in the field of environmental conservation would be particularly problematic. In IAS regulation, for example, if issues of causation had to be determined prior to concluding whether a measure was “made effective”, this might lead to unanswerable questions. Gaps and uncertainties in the information on IAS and the time lapse between implementation of a measure and its visible beneficial effects⁶⁸ would almost certainly defeat a requirement of “effectiveness”.

Overall, the final component of Article XX(g) has been held to entail “even-handedness in the imposition of restrictions”, so that similar restrictions are placed on both imported and domestic products.⁶⁹ Although it is not necessary to ensure that domestic and imported products are treated identically; if all the restrictions were placed on imported products this would clearly indicate discrimination designed to protect local products.⁷⁰ This means that if a state were to deny entry to alien species or otherwise regulate the species that state would also need to show that attempts had been made to regulate those alien species domestically. Hence, in Australia, the prohibited plant species list set out

⁶⁷ K Saito, *Yardsticks for ‘Trade and Environment’: Economic Analysis of the WTO Panel and the Appellate Body Reports regarding Environment-oriented Trade Measures* New York University School of Law Jean Monnet Center (2001) paragraph 2. Available <<http://www.jeanmonnetprogram.org/papers/01/013701.html>> (June 2006).

⁶⁸ See discussion in section 1.3.3 of Chapter 1 of this study. The effectiveness of a measure may nevertheless be important, for if the measure does not have a hope of succeeding, then it is arguable that the measure was primarily aimed at constructing a trade barrier, rather than conserving species *US – Gasoline* (Appellate Body), paragraph III C.

⁶⁹ *US – Gasoline* (Appellate Body), above n 37.

⁷⁰ *US – Gasoline* (Appellate Body), paragraph III C. This is what happened in *1982 Tuna and Tuna Products from Canada*, paragraphs 4.9-4.11.

by *Quarantine Proclamation 2006* (No.7) is supplemented by national and state strategies to eradicate and contain weeds and pests of plants.⁷¹

By and large, Article XX(g) imposes a less burdensome obligation on a defending party than does Article XX(b). The search is not for the least trade- restrictive measure that can be reasonably employed, but rather for a determination of whether a balanced approach between conservation and trade has been achieved. As with Article XX(b), the focus is on how the laws are applied, although from a slightly different and perhaps more permissive perspective.

Finally, both Article XX(b) and Article XX(g) are subject to the proviso or “Chapeau” of Article XX. The Chapeau concentrates on procedural matters ensuring that measures are not applied arbitrarily, and are not a disguised restriction on international trade:

The chapeau by its express terms addresses, not so much the questioned measure or its specific contents as such, but rather the manner in which that measure is applied.⁷²

Three conditions must be fulfilled to satisfy the requirements of the Chapeau, with a breach of any condition being sufficient to disallow a measure. First, the measure should not be an arbitrary discrimination against international trade; second the measure should not be an unjustifiable discrimination against international trade; and third the measure should not be a disguised restriction on international trade.⁷³

Early GATT cases tended not to define these three conditions, either individually, or specifically. However, two more recent cases, *US – Gasoline* and *US – Shrimp*, have explored the general meaning of these terms in greater detail. The Appellate Body has held that the three

⁷¹ See for instance, ‘Weeds Australia’ <<http://www.weeds.org.au/>> (April 2007). Weeds of National Significance <<http://www.environment.gov.au/biodiversity/invasive/weeds/wons.html>> (April 2007); The NSW Weeds Strategy <<http://www.ricecrc.org/reader/weed-legislation/nswstrat.htm>> (April 2007). These, however, may not always be implemented appropriately. See discussion in section 3.6 of Chapter 3 of this study.

⁷² *US – Gasoline* (Appellate Body), paragraph IV.

⁷³ *US – Shrimp*, paragraph 150.

requirements are related and overlap in a way that is designed to ensure that the Article XX exceptions are not abused by the contracting parties:

.....the kinds of considerations pertinent in deciding whether the application of a particular measure amounts to 'arbitrary or unjustifiable discrimination', may also be taken into account in determining the presence of a 'disguised restriction' on international trade. The fundamental theme is to be found in the purpose and object of avoiding abuse or illegitimate use of the exceptions to substantive rules...⁷⁴

This linking may explain why GATT jurisprudence has not ascribed a discreet meaning to the phrases and also why the focus has concentrated on the balance to be achieved between the use of the Article XX exceptions and parties' other obligations pursuant to GATT.⁷⁵ It should also be kept in mind that while the concept of non-discrimination is found in the substantive obligations of GATT, such as, Articles I and III⁷⁶ as well as the Chapeau, the latter is not to be interpreted in the same way as the Articles.

Rather, the Chapeau "is but one expression of the principle of good faith" designed to prohibit an abusive exercise of rights.⁷⁷ One element of good faith involves procedural fairness. If we refer to the third and fourth columns of Table 9 we see that in both *US – Gasoline* and *US – Shrimp*, the United States laws initially came within the ambit of Article XX(g), as enforcing legitimate policy goals of conservation. However, both laws failed the discrimination-based test of the Chapeau because the measures lacked procedural fairness.⁷⁸ Namely, the United States discriminated between WTO members by negotiating with and providing technical assistance to some Caribbean members, but not to India, Malaysia, Pakistan and Thailand.⁷⁹

⁷⁴ *US – Gasoline* (Appellate Body), paragraph IV.

⁷⁵ These obligations relate to fostering the central purpose of GATT which is to liberalize trade markets. See Discussion M Cadeddu, above n 52, 193-4.

⁷⁶ *US – Shrimp*, paragraph 150.

⁷⁷ *US – Shrimp*, paragraph 158-159.

⁷⁸ *US – Gasoline*, paragraphs V(b) and V(c); *US – Shrimp* paragraphs 159-186; see also *United States – Import Prohibition of Certain Shrimp and Shrimp Products - Recourse to Article 21.5 by Malaysia (US – Shrimp Article 21.5)* WTO Doc WT/DS58/RW (Appellate Body 2001), which was the implementation phase of *US – Shrimp*. In this case, the US measures passed the Chapeau test and for that reason were validated.

⁷⁹ *US – Shrimp*, paragraphs 148-186 and in particular 172.

Panels and the Appellate Body have held that components of procedural fairness include: examination of attempts made to negotiate bilateral treaties;⁸⁰ analysis of whether national law has been applied in a transparent and predictable manner; and scrutiny of the measures under review to establish whether they are sufficiently flexible in application.⁸¹

No quarantine laws have successfully been challenged on the sole basis that they did not meet the requirements of Article XX. Moreover, in none of the XX(b) or XX(g) cases were the measures examined for their scientific underpinnings. Instead, the examination has centred on the procedures and processes involved in the implementation of the measures. It is in this sense that GATT is strongly discrimination-based. By contrast, the Agreement on the Application of Sanitary and Phytosanitary Measures is strongly science-based, subjecting the content of national measures to rigorous scrutiny.

4.3 THE AGREEMENT ON THE APPLICATION OF SANITARY AND PHYTOSANITARY MEASURES (SPSA)

The SPSA influences the design and implementation of national quarantine regimes and, therefore, also potentially impacts on the way that states manage invasive alien species. Moreover, the adoption of the SPSA within the broader framework of the WTO and its enhanced dispute resolution mechanisms mean that the influence of the SPSA is likely to be significantly heightened. Unlike GATT 1947, Panel and Appellate Body decisions are automatically adopted, unless they are rejected by consensus.⁸² Overall, this signals that states' quarantine laws are likely to be an abundant source of dispute.⁸³

⁸⁰ The Appellate Body in *US – Shrimp*, paragraphs 170-172; the Panel in *Tuna I* at paragraph 5.28.

⁸¹ Appellate Body, *US – Shrimp*, paragraph 163.

⁸² DSU Article 16(4) with respect to Panel reports and Article 17(14) with respect to Appellate Body reports. The DSU is the Understanding on Rules and Procedures Governing the Settlement of Disputes [1995] ATS no 8. The DSU is the main WTO

4.3.1 Background to the Introduction of the Agreement on the Application of Sanitary and Phytosanitary Measures

The “Uruguay Round” of trade talks that led to the current WTO began in 1986. The session was introduced by the *Punta del Este Ministerial Declaration*, which accentuated the need to “halt and reverse protectionism and to remove distortions to trade.”⁸⁴ Singled out for special mention was the necessity of diminishing adverse impacts that sanitary and phytosanitary barriers could have on trade in agricultural products.⁸⁵ It was thought that to achieve these objectives, parameters needed to be set, not only with respect to the procedural aspect of quarantine laws, but also with regard to their content. Justification for the content would be demonstrated where measures were based on “science”. Additionally, internationally recognized base-lines would provide points of reference for comparison to national quarantine laws.

Before the Uruguay Round concluded, it became obvious that international organizations, such as the 1997 International Plant Protection Convention (IPPC)⁸⁶ and the 1924 International Agreement for the Creation at Paris of an International Office for Dealing with Contagious Diseases of Animals, and Annex (OIE),⁸⁷ were to play key roles in setting

document dealing with how disputes are resolved. The Dispute Settlement Body is made up of all member governments represented by ambassadors. See explanation on WTO website www.wto.org. See discussion David G Victor, ‘The Sanitary and Phytosanitary Agreement of the World Trade Organization: An Assessment After Five Years’ (2000) 32 *International Law and Politics* 865, 873-4, 896-7.

⁸³ Kevin Kennedy ‘Resolving International Sanitary and Phytosanitary Disputes in the WTO: Lessons and Future Directions’ (2000) 55 *Food and Drug Law Journal* 81, 83; David G Victor, above n 82, 879-85.

⁸⁴ 1986 *Punta del Este Ministerial Declaration*, (1986) 25 ILM 1623 part 1, Preamble.

⁸⁵ 1986 *Punta del Este Ministerial Declaration*, Part 1 D Heading ‘Agriculture’ (iii). See discussion – Donna Roberts ‘The Integration of economics in SPS risk management policies: issues and challenges’ in Kym Anderson, Cheryl McRae and David Wilson (eds) *The Economics of Quarantine and the SPS Agreement*, Centre for International Economic Studies Adelaide and AFFA, Biosecurity Australia. (2001) 9, 13; Steve Charnovitz ‘The Supervision of Health and Biosafety Regulation by World Trade Rules’ (1999-2000) 13 *Tulane Environmental Law Journal* 271, 272; generally J Croome, *Reshaping the World Trading System, A history of the Uruguay Round*, World Trade Organization (1995).

⁸⁶ *International Plant Protection Convention 1997*, adopted 17 November 1997, [2005] ATS No 23 (entered into force 2 October 2005). As of November 2007, the *International Plant Protection Convention 1997* (IPPC) has 166 parties.

⁸⁷ *International Agreement for the Creation at Paris of an International Office for Dealing with Contagious Diseases of Animals, and Annex 1924*, adopted 25 January

these base-lines.⁸⁸ The move would, henceforth, be made from a discrimination-based regime to one where scientific justification of the content of quarantine measures became equally important.

4.3.2 Overview of the Agreement on the Application of Sanitary and Phytosanitary Measures

The SPSA is designed to elaborate rules for the administration of national quarantine legislation in international trade⁸⁹ and also to provide additional direction for the operation of article XX(b) GATT.⁹⁰ This connection with GATT, however, should not be taken as an indication that the SPSA is only a lengthier and more detailed version of article XX(b). Although in some respects the SPSA might appear to be just that, the Panel in *EC Measures Concerning Meat and Meat Products (Hormones) Complaint by Canada Report of the Panel (EC – Hormones Panel Report Canada)* said:

...the general approach adopted in Article XX(b) of GATT is fundamentally different from the approach adopted in the SPS Agreement. Article XX(b), which is not limited to sanitary or phytosanitary measures, provides for a general exception which can be invoked to justify any violation of another GATT provision. The SPS Agreement, on the other hand, provides for specific obligations to be met in order for a Member to enact or maintain specific types of measures, namely sanitary and phytosanitary measures.⁹¹

If the SPSA were only an embellished version of article XX(b), the provisions of the SPSA would have adhered to the discrimination-based approach of GATT. In contrast, the SPSA is a free-standing agreement⁹² that links the validity of national quarantine laws to scientific

1924 [1925] ATS No 15, (entered into force 12 January 1925). The organization is known as the OIE and as at November 2007 has 173 members.

⁸⁸ R Griffin, 'Introduction to the International Plant Protection Convention (IPPC)' in Multilateral Trade Negotiations on Agriculture, A Resource Manual FAO Rome (2000).

⁸⁹ Article 12 of the SPSA provides for the establishment of a Committee on Sanitary and Phytosanitary Measures (the SPS Committee). The SPS Committee provides a regular forum for consultation and discussion of quarantine and trade measures, as well as guides the implementation of the SPSA. See SPSA, Articles 3.5 and 12.1.

⁹⁰ SPSA, Preamble.

⁹¹ *EC Measures Concerning Meat and Meat Products (Hormones) Complaint by Canada Report of the Panel (EC – Hormones Panel Report Canada)* WTO Doc WT/DS48/R/CAN (Panel Report 1997) paragraph 8.42.

⁹² *EC – Hormones* Panel Report, paragraphs 8.37-8.44.

cornerstones. It sets out binding requirements for plant, animal and food health and safety and underpins these with a set of essential principles, found in Articles 2-10.⁹³ Article 2.1 provides a statement of basic rights of members:

Members have the right to take sanitary and phytosanitary measures necessary for the protection of human, animal or plant life or health, provided that such measures are not inconsistent with the provisions of this Agreement.

The provisions of the SPSA referred to in the proviso to Article 2.1 include requirements concerning harmonization of measures and adherence to international standards;⁹⁴ the expectation that otherwise measures will be based on international standards even if measures do not precisely adhere to these standards;⁹⁵ the need to justify measures by the use of risk assessment and scientific validation;⁹⁶ the requirement that measures should not extend beyond a state's appropriate level of protection;⁹⁷ and the requirement that measures should not be discriminatory or a disguised restriction on international trade.⁹⁸ The design and implementation of quarantine measures is not, therefore, a totally autonomous exercise and is subject to those limitations set by the SPSA.

Moreover, some limitations set by the SPSA, such as those relating to non-discrimination and disguised trade restraints, overlap with similar provisions found in GATT.⁹⁹ Similarly, members' rights to implement quarantine regulation overlap with the exceptions to substantive GATT obligations found in Articles XX(b) and XX(g) GATT. It is therefore

⁹³ For a discussion of the SPSA see generally Joost Pauwelyn 'The WTO Agreement and Phytosanitary (SPS) Measures as Applied in the First Three SPS Disputes' [1999] *Journal of International Economic Law* 641; Andrew P Thompson 'Australia – Salmon and Compliance Issues Surrounding the SPS Agreement: Sovereign Acceptance and Measure Adaptation' (2002) 33 *Law and Policy in International Business* 717; Joseph P Whitlock 'Japan – Measures Affecting Agricultural Products: Lessons for Future SPS Disputes Agricultural Trade Disputes' (2002) 33 *Law and Policy in International Business* 741.

⁹⁴ SPSA, Article 3.2.

⁹⁵ SPSA, Article 3.1.

⁹⁶ SPSA, Articles 2.2 and 5.

⁹⁷ SPSA, Article 2.2.

⁹⁸ SPSA, Articles 2.3 and 5.5.

⁹⁹ For example, Articles I and III GATT and Article 2.3 SPSA.

necessary to say a word or two about the relationship between the SPSA and GATT and the sphere of operation of each agreement.

4.3.3 The Relationship Between the SPSA and GATT Article XX

One aspect of the relationship between the SPSA and GATT - a determination on the hierarchy of the two agreements - has been settled in favour of the SPSA.¹⁰⁰ Support for this proposition is found both in the SPSA itself and in *EC – Hormones Panel Report Canada*.¹⁰¹ Article 2.4 of the SPSA provides, where measures conform to the SPSA they enjoy a presumption of compliance with those GATT articles that relate “to the use of sanitary or phytosanitary measures, in particular the provisions of Article XX(b)”. There is no reverse proposition that GATT-compliant measures are presumed to comply with the SPSA. Indeed, in *EC – Hormones Panel Report Canada*¹⁰² the Panel confirmed that, if a measure needs to comply with the SPSA, it cannot be contended that the measure instead complies with GATT.¹⁰³

However, the provisions of GATT have not been rendered nugatory by the SPSA.¹⁰⁴ In *EC – Hormones*, the Panel noted that, in the submissions made by the European Community and the United States, neither party had argued that the provisions of the SPSA automatically conflicted with,

¹⁰⁰ SPSA, Article 2.4; *EC – Hormones Panel Report Canada*, paragraphs 8.43-8.45.

¹⁰¹ *EC – Hormones* Panel Report, paragraphs 8.43-8.45.

¹⁰² *EC – Hormones* Panel Report, paragraphs 8.43-8.45.

¹⁰³ *EC – Hormones* Panel Report, paragraphs 8.43-8.45. Although the decision in that case specifically related to article XX(b) of GATT, presumably the same reasoning would apply to article XX(g). However, there was no decision on this latter point, because it was not argued. For a differing opinion see F Macmillan, *WTO and the Environment* above n 43 at paragraph 4.50.

¹⁰⁴ In some circumstances, the precise relationship of the two agreements has yet to be determined. In *Australia-Salomon*, for example, Canada argued that Australia’s import prohibition breached both the SPSA and Article XI GATT. However, once the Panel found Australia’s measure breached the SPSA the Panel did not adjudicate upon Article XI GATT further. See paragraph 8.185. One reason for this approach stems from the concept of ‘judicial economy’. Where multiple arguments are before the Panel or Appellate Body, the practice has developed of determinations only being made on those legal issues essential to the findings. *United States – Measures Affecting Imports of Woven Wool Shirts and Blouses from India* WT/DS33/AB/R at paragraph VI. See discussion in William Davey ‘Has the WTO Dispute Settlement System Exceeded Its Authority?: A Consideration of Deference Shown by the System to Member Government Decisions and Its Use of Issue-Avoidance Techniques’ (2001) 4 *Journal of International Economic Law* 79.

or superseded, GATT Article XX.¹⁰⁵ In short, while the potential to use GATT, and in particular the Article XX exceptions, has diminished since 1995, GATT will apply where the SPSA does not. Consequently, the meaning of an SPS measure and a discussion of the ambit of the SPSA are important to determining the residual application of GATT.

4.3.4 The Meaning of an SPS Measure

An SPS measure is defined widely in the SPSA as any measure that is applied:

(a) to protect animal or plant life or health within the territory of the Member from risks arising from the entry, establishment or spread of pests, diseases, disease-carrying organisms or disease-causing organisms;¹⁰⁶ and

(d) to prevent or limit other damage within the territory of the Member from the entry, establishment or spread of pests.¹⁰⁷

Clearly, laws designed to protect agriculture and farming from diseased or contaminated species or products¹⁰⁸ are SPS measures, as are laws that regulate otherwise healthy “pests” that could nonetheless cause damage within the territory of a member.¹⁰⁹ The term “SPS measure” would therefore include all types of measures that can be implemented, such as pre-import inspections and certifications, border controls, ranging from prohibitions on import to risk assessment, inspection and treatment as well as post-import measures, such as monitoring and surveillance.

Additionally, the fact that a measure has environmental objectives does not prevent it from being classified as an SPS measure.¹¹⁰ Environmental objectives, for example, can still relate to stopping the spread of diseases and pests within paragraphs 1(a) and 1(d) above. The issue was addressed

¹⁰⁵ *EC – Hormones Panel Report Canada*, paragraph 8.35. The exact relationship of GATT Article XX to the SPSA is yet to be determined.

¹⁰⁶ SPSA, Annex A Article 1(a).

¹⁰⁷ SPSA, Annex A Article 1(d).

¹⁰⁸ SPSA, Annex A Articles 1(a) (b) and (c).

¹⁰⁹ SPSA, Annex A Article 1(d).

¹¹⁰ *European Communities – Measures Affecting the Approval and Marketing of Biotech Products* WTO Doc WT/DS/291, WT/DS/292 and WT/DS/293 (*Biotech Products*) (Report of the Panel, 2006).

in *European Communities – Measures Affecting the Approval and Marketing of Biotech Products (Biotech Products.)*¹¹¹

That case involved a long-running dispute between the EC as respondent and the United States of America, Canada and Argentina as complainants. The dispute stemmed from delays by the EC to authorize the commercial use of genetically modified products, including genetically modified crops, with no genetically modified products having been authorized by the EC since 1998. The complainants argued that this amounted to a *de facto* moratorium by the EC in violation of the SPSA.¹¹² The Panel ultimately found that the EC had indeed maintained a moratorium¹¹³ because it had failed to “complete approval procedures without undue delay”.¹¹⁴

During the course of their arguments the EC asserted that for a measure to be an SPS measure it had to have an objective or purpose within the ambit of the SPSA.¹¹⁵ The EC said

(T)he *SPS Agreement* was not intended by its drafters to apply to all products and all risks in all circumstances ... Article 1.1 of the *SPS Agreement* describes what the agreement “applies to” and refers specifically to “sanitary and phytosanitary measures.” ... therefore, there is a threshold issue to be decided: does the matter fall within the scope of the *SPS Agreement*? If a matter falls outside the scope of the *SPS Agreement* then it cannot be inconsistent with that agreement. To determine whether a given matter falls within the scope of the *SPS Agreement* the starting point must be point 1 of Annex A.¹¹⁶

¹¹¹ *Biotech Products*, paragraph 7.158.

¹¹² These included: Article 2.2, Article 2.3, Article 5.1, Article 5.5, Article 5.6.

¹¹³ *Biotech Products*, paragraphs 8.13 -8.15.

¹¹⁴ *Biotech Products*, paragraphs 8.6. It should be emphasised that in doing so, the Panel clearly indicated that it was not making decisions concerning the safety or otherwise of genetically modified products.

¹¹⁵ *Biotech Products*, paragraph 7.151. See also *European Communities – Measures Affecting Biotech Products First Written Submission the Approval and Marketing of Biotech Products by the European Communities DS/291, DS/292, DS/293* First written submission by the European Communities Geneva 17 May 2004 at paragraphs 389-433.

¹¹⁶ *European Communities – Measures Affecting Biotech Products First Written Submission the Approval and Marketing of Biotech Products by the European Communities DS/291, DS/292, DS/293* First written submission by the European Communities Geneva 17 May 2004, paragraph 392.

The EC further contended that, as the word “environment” was not used in the SPSA in conjunction with the definition of a risk assessment,¹¹⁷ the SPSA was not relevant where SPS measures were implemented to achieve environmental objectives:¹¹⁸

Directive 90/220 focuses on environmental protection. It uses the word “environment” or an equivalent at least 20 times in its recitals; Directive 2001/18 uses the term at least 29 times ... By contrast, Annex A of the *SPS Agreement* does not address environmental protection ... The *SPS Agreement* was not intended to address the prevention of risks to the environment.¹¹⁹

Had these arguments succeeded, it would have meant that SPS measures designed to protect the environment would be adjudicated under other WTO instruments, such as the Article XX exceptions to GATT, or perhaps even outside the WTO.¹²⁰ However, the Panel countered these arguments, finding:

Nor does the SPS Agreement say that an SPS measure – meaning a measure addressing a risk enumerated in Annex A – somehow loses its status as an SPS measure if the adoption of the measure is also supported by other rationales.¹²¹

In finding that Articles (1)(a) and (d) Annex A of the SPSA were wide enough to cover risks to the environment,¹²² the Panel effectively ensured that quarantine measures implemented to protect biodiversity from the threat of alien species also come within the ambit of the SPSA. This gives the concept of an SPS measure an expansive meaning. For the purposes of this study the term “quarantine measures” is used synonymously with “SPS measures”.

¹¹⁷ The word ‘environment’ is used in article 5.2 of the SPSA in connection with the types of matters that may be taken into account in a risk assessment.

¹¹⁸ See discussion in *Biotech Products*, paragraphs 7.151 and 7.198.

¹¹⁹ *European Communities – Measures Affecting Biotech Products First Written Submission the Approval and Marketing of Biotech Products by the European Communities DS/291, DS/292, DS/293* First written submission by the European Communities Geneva 17 May 2004, paragraph 416.

¹²⁰ In *Biotech Products* the EC had argued that the case should have been decided on the basis of the Agreement on Technical Barriers to Trade, rather than the SPSA, because the Agreement on Technical Barriers to Trade mentions the word ‘environment’ and the SPSA does not. *Biotech Products*, paragraph 7.198.

¹²¹ *Biotech Products*, paragraph 7.158.

¹²² *Biotech Products*, paragraph 7.365.

4.3.5 The Appropriate Level of Protection (ALOP)

The appropriate level of protection, or ALOP, is defined in the SPSA as: “the level of protection deemed appropriate by the member”.¹²³ Fundamentally, the ALOP determines what level of risk is acceptable for a member.¹²⁴ As a preliminary matter, the ALOP needs to be distinguished from an actual SPS measure. The former is an objective that a member seeks to achieve, while the latter is the means by which that objective is to be realized.¹²⁵ Consequently, while there are no provisions in the SPSA that categorically declare a state *must* determine its ALOP, a state would need to determine its ALOP prior to enactment of quarantine measures. Logically, a quarantine measures should be designed to achieve pre-determined objectives set by the ALOP.¹²⁶

In principle, the determination of an ALOP is the prerogative of the member concerned. This much was emphasized by the Appellate Body in *EC – Hormones*:

...this right of a member to establish its own level of sanitary protection under Article 3.3 of the SPS Agreement is an autonomous right and *not* an “exception “from a “general obligation” under Article 3.1.”¹²⁷

¹²³ SPSA, Annex A Article 5. For discussion of the ALOP see Jeffrey Atik ‘The Weakest Link: Demonstrating the Inconsistency of ‘Appropriate Levels of Protection’ in *Australia – Salmon*’ (2004) 24 *Risk Analysis* 483; Spencer Henson ‘The ‘appropriate level of protection’: a European perspective’ in Kym Anderson, Cheryl McRae and David Wilson (eds) *The Economics of Quarantine and the SPS Agreement*, Centre for International Economic Studies Adelaide and AFFA Biosecurity Australia. (2001) 105; Parliament of Australia (Senate): Senate Committees: An Appropriate Level of Protection. *The Importation of Salmon Products*. Commonwealth of Australia 2000.

¹²⁴ Gretchen Stanton, ‘The Multilateral Trading System and SPS Agreement’ in Quarantine and Market Access. Forum Proceedings 6-7 September 2000, Department of Agriculture & Forestry- Canberra Australia (2000) 73, 75-6.

¹²⁵ *Australia – Measures Affecting Importation of Salmon (Australia – Salmon)* WTO Doc WT/DS/18/AB/R (Report of the Appellate Body, 1998), paragraph 200.

¹²⁶ *Australia – Salmon*, paragraph 201. Moreover, the requirement to set an ALOP is implicit in the wording of several provisions in the SPSA such as Article 4.1 which deals with equivalence and Articles 5.4 and 5.6 which refer to the least trade-restrictive measures, all of which proceed on the assumption that an ALOP has already been set. *Australia – Salmon*, paragraph 205.

¹²⁷ *European Communities — Measures Concerning Meat and Meat Products (Hormones) (EC – Hormones)* WTO Doc WT/DS/26/AB/R, WT/DS48/AB/R (report of the Appellate Body, 1998) paragraph 172.

As an objective, the ALOP will normally be formulated in terms of “broad qualitative statement(s) of quarantine policy”,¹²⁸ although the ALOP may also be formulated quantitatively.¹²⁹ Ideally, the ALOP should also provide the best possible level of protection, rather than supply a level of risk that can be tolerated.¹³⁰ A high level of protection paves the way for the implementation of strong quarantine regimes.

The relationship between the objectives that a state is trying to achieve and the setting of an ALOP is significant. One objective may be to reveal to other trading partners the degree of caution that a state considers it should exercise with respect to quarantine matters. In effect, the ALOP provides an upper ceiling for the implementation of measures; an ALOP that sets a low level of protection gives an opponent an opportunity to challenge another state’s quarantine measures as unduly restrictive.

In the context of the regulation of IAS an ALOP set at a high level indicates that a state considers it has a high degree of exposure to invasion by alien species and, consequently, is exercising a high degree of caution. This also means that the state is only prepared to accept a low level of risk that unwanted species will gain entry. On the other hand, where the ALOP is set at a low level, then the state may be signalling that it is prepared to accept a high degree of risk that unwanted or harmful species might gain entry, or the state may be indicating that it considers itself to have a low level of exposure to future harm from alien species. Table 10 illustrates these relationships. In reality, different countries will formulate their

¹²⁸ David Wilson, ‘The Appropriate Level of Protection’ in Quarantine and Market Access. Forum Proceedings 6-7 September 2000. Department of Agriculture & Forestry-Canberra Australia (2000) 159, 163.

¹²⁹ For example, even though the risk must be an ascertained one, so that it can be the subject of a risk assessment, there is nothing in WTO practice to prevent a member from setting their ALOP at zero. This is the highest level of protection, as it signals to other WTO members that a state has a ‘zero tolerance’ for this particular risk. This might be the case, for example, with respect to the entry of animal diseases, such as foot and mouth disease. See *EC – Hormones*, paragraph 186 and *Australia — Salmon*, paragraph 125.

¹³⁰ Gavin Goh and Andreas Ziegler, ‘Implications of Recent SPS Dispute Settlement Cases’ in Kym Anderson, Cheryl McRae and David Wilson (eds) *The Economics of Quarantine and the SPS Agreement* Centre for International Economic Studies Adelaide and AFFA Biosecurity Australia (2001) 75, 78.

ALOPs in different ways, for different reasons. For example, Australia's ALOP has been said to be high or very conservative, while not being a zero level of risk.¹³¹ This means that Australia exercises a high degree of caution, which generally reflects Australia's comparatively disease-free status¹³² and the importance of this to Australia's trade in agricultural products.¹³³

TABLE 10
Relationship of the ALOP to Level of Risk and Future Harm

LEVEL OF PROTECTION DETERMINED BY A STATE IN THE SETTING OF ITS ALOP	LEVEL OF RISK THAT A STATE IS PREPARED TO ACCEPT	EXPOSURE TO FUTURE HARM
HIGH LEVEL OF PROTECTION DETERMINED BY THE ALOP	LOW LEVEL OF RISK	HIGH LEVEL OF EXPOSURE TO FUTURE HARM
MEDIUM LEVEL OF PROTECTION DETERMINED BY THE ALOP	MEDIUM LEVEL OF RISK	MEDIUM LEVEL OF EXPOSURE TO FUTURE HARM
LOW LEVEL OF PROTECTION DETERMINED BY THE ALOP	HIGH LEVEL OF RISK	LOW LEVEL OF EXPOSURE TO FUTURE HARM

¹³¹ See discussion in *Australia – Salmon*, paragraphs 197 and 231.

¹³² R Jessop and R Wright, 'Power Over the Land' in J Smith (ed), *The Unique Continent* University of Queensland Press, Queensland (1992) 141, 144.

¹³³ Gavin Goh, and Andreas Ziegler, above n 130, 77.

The EC has also set its ALOP at a high level, as mandated by Articles 95(3) and 152 of the Treaty Establishing the European Community.¹³⁴ Article 95(3) provides that, in health issues, the EC will adopt a high level of protection; while Article 152(1) provides that a “high level of human health protection shall be ensured in the definition and implementation of all Community policies and activities”. These Articles became important in the *EC – Hormones* decision,¹³⁵ because the EC sought to justify a ban on meat products grown with the use of hormones by setting a high ALOP. This decision was reflected in a zero tolerance of risk with respect to the use of hormones in the beef industry, so that *any* meat grown using hormones was banned throughout the EC. On the other hand, from the *EC – Hormones* decision, the United States, in setting its ALOP, would give most weight to the level of scientific justification that is available to underpin an ALOP.¹³⁶

Inasmuch as a high ALOP will support strong quarantine measures, where there is a need to prevent entry of IAS, this factor should point towards the setting of an ALOP to a high level. However, there are limits to how states set their ALOP and to the way the ALOP operates in practice.

4.3.6 Limitations on the Setting of an ALOP

Although there are no provisions in the SPSA that specifically permit a review of the *policy* decision to set the ALOP,¹³⁷ the SPSA does limit the *manner* of setting an ALOP. These are designed to ensure that neither the

¹³⁴ 2002 Consolidated Version of the Treaty Establishing the European Community *Official Journal* C 325 24 December 2002; Spencer Henson ‘The ‘appropriate level of protection’: a European perspective’ in Kym Anderson, Cheryl McRae and David Wilson (eds), *The Economics of Quarantine and the SPS Agreement*, Centre for International Economic Studies Adelaide and AFFA Biosecurity Australia. (2001) 105, 114; Grace Skogstad, ‘The WTO and Food Safety Regulation Policy Innovation in the European Union’ (2001) 39 *Journal of Common Market Studies* 486, 489-92.

¹³⁵ For discussion of the *EC – Hormones* decision see Regine Neugebauer, ‘Fine-Tuning WTO Jurisprudence and the SPS Agreement: Lessons from the Beef Hormones Case’ (2000) 31 *Law and Policy in International Business* 1255; Richard Quick and Andreas Blüthner, ‘An Appraisal and Criticism of the Ruling in the WTO *Hormones* Case’ (1999) *Journal of International Economic Law* 603; David G Victor, above n 82, 898-904.

¹³⁶ Spencer Henson, above n 123, 115.

¹³⁷ *EC – Hormones*, paragraph 172.

ALOP, nor measures enacted pursuant to the ALOP, are used to construct unwarranted trade barriers.

First, the ALOP must be set with sufficient precision to enable determinations to be made under the SPSA. For example, Article 5.6 provides that:

when establishing or maintaining sanitary or phytosanitary measures to achieve the appropriate level of sanitary or phytosanitary protection, Members shall ensure that such measures are not more trade-restrictive than required to achieve their appropriate level of sanitary or phytosanitary protection, taking into account technical and economic feasibility

It would not be possible to decide whether, further to Article 5.6, a measure is more trade-restrictive than required, unless the ALOP were known with certainty.¹³⁸ If a member were not required to set a precise ALOP, or indeed an ALOP at all, this might provide a loophole allowing members to avoid their obligations. It would mean that an adjudicator could not tell whether national measures were designed to achieve an ALOP, or were designed to restrict trade. Consequently, where an ALOP has not been determined, or has been imprecisely determined, the Appellate Body has indicated that the ALOP may be inferred from the measures themselves.¹³⁹

One difficulty identified in using this approach is that quarantine measures, themselves, deal with specific risks attached to imports and are, therefore, specifically drawn.¹⁴⁰ If they were to be examined in isolation, the measures may not necessarily be indicative of the ALOP. According to one commentator, should the Appellate Body adopt this method, then a range of measures would need to be examined and a method established of correlating them with the ALOP.¹⁴¹ In the example discussed in Chapter 3 concerning trade between Canada and the United States,¹⁴² the fact that Canada does not regulate fruit flies could be used to draw a

¹³⁸ *Australia – Salmon*, paragraphs 205- 206.

¹³⁹ *Australia – Salmon*, paragraph 207.

¹⁴⁰ David Wilson, *The Appropriate Level of Protection*, above n 128, 163.

¹⁴¹ *Ibid.*

¹⁴² See discussion in section 3.4.2 of Chapter 3 of this study.

conclusion that Canada has a low ALOP with respect to agricultural products. However, before this conclusion could be drawn, it would be necessary to compare measures regulating a range of agricultural products, pests and diseases.

In addition, the setting of an ALOP needs to conform to Articles 3.3 and 5.1 which tie quarantine measures to scientific cornerstones. Article 3.3 provides that

Members may introduce or maintain sanitary or phytosanitary measures which result in a higher level of sanitary or phytosanitary protection than would be achieved by measures based on the relevant international standards, guidelines or recommendations, if there is a scientific justification, or as a consequence of the level of sanitary or phytosanitary protection a Member determines to be appropriate in accordance with the relevant provisions of paragraphs 1 through 8 of Article 5 ...

Article 5.1 provides

Members shall ensure that their sanitary or phytosanitary measures are based on an assessment, as appropriate to the circumstances, of the risks to human, animal or plant life or health, taking into account risk assessment techniques developed by the relevant international organizations.

Article 3.3 requires scientific justification for measures based on standards higher than international ones, and Article 5.1 stipulates that measures must be based on risk assessment.¹⁴³ In *EC – Hormones*, the Appellate Body said that the setting of an ALOP is not “an absolute or unqualified right”; and in particular referred to Article 3.3, which requires scientific justification for the measures which in any event “shall not be inconsistent with any other provision in this agreement”.¹⁴⁴ In fact, Articles 3.3 and 5.1 link the setting of the ALOP to the measures themselves. It means that where measures are set at standards higher than international ones, then the measures require scientific justification by way of risk assessment.

¹⁴³ *EC – Hormones*, paragraph 173.

¹⁴⁴ *Ibid.*

In *EC – Hormones*, the Appellate Body held that, because the EC had established an ALOP higher than that found in the standards set by the Codex Alimentarius Commission, the EC was bound to comply with the requirements of Article 5.1.¹⁴⁵ The Appellate Body emphasized that Article 5.1 was intended to operate as a countervailing factor, with respect to members’ rights to set their own ALOP, and was furthermore designed to encourage harmonization of SPS measures, as set out in Article 3. Yet, if the setting of an ALOP is truly the prerogative of a member, and the ALOP is a policy objective that may take into consideration matters other than pure science, it is incongruous that that right is subject to a scrutiny via the measures that themselves need to be science-based. Although theoretically a state does not need to justify the setting of its ALOP, an ALOP functions through the measures that support it.¹⁴⁶ Consequently, where a state cannot justify measures because of lack of scientific certainty, it also means that the ALOP is under challenge; a situation that has led one commentator to state that in some instances a state’s right to set its own ALOP may be “more illusory than real”.¹⁴⁷

A further requirement stems from Article 5.5 that stipulates:

With the objective of achieving consistency in the application of the concept of appropriate level of sanitary or phytosanitary protection against risks to human life or health, or to animal and plant life or health, each Member shall avoid arbitrary or unjustifiable distinctions in the levels it considers to be appropriate in different situations, if such distinctions result in discrimination or a disguised restriction on international trade.

An important consideration is how the phrase “different situations” is interpreted. The Appellate Body has held that the phrase refers to different, but comparable situations.¹⁴⁸ To be comparable, the ALOPs must have some common elements¹⁴⁹ such as risk of entry, establishment or spread of the same or similar diseases; or involve the same or similar

¹⁴⁵ *EC – Hormones*, paragraph 176.

¹⁴⁶ SPSA, Article 3.3; *EC – Hormones*, paragraph 173.

¹⁴⁷ G Anderson ‘Quarantine and the SPS Agreement Maintaining a Balance between Protection and Protectionism’ (paper presented at a Symposium on WTO Law and Economic Welfare Effects, Adelaide 25 February 2004) 5. <http://www.iit.adelaide.edu.au/docs/Gordon%20Anderson.pdf>

¹⁴⁸ *Australia – Salmon*, paragraph 216.

¹⁴⁹ *Australia – Salmon*, paragraph 217.

associated biological and economic consequences.¹⁵⁰ Hence, in designing IAS regimes, states need to be careful how they treat comparable risks across different product sectors; for the lowest level of protection can act as a ceiling for all related species.¹⁵¹ This is precisely what happened to Australia in *Australia - Measures Affecting Importation of Salmon*.¹⁵² In that case, the Appellate Body found that Australia effectively maintained a low ALOP for imported ornamental finfish and live bait, but set a high ALOP for chilled salmon. This breached Article 5.5, because the product sectors are comparable and live fish pose more of a risk of introducing diseases and pests than chilled salmon.¹⁵³ The limitations on the setting of an ALOP are also mirrored by limitations that states have in their choice of SPS measures.

4.3.7 Limitations on Design and Implementation of SPS Measures

Limitations on a state's choice of measures are designed to ensure that measures are not used to construct unwarranted trade barriers. The SPSA retains elements of GATT's discrimination-based approach,¹⁵⁴ but synthesizes them with requirements of scientific certainty. States may demonstrate scientific certainty either by using international standards or by undertaking a risk assessment. In the absence of international standards, or sufficient scientific information, states may implement temporary measures pursuant to Article 5.7.¹⁵⁵ This Article represents a qualified exemption from the general proscription against measures being maintained without sufficient scientific evidence¹⁵⁶ and the measures must be reviewed within a reasonable time. The Appellate Body has not, to date, provided a great deal of guidance on how this part of article 5.7 is to

¹⁵⁰ *Australia – Salmon*, paragraph 146. Gavin Goh, and Andreas Ziegler, above n 130, 79.

¹⁵¹ See general discussion Jeffrey Atik, 'The Weakest Link: Demonstrating the Inconsistency of 'Appropriate Levels of Protection' in *Australia – Salmon*' above n 123.

¹⁵² *Australia - Measures Affecting Importation of Salmon* (*Australia – Salmon*) (Report of the Appellate Body), above n 125.

¹⁵³ *Australia – Salmon*, paragraphs 144-158.

¹⁵⁴ See for example SPSA, Article 2.3, 5.5 and 5.6.

¹⁵⁵ See further discussion in section 5.2.3 of Chapter 5 and section 6.2.3 of Chapter 6 of this study.

¹⁵⁶ *Japan – Measures Affecting Agricultural Products* (*Japan – Agricultural*) WTO Doc WT/DS76/AB/R (report of the Appellate Body 1999) paragraph 80.

operate.¹⁵⁷ Figure 1 demonstrates the process of risk assessment and its link to the ALOP in diagrammatic form.

4.3.8 International Standards

The SPSA contains a collective definition of “international standards, recommendations and guidelines”, articulated by reference to the standards, guidelines and recommendations developed within the framework of the three nominated standard-setting bodies,¹⁵⁸ the Codex Alimentarius,¹⁵⁹ the OIE¹⁶⁰ and the IPPC.¹⁶¹ This definition reflects the fact that standards themselves are not set by the WTO, but rather are formulated by the three nominated bodies and adopted by international agreement. Similarly, the International Standards Organization (ISO),¹⁶² defines standards as solutions developed by consensus to overcome problems created by technical barriers arising out of different technical regulations “developed independently and separately by each nation”.¹⁶³ Therefore, in the context of the SPSA, an important feature of standards is to provide a level of harmonization and safety in SPS measures applying to trade in plant and animal products.

¹⁵⁷ For discussion, see R Cooney ‘Precaution and invasive alien species: challenges at the interface of the trade and environment regimes’. (paper presented at proceedings of a Global Synthesis Workshop on Biodiversity Loss and Species Extinctions; Managing risk in a Changing World Sub theme: Invasive Alien Species – Coping with Aliens San Jose, Costa Rica. May 1999.) 9 Available at <<http://www.iucn.org/congress/documents/outputs/biodiversity-loss/precaution-cooney.pdf>> (March 2006) at 9. Also, the impact of this requirement is most likely to be felt most strongly by developing states. Their limited finances could mean that they would be hard pressed to gather fresh information in a ‘reasonable’ time for every provisional measure. Conversely, they may find it difficult to mount challenges to provisional measures of other states.

¹⁵⁸ SPSA, Annex A paragraph 3.

¹⁵⁹ Pursuant to SPSA, Annex A Article 3(a). The Codex Alimentarius Commission was created in 1963 by FAO/WHO. As at November 2007 it has 176 members. See official web site http://www.codexalimentarius.net/web/index_en.jsp The main purposes of the Food Standards Programme are protecting health of the consumers and ensuring fair trade practices in the food trade, and promoting coordination of all food standards work undertaken by international governmental and non-governmental organizations. <http://www.codexalimentarius.net/web/index_en.jsp> (April 2006).

¹⁶⁰ Nominated pursuant to SPSA, Annex A Article 3(b).

¹⁶¹ Nominated pursuant to SPSA, Annex A Article 3(c).

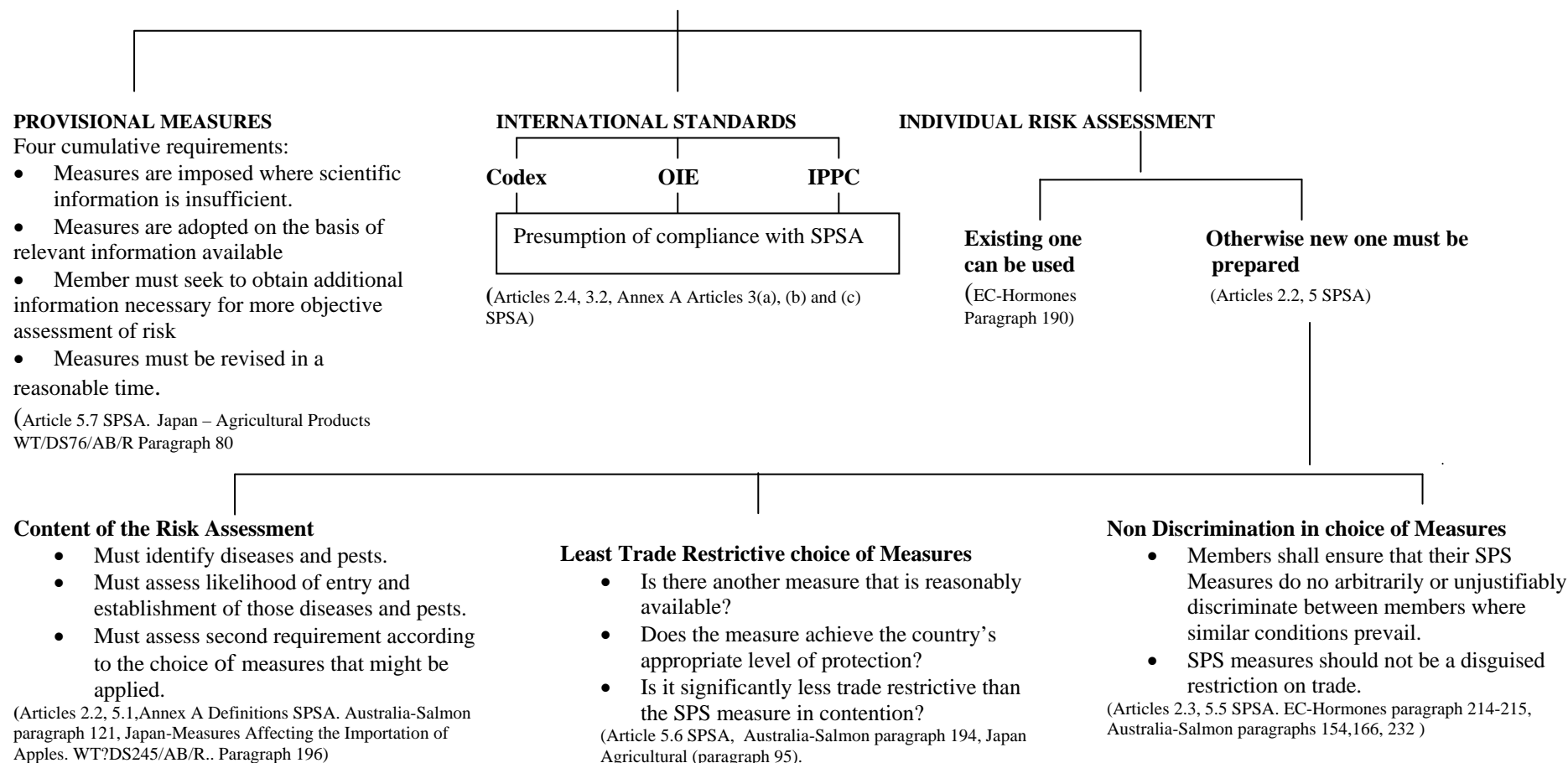
¹⁶² The International Standards Organization (ISO) ‘is a network of the national standards institutes of 157 countries, on the basis of one member per country’ It is a non-governmental organization and is the ‘world’s largest developer and publisher of standards’. See web site , <<http://www.iso.org/iso/about.htm>> (June 2007) with a Central Secretariat in Geneva, Switzerland, that coordinates the system.

¹⁶³ Ibid. Description formulated using information on the operation of the ISO.

HOW THE SPSA OPERATES

APPROPRIATE LEVEL OF PROTECTION NEEDS TO BE SET.

(This is the level of risk/protection deemed appropriate by a member. Definition Annex A no 5 SPSA. Impliedly required article 2.1 SPSA. See Australia - Measures Affecting Importation of Salmon. WT/DS18/AB/R. Paragraph 200 (Australia-Salmon) and EC Measures Concerning Meat and Meat Products (Hormones) WT/DS26/AB/R, WT/DS48/AB/R Paragraph 172 (EC-Hormones).



The origins of standards within the WTO can be traced to the 1979 Agreement on Technical Barriers to Trade (Standards Code), which was designed to promote the use of international standards as a means of substantiating trade restrictions based on technical barriers.¹⁶⁴ However, as the Code was only binding on signatories, it did not commit all trade partners.¹⁶⁵ Consequently, as already noted,¹⁶⁶ the use of international standards became an important consideration during the negotiation of the SPSA. Yet, their use was not made compulsory; rather the SPSA consistently underscores advantages to using international standards.¹⁶⁷ The use of international standards has also been cemented by findings of the Appellate Body that these standards represent a basis for risk assessment which has already been “internationally agreed”.¹⁶⁸ A state, therefore, is saved the expense and effort of formulating its own risk assessment. A further benefit is afforded by a presumption of compliance with GATT and with the SPSA.¹⁶⁹

The relationship between international standards and IAS has already been discussed in Chapter 3¹⁷⁰ in the context of the OIE and IPPC. It will be recalled that difficulties regarding the effectiveness of standards stem from lack of coverage and lack of adequate regard to environmental issues at large. In accordance with the provisions of the SPSA, where no international standards exist, or where measures are based on criteria set higher than international standards, states may demonstrate scientific

¹⁶⁴ 1979 *Agreement on Technical Barriers to Trade* (Standards Code). This entered into force on 1 January 1980 and was superseded by the 1995 WTO. The text of the Standard’s Code is available at <http://www.worldtradelaw.net/tokyoround/standardscode.pdf> (April 2006)

¹⁶⁵ R Griffin, *International Standards History of the Development of the SPS Agreement*. Available at <http://www.fao.org/docrep/003/x7354e/x7354e01.htm> (March 2007).

¹⁶⁶ See discussion in part 4.6 of Chapter 4 of this study.

¹⁶⁷ SPSA, articles 3.1 and 3.2. The use of international standards is not compulsory, because a country still has the right to set its own level of protection and to implement measures to give effect to that level of protection. However, this still needs to be tempered by the overall support for members to follow international standards. See also D Wilson, above n 128, 163; see discussion *EC – Hormones*, paragraph 165.

¹⁶⁸ *EC – Hormones*, paragraphs 170-171.

¹⁶⁹ SPSA, Article 3.2.

¹⁷⁰ See discussion on standards and limitations of IPPC and OIE in Section 3.4.1 of Chapter 3 of this study.

justification¹⁷¹ by way of a risk assessment.¹⁷² In reality, risk assessment is a crucial component of the SPSA. At present, the heavy workloads of the international standard-setting bodies¹⁷³ and limitations on the coverage of the regimes they represent means that standards have not been formulated for all situations.¹⁷⁴ Therefore, the conduct of individual risk assessments remains an important means of validating SPS measures, including those that protect biodiversity from IAS.

4.3.9 Risk Assessment

The SPSA contains one definition of “risk assessment”, applicable to two situations depending on whether the assessment is to be carried out with respect to foodstuffs or a “pest”:

Risk assessment — The evaluation of the likelihood of entry, establishment or spread of a pest or disease within the territory of an importing Member according to the sanitary or phytosanitary measures which might be applied, and of the associated potential biological and economic consequences; or the evaluation of the potential for adverse effects on human or animal health arising from the presence of additives, contaminants, toxins or disease-causing organisms in food, beverages or feedstuffs..¹⁷⁵

The definition is sufficiently broad to capture a variety of IAS and their impacts on biodiversity. For example, imported birds may contain avian influenza that could spread to wild bird populations. Therefore, considerations of this risk would be encompassed within the first part of the definition that refers to the ‘establishment or spread of a pest or

¹⁷¹ SPSA, Article 3.3 and Article 2.1.. See discussion Kevin Kennedy above n 83, 87. It should also be kept in mind that states may be under other obligations to regulate IAS, such as those found in Article 8(h) of the Convention on Biological Diversity.

¹⁷² SPSA, Article 5 of the SPSA. See generally Marc Powell *Science in Sanitary and Phytosanitary Dispute Resolution* Discussion Paper 97-50 Resources for the Future, Washington DC (1997) 2. <<http://www.rff.org/rff/Documents/RFF-DP-97-50.pdf>> (January 2005). It should also be kept in mind that a state does not need to carry out its own risk assessment, but may rely on a risk assessment conducted by another state; *EC – Hormones* paragraph 190.

¹⁷³ European and Mediterranean Plant Protection Organization ‘Annual Report for 2003’ (2004) 34 *OEPP/EPPO Bulletin* 489, 490-491.

¹⁷⁴ See discussion of standards and limitations of IPPC and OIE in Section 3.4.1 of Chapter 3 of this study.

¹⁷⁵ SPSA, Annex A (4) definitions.

disease within the territory of an importing Member'.¹⁷⁶ Similarly, the second part of the definition, that incorporates evaluation of feedstuff potentially contaminated with diseases, could also apply to IAS. For example, bovine spongiform encephalopathy (BSE) can be transmitted to animals including “mice, mink, marmosets and macaque monkeys”.¹⁷⁷ Therefore, measures regulating contaminated feedstuff that can be a potential source of IAS would also require a risk assessment.

The content and scope of risk assessment is set out in Article 5 of the SPSA.¹⁷⁸ The matter has also been considered in a number of WTO decisions including *Australia – Salmon*¹⁷⁹ and *Japan – Measures Affecting the Importation of Apples (Japan – Apples)*.¹⁸⁰ The decisions in these cases have been chosen for discussion because both cases deal with risk assessment in a situation where the respondents sought to implement strict quarantine measures to prevent entry of pests and diseases, a situation entirely analogous to using quarantine regimes to prevent entry of alien species that threaten biodiversity.

The dispute in *Australia – Salmon* was triggered by a request from Canada to export chilled salmon to Australia. At the time, the importation of fish products into Australia was subject to quarantine regulations authorized by Quarantine Proclamation 86A, 19 February 1975. Prior to 1975 Australia had not imposed restrictions on the importation of salmonid

¹⁷⁶ Avian influenza is a viral disease that can infect a large number of domestic and wild birds. See Fact sheet NSW Department of Primary Industries ‘Avian Influenza – questions and answers’ 2005 <<http://www.dpi.nsw.gov.au/agriculture/livestock/poultry/health-disease/avian-influenza/questions-answers#Can-I-contract-H5N1-from-handling-wild-birds>> (May 2007)

¹⁷⁷ OIE, Fact sheet ‘Animal Diseases Data’ Bovine Spongiform Encephalopathy’ 22 April 2002. <http://www.oie.int/eng/maladies/fiches/a_B115.htm> (May 2007).

¹⁷⁸ See for example Article 5.1 which obliges parties to carry out a risk assessment; Articles 5.2 and 5.3 of the SPSA which provide guidance to states on the types of matters to be taken into account in a risk assessment, as well as the choice of measures to manage the risk.

¹⁷⁹ *Australia – Salmon*, paragraph 121.

¹⁸⁰ *Japan – Measures Affecting the Importation of Apples (Japan – Apples)* WTO Doc WT/DS245/AB/R (report of the Appellate Body, 2003) at paragraph 196. Another case that has considered risk assessment is *Japan – Measures Affecting Agricultural Products (Japan – Agricultural)* WTO Doc WT/DS76/AB/R (report of the Appellate Body, 1999) paragraphs 72-94.

products.¹⁸¹ Following Canada's request, a final risk assessment on the importation of uncooked salmon was settled in December 1996 by AQIS, the Australian Quarantine and Inspection Service.¹⁸² The report recommended that quarantine prohibitions on the importation of uncooked salmon should remain. Canada, being dissatisfied with these recommendations, commenced formal proceedings in March 1997. In June 1998, the Panel decided against Australia, as did the Appellate Body in October 1998, primarily on the grounds that Australia's measures were not based on a risk assessment.

In the case of *Japan – Apples* the United States commenced an action against Japan, due to quarantine restrictions implemented by Japan on apples imported from the United States. Japan contended the quarantine restrictions were necessary to prevent fire blight from entering Japan. However, the United States countered this claim on the basis that the United States exports only mature, symptomless apples and that the available scientific evidence indicates that these types of apples do not transmit fire blight. In July 2003, the Panel found against Japan primarily on the grounds that Japan's measures were not based on a risk assessment and in November 2003 these findings were largely confirmed by the Appellate Body.

The issue of what constitutes a proper risk assessment was therefore, pivotal to the decisions in both *Australia – Salmon* and *Japan – Apples*. In *Japan – Apples*¹⁸³ the Appellate Body confirmed its previous findings in *Australia – Salmon*,¹⁸⁴ that there are three elements to a proper risk assessment, all of which must be fulfilled. A risk assessment must:

- (1) identify the diseases whose entry, establishment or spread a Member wants to prevent within its territory, as well as the potential biological and economic consequences associated with the entry, establishment or spread of these diseases;

¹⁸¹ *Australia – Salmon*, paragraph 2.

¹⁸² Until the establishment of Biosecurity Australia in 2000, AQIS carried out risk assessments for importation of goods and commodities. See discussion in section 3.5.1 of Chapter 3 of this study.

¹⁸³ *Japan – Apples*, paragraph 196.

¹⁸⁴ *Australia – Salmon*, paragraph 121.

(2) evaluate the likelihood of entry, establishment or spread of these diseases, as well as the associated potential biological and economic consequences; and

(3) evaluate the likelihood of entry, establishment or spread of these diseases according to the SPS measures which might be applied.

Where a state has not carried out *any*, or any *proper*, risk assessment, this means that a state's measures are not based on risk assessment, as required by Article 5.1. This constitutes a breach of Article 5.1 and the SPSA itself.¹⁸⁵

The first and second requirements entail very detailed information with specific diseases, or pests, being the subject of the risk assessment.¹⁸⁶ A general discussion does not qualify a report as a proper risk assessment and, additionally, the existence of unknown and uncertain components does not justify a departure from the risk assessment process.¹⁸⁷ In *Australia – Salmon*, Australia did not comply with the second requirement, as the report lacked specific details on how likely it would be that nominated diseases and pests would establish. This meant that, since the 1996 report Australia tendered did not qualify as a risk assessment, the submission of the report led to a breach of Article 5.1, because the resulting measures were not based on a risk assessment.¹⁸⁸

¹⁸⁵ *Australia – Salmon*, paragraph 136. As a preliminary issue the Appellate Body has confirmed that a risk assessment is needed for measures that were enacted before the entry into force of the SPSA. *EC – Hormones*, paragraphs 126-130. At paragraph 128 the Appellate Body stated 'Unlike the GATT 1947, the *WTO Agreement* was accepted definitively by Members, and therefore, there are no longer 'existing legislation' exceptions (so-called 'grandfather rights') It should be pointed out however that the Appellate Body acknowledged that there would be many pre-1995 measures in existence for which no risk assessment had been undertaken and that this could impose burdens on members. In this regard, the Appellate Body pointed out that Article 5.1 refers to risk assessment being undertaken 'as appropriate to the circumstances.' This could be an indication that the Appellate Body is likely to be more accommodating with respect to pre-1995 measures, but, as they did not elaborate on what they thought 'appropriate in the circumstances' meant, this issue is still open to debate. See generally paragraphs 129-130.

¹⁸⁶ *Japan – Apples*, paragraph 204.

¹⁸⁷ *Australia – Salmon*, paragraphs 125 and 130.

¹⁸⁸ *Australia – Salmon*, paragraphs 121, 136-138. See discussion Kevin Kennedy above n 83, 97; J Pauwelyn, 'The WTO Agreement and Phytosanitary (SPS) Measures as Applied in the First Three SPS Disputes' above n 93 at 647.

Similarly, in *Japan – Apples* the risk assessment Japan tendered did not address, to a sufficient extent, the risk of mature apples transmitting fire blight.¹⁸⁹ Therefore, in similarity with the findings against Australia in *Australia – Salmon*, the Appellate Body found that Japan’s measures breached the SPSA as they were not based on a risk assessment, as required by Article 5.1.¹⁹⁰

The Appellate Body also held that Japan did not comply with the third requirement. This requirement addresses two matters: the range of measures that might be applied and whether the measures in question are responsive to the risks identified by the first two elements of the risk assessment. With regard to the first matter, the phrase “measures which might be applied” not only refers to the measures in question, but also includes consideration of measures that could have been applied. Otherwise, as the Appellate Body pointed out, a review of the measures would be limited to those favoured by the member, rather than the range of measures which it is possible to apply.¹⁹¹ In particular, the risk assessment should consider any possible less trade-restrictive measures. As Japan had not taken into consideration other relevant less trade-restrictive SPS measures,¹⁹² this led to yet another breach of Article 5.1.

The principles enunciated in these cases would apply equally to evaluations of damage to the environment at large, as to evaluations of pests and disease in the agricultural and farming product sectors. To undertake assessments of the calibre expected within the WTO requires a great deal of knowledge and expertise on pests, diseases and their impacts.¹⁹³ Where the information is lacking, or inconclusive, states run the risk of having their measures challenged and struck down.¹⁹⁴

¹⁸⁹ *Japan – Apples*, paragraphs 202-206.

¹⁹⁰ *Japan – Apples*, paragraphs 203-206, 216.

¹⁹¹ *Japan – Apples*, paragraph 216.

¹⁹² Kevin Kennedy, above n 83, 99; Joost Pauwelyn, ‘The WTO Agreement and Phytosanitary (SPS) Measures as Applied in the First Three SPS Disputes’ above n 93, 647.

¹⁹³ Information may be so lacking that it is not possible to carry out a risk assessment. States may implement temporary measures pursuant to Article 5.7 of the SPSA.

¹⁹⁴ See discussion later in section 5.2.3 of Chapter 5 of this study.

Therefore, one substantial limitation on the way states design and implement their SPS measures stems from the amount of detail required in the risk assessment process. Additional limitations stem from the procedural aspects of quarantine regulation, and discriminatory, or unnecessary, or disguised, restraints on international trade.

4.3.10 Discriminatory, Unnecessary or Disguised Trade Restraints

Several Articles of the SPSA deal with discriminatory, unnecessary and disguised trade restraints. These include Article 2.3 that deals with discriminatory measures; Article 2.2 that provides measures must be “necessary”; and Article 5.6 that specifies states need to choose the least trade-restrictive measures available.

Article 2.3 of the SPSA stipulates that:

Members shall ensure that their sanitary and phytosanitary measures do not arbitrarily or unjustifiably discriminate between Members where identical or similar conditions prevail, including between their own territory and that of other Members. Sanitary and phytosanitary measures shall not be applied in a manner which would constitute a disguised restriction on international trade.

The Appellate Body has held that Article 2.3 “takes up obligations similar to those arising under Article I.I and Article III.4 of the GATT 1994 and incorporates part of the “chapeau” to Article XX of the GATT 1994.”¹⁹⁵

In *Australia - Measures Affecting Importation of Salmon* *Australia - Recourse to Article 21.5 (Australia – Salmon Article 21.5)*¹⁹⁶ the Panel held that a breach of Article 2.3 involves three elements that are cumulative in nature:

¹⁹⁵*Australia – Salmon*, paragraph 251.

¹⁹⁶ *Australia - Measures Affecting Importation of Salmon* *Australia - Recourse to Article 21.5 (Australia – Salmon Article 21.5)* WTO Doc WT/DS18/RW (Report of the Panel, 2000). This case represents the implementation phase of the *Australia – Salmon* dispute. Although Australia had amended its quarantine measures to bring them in line with the decision in the primary case, Canada alleged that the amended measures still breached the SPSA.

- (1) the measure discriminates between the territories of Members other than the Member imposing the measure, or between the territory of the Member imposing the measure and that of another Member;
- (2) the discrimination is arbitrary or unjustifiable; and
- (3) identical or similar conditions prevail in the territory of the Members compared.¹⁹⁷

Article 2.3, therefore, targets discriminatory measures not only between domestic and imported products, but also between comparable products of different members. As already noted above in the discussion of Article 5.5 and the ALOP,¹⁹⁸ it could be difficult for states to ensure that measures across all sectors have been investigated for compatibility.¹⁹⁹

The difficulty lies not only in ensuring that domestic laws apply equally to comparable domestic and imported products, but also that domestic laws apply equally to different imported products that might be comparable. In IAS regulation, an opponent may argue that species, diseases and pathways have comparable characteristics. Consequently, measures may be deemed discriminatory, or amount to a disguised restriction on international trade, where these species diseases and pathways are regulated in different ways permitting entry to some, but denying entry to others.²⁰⁰ The example discussed above, with respect to the nursery trade in the context of GATT, illustrates this point.²⁰¹

It will be recalled that the use of lists is a popular method of determining whether plants and plant products are permitted, or denied entry.²⁰² The extent to which plants and plant products on these lists may be considered comparable is not clear. An opponent may argue that certain species have comparable characteristics, so a state that permits entry to some plants on these lists, but excludes others, could potentially be breaching the SPSA. The matter may be further complicated by the way states classify plants.

¹⁹⁷ *Australia – Salmon (Article 21.5 - Canada)*, paragraph 7.111.

¹⁹⁸ See above section 4.3.5 discussion of Article 5.5 SPSA.

¹⁹⁹ Gavin Goh and Andreas Ziegler, above n 130, 78.

²⁰⁰ *Australia – Salmon*, paragraph 252.

²⁰¹ See discussion section 4.2.1 of this Chapter.

²⁰² See discussion in the following sections of Chapter 3 of this study: 3.3.1 for lists maintained by the IPPC and section 3.5.2 for lists maintained by Australia. For information on disease and pests issued by the OIE in respect of animals, see section 3.3.2 of this study.

The classification may be broad, such as a plant's genera, or more specific, such as a plant's species. Yet within genera, plants can differ greatly and a genus classification can include both invasive and non-invasive species.²⁰³ Where one state lists plants according to genera, this provides a potential foothold for another state to argue that the very classification affords a comparable characteristic, making it more difficult to justify selective prohibitions within a genus classification.

In addition, the Appellate Body has held that Article 2.3 and Article 5.5 are linked. However, the extent of the closeness of this link has not yet been settled. In *Australia – Salmon*, the Appellate Body held that, by acting inconsistently with Article 5.5, Australia had “by implication” breached Article 2.3.²⁰⁴ Hence, a finding that a measure is a disguised restriction on trade under Article 5.5, because it embodies, or reflects, arbitrary or unjustifiable restrictions in the setting of an ALOP for related product sectors, will also lead to a finding that the supporting measure breaches Article 2.3.

In *EC – Hormones*, the Appellate Body took a slightly different approach and found that, although Articles 2.3 and Article 5.5 may appear to lead to the same result via a different route,²⁰⁵ “the presence of different levels of protection operate as a ‘warning’ signal that the implementing *measure* in its application *might* be a discriminatory measure or *might* be a restriction on international trade ...”²⁰⁶ This means that a conclusion of discrimination, or disguised trade restraint, is not automatic merely because the ALOP evinces arbitrary or unjustifiable distinctions. The reason for this is that while measures ostensibly give effect to the ALOP, the measures may not necessarily reflect the ALOP in all respects. Therefore, the measures themselves still need to be assessed separately, although in the context of the different levels of protection.²⁰⁷

²⁰³ See discussion in section 3.6 of this study on the difficulties of using these classifications in Australia with respect to *Asparagus asparagoides* and *Rubus fruticosus*.

²⁰⁴ *Australia – Salmon*, paragraphs 178 and 240.

²⁰⁵ *EC – Hormones*, paragraph 212.

²⁰⁶ *EC – Hormones*, paragraph 215.

²⁰⁷ *EC – Hormones*, paragraph 215.

Article 2.2 stipulates that:

Members shall ensure that any sanitary or phytosanitary measure is applied only to the extent necessary to protect human, animal or plant life or health, is based on scientific principles and is not maintained without sufficient scientific evidence, except as provided for in paragraph 7 of Article 5

Unlike GATT, where the concept of “necessary” refers to the proportionality of the measure adjudged by a means and ends test, the necessity of a measure under the Article 2.2 entails “a rational or objective relationship between the SPS measure and the scientific evidence”.²⁰⁸ This is to be determined on a case-by-case basis, having regard to the characteristics of the measure and the “quality and quantity of the scientific evidence”.²⁰⁹

The high threshold for this “rational or objective relationship” is illustrated by the decision in *Japan – Measures Affecting the Importation of Apples, Recourse to Article 21.5 (Japan – Apples 21.5)*.²¹⁰ This case represents the implementation phase of the *Japan – Apples* decision. After the findings of the Appellate Body went against Japan in the primary case, Japan made a number of revisions to its quarantine measures. The revised measures, which included the following set out below, were the subject of further challenge by the United States in *Japan – Apples 21.5*:

- (a) Fruit must be produced in designated fire blight-free orchards. Designation of a fire blight-free area as an export orchard is made by the United States; Department of Agriculture upon application by the orchard owner. Currently, the designation is accepted only for orchards in the states of Washington and Oregon;
- (b) The export orchard must be free of plants infected with fire blight;
- (c) The fire blight-free orchard must be surrounded by an approximately ten-meter buffer zone (or border zone) free of fire blight;
- (d) The orchard and surrounding buffer zone must be inspected once per year at early fruitlet stage;

²⁰⁸ *Japan – Agricultural* paragraph 84; *Japan – Apples* WT/DS245/AB/R Appellate Body report, paragraphs 147 and 196.

²⁰⁹ *Japan – Apples*, paragraph 162.

²¹⁰ *Japan – Measures Affecting the Importation of Apples, Recourse to Article 21.5 (Japan – Apples 21.5)* WTO Doc WT/DS245/RW (report of the Panel, 2005).

- (e) Harvested apples must be treated with surface disinfection by soaking in sodium hypochlorite solution;
- (f) The interior of the packing facility must be disinfected by a chlorine treatment;
- (g) Fruit destined for Japan must be kept separate post-harvest from other fruit;
- (h) US plant protection officials must certify that fruits are free from fire blight and have been treated post-harvest with chlorine; and
- (i) Japanese officials must confirm the US officials' certifications and inspect packing facilities.²¹¹

The Panel confirmed a two-stage approach to determining the rational relationship between a measure and the scientific evidence. First, the Panel would need to determine whether scientific evidence supported the contention that a species or pathway could introduce a pest or disease; and, second, the Panel would determine the relationship between the threat, the measures and the scientific evidence. Applying this to the facts of *Japan – Apples 21.5*, the Panel needed to assess whether mature symptomless apples could carry fire blight and contaminate orchards in Japan and after that, assess to what extent the revised measures bore a rational or objective relationship to the scientific evidence.²¹²

The Panel found that the evidence could support the contention that mature symptomless apples could harbour latent infection,²¹³ but that the risk of these apples infecting Japan's apple orchards was very slight. Consequently, apart from SPS measure (h) that related to the certification process, the rest of the measures did not bear a rational relationship to the risk.²¹⁴ In fact, the Panel not only struck down Japan's measures, but went so far as holding that Japan was obliged to accept apples from orchards infected with fire blight provided that the apples were mature and symptomless.²¹⁵

²¹¹ *Japan – Apples 21.5*, paragraph 2.22.

²¹² *Japan – Apples 21.5*, paragraph 8.37.

²¹³ *Japan – Apples 21.5*, paragraph 8.71.

²¹⁴ *Japan – Apples 21.5*, paragraph 8.120. Although, as the Panel point out in paragraph 8.121, the requirement that exported apples be mature and symptomless is itself a phytosanitary measure and 'Japan would be entitled to verify that this is actually the case'. See generally Gavin Goh, 'Tipping the Apple Cart: The Limits of Science and Law in the SPS Agreement after *Japan – Apples*' (2006) 40 *Journal of World Trade* 655.

²¹⁵ *Japan – Apples 21.5*, paragraphs 8.39-8.71, 8.119-8.121 and 9.1.

The Panel came to this conclusion despite three significant pieces of background information: first, that fire blight originated from the United States and it is not known how the disease spread from the United States to other locations;²¹⁶ second, that Japan is currently free of fire blight;²¹⁷ and third, that Japan has set its ALOP at a high level, including keeping its territory free of fire blight.²¹⁸ In the light of these three factors and the devastation that fire blight can cause, Japan had determined that very stringent measures were needed.

Although the measures did not exceed Japan's ALOP, without a rational or objective relationship to the scientific evidence this in itself was insufficient to justify the measures. As one commentator has said, the decision in *Japan – Apples 21.5* involved the Panel balancing “political, legal and scientific complexities,”²¹⁹ yet there were also

legitimate concerns expressed by the scientific experts about “eliminating ‘in one step’ all phytosanitary controls, taking into account Japan’s island environment and climate”, and [the experts] considered it appropriate not to export apples from “severely blighted” orchards.”²²⁰

Not surprisingly, the approach of the Panel reveals an underlying policy to promote trade.²²¹ States have negotiated the SPSA in a way that the “default” position is the continuance of trade, while the WTO has interpreted the SPSA in a way that trade restraints require a great deal of justification that is grounded in “sound” science. The absence of scientific evidence of a high calibre becomes a limiting factor for SPS measures. It is also important to note that a high quality of scientific evidence is needed for the full range of SPS measures. In *Japan – Apples 21.5*, Japan's measure did not merely concern trade bans; many of the measures

²¹⁶ *Japan – Apples*, Panel report paragraphs 2.5 and 2.6. See Also discussion generally G Goh ‘Tipping the Apple Cart: The Limits of Science and Law in the SPS Agreement after *Japan – Apples*’ above n 214.

²¹⁷ *Japan – Apples*, Panel report paragraphs 4.25 and 4.26

²¹⁸ *Japan – Apples*, Panel report paragraph 4.182.

²¹⁹ Gavin Goh, ‘Tipping the Apple Cart: The Limits of Science and Law in the SPS Agreement after *Japan – Apples*’ above n 214, 671.

²²⁰ *Ibid.*

²²¹ The overriding objective of the WTO is stated ‘to help trade flow smoothly, fairly and predictably’. WTO *The World Trade Organization* at 7 WTO 2007 <http://www.wto.org/english/res_e/doload_e/inbr_e.pdf> (April 2007).

dealt with treatments, inspections and monitoring. The rigid approach of the WTO could be problematic in IAS regulation, given the knowledge gaps in the regimes²²² and lengthy lag times between a species introduction and the manifestation of its invasive qualities.²²³

Another limitation on the choice of measures available to states stems from Article 5.6 which also obliges states to choose the least trade-restrictive measure available. The most trade-restrictive measure is a trade ban. However, if the same quarantine objective can be achieved using less drastic means, then they must be chosen.

For example, most countries wish to prevent entry of a variety of alien species, including agricultural pests, other plant and animal diseases, and they are also obliged to prevent the entry of those species destructive of biodiversity.²²⁴ One foolproof approach would be to ban trade, not only in the relevant species, but also according to the pathways by which the IAS might gain entry. This approach has the advantage of achieving a high degree of certainty, but it would also involve substantial and perhaps in some cases total and unwarranted disruptions to international trade. If the use of less drastic measures, such as pesticides, disinfection, or vaccination will achieve the same purpose, then the least drastic measures should be used.²²⁵

In *Australia – Salmon*, the Appellate Body established a three-pronged test to determine whether Article 5.6 had been breached. The requirements are cumulative, so that a breach will only occur where all three criteria have been met.²²⁶ The question is whether there is another measure that:

²²² See discussion in section 1.3.3 of Chapter 1 of this study.

²²³ Ibid.

²²⁴ See generally Anne Perrault and William Carroll Muffett, 'Turning off the Tap: A strategy to Address International Aspects of Invasive Alien Species' (2002) 11 (2) *Review of Community and International Environmental Law* 211.

²²⁵ G Stanton, *The Multilateral Trading System and SPS Agreement* above n 124, 23.

²²⁶ *Australia – Salmon*, paragraph 194; see also discussion in *Japan – Agricultural Appellate Body Report* paragraph 95.

1. Is reasonably available, taking into account technical and economic feasibility;
2. Achieves the Member's appropriate level of sanitary or phytosanitary protection; and
3. Is significantly less restrictive to trade than the SPS measure contested.²²⁷

Where an exporting member is able to establish that an alternative measure is as secure as a ban on trade, then that alternative measure must be pursued. In *Japan-Measures Affecting Agricultural Products (Japan – Agricultural Products)*²²⁸ Japan had imposed different quarantine measures for different agricultural products, all designed to prevent entry of the codling moth. Japan argued that the multiplicity of measures was necessary because the codling moth varied in its stages of development with each agricultural product. Thus, a treatment that was effective for one product might not necessarily be effective for another.²²⁹ The United States disputed that the scientific evidence supported this contention and argued that Japan's measures were more trade-restrictive than necessary.²³⁰ The Panel agreed with these arguments and determined that testing of each agricultural product, rather than varietal treatment, “would achieve Japan's appropriate level of protection”.²³¹

As with Article 2.2 and the regulation of IAS, the requirement to choose the least trade-restrictive measure can lead to difficulties that stem from the incomplete data available on IAS. It may not be possible for instance to know with certainty whether a less trade-restrictive measure achieves the member's appropriate level of sanitary or phytosanitary protection to the same degree as a more trade- restrictive measure.

²²⁷ *Australia – Salmon*, paragraph 194.

²²⁸ *Japan-Measures Affecting Agricultural Products (Japan – Agricultural Products Japan – Agricultural)* WTO Doc WT/DS76/R (Report of the Panel, 1998) and WTO Doc WT/DS76/AB/R (report of the Appellate Body, 1999).

²²⁹ *Japan – Agricultural Panel Report*, paragraphs 4.25-4.30..

²³⁰ *Japan – Agricultural Panel Report*, paragraphs 4.43, 4.65, See discussion David G Victor above n 82, 909-910.

²³¹ *Japan – Agricultural Panel Report*, paragraph 8.76, 8.84, 8.91 and 8.103.

4.4 CONCLUSION

The SPSA was negotiated to prevent states using their quarantine regimes to construct unwarranted trade barriers, an approach that was premised on two grounds: first, that quarantine regulation did in fact impose unwarranted barriers to international trade; and second, that the discrimination-based approach of GATT had failed to reign in the unnecessary use of quarantine.

With respect to the first point, the discussion in section 3.2.2 of Chapter Three of this study revealed a number of instances where quarantine regulation has been used in a controversial manner. The very nature of quarantine and its potential to restrict international trade will inevitably magnify scrutiny of national quarantine measures, even if the extent of misuse has not been quantified; and even where the notion of misuse may be based on perceptions rather than reality. Nevertheless, the fact remains that quarantine regulation can restrict international trade.

The GATT contains core principles of non-discrimination and prohibitions against quantitative restrictions that can reign in the use of quarantine regulation. These principles, however, are subject to the Article XX(b) and XX(g) exceptions, which are largely discrimination-based. States need to provide evidence that their quarantine measures fulfil legitimate policy objectives and that the application of measures is procedurally fair. GATT's approach gives states a great deal of leeway to design and implement quarantine measures, as long as trading partners are treated equally, domestic products are not favoured over imported ones and that good faith attempts to negotiate with other states have been made prior to the implementation of measures. The scientific underpinning of quarantine measures was never an issue.

The adoption of the SPSA signalled a more technical, and in some ways more restrictive, approach to the way states design and implement their quarantine measures. The SPSA is very strongly science-based and these

science-based requirements are superimposed on discrimination-based principles derived from GATT. Since 1995, quarantine measures need to be supported by scientific evidence of the need for measures, demonstrated either by compliance with international standards, or by the conduct of a risk assessment. In addition, science is used in the SPSA to validate measures at each stage of determination. This is the case, even in an indirect way, with respect to matters such as the setting of an ALOP, for science validates the measures that make the ALOP operational.

The definition of an SPS measure extends the reach of the WTO beyond trade concerns and towards a variety of other issues associated with the regulation of IAS. These include environmental consequences of IAS. It means that the scientific underpinnings of the SPSA have also spread to the regulation of those IAS introduced by way of international trade. At least one issue that stems from this situation is whether the adoption of such a strongly-based science approach lends itself to a workable IAS regime. For example, the need for very detailed and specific information in the risk assessment process may not sit well with the notion of *preventing* harm – especially where the knowledge base is incomplete, as is often the case with IAS. The next chapter examines the relationship of quarantine, trade and invasive alien species to determine how the interplay of the quarantine and trade regimes affect states' ability to regulate IAS.

CHAPTER 5

QUARANTINE, TRADE AND INVASIVE ALIEN SPECIES

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CHAPTER 5

QUARANTINE, TRADE AND INVASIVE ALIEN SPECIES

5.0 INTRODUCTION

Balancing the relationship between quarantine, trade and invasive alien species (IAS) essentially calls for integration of quarantine measures with the freedom to conduct international trade. Furthermore, such integration should take biodiversity considerations into account. Certainly quarantine measures can prevent the entry and establishment of IAS, but equally importantly effective quarantine is also crucial to the long-term viability of international trade. If pests, diseases and other IAS were to be extensively introduced from one state to another, this could ultimately destroy the very resources upon which trade depends.¹

Chapter 4 examined the operation of the Agreement on Sanitary and Phytosanitary Measures (SPSA)² and introduced the relationship of that Agreement to invasive alien species (IAS). This Chapter examines in greater detail the problems faced by states in achieving a balance between their quarantine needs and their obligations under international trade. The discussion commences with a short history and description of the multi-faceted relationship between quarantine and international trade, before turning to a discussion of the SPSA. As already discussed in Chapter 4 of this study, since the commencement of the World Trade Organization (WTO) in 1995, quarantine regimes of member states must comply with the SPSA. The heart of the SPSA lies in the evaluation processes that

¹ It was for this very reason that the earliest treaties were negotiated to stop the introduction and spread of the *phylloxera* insect. See introduction and section 3.2.2 of Chapter 2 of this study.

² The *Agreement on the Application of Sanitary and Phytosanitary Measures* (SPSA) [1995] ATS No 8, 65. Members of the WTO are automatically members of the SPSA..

underpin quarantine measures, and the issue is how these processes impact on the types of quarantine measures states implement to regulate IAS.

5.1 QUARANTINE AND TRADE: A MULTI-FACETED RELATIONSHIP

The relationship between international trade and quarantine may be described as multi-faceted. As already noted by its very nature quarantine regulation can hinder or impede international trade. Quarantine measures run the gamut from outright bans on trade,³ to less drastic measures, such as inspections, certifications and treatments. Each type of measure may hinder international trade to varying degrees.⁴ However, quarantine measures designed to stop the spread of disease and pestilence are also necessary for the long-term maintenance of trade. As noted in the preamble to the 1935 International Convention for the Campaign Against Contagious Diseases of Animals:

Recognising unanimously, moreover, that, in any action intended to facilitate international trade in live-stock and animal products, the first item in the programme must be the improvement of veterinary health conditions by every possible means, including closer and more frequent international cooperation⁵

The notion of improvements in veterinary health includes inspections and certification of meat intended for export and closer supervision of quarantine stations.⁶ While in the short-term, these types of quarantine measures may impede trade, they are also necessary to its long-term

³ See discussion in section 3.1 and 3.5.2 of Chapter 3 of this study..

⁴ For example in *Japan – Measures Affecting the Importation of Apples, Recourse to Article 21.5 (Japan – Apples 21.5)* WT/DS245/RW, the disputed measures included limitations on the sourcing of the apples, as well as inspections and treatments. See discussion in section 4.3.10 of Chapter 4 of this study.

⁵ 1935 *International Convention for the Campaign Against Contagious Diseases of Animals*, adopted 20 February 1935 Volume IV *International Protection of the Environment*, B Rüster and B Simma (eds), Oceana New York (1975), 1705, Preamble (entered into force 23 March 1938). As at November 2007 the convention had 7 parties See also 1959 *Agreement Concerning Co-Operation in the Field of Veterinary Science*, adopted 14 December 1959 (1962) 422 UNTS 64, Preamble (entered into force on 12 September 1960). As at November 2007 it had 9 parties

⁶ 1935 *International Convention for the Campaign Against Contagious Diseases of Animals*, Articles 1(1) and 3(5)(b).

survival. The challenge for states lies in balancing quarantine regulation against the free flow of trade – a task that will never be an easy one.

At the domestic level the matter is complicated by the fact that quarantine systems are frequently located within government departments that focus on gaining market share for agriculture and primary product sectors.⁷ In Australia for example, Biosecurity Australia (which determines policy and undertakes quarantine-related risk assessments), and AQIS (which is responsible for the operational aspect of quarantine), are both part of the Department of Agriculture, Fisheries and Forestry (DAFF). The functions of DAFF include the development and implementation of “policies and programs that ensure Australia's agricultural, fisheries, food and forestry industries remain competitive, profitable and sustainable”. DAFF considers that these objectives incorporate not only the development of policies, strategies and programmes relating to the health and safety of plant and animal products,⁸ but also the development of policies, strategies and programmes related to improving market access for Australia’s agricultural products.⁹

Consequently, while AQIS and Biosecurity Australia share common objectives with respect to the maintenance of effective border controls, these objectives must be balanced against the requirement to enhance Australia’s export markets.¹⁰ These multi-faceted objectives may strain the capabilities of quarantine regimes to fulfill dual roles that at once seek

⁷ See discussion in Section 3.4.2 of Chapter 3 of this study.

⁸ DAFF, ‘Product Integrity/Animal and Plant Health Home’ <<http://www.daff.gov.au/content/output.cfm?ObjectID=3E48F86-AA1A-11A1-B6300060B0AA00002&contType=outputs&subdisplay=6>> (April 2007)

⁹ DAFF, ‘Market Access and Trade Home’ <<http://www.daffa.gov.au/market-access-trade>> (April 2007).

¹⁰ AQIS, for example, has the dual roles of protecting Australia from imported pests and diseases, but at the same time it has a facilitative role in the export of Australian agricultural products. This facilitative role is undertaken by providing pre-export advice on importing country requirements and also providing inspections in Australia before products are exported. See AQIS data base <<http://www.daff.gov.au/aqis>> (April 2007) ; Biosecurity Australia provides ‘science based quarantine assessments and policy advice’ to protect Australia from pests and diseases, but at the same time Biosecurity Australia is also mindful that its activities should enhance ‘Australia's access to international animal and plant related markets.’ See web site of Biosecurity Australia <<http://www.daffa.gov.au/ba>> (April 2007).

to gain market share for exports, while implementing measures that may narrow market share for imports.¹¹

5.1.1 Quarantine Treaties and International Trade.

The relationship between quarantine and trade has long been a contentious one.¹² Recitals to early quarantine treaties often stressed the importance of the nexus between quarantine and trade and served as a reminder that accommodation of trade was an important concern.¹³ Yet substantive treaty provisions did not prohibit states from taking stringent measures even where these hindered trade. For example, Article 6 of the 1929 International Convention for the Protection of Plants¹⁴ permitted an importing state to carry out inspections and reject consignments, even where they were accompanied by a clear health certificate from the exporting states. Essentially, such treaties were permissive in nature and allowed states to adopt more stringent measures than specified by the terms of the treaty. This is still the case today, where the provisions of the IPPC¹⁵ and OIE¹⁶ provide minimum standards, but give states latitude to design and implement more stringent quarantine regimes.

¹¹ See discussion in section 5.4 of this Chapter.

¹² See discussion in section 3.2.1 of Chapter 3 of this study.

¹³ See, for example, 1959 *Agreement Concerning Co-Operation in the Quarantine of Plants and Their Protection Against Pests and Diseases* adopted 14 December 1959, (1962) 422 UNTS 42, Preamble (entered into force 19 October 1960). As at November 2007 the Agreement had 9 parties. The Preamble emphasises the need to develop trade and economic relations as part of the treaty. See also 1968 *Agreement on Plant Protection and Phytosanitary Quarantine Between the People's Republic of Bulgaria and the United Arab Republic*, signed 9 December 1966, Volume IV *International Protection of the Environment*, B Rüster and B Simma (eds), Oceana New York (1975), 2005, Preamble (entered into force 22 August 1968). The Preamble specifies that one of the purposes of the treaty is to strengthen and expand the existing economic and trade relations between the two countries.; see also *International Plant Protection Convention 1997*, adopted 17 November 1997, [2005] ATS No 23, preamble and Article VII(2) (entered into force 2 October 2005). As of November 2007, the *International Plant Protection Convention 1997* (IPPC) had 166 parties.

¹⁴ 1929 *International Convention for the Protection of Plants* (1931-32) CXXVI *League of Nations Treaty Series* 307. The Convention was signed on 16 April 1929 and entered into force on 15 January 1932. As at November 2007 the Convention had 28 parties.

¹⁵ For example, 1997 IPPC, Article V(2)(b) and Article X(4). See discussion in section 3.3.1 of Chapter 3 of this study.

¹⁶ OIE, *Terrestrial Animal Health Code 2007* 16th Edition OIE Paris (2007) Article 1.2.1.2; *Aquatic Animal Health Code 2007* 10th Edition OIE Paris (2007). See also discussion in section 3.3.2 of Chapter 3 of this study.

However, the fact that other instruments, such as, those relating to international trade overlap with quarantine instruments means that limitations on states' ability to enact quarantine laws may derive from outside the quarantine arena. The relationship between quarantine and other instruments is broached by Article 1(2) of the IPPC that specifies the implementation of the 1997 IPPC is "without prejudice to obligations assumed under other international agreements". "Other international agreements", would of course, include the SPSA. This provision does not specifically subordinate the IPPC to the SPSA and much would depend on the terms of the SPSA and how they have been interpreted. With respect to animal health, the OIE does not contain a comparable provision to Article 1(2) of the IPPC. However, OIE standards are in the form of recommendations and guidelines and hence are capable of being subordinated to outside treaty obligations. For WTO members, these are important matters, because the provisions of the SPSA, a trade instrument, provide the balance between quarantine and trade. Historically, the relationship between quarantine and trade has been contentious and this is reflected in both trade and commerce treaties as well as quarantine treaties.

5.1.2 Treaties of Trade and Commerce and Quarantine Regulation

Although states readily negotiated treaties such as the 1878 Convention on Measures to be Taken Against *Phylloxera Vastatrix*,¹⁷ they were generally unwilling to relinquish national control over their quarantine regimes in less drastic situations.¹⁸ Consequently, shortly after the time of the

¹⁷ *Germany, Austria-Hungary, Spain, France, Italy, Portugal and Switzerland: Convention on Measures to be Taken Against Phylloxera Vastatrix*, adopted 17 September 1878, Volume IV *International Protection of the Environment*, B Rüster and B Simma (eds), Oceana New York (1975), 1565 (entered into force 31 December 1879). As at November 2007 the convention had 8 parties. This convention was amended in 1881 by the *International Phylloxera Convention with a Final Protocol between Germany, Austria-Hungary, France, Portugal and Switzerland* adopted 3 November 1881, Volume IV *International Protection of the Environment*, B Rüster and B Simma (eds), Oceana New York (1975), 1571, (instruments of ratification were deposited on 29 April 1882 and 8 June 1882). As at November 2007 the convention had 7 parties.

¹⁸ See for example section 3.2.2 of Chapter 3 of this study and the dissention that surrounded the negotiation of the 1892 *International Sanitary Convention between*

phylloxera treaties, specific references to quarantine regulation started to be incorporated into trade treaties that reserved the scope and content of quarantine laws to the national domain.¹⁹ A typical example is found in the Convention between France and Great Britain for the Regulation of Commercial and Maritime Relations,²⁰ where provision was made for each party to retain for itself the right to make whatever restrictions it thought appropriate for “sanitary reasons” in order to prevent the destruction of farm animals or crops. These stipulations were wide enough to capture direct and indirect damage to plant and animals.²¹ Theoretically, the provisions could also have applied to what are today known as IAS. The practice of reserving quarantine regulation in this manner continued up to the earlier part of the twentieth century.²²

As international trade increased, so too did the possibility of introducing pests and diseases from one state to another. Although stopping this cycle of introductions required international collaboration and cooperation in the areas of both international trade and quarantine, states squarely regarded

Austria-Hungary, Denmark, France, Germany, Great Britain, Italy, the Netherlands, Portugal, Russia, Spain, Sweden-Norway and Turkey adopted 30 January 1892, (1892) 176 CTS 396 (entered into force on 18 November 1893) As at November 2007 it had 12 parties.

¹⁹ See for example, the *Convention between France and Great Britain for the Regulation of Commercial and Maritime Relations*, adopted 28 February 1882, 160 CTS 143 (entered into force on 16 May 1882). Article II of the convention allowed each party to reserve for itself the right to make whatever restrictions it thought appropriate for ‘sanitary reasons’ in order to prevent the destruction of farm animals or crops. See also S. Steve Charnovitz ‘Exploring the Environmental Exceptions in GATT Article XX’ (1991) 25 (5) *Journal of World Trade Law* 37, 38-40.

²⁰ 1882 *Convention between France and Great Britain for the Regulation of Commercial and Maritime Relations*, Article II.

²¹ For example, see 1926 *Treaty of Commerce and Navigation with a final Protocol and Additional Protocol Between Albania and the Kingdom of the Serbs, Croats and Slovenes*, signed 22 June 1926, (1929) 91-92 *League of Nations Treaty Series* 10, Article 7(3) that referred to the enactment of laws ‘for reasons of public health or to protect animals or useful plants against disease insects and harmful parasites’ (entered into force 6 June 1929). See also 1923 *Treaty of Commerce and Navigation made between Denmark and Finland*, signed 3 April 1923, (1923-24) XXXI *League of Nations Treaty Series* 269, Article VIII (3) that referred to laws to protect against infectious diseases of plants or animals, (entered into force 21 December 1923).

²² See for example 1923 *Treaty of Commerce and Navigation made between Denmark and Finland*, Article VIII; 1926 *Treaty of Commerce and Navigation, with a final Protocol and Additional Protocol Between Albania and the Kingdom of the Serbs, Croats and Slovenes*, Article 7.

preventing introduction of pests and diseases as a quarantine matter.²³ Yet at the same time, states also realised that preservation of quarantine to national power presented the potential for quarantine laws to be used as a disguised trade restraint. Therefore, by the twentieth century, trade treaties started to incorporate provisions designed to rein in the use of domestic quarantine regimes.²⁴

Restrictions took a variety of forms and included provisions that quarantine regulation had to be “applicable to all countries or to countries in similar circumstance;”²⁵ that measures had to be made in “conformity with the universally recognized international regulations;”²⁶ or, that measure had to be made in conformity with adopted international principles.²⁷ Charnovitz has pointed out that despite references to “universally recognized international regulations” and “adopted international principles”, these regulations and principles were neither defined, nor identified.²⁸ The references were likely aimed at provisions in quarantine treaties that sought to harmonize quarantine regimes by the use of minimum standards and certifications in standard form.²⁹

It is noteworthy that by deferring to outside principles and regulations this tacitly acknowledged that balancing quarantine and trade was more

²³ See discussion in section 3.2.2 of Chapter 3 of this study.

²⁴ Steve Charnovitz, ‘Exploring the Environmental Exceptions in GATT Article XX’ above n 19, 41.

²⁵ See Discussion Steve Charnovitz Ibid; see also 1928 *Treaty of Commerce and Navigation with Final Protocol and Protocol concerning the Import and Export Régime in Italy Between Hungary and Italy*, signed 4 July 1928, (1929) 91-92 XCII *League of Nations – Treaty Series* 117, Article 14 (entered into force on 1 June 1929).

²⁶ See Discussion Steve Charnovitz above n 19; see also 1925 *Convention of Commerce and Navigation with Final Protocol Sweden and Czechoslovakia*, signed 18 April 1925, (1925) 35-36 XXXVI *League of Nations – Treaty Series* 290, Article 4 (entered into force 27 June 1925).

²⁷ 1928 *Treaty of Commerce and Navigation between Bulgaria and Turkey, Angora*, signed 12 February 1928, Volume IV *International Protection of the Environment* B Rüster and B Simma (eds), Oceana New York (1975), 1664, Article 5(3) (entered into force 31 August 1931).

²⁸ Steve Charnovitz, ‘Exploring the Environmental Exceptions in GATT Article XX’ above n 19, 41. In addition, if a difference of opinion were to arise with respect to a trade and quarantine dispute, there was no regime that yet incorporated an effective system for adjudication of these disputes.

²⁹ See discussion in section 3.2.3 of Chapter 3 of this study.

appropriately achieved under the guidance of quarantine treaties. Yet, the multi-faceted nature of the quarantine-trade relationship also meant that trade regimes could be a legitimate forum for regulation of quarantine issues. Partly due to concerns with the potential for misuse of quarantine, the League of Nations sponsored an international summit³⁰ that led to the negotiation of the 1927 Convention for the Abolition of Import and Export Prohibitions and Restrictions.³¹

Article 3 of the convention allowed eight exceptions to the general goal of abolition of trade restrictions³² and the fourth exception, which was set out in Article 4.4, permitted prohibitions, or restrictions, where the objective was to protect animals or plants against disease, insects and harmful parasites.³³ A protocol to the 1927 Convention³⁴ confirmed that this exception also incorporated measures taken to preserve animals or plants from degeneration and extinction and measures taken against harmful seeds, plants, parasites and animals. These exceptions were further subject to two provisos: first, that they were not applied in a manner that constituted an arbitrary discrimination between countries; and, second, that they were not a disguised restriction on trade.³⁵

Against this backdrop, the treaties still largely left the content of national laws to individual nations. However, in accordance with the 1927 Convention for the Abolition of Import and Export Prohibitions and Restrictions, the implementation of national quarantine laws was to

³⁰ *Ibid.*

³¹ 1927 *Convention for the Abolition of Import and Export Prohibitions and Restrictions*, signed on 8 November 1927, (1929-1930) 97-98 XCVII *League of Nations – Treaty Series* 392. A supplementary agreement and protocol were signed respectively on 11 July 1928 and 20 December 1929. The Convention, supplementary Agreement and Protocol entered into force 1 January 1930. As at November the Convention had 28 parties.

³² 1927 *Convention for the Abolition of Import and Export Prohibitions and Restrictions*, Articles 3 and Article 4(1)-(8).

³³ 1927 *Convention for the Abolition of Import and Export Prohibitions and Restrictions*, Article 4.4.

³⁴ 1927 *Protocol of the Convention on the Abolition of Import and Export Prohibitions and Restrictions*, Section III (amended Article 4 of the convention). See discussion Steve Charnovitz, 'Exploring the Environmental Exceptions in GATT Article XX', above n 19, 41.

³⁵ 1927 *Convention for the Abolition of Import and Export Prohibitions and Restrictions*, Article 4.

operate within a multi-lateral trading system that regulated the manner in which those laws were applied. This meant that national quarantine laws could neither be a disguised restriction on international trade, nor discriminatory.³⁶ As a result, the focus of trade regimes on domestic quarantine laws primarily centred on the process by which quarantine laws were administered and, furthermore, the focus was underpinned by discrimination-based concepts.³⁷ This development was not in itself unusual and indeed mirrored developments in the quarantine treaties that proscribed discriminatory, or unwarranted trade restrictions.³⁸

For the next twenty years, most bilateral trade treaties took advantage of the exceptions permitted by the 1927 Convention for the Abolition of Import and Export Prohibitions and Restrictions and embodied some type of exemption for regulations designed to protect plants or animals.³⁹ However, despite the negotiation of that convention, and the restrictions imposed in quarantine treaties, the potential for abusing quarantine still existed. In fact, in the years between the two world wars countries regularly exploited quarantine regulation, to procure economic gains.⁴⁰

For example, in the late 1920s, the United States of America (United States) and Argentina were involved in a dispute over United States quarantine measures that banned the import of chilled meat from Argentina. At first, the ban only applied to products sourced from areas where there had been outbreaks of foot-and-mouth disease. However, under the *Smoot-Hawley Tariff Act* 1930, the ban was extended to an

³⁶ Steve Charnovitz, 'Exploring the Environmental Exceptions in GATT Article XX', above n 19, 41.

³⁷ See discussion in part 4.4 of this Chapter.

³⁸ See discussion on IPPC and OIE in section 3.3.3 of Chapter 3 of this study.

³⁹ Steve Charnovitz, 'Exploring the Environmental Exceptions in GATT Article XX', above n 19, 43. See, for example, 1928 *Treaty of Commerce and Navigation with Final Protocol and Protocol concerning the Import and Export Régime in Italy Between Hungary and Italy*, Article 14; 1928 *Treaty of Commerce and navigation with Protocol Between Union of South Africa and Germany*, signed 1 September 1928, (1929-1930) 95-96 XCV *League of Nations – Treaty Series* 289 Article 10 (entered into force 11 June 1928).

⁴⁰ Daniel Esty, *Greening the GATT: Trade, Environment and the Future* Institute for International Economics, Washington DC (1994) 243.

entire state of Argentina if an outbreak of disease was detected in any part of that state.⁴¹ This quarantine measure was introduced in the political climate of an election campaign fought in 1928 on the basis of increasing tariffs in order to protect farmers from the falls in prices of primary produce items that had occurred in the 1920s.⁴² It is, therefore, not surprising that the importation bans imposed by the United States were heavily criticized by Argentina.⁴³

In 1935, the United States was on the receiving end of similar policies, when the United Kingdom banned the importation of all animals and agricultural products from Colorado, following an outbreak of foot and mouth disease in California.⁴⁴ The United States was vociferous in its condemnation and criticized the United Kingdom for doing “...nothing to foster trust and cooperation among nations in either the political or economic realm during a perilous era in international relations.”⁴⁵

With the adoption of GATT 1947,⁴⁶ quarantine regulation in international trade came under the umbrella of the article XX exceptions and the discrimination-based approach of GATT.⁴⁷ Almost fifty years later, the adoption of the SPSA in 1995 heralded a new era in quarantine-trade relations. Quarantine was henceforth regarded as much of a trade matter as a means of stopping the introduction and spread of disease and

⁴¹ C Langdon White, ‘The Argentine Meat Question’ (1945) 35 *Geographical Review* 634, 643. Today, this measure would need to be carefully considered in view of Article 6 of the WTO Agreement on Sanitary and Phytosanitary Measures that requires states to adapt their quarantine measures to regional conditions, including taking into account areas that are disease-and pest-free.

⁴² See Explanatory memorandum *Smoot-Hawley Tariff Act* 1930, issued by the US Department of State <<http://www.state.gov/r/pa/ho/time/id/17606.htm>> (April 2007). Also see Richard Pomfret, ‘Trade Policy in Canada and Australia in the Twentieth Century’ (2000) 40 *Australian Economic History Review* 114, 115.

⁴³ See generally C Langdon White ‘The Argentine Meat Question’ above n 41.

⁴⁴ C Langdon White ‘The Argentine Meat Question’ Ibid, 644.

⁴⁵ See Explanatory memorandum issued by the US Department of State above n 42. In 1935 the United States tried to reverse this position by entering into an agreement with Argentina that would have restored the *status quo* pre 1930, but the Senate refused to ratify the agreement. See also C Langdon White, Ibid, 643.

⁴⁶ GATT 1947 has been subsumed into the 1994 General Agreement on Tariffs and Trade (GATT 1994) and members of the WTO are members of GATT 1994.

⁴⁷ See discussion in section 4.2 of Chapter 4 of this study.

pestilence. By nominating the IPPC and OIE as recognized standard-setting bodies, the SPSA provides a direct link between international trade and domestic quarantine regimes. However, unlike quarantine treaties, the SPSA in its operation, if not in terminology, is prohibitive, so that measures that do not conform to the provisions of the SPSA are prohibited.⁴⁸ Although the wording of the SPSA gives states much latitude to set their own ALOP⁴⁹ and adopt more stringent measures than those provided by international standards,⁵⁰ these concessions are subject to verification by scientific evidence of a high calibre. Otherwise the measures are struck down. The fact that states need to set an ALOP, and that measures cannot manage a risk that extends beyond the ALOP, are part of what is known as the “managed risk” approach towards quarantine matters.⁵¹

5.2 THE MANAGED RISK APPROACH

5.2.1 The Managed Risk

The managed risk approach is a way of assessing whether quarantine-related risks can co-exist with members’ needs, expectations and resource constraints. At the quarantine-trade interface it also represents the negotiated balance within the WTO between quarantine and international trade. The approach is based on the amount of damage a state is prepared to tolerate and is reflected in the way that the appropriate level of protection, or ALOP, is set. As was discussed in Chapter 4, although the setting of an ALOP is the prerogative of a member, it is an exercise that nevertheless needs to be balanced against trade-related considerations,

⁴⁸ See discussion in sections 4.3.6, 4.3.7 of Chapter 4 of this study and section 5.2.5 of this Chapter.

⁴⁹ SPSA, Article 3.3.

⁵⁰ SPSA, Article 3.3.

⁵¹ For a short discussion of the managed risk approach see M E Nairn, P G Allen, A R Inglis and C Tanner *Australian Quarantine: A Shared Responsibility* Department of Primary Industries and Energy, Canberra (1996) paragraph 7.1.1.

such as minimizing negative trade impacts⁵² and achieving cost-benefit justification between quarantine measures and their impact on trade.⁵³

The managed risk approach, therefore, is different from a “no-risk” approach and different again from a “least-risk” approach.⁵⁴ A no-risk approach would see quarantine regulation restricting trade in all but the safest commodities; while a “least-risk” approach would see trade permitted only for those imports that present a negligible risk. Under a discrimination-based regime it would be easier for states to justify no risk and least risk approaches by showing that all trading partners were treated equally and that domestic products were not favoured over imported ones. However, in practice, “no risk” and “least risk” approaches are difficult and perhaps impracticable to implement.⁵⁵

Realistically, quarantine systems will rarely have the capacity to carry out inspections on every import;⁵⁶ and even the strictest of quarantine measures may not be carried out effectively.⁵⁷ Moreover, in some product sectors, least-risk and no-risk approaches would be seen as unjustifiably

⁵² SPSA Articles 2.2 and 5.4. Article 2.2 provides that quarantine measures should only be applied ‘to the extent necessary to protect human, animal or plant life or health...’; while Article 5.4 stresses that members should, take into account the objective of minimizing negative trade effects.

⁵³ SPSA Article 5.2 provides that when members are undertaking a risk assessment they should take into account ‘the potential damage in terms of loss of production or sales in the event of the entry, establishment or spread of a pest or disease...and the cost-effectiveness of alternative approaches to limiting risks’.

⁵⁴ Mike Nunn, ‘Quarantine Risk Analysis’ (1997) 41 *Australian Journal of Agricultural and Resource Economics* 572.

⁵⁵ Ibid; M E Nairn, P G Allen, A R Inglis and C Tanner, *Australian Quarantine: A Shared Responsibility*, above n 51 paragraph 7.1.1.

⁵⁶ Senate Standing Committee on Rural and Regional Affairs and Transport, Parliament of Australia, *Administration of Biosecurity Australia – Revised Draft Import Risk Analysis for Apples from New Zealand*, 2005, Senate Printing Unit, Department of the Senate, Parliament House, Canberra (2005) paragraph 3.15. Biosecurity Australia proposed to inspect 600 units of fruit of every shipment. This would equate to a ‘95 per cent confidence level that no more than 0.5 per cent of the fruit is accompanied by trash’ that could act as a vector to introduce disease and pathogens.

⁵⁷ See, for example, discussion in Senate Standing Committee on Rural and Regional Affairs and Transport, Parliament of Australia, *Administration of Biosecurity Australia – Revised Draft Import Risk Analysis for Apples from New Zealand*, above n 56, paragraphs 3.12-3.13 where the Batlow Fruit Growers Association came into conflict with Biosecurity Australia over the effectiveness of harvesting measures in New Zealand in reducing the likelihood of fire blight entering Australia.

exclusionary and harmful to international trade.⁵⁸ States see the managed risk approach as a way of balancing the competing claims of quarantine and free trade. The managed risk approach commences with a state setting an appropriate level of protection; for measures cannot manage risks that exceed the appropriate level of protection. At issue is whether the managed risk approach, at least as it operates within the WTO, promotes optimum quarantine practice, or whether it has the potential to lower quarantine barriers disproportionately in order to facilitate international trade.

Another important component of the managed risk approach is the evaluation process that determines whether or not species will gain entry, or whether pathways of introduction will be targeted for remedial measures. A number of features of the evaluation processes are significant, including; the volume of the scientific evidence; the sufficiency of the scientific evidence; the relationship between risk and harm; and the differentiation between risk management and risk assessment.

5.2.2 Volume of Scientific Evidence

One of the objectives that underpinned the negotiation and adoption of the SPSA was the desire to prevent quarantine measures from being used as an unnecessary restraint on international trade.⁵⁹ Therefore, measures need to be based on scientific evidence which is tested either by using international standards or by a risk assessment.

⁵⁸ M E Nairn, P G Allen, A R Inglis and C Tanner, above n 51.

⁵⁹ 1986 *Punta del Este Ministerial Declaration*. (1986) 25 ILM 1623, part 1 preamble and Part 1 D Heading 'Agriculture' (iii); Donna Roberts, 'Preliminary Assessment of the Effects of the WTO Agreement on Sanitary and Phytosanitary Trade Regulations' (1998) 1 *Journal of International Economic Law* 377, 380; Steve Charnovitz, 'The Supervision of Health and Biosafety Regulation by World Trade Rules' (1999-2000) 13 *Tulane Environmental Law Journal* 271, 272; Donna Roberts 'The Integration of Economics in SPS Risk Management Policies: Issues and Challenges' in Kym Anderson, Cheryl McRae and David Wilson (eds) *The Economics of Quarantine and the SPS Agreement*, Centre for International Economic Studies Adelaide and AFFA, Biosecurity Australia. (2001) 9, 13.

Each method of evaluation, based on either international standards or risk assessment, identifies and differentiates between risks that breach a state's appropriate level of protection (ALOP) and those that do not. As already mentioned, only the former risks may be managed by way of quarantine measures. Consequently, the evaluation process needs to be precise enough to distinguish between different levels of risk. For example, International Standards for Phytosanitary Measures (ISPM) number 11 ("Pest Risk Analysis for Quarantine Pests Including Analysis of Environmental Risks and Living Modified Organisms")⁶⁰ provides that in pest risk analysis states need to identify and assess each pest for its potential to establish, spread and cause damage.⁶¹ Similarly, in animal quarantine, the *Aquatic Animal Health Code 2007*⁶² specifies that each "hazard" or pathogen that could produce adverse consequences⁶³ should be identified and evaluated.⁶⁴ A comparable approach is taken with respect to risk assessments undertaken independently of international standards. The Appellate Body has held that these risk assessments should identify specific pests and diseases and the biological and economic consequences associated with the entry, establishment or spread of each pest and disease.⁶⁵

This means that evaluations conducted either in accordance with international standards, or risk assessments involve very detailed studies

⁶⁰ International Standards for Phytosanitary Measures ISPM No 11 Pest Risk Analysis for Quarantine Pests Including Analysis of Environmental Risks and Living Modified Organisms 2004. Produced by the Secretariat of the International Plant Protection Convention FAO Rome (2006).

⁶¹ ISPM no 11 Pest Risk Analysis for Quarantine Pests Including Analysis of Environmental Risks and Living Modified Organisms section 2 'Stage 2: Pest Risk Assessment'.

⁶² *Aquatic Animal Health Code 2007*, above n 16.

⁶³ See *Aquatic Animal Health Code 2007*, above n 16, section 1.4.2.2 definitions of 'hazard' and 'hazard identification'.

⁶⁴ See generally *Aquatic Animal Health Code 2007*, above n 16, section 1.4.2 'Guidelines for import risk analysis' and in particular section 1.4.2.4 that sets out the steps for risk assessment.

⁶⁵ *Australia - Measures Affecting Importation of Salmon (Australia – Salmon)* WTO Doc WT/DS18/AB/R (Report of the Appellate Body 1998) paragraph 121 and *Japan – Measures Affecting the Importation of Apples (Japan – Apples)* WTO Doc WT/DS245/AB/R (Report of the Appellate Body 2003) paragraph 196.

supported by large volumes of information.⁶⁶ In both a practical and legal sense, the requirements also affirm a high threshold for compliance.⁶⁷

The strictness of the risk assessment process and the demanding level of knowledge required to support measures are reinforced by the decision in *European Communities – Measures Concerning Meat and Meat Products (Hormones)*, (*EC – Hormones*).⁶⁸ The *EC – Hormones* dispute arose out of a ban imposed by the European Communities (EC)⁶⁹ on beef imported from the United States that had been grown using hormones. The EC supported the import ban based on a risk assessment that contained general evaluations of the carcinogenic potential of hormones in meat, but without details, statistics or analysis of particular hormones. The Appellate Body held that this lack of detail was insufficient to underpin an import ban.⁷⁰ The EC should have included an analysis of the carcinogenic potential of the hormones in question, together with a further analysis of their impact, as residues in meat derived from cattle which had been fed the hormones.⁷¹

⁶⁶ Digby Gascoine, 'WTO Dispute Settlement: Lessons Learned from the Salmon Case', (paper presented at a conference on International Trade Education and Research held in Melbourne 26-7 October 2000) paragraph 10. Available at <<http://www.apec.org.au/docs/gascoine.PDF>> (March 2005); Steve Charnovitz, 'The Supervision of Health and Biosafety Regulation by World Trade Rules' above n 59, 290.

⁶⁷ See Appellate Body in *Australia – Salmon* paragraphs 112-115; David G Victor 'The Sanitary and Phytosanitary Agreement of the World Trade Organization: An Assessment after Five Years' (2000) 32 *International Law and Politics* 865, 907. An example is provided by the third draft Import Risk analysis prepared by Biosecurity Australia, *Revised Draft Import Risk Analysis Report for the Importation of Cavendish Bananas from the Philippines* that was released in three volumes and covered more than 500 pages. Parts A, B and C Biosecurity Australia, Canberra (2007).

⁶⁸ *European Communities – Measures Concerning Meat and Meat Products (Hormones)* (*EC – Hormones*) WTO Doc WT/DS/26/AB/R (Report of the Appellate Body 1998). See also the discussion of *Australia – Salmon* and *Japan – Apples* in section 4.3.9 of Chapter 4 of this study.

⁶⁹ 'The European Communities' is the name given collectively within the WTO to the European Union and its 27 member states. See footnote 5 in Chapter 4 of this study. The European Union was created by the *Treaty on European Union* (the Maastricht Treaty) that was signed on 7 February 1992, 1992 *Official Journal* C 191, 29 July 1992 (entered into force 1 November 1993). As at November 2007 the European Community had 27 members.

⁷⁰ *EC – Hormones*, paragraphs 206-208.

⁷¹ *EC – Hormones*, paragraphs 206-208.

The high level of information needed to satisfy the requirements of international standards and risk assessment is further illustrated by the second draft Import Risk Analysis (IRA)⁷² Biosecurity Australia conducted on the importation of bananas from the Philippines: “*Importation of Fresh Bananas from the Philippines Draft IRA Report February 2004*”⁷³ (*Bananas from the Philippines*).

Part of the report evaluated whether the importation of bananas could lead to the accidental introduction of IAS in breach of Australia’s ALOP.⁷⁴ To determine this point, the report detailed species found in the Philippines such as weeds, mammals, frogs, reptiles and molluscs that could accidentally be transported with bananas.⁷⁵ It is important to keep in mind that the species evaluated by Biosecurity Australia not only included species native to the Philippines, but also included alien species introduced into the Philippines that could further be introduced from the Philippines to Australia.⁷⁶ In addition, the report evaluated all known alien species whether or not these species were invasive. The fact that a species is already invasive in one location makes it more likely that it will be invasive elsewhere.⁷⁷ Yet the reverse proposition cannot be assumed; for a non-invasive alien species may become invasive in a new location.

⁷² For discussion of the IRA process see discussion section 3.5.3 of Chapter 3 of this study.

⁷³ Australia received a request from the Philippine government to export bananas in 2000. See AQIS Quarantine Policy Memorandum (PQPM) number 2000/01 of 13 March 2000, referred to in AQIS Quarantine Policy Memorandum (PQPM) number 2000/10 of 28 June 2000. Available from <http://www.daff.gov.au/_data/assets/file/0016/22903/2000-10.rtf> (April 2007) To date, Biosecurity Australia has undertaken three draft Import Risk Analyses following this request: Biosecurity Australia, *Importation of Fresh Bananas from the Philippines Draft IRA Report June 2002* Biosecurity Australia DAFF (2002) Available <http://www.daffa.gov.au/_data/assets/pdf_file/164001/draft-ira.pdf> (April 2007); Biosecurity Australia, *Importation of Fresh Bananas from the Philippines Draft IRA Report February 2004* Biosecurity Australia DAFF (2004). Available <http://www.daffa.gov.au/_data/assets/pdf_file/22866/banana_rev_draft.pdf> (April 2007 ; Biosecurity Australia, *Revised Draft Import Analysis Report for the Importation of Cavendish Bananas from the Philippines*, Part B Biosecurity Australia (2007) (Released in parts A, B and C) above n 67.

⁷⁴ Biosecurity Australia, *Importation of Fresh Bananas from the Philippines Draft IRA Report February 2004* above n 73, 295-326.

⁷⁵ Ibid.

⁷⁶ Ibid, 332, where the report discusses introduced mammals and amphibians that inhabit the Philippines.

⁷⁷ Rüdiger Wittenberg and M Cock (eds), *Invasive Alien Species: A Toolkit of Best Prevention and Management Practices* CAB International, Wallingford Oxon UK (2001)

The problem with this level of detail is that it is at least partly dependent on the depth of information amassed by the exporting state. It is not possible, for example, for the importing state to identify and assess individual species unless the exporting state has knowledge of alien species found in its territory. Yet, states have different resource levels and up till now many states have not made inventories and established tracking systems for alien species.⁷⁸ Without this information, it will not be possible for the importing state to know with accuracy which species are likely to be accidentally transported. Furthermore, the amount of detail required creates particular problems where states are trying to prevent entry of IAS by regulating pathways, or vectors of introduction.

The Global Invasive Species Programme (GISP)⁷⁹ has identified multiple hitchhikers as a common problem in pathways and vectors, such as nursery stock, seeds, mail, cargo and cut flowers.⁸⁰ While it may not be possible to identify every conceivable species that could gain entry, the fact that a commodity is already a vector for one species foreshadows that it might well be a vector for other species. Moreover, a treatment that is effective for one species may not be effective for another.⁸¹ These factors should signal a conservative approach towards quarantine regulation of pathways and vectors. However, the fact that a pathway or vector has been identified as responsible for introducing IAS does not alter the strict

134. The toolkit states that one of the best indicators of a species' invasive potential is whether it is invasive in other states, especially those with similar 'ecological and climatic conditions'.

⁷⁸ See section 2.4 of Chapter 2 of this study, especially the discussion surrounding Table 4 that indicates only 12.4% of states have identified alien species of major concern and established tracking system. 65.7% of states have identified some alien species, but have not yet established tracking systems.

⁷⁹ GISP is the Global Invasive Species Programme. It is an international organization that was formed in 1997 and has initially been funded through the World Bank. GISP works closely with international organizations, such as, the IUCN, the secretariat of the CBD and scientific, research and conservations groups, such as CAB International, SCOPE and CSIRO to develop best practices to control IAS on a global scale. The institution of this organization serves as a basis to gather and collate information on IAS on a world-wide scale. Their web site is www.gisp.org

⁸⁰ Global Invasive Species Programme, On-Line Toolkit 3.3.2 Accidental Introductions Available at <http://www.cabi-bioscience.ch/wwwgisp/gtc3_2c.htm> (March 2006).

⁸¹ For example, the trade in cut flowers can introduce invertebrate IAS, such as thrips, mites and moths, as well as seeds. Treatments would need to take this variety of IAS into account. Rüdiger Wittenberg and M Cock (eds), above n 77, 60.

requirements set out in *EC – Hormones*. Individual species must still be identified and evaluated.

To be sure, the SPSA does not prohibit states from preventing entry of IAS by targeting pathways or vectors, yet the findings of the Appellate Body in cases such as *EC – Hormones*⁸² may discourage such an approach. The preparation of a risk assessment will normally demand considerable outlay and expertise which can only increase in proportion to the level of information required to underpin the process.⁸³ In addition, these difficulties are exacerbated by requirements with respect to the “sufficiency” of scientific information.

5.2.3 Sufficiency of Scientific Evidence

The sufficiency of the scientific evidence is referred to, but not defined, in Articles 2.2 and 5.7 of the SPSA. Article 2.2 prohibits states from maintaining permanent measures without sufficient scientific evidence, while Article 5.7 permits temporary measures where scientific evidence is not sufficient.⁸⁴ Two questions may be asked: first, what is meant by the word “sufficient”; and, second, whether the quality of evidence required for permanent measures under Article 2.2 differs from the standard of evidence required for a provisional measure under article 5.7.

In *Japan – Measures Affecting Agricultural Products (Japan – Agricultural)*⁸⁵ and *Japan – Measures Affecting the Importation of Apples (Japan – Apples)*⁸⁶ the Appellate Body held that the concept of

⁸² The same reasoning can be drawn from *Australia – Salmon* and *Japan – Apples*, discussed in section 4.3.9 of Chapter 4 of this study.

⁸³ See discussion in section 3.6 of Chapter 3 of this study.

⁸⁴ *Japan – Apples*, paragraphs 175-185. See discussion Joost Pauwelyn, ‘The WTO Agreement and Phytosanitary (SPS) Measures as Applied in the First Three SPS Disputes’ [1999] *Journal of International Economic Law* 641.

⁸⁵ *Japan – Measures Affecting Agricultural Products (Japan – Agricultural)*, WT/DS76/AB/R, paragraph 84. For general discussion see J Whitlock ‘*Japan – Measures Affecting Agricultural Products: Lessons for Future SPS Disputes*’ Agricultural Trade Disputes’ (2002) 33 *Law and Policy in International Business* 741; Steve Charnovitz, ‘The Supervision of Health and Biosafety Regulation by World Trade Rules’ above n 59, 288; David G Victor, above n 67, 909-913; Oliver Landwehr, ‘Decisions of the Appellate Body of the World Trade Organization *Japan – Measures Affecting Agricultural Products* (1999) 10 *European Journal of International Law* 461.

⁸⁶ *Japan – Measures Affecting the Importation of Apples (Japan – Apples)*, WTO Doc WT/DS245/AB/R (Report of the Appellate Body 2003) paragraphs 143-168.

“sufficiency” in article 2.2 denotes a rational, or objective, relationship between the SPS measure and the scientific evidence that “...will depend upon the particular circumstances of the case including the characteristics of the measure at issue and the quality and quantity of the scientific evidence.”⁸⁷ Consequently, quarantine measures cannot be maintained pursuant to Article 2.2 without a sufficient quality and quantity of scientific evidence that is proportional to the severity of the measure. In other words, greater levels of quality and quantity in scientific evidence are needed the more trade-restrictive a measure becomes.⁸⁸

A somewhat different approach has been taken with respect to Article 5.7. In *Japan-Apples*, Japan argued that Article 5.7 could be interpreted as referring to an insufficiency of evidence, either where there was a lack of quantity of scientific evidence, or where there was a sufficient quantity, but the evidence was inconclusive or uncertain.⁸⁹ In rejecting Japan’s argument, the Appellate Body said that the question to be answered is whether the evidence is sufficient to “permit the evaluation of the likelihood of entry, establishment or spread of, in this case, fire blight by Japan.”⁹⁰ In addition, the concept of “sufficiency” in Article 5.7 incorporates the quality, or reliability, of the evidence,⁹¹ but not necessarily its conclusiveness. The only issue is whether there is enough reliable scientific information to conduct a risk assessment.

The difficulty with this approach, however, is that arguably it does not take into account those situations where evidence is plentiful and reliable, but is nevertheless inconclusive; nor does the approach grapple with

⁸⁷ *Japan – Agricultural* WTO Doc WT/DS76/AB/R (Report of the Appellate Body 1999) paragraph 84 Quoted with approval in *Japan – Apples*, paragraph 162.

⁸⁸ Cameron Hutchinson, ‘International Environmental Law Attempts to be ‘mutually supportive’ with International Trade Law: a compatibility analysis of the Cartagena Protocol to the Convention on Biological Diversity with the World Trade Organisation agreement on the application of sanitary and phytosanitary measures’ (2001) 4 (1) *Journal of International Wildlife Law & Policy* 1, paragraph 6.6.1.1.

⁸⁹ *Japan – Apples*, Paragraphs 175-185.

⁹⁰ *Japan – Apples*, paragraph 179.

⁹¹ *Japan – Apples*, paragraph 185. See WorldTradeLaw.Net ‘Dispute Settlement Commentary (DSC) Japan-Measures Affecting the Importation of Apples’, 16 <www.worldtradelaw.net> (April 2006).

problems stemming from scientific evidence that is so inconclusive as to be uncertain.⁹² These issues were the subject of an *amicus curiae* brief⁹³ in *European Communities – Measures Affecting the Approval and Marketing of Biotech Products*⁹⁴ (*Biotech case*). The *amicus curiae* brief explored the link between inconclusiveness and uncertainty in scientific evidence:

In this regard, uncertainty is a critical factor in determining the quality of the relevant scientific evidence. In fact, uncertainty may be thought of as a continuum ranging from zero for certain information ... to high levels for information with true uncertainty or indeterminacy ... when the available information cannot appropriately describe the risks to human, animal, or plant life or health because of the lack of understanding of events and processes, [then] policy- makers cannot ignore the lack of quality of the scientific evidence.⁹⁵

This reasoning indicates that where scientific evidence is so inconclusive or uncertain that it cannot identify risks, it should not be used to carry out a risk assessment.⁹⁶ Moreover, a high degree of uncertainty in the scientific evidence can also directly relate to the quality of the evidence. Therefore, the ability to implement provisional measures should not be dependent upon a lack of quantity of scientific evidence, but should also incorporate circumstances where the scientific evidence is so inconclusive that it cannot identify risks. Often, states that seek to prevent entry of IAS will be faced with both gaps and uncertainties in the knowledge base. These include lack of knowledge generally, uncertainty with respect to whether alien species will become invasive, and uncertainty concerning the impact of alien species on native biodiversity.⁹⁷ Indeed, under Article 2.2 of the SPSA, the same level of uncertainty that prevents the

⁹² *Japan – Apples*, paragraph 185. See WorldTradeLaw.Net ‘Dispute Settlement Commentary (DSC) Japan-Measures Affecting the Importation of Apples’, 16 <www.worldtradelaw.net> <www.worldtradelaw.net> (April 2006).

⁹³ The Amicus Curiae brief was lodged collectively by the Center for International Environmental Law (CIEL), Friends of the Earth – United States (FOE-US), Defenders of Wildlife, Institute for Agriculture and Trade Policy (IATP) and the Organic Consumers Association – United States (OCA- USA) June 2004. (Amicus Curiae brief) <http://www.ciel.org/Publications/ECBiotech_AmicusBrief_2June04.pdf> (February 2007).

⁹⁴ *European Communities – Measures Affecting the Approval and Marketing of Biotech Products (Biotech case)* WTO Doc WT/DS/291, WT/DS/292 and WT/DS/293 (Report of the Panel 2006).

⁹⁵ Amicus Curiae brief, 37.

⁹⁶ Amicus Curiae brief, 36.

⁹⁷ Rüdiger Wittenberg and M Cock (eds), above n 77, 60.

implementation of provisional measures would also be considered relevant to whether there was an adequate rational, or objective, relationship between the SPS measure and the scientific evidence. In the absence of such a relationship between the scientific evidence and the measure, the measure will not be upheld.

This directly relates to the question whether the quality of evidence required for permanent measures under Article 2.2 differs from the standard of evidence required for a provisional measure under article 5.7. Permanent measures under Article 2.2 require an appropriate volume of evidence that is also conclusive. However, under Article 5.7 provisional measures may only be implemented absent an appropriate volume of evidence, whether or not the evidence is conclusive. The major differences between the articles, therefore, stem from the contradictory treatment of “conclusive/inconclusive” evidence.

While states are expected to undertake a risk assessment where an appropriate volume of evidence exists, once inconclusive evidence becomes subject to a risk assessment, it potentially makes the resulting measures difficult, if not impossible, to justify. This is inevitable, because it is almost guaranteed that those measures will lack a rational relationship to the scientific evidence.⁹⁸ Similarly, because a measure must also be proportionate to the risk as determined by the scientific evidence,⁹⁹ it will be almost impossible to show that a stringent trade restraint is proportionate to the risk it is seeking to avoid, where the scientific evidence is inconclusive. In essence, by pushing inconclusive evidence into the risk assessment process, the provisions of the SPSA steer quarantine regulation towards the lowering of quarantine barriers and shift the focus of IAS regimes towards “cure” rather than prevention. This is a trend that is also evident in the way that risk and harm are treated.

5.2.4 Risk and Harm

⁹⁸ *Japan – Apples*, paragraphs 162-63.

⁹⁹ *Japan – Apples*, paragraph 163.

For the purposes of quarantine, harm has been described as “the damage done by something that might have been prevented through biosecurity; whereas “risk” is the chance of that harm occurring.”¹⁰⁰ Therefore, harm refers to the occurrence of the damaging event; whereas risk is the anticipation of the harm.¹⁰¹ Ideally, international standards and risk assessment should be proactive in identifying risk and managing it before harm occurs.

In practice estimating risk is very complex and subject to a number of variables. Consequently, risk is often determined qualitatively rather than quantitatively.¹⁰² A qualitative assessment determines magnitudes of risk in comparative terms such as “high”, “medium”, “low” or “negligible”.¹⁰³ A quantitative risk assessment determines magnitudes of risk in numerical terms, such as a one-in-three chance of an event occurring.¹⁰⁴ Qualitative assessments are useful where the data is incomplete.¹⁰⁵ However, even with a qualitative estimation, to be considered a proper risk assessment for the purposes of the SPSA, the degree of risk must be more than a theoretical one¹⁰⁶ although the risk does not necessarily need to reach a certain magnitude or threshold.¹⁰⁷

¹⁰⁰ M Cock, *Biosecurity and Forests: An Introduction – With Particular Emphasis on Forest*

Pests, FAO Forest Health and Biosecurity Working Paper FBS/2E, (2003) 9.

¹⁰¹ K McMunigal, ‘Distinguishing Risk from Harm in Conflict of Interest’ Case Western Reserve University Center for the Study of Ethics in the Professions at IIT (1997) 17 (1) 1 CSEP <http://ethics.iit.edu/perspective/pers17_1fall97_2.html> (April 2007).

¹⁰² For example, Biosecurity Australia uses a risk estimation matrix that produces qualitative estimates, ranging from extreme/ high/ moderate/ low/ very low/ negligible. Any estimate other than very low or negligible breaches Australia’s ALOP. See discussion, Senate Standing Committee on Rural and Regional Affairs and Transport, Parliament of Australia, *Administration of Biosecurity Australia – Revised Draft Import Risk Analysis for Bananas from the Philippines* 2005, Senate Printing Unit, Department of the Senate, parliament House, Canberra (2005), paragraph 2.41.

¹⁰³ *Terrestrial Animal Health Code* 2007, above n 16, definition Section 1.1.1.1.

¹⁰⁴ *Terrestrial Animal Health Code* 2007, above n 16, definition Section 1.1.1.1.

¹⁰⁵ *Aquatic Animal Health Code* 2007, above n 16, section 1.4.2.3 (2).

¹⁰⁶ *EC – Hormones* paragraph 186.

¹⁰⁷ *Australia – Salmon*, paragraphs 123-124. The level of risk, however, might be relevant in the choice of measures. See discussion in section 4.3.10 of Chapter 4 of this study and section 5.3.5 of this Chapter.

In *Japan – Measures Affecting the Importation of Apples, Recourse to Article 21.5 (Japan – Apples 21.5)*¹⁰⁸ the Panel examined the level of risk associated with mature symptomless apples acting as a vector for transmission of fire blight:

The Original Panel concluded that there was not sufficient scientific evidence that apple fruit are likely to serve as a pathway for the entry, establishment or spread of fire blight within Japan. The Panel nonetheless ... considered that the scientific evidence “does suggest that some slight risk of contamination cannot be excluded.” [The] ...experts all categorized this risk as “negligible” [The Panel] ... could not agree with the United States that [a negligible risk]... should be completely assimilated to a “theoretical risk.”¹⁰⁹

Although the Panel conceded that a negligible risk is not to be equated with a theoretical risk, the use of the word “negligible” can nevertheless be ill-conceived. In one sense, the likelihood of an event happening might be “negligible,” such as the likelihood of fruit fly establishing in Canada.¹¹⁰ However, it may not be appropriate to use the word “negligible” to describe a low probability event if it has a high potential for damage, such as often occurs with damage caused by IAS.¹¹¹ In these instances, the word “negligible” is seemingly used in a heuristic sense to describe the likelihood of the event happening, while glossing over management issues relevant to preventing the entry of IAS.

As GISP has pointed out, at present it is difficult to determine minimum levels of risk for a species to be considered invasive. Partly this is due to the fact that:

...no criteria have yet been agreed upon for the minimum damage, spread or size of population needed for an alien species to be considered invasive. However, it is clear that a very small number of individuals, representing a small fraction of the genetic variation of the species in its native range, can

¹⁰⁸ *Japan – Measures Affecting the Importation of Apples, Recourse to Article 21.5 (Japan – Apples 21.5)* WTO Doc WT/DS245/RW (Report of the Panel 2005).

¹⁰⁹ *Japan – Apples 21.5*, paragraph 8.40 (footnotes omitted).

¹¹⁰ See discussion in section 3.4.2 of Chapter 3 of this study.

¹¹¹ D Adamson and D Cook, ‘Re-examining Economic Options for Import Risk Assessments’ (paper presented at AARES Conference, 13-16 February 2007, Queenstown, New Zealand Murray Darling Program Working Paper: M07#3) 6. Available <http://www.uq.edu.au/rsmg/WP/WPM07_3.pdf> (July 2007).

be enough to generate, through its reproduction and spread, massive environmental damage in a new environment.¹¹²

In risk assessment, it is not clear to what extent the use of the word “negligible” takes into account the fact one of the most serious types of damage that IAS can cause is extinction of species and loss of genetic diversity amongst species. These consequences are irreversible.¹¹³ Thus, while the probability of the event occurring might be negligible, should the event occur, the consequences are anything but negligible. Yet, by classifying a risk as negligible when the consequences are extreme, not only is the focus of regulation again shifted from prevention towards “cure” but the classification can also limit states in their choice of measures. One reason for this is the lack of differentiation within the WTO between risk assessment and risk management.

5.2.5 Risk Assessment and Risk Management

As previously discussed,¹¹⁴ traditionally risk assessment and risk management are regarded as separate processes, the former being a scientific undertaking, while the latter incorporates social and policy considerations.

In *EC – Hormones*, the Appellate Body refused to countenance risk management as a distinct process from risk assessment.¹¹⁵ Primarily, the Appellate Body pointed to the fact that the phrase “risk management” is not used in the SPSA, therefore there was no “textual basis” for recognizing risk management as a separate process from risk assessment.¹¹⁶

The Appellate Body did, however, concede that in implementing quarantine measures states may take into account a broad range of factors

¹¹² GISP Fact Sheet ‘Invasive Alien Species – A Growing Global Threat’ <<http://www.gisp.org/ecology/IAS.asp#environmental>> (March 2006).

¹¹³ P Vitousek, C D’Antonio, L Loope, M Rejmánek and R Westbrooks, ‘Introduced Species: A significant Component of Human-Caused Global Change’ (1997) 21 (1) *New Zealand Journal of Ecology* 1, 9.

¹¹⁴ See introduction to this topic in section 3.3.1 of Chapter 3 of this study.

¹¹⁵ *EC – Hormones*, paragraph 181.

¹¹⁶ *EC – Hormones*, paragraph 181.

drawn from divergent and respected sources.¹¹⁷ The Appellate Body stressed that although many of the criteria involved in risk assessment are science-based:

...to the extent that the Panel purports to exclude from the scope of a risk assessment in the sense of Article 5.1, all matters not susceptible of quantitative analysis by the empirical or experimental laboratory methods commonly associated with the physical sciences, we believe that the Panel is in error.... Furthermore, there is nothing to indicate that the listing of factors that may be taken into account in a risk assessment of Article 5.2 was intended to be a closed list¹¹⁸

In essence, the approach of the Appellate Body means that while non-scientific material can be taken into account, this must be done as part of risk assessment. Yet, the fact that the risk assessment process needs to be underpinned by scientific certainty arguably makes this concession somewhat hollow. The concession does not, for example, permit measures to be based on social or policy value judgments. States themselves have indicated that these values are important.

In *Japan – Apples*, Australia made third-party submissions highlighting the imbalance caused by using scientific certainty as the determinant at both the risk assessment and risk management stages of regulation. Australia submitted that while science might inform as to the risk, the Panel had been wrong to require the choice of measures to be justified by scientific evidence. Australia contended that the approach of the Panel ignored the role of the appropriate level of protection and “undermined the negotiated balance of rights and obligations in the SPSA”.¹¹⁹ Although the submission was not accepted by the Appellate Body there is considerable merit in the arguments made by Australia.

While risk management is not explicitly mentioned in the SPSA, the concept finds expression through a Member's right to set its own level of protection and the implicit connection between the level of protection and the choice of measures by way of risk management. It is risk management,

¹¹⁷ *EC – Hormones*, paragraphs 180-187.

¹¹⁸ *EC – Hormones*, paragraph 187.

¹¹⁹ *Japan – Apples*, paragraph 98.

for example, that makes the ALOP operational.¹²⁰ Perhaps for this reason the Appellate Body's decision in *EC – Hormones* has been criticized. Criticisms range from the impact of the decision on the setting of an ALOP, to the fact that risk management ought to be recognised as a separate process, because it permits social considerations to be taken into account in a way that risk assessment does not, to the fact that risk management is a distinct process within international standard-setting bodies sanctioned by the SPSA.¹²¹

The criticisms relating to the lack of integration of social and policy concerns are exacerbated by the rules against arbitrary trade restrictions under Article 2.3 of the SPSA.¹²² In a dispute relating to whether a state's quarantine measures are arbitrary, scientific data would be need to be presented as part of the evidence in pleadings for or against arbitrariness. For example, in *Australia – Measures Affecting Importation of Salmon (Article 21.5 - Canada)*¹²³ the implementation phase of the *Australia – Salmon* decision, Canada argued that Australia's measures were discriminatory and arbitrary, because, *inter alia* live fish were not subject to as stringent quarantine laws as chilled fish. Canada submitted that "The new policies that Australia announced on 19 July are at odds with sound science and internationally-accepted good practice",¹²⁴ and adduced scientific evidence to substantiate this claim.¹²⁵ This adds a further dimension to the need for sufficient scientific evidence, which has become necessary at all levels of decision-making pursuant to the SPSA.

¹²⁰ Cameron Hutchinson, above n 88, paragraph 6.4.2.

¹²¹ Iain Sandford, *Hormonal Imbalance? Balancing Free Trade and SPS Measures After the Decision in Hormones*. (1999) 29 *Victoria University of Wellington Law Review* 389; Fiona Macmillan, *WTO and the Environment* Sweet and Maxwell London (2001) paragraphs 6.13-6.20.

¹²² See discussion in section 4.3.10 of Chapter 4 of this study.

¹²³ *Australia - Measures Affecting Importation of Salmon (Article 21.5 - Canada)* WT/DS18/RW.

¹²⁴ *Ibid* at paragraph 4.15.

¹²⁵ See *Australia - Measures Affecting Importation of Salmon (Article 21.5 - Canada)*, paragraphs 4.329-4.348 for Panel discussion on the evidence presented by Canada and the competing submissions by Canada and Australia in relation to the evidence.

Finally, whilst the SPSA only uses the term “risk assessment”,¹²⁶ some SPSA processes accord risk management a separate role. For example, both the 1997 IPPC and OIE have adopted codes and standards that distinguish between risk assessment and risk management.¹²⁷ In each case, the basis for choosing measures is their effectiveness in reducing the introduction and spread of either a disease,¹²⁸ or a pest.¹²⁹ The motivation behind the choice is not an issue and as long as the measure is effective the policy choices do not require scientific justification.

In ignoring the differences between risk assessment and risk management, the Appellate Body is interpreting the SPSA literally in accordance with the agreement’s text. The focus is directly on science, which has the tendency to limit the incorporation of social and policy matters into IAS regimes. Measures, for example, may potentially be impossible to justify where they are designed to conserve a component of biodiversity such as a national emblem and there is insufficient scientific evidence of a high calibre to justify trade restraints. The problem, however, lies not so much with science as with the way that science is used.

¹²⁶ IPPC Definitions found in International Standards for Phytosanitary Measures ISPM No 11 Pest Risk Analysis for Quarantine Pests Including Analysis of Environmental Risks and Living Modified Organisms; *Terrestrial Animal Health Code 2007* Article 1.3.1.1 above n 16; *Aquatic Animal Health Code 2007* Article 1.4.1.1 above n 16. The *Aquatic Animal Health Code 2007* also identifies 4 components to risk analysis and treats risk analysis and risk assessment independently.

¹²⁶ SPSA, Article 5 and definitions contained in Annex A, paragraph 4.

¹²⁷ *Terrestrial Animal Health Code 2007*, above n 16, Article 1.3.2.5; see also definition of pest risk management ISPM (International Standards for Phytosanitary Measures) No 5 Glossary of Phytosanitary Terms 2006. Produced by the Secretariat of the International Plant Protection Convention FAO Rome (2006). Paragraph 3.4 International Standards for Phytosanitary Measures ISPM No 11 Pest Risk Analysis for Quarantine Pests Including Analysis of Environmental Risks and Living Modified Organisms.

¹²⁸ *Terrestrial Animal Health Code 2007*, above n 16, Article 1.3.2.5.

¹²⁹ International Standards for Phytosanitary Measures ISPM No 11 Pest Risk Analysis for Quarantine Pests Including Analysis of Environmental Risks and Living Modified Organisms (2004) paragraph 3.4.

5.3 THE FOCUS ON SCIENCE

The fact that both risk assessment and risk management are based on science is an indication of the importance of science in the SPSA. Science, of course, *is* important to quarantine regulation;¹³⁰ and basing measures on science is vital to ensuring efficacy and transparency of quarantine measures.

However, science may not be the only discipline relevant to the design and implementation of quarantine measures. One of the problems with a single science-based approach is the assumption that science will lead to a better balance being struck between trade obligations and members' other rights and obligations. Moreover, this presumption also seems to take it for granted that the balance is unassailable, because basing measures on science is the most objective and transparent method of achieving balance.¹³¹ Furthermore, and as a corollary, using science in this way also demonstrates an optimistic expectation that science can provide answers at every stage of determination of quarantine measures.

However, an exclusively science-based approach ignores policy and social concerns, without an adequate explanation why this should be the case. National environmental policies, for example, may be guided by morals, principles and ethics in a way that is not captured solely by reliance on science.¹³² Moreover, democratic ideals may call for recognition of the electoral voice, even where this does not accord with hard science.¹³³ An

¹³⁰ See, for example, discussion in J R Fisher, 'Origins of Animal Quarantine in Australia' (2000) 78 *Australian Veterinary Journal* 478, on some of the difficulties that regulators faced in the implementation of quarantine measures where those with vested interests, such as the Acclimatization Societies argued against the scientific evidence of the harm that alien species could cause.

¹³¹ Aynsley Kellow, Marcus Haward and Kristy Welch, 'Salmon and Fruit Salad: Australia's Response to World Trade Organisation Quarantine Disputes' (2005) 40 *Australian Journal of Political Science* 17, 30.

¹³² Marc Miller, 'Does the WTO Substantially Limit the Ability of Countries to Regulate Harmful Non-Indigenous Species?' (2003) 17 *Emory International Law Review* 100, 116-117.

¹³³ Theofanis Christoforou, 'Settlement of Science-Based Trade Disputes in the WTO: A Critical Review of the Developing Case Law in the Face of Scientific Uncertainty' (2000) 8 *New York University Environmental Law Journal* 622, 622-3.

explanation often proffered is that science is objective, whereas policy may not be.¹³⁴

Yet, basing measures on science is not necessarily a wholly objective exercise. Subjective elements can characterize a science-based approach and can influence the result. For example, the outcome may be distorted by the terms of reference in which the information is requested, how it is perceived by the scientist and whether the scientist has a personal bias.¹³⁵ One commentator has pointed out that, when an assessor is faced with the unknown, guidelines assisting assessors, called “science policies”, come into operation.¹³⁶ These are not necessarily grounded in science, because, while they might appear scientific, they are nevertheless based on “a number of plausible accounts”, any of which might apply. Where science itself cannot predict the outcome,¹³⁷ the accuracy of the prediction may hinge on the science policy at play.

Hence, science policies, that themselves are not “pure” science, represent a fundamental link between uncertainty and science and, as such, are a central component of any risk assessment. However, the heavy dependency on scientific information often fails to acknowledge the limitations of science. The interpretation of “sufficiency” in Article 5.7 of the SPSA, provides an example where plentiful, but inconclusive, evidence is expected to form the basis of a risk assessment.

This leads to an apparent expectation, not just that science alone *can* provide an answer, but that it *will*. Not only does it put states in a position

¹³⁴ D Robertson, *Incorporating Risk Assessments into Trade Policy* Fact Sheet issued by Cairns Group Farm Leaders (2004) <<http://www.cairnsgroupfarmers.org/ni/reportspapers/risk.htm>> (March 2006); D Roberts Preliminary Assessment of the Effects of the TO Agreement on Sanitary and Phytosanitary Trade Regulations’ above n 59, 378.

¹³⁵ Marc Miller, above n 132, 116-117; see also Mike Nunn, above n 54; Vern Walker, ‘The Myth of Science as a ‘Neutral Arbiter’ for Triggering Precautions’ (2003) 26 *Boston College International and Comparative Law Review* 197; Jeffery Atik and David A Wirth, ‘Science and International Trade – Third Generation Scholarship’ (2003) 26 *Boston College International and Comparative Law Review* 171.

¹³⁶ Vern R Walker, above n 135, 214; see also Cameron Hutchinson, above n 88, paragraph 5.1.

¹³⁷ Vern R Walker, above n 135, 214-217.

of conducting a risk assessment based on incomplete, or inconclusive material, but it also creates an expectation that even with inconclusive evidence a risk assessment will be able “to predict outcomes”.¹³⁸ Consequently, the focus centres on how to reach a decision¹³⁹ while not adequately taking into account the fact that the evidence may be so incomplete, or inconclusive that a decision cannot be reached, at least not with any degree of certainty. The difficulty from the point of view of regulating IAS is that if the emphasis is placed on ways of permitting species entry, then a risk assessment conducted under the SPSA may not effectively take into account whether or not those species are likely to become invasive.

In the *EC – Hormones* (Panel) decision,¹⁴⁰ for example, the Panel perused two reports that the EC had commissioned during the progression of the dispute in the 1980s. These were the 1982 and 1987 Lamming Reports,¹⁴¹ which had indicated that, while the incidence of cancer from hormone use might be low, this was dependent upon the exercise of “good agricultural/animal husbandry practice”.¹⁴² The EC had argued that it was not possible to police whether good practices had been followed and, consequently, these assessments did not take into consideration the potential for misuse of the hormone by those administering it to the animals.¹⁴³ On appeal, the Appellate Body indicated that it would have been possible to undertake a risk assessment on this point and, further, that the EC should have done this.¹⁴⁴ However, the difficulty in applying a “pure” scientific approach in this situation lies in the difficulty science

¹³⁸ Jaye Ellis and Alison FitzGerald ‘The Precautionary Principle in International Law: Lessons from Fuller’s Internal Morality’ (2004) 49 *McGill Law Journal* 779, 783.

¹³⁹ *Ibid.*

¹⁴⁰ *EC Measures Concerning Meat and Meat Products (Hormones) Complaint by Canada* WTO Doc WT/DS48/R/CAN (Report of the Panel 1997) paragraphs 9.94-8.100; *EC Measures Concerning Meat and Meat Products (Hormones) Complaint by the United States* WTO Doc WT/DS26/R/USA (Report of the Panel 1997) paragraphs 8.91-8.97.

¹⁴¹ *EC – Hormones* (Panel), paragraphs IV 128-IV137.

¹⁴² *EC – Hormones* (Panel), paragraph IV 129.

¹⁴³ See discussion: Steve Charnovitz, ‘The Supervision of Health and Biosafety Regulation by World Trade Rules’ above n 59.

¹⁴⁴ *EC – Hormones*, paragraphs 187 and 206-209.

would have in predicting the extent of matters, such as potential misuse.¹⁴⁵ At least one study carried out in this field indicates that “quantitative assessments [of potential misuse] could vary by as much as eight orders of magnitude”.¹⁴⁶

Ironically, the dependency upon “conclusive” science may actually undermine a state’s ability to use quarantine for environmental protection purposes. Where science is not sufficiently conclusive to demonstrate a clear link between alien species and an environmental threat, measures restricting international trade will potentially be unjustifiable. States may be disinclined to implement measures for environmental protection purposes in all but the most certain circumstances.¹⁴⁷

5.4 CHILLING EFFECT OF TRADE LAW ON QUARANTINE MEASURES

The problems discussed thus far demonstrate an overall trend towards gaps and inconsistencies in knowledge being decided in favour of the continuation of international trade. This phenomenon has the effect of steering regulation away from prevention and may in reality be part of what has been described as the “chilling effect” of the WTO.¹⁴⁸ Essentially, this effect is characterized by “self-censoring”¹⁴⁹ of trade restraints,¹⁵⁰ where these restraints are vulnerable to a WTO challenge. Although the literature on this point originates from the perspective of the negotiation of multilateral environmental agreements in international law,

¹⁴⁵ Vern R Walker, above n 135, 206-7.

¹⁴⁶ Mike Nunn, above n 54.

¹⁴⁷ Issues relating to uncertainty and the role of the precautionary principle in the management of IAS are discussed in section 6.2.3 of Chapter 6 of this study.

¹⁴⁸ Robyn Eckersley, ‘The Big Chill: The WTO and Multilateral Environmental Agreements’ (2004) 4 (2) *Global Environmental Politics* 24.

¹⁴⁹ *Ibid*, 26.

¹⁵⁰ See also, K Conca, ‘The World Trade and the Undermining of Global Environmental Governance’ (2000) 7 *Review of International Political Economy* 484.

anecdotal evidence is surfacing of similar developments in the design of quarantine measures at the domestic level.¹⁵¹

Investigations conducted by a Senate Committee of the Parliament of Australia into two Import Risk Analyses (IRAs)¹⁵² undertaken by Biosecurity Australia illustrate this point. The first relates to an IRA carried out for the importation of bananas from the Philippines;¹⁵³ the second, to an IRA for importation of apples from New Zealand.¹⁵⁴

¹⁵¹ See general discussion F Campbell 'The Science of Risk Assessment for Phytosanitary Regulation and the Impact of Changing Trade Regulations' (2001) 51 *Bioscience* 148, 153.

¹⁵² Senate Standing Committee on Rural and Regional Affairs and Transport, Parliament of Australia, *Administration of Biosecurity Australia – Revised Draft Import Risk Analysis for Bananas from the Philippines* 2005, above n 102; Senate Standing Committee on Rural and Regional Affairs and Transport, Parliament of Australia, *Administration of the Department of Agriculture, Fisheries and Forestry, Biosecurity Australia and AQIS in relation to the final import risk analysis report for apples from New Zealand* 2007, Commonwealth of Australia, Senate Printing Unit, Department of the Senate, parliament House, Canberra (2007).

¹⁵³ Australia received a request from the Philippine government to export bananas in 2000. See AQIS Quarantine Policy Memorandum (PQPM) number 2000/01 of 13 March 2000, referred to in AQIS Quarantine Policy Memorandum (PQPM) number 2000/10 of 28 June 2000. Available from <http://www.daff.gov.au/_data/assets/file/0016/22903/2000-10.rtf> (April 2007). To date, Biosecurity Australia has undertaken three draft Import Risk Analyses following this request: Biosecurity Australia, *Importation of Fresh Bananas from the Philippines Draft IRA Report June 2002* above n 73; Biosecurity Australia, *Importation of Fresh Bananas from the Philippines Draft IRA Report February 2004* above n 73; Biosecurity Australia, *Revised Draft Import Analysis Report for the Importation of Cavendish Bananas from the Philippines* Part B Biosecurity Australia 2007. (Released in parts A, B and C) above n 67. The second and third of these reports have been subject to inquiry by the Senate Rural and Regional Affairs and Transport Committee. The Senate Rural and Regional Affairs and Transport Legislation Committee is an investigative committee established by the Parliament of Australia to investigate rural affairs and transport including 'the performance of departments and agencies allocated to them'. The operation of AQIS and Biosecurity Australia are part of the rural and regional affairs portfolio that incorporates DAFFA. <http://www.aph.gov.au/Senate/committee/rrat_ctte/ctte_info/index.htm> (April 2007).

¹⁵⁴ The IRAs, with respect to the importation of apples from New Zealand, were undertaken following a request by New Zealand in 1998 for market access to sell New Zealand apples in Australia. See AQIS Notification to Stakeholders on Import Risk Analysis - Apples From New Zealand Communication number 1999/237. <http://www.daff.gov.au/_data/assets/word_doc/0006/20301/1999-237.doc> (April 2007). The request resulted in the release of three draft IRAs. The first draft IRA, the *Importation of Apples from New Zealand* was issued in 2004 in three parts, A, B and C. Biosecurity Australia, *Importation of Apples from New Zealand Revised Draft IRA Report Part A* Biosecurity Australia Canberra (2004); Biosecurity Australia, *Importation of Apples from New Zealand Revised Draft IRA Report Part B* Biosecurity Australia Canberra (2004); Biosecurity Australia, *Importation of Apples from New Zealand Revised Draft IRA Report Part C* Biosecurity Australia Canberra (2004). Available from DAFF, documents 2004/03a-2005/03c <<http://www.daff.gov.au/ba/ira/final-plant/apples-nz>> (April 2007). The second draft IRA, the *Revised Draft Import Risk Analysis Report for Apples from New Zealand*, was issued in December 2005 in three parts, A, B and C.

During the course of the first inquiry, *Administration of Biosecurity Australia – Revised draft import risk analysis for bananas from the Philippines*, (*Bananas from the Philippines*) it became apparent that industry stakeholders, such as the Australian Banana Growers Council¹⁵⁵ and the Department of Primary Industries and Fisheries, Queensland,¹⁵⁶ perceived that the IRA process had come under pressure to deliver an outcome as least restrictive of trade as possible.¹⁵⁷ In particular, evidence from a consulting horticulturalist was that:

...at the beginning of every stakeholder meeting in Australia, Australia's trade position and WTO obligations were stressed at length.¹⁵⁸

This statement, of course, does not necessarily indicate that the threat of a WTO challenge was in reality exerting a chilling effect on the risk assessment process. It is entirely possible that Biosecurity Australia was merely exercising caution in its approach to risk assessment. The Senate

Biosecurity Australia, *Draft Import Risk Analysis Report for Apples from New Zealand Part A* Biosecurity Australia Canberra (2005); Biosecurity Australia, *Draft Import Risk Analysis Report for Apples from New Zealand Part B* Biosecurity Australia Canberra (2005); Biosecurity Australia, *Draft Import Risk Analysis Report for Apples from New Zealand Part C* Biosecurity Australia Canberra 2005. Available from DAFF, documents 2005/20a-2005/20c <<http://www.daff.gov.au/ba/ira/final-plant/apples-nz>> (April 2007). The third IRA, the *Final Import Risk Analysis Report for Apples from New Zealand*, was released in November 2006 in three parts A B and C. Biosecurity Australia, *Final Import Risk Analysis Report for Apples from New Zealand Part A* Biosecurity Australia Canberra (2006); Biosecurity Australia, *Final Import Risk Analysis Report for Apples from New Zealand Part B* Biosecurity Australia Canberra (2006); Biosecurity Australia, *Final Import Risk Analysis Report for Apples from New Zealand Part C* Biosecurity Australia Canberra (2006). Available from DAFF, documents 2006/37a-2006/37c <<http://www.daff.gov.au/ba/ira/final-plant/apples-nz>> (April 2007). The second and third of these reports have been subject to a senate inquiry. See Senate Standing Committee on Rural and Regional Affairs and Transport, Parliament of Australia, *Administration of Biosecurity Australia – Revised Draft Import Risk Analysis for Apples from New Zealand*, above n 56; Senate Standing Committee on Rural and Regional Affairs and Transport, Parliament of Australia, *Administration of the Department of Agriculture, Fisheries and Forestry, Biosecurity Australia and AQIS in relation to the final import risk analysis report for apples from New Zealand* 2007, above n 152.

¹⁵⁵ The Australian Banana Growers Council is an industry body that represents approximately 1200 banana growers in Australia. <<http://www.abgc.org.au/pages/home.asp>> (April 2007).

¹⁵⁶ The Department of Primary Industries and Fisheries is a government department that assists the Queensland rural and fisheries sectors 'to increase productivity, sustainability, market growth and adaptability.' <http://www.dpi.qld.gov.au/cps/rde/xchg/dpi/hs.xsl/home_ENA_HTML.htm> (April 2007).

¹⁵⁷ Senate Standing Committee on Rural and Regional Affairs and Transport, Parliament of Australia, *Administration of Biosecurity Australia – Revised Draft Import Risk Analysis for Bananas from the Philippines* 2005, above n 102 at paragraphs 4.1-4.18.

¹⁵⁸ Ibid, paragraph 4.2 – the evidence of Mr Peasley.

Committee was ultimately unable to reach a determination on this point, because of lack of accuracy in the minutes of meetings maintained by Biosecurity Australia.¹⁵⁹ A real problem however is the perception of bias of the risk assessment process among stakeholders and the accompanying lack of political credibility that the process can engender.

The second inquiry, *Administration of Biosecurity Australia – Revised draft import risk analysis for apples from New Zealand (Apples from New Zealand)*,¹⁶⁰ also heard evidence of similar allegations of WTO bias. Stakeholders were concerned that Biosecurity Australia had not given adequate regard to the potential of New Zealand consignments to introduce fire blight. Their concerns stemmed from attempts by New Zealand to argue that the decision in *Japan-Apples* stood for the proposition that mature symptomless apples could not be regarded as a vector for the introduction of fire blight.¹⁶¹

Biosecurity Australia had countered this submission by pointing to the fact that the *Japan-Apples* decision was qualified by the requirement that each case had to be decided on its own facts.¹⁶² This meant that if scientific evidence could be adduced that mature symptomless apples could act as a vector for introducing fire blight, quarantine measures managing that risk would be upheld. Yet, despite this assurance, industry stakeholders remained unconvinced. They were especially concerned that WTO case law was exerting a dampening effect on risk assessments undertaken by Biosecurity Australia.¹⁶³ In particular, the Australian Apple

¹⁵⁹ Senate Standing Committee on Rural and Regional Affairs and Transport, Parliament of Australia, *Administration of Biosecurity Australia – Revised Draft Import Risk Analysis for Bananas from the Philippines* 2005, above n 102 at paragraphs 4.10-4.18.

¹⁶⁰ Senate Rural and Regional Affairs and Transport Legislation Committee *Administration of Biosecurity Australia – Revised draft import risk analysis for apples from New Zealand* above n 56.

¹⁶¹ Senate Standing Committee on Rural and Regional Affairs and Transport, Parliament of Australia, *Administration of Biosecurity Australia – Revised Draft Import Risk Analysis for Apples from New Zealand*, 2005, above n 56 paragraph 2.18; see general discussion Caroline E Foster 'Japan – Measures Affecting the Importation of Apples: Rotten to the Core?' (2006) 25 *Australian Year Book of International Law* 309.

¹⁶² Senate Standing Committee on Rural and Regional Affairs and Transport, Parliament of Australia, *Administration of Biosecurity Australia – Revised Draft Import Risk Analysis for Apples from New Zealand*, 2005, above n 56 at paragraphs 2.20-2.21.

¹⁶³ *Ibid*, paragraphs 2.182.24-2.30.

and Pear Industry Fireblight Taskforce¹⁶⁴ submitted that the *Japan-Apples* decision had made the second draft IRA less trade-restrictive than the first:

There is no doubt that Biosecurity have a high level of concern in relation to a W.T.O. challenge by New Zealand. From our observation this is a common occurrence in all I.R.A.'s undertaken by Biosecurity Australia.....There is a very real danger that protecting Australia from any potential W.T.O. challenge will result in taking the "easy or safe options" when faced with issues that are reliant on opinions to resolve¹⁶⁵

There is no doubt that what is the least trade restrictive is what influences Biosecurity's thinking. There is no doubt that everything they do is based on what the WTO would think about it, and I think it would be equally true to say that there is a free trade culture within Biosecurity and [DAFFA] that pushes the lead on these issues.¹⁶⁶

While these comments could readily be seen as bias on the part of industry and growers aimed at protecting their product sectors, their comments and perceptions were not dismissed out of hand by the Senate Committee. The committee, however, did accept the reassurances of Biosecurity Australia that the risk assessment process had balanced Australia's concerns with respect to pests and diseases against obligations under the WTO.¹⁶⁷

Nevertheless, it is clear that an industry perception exists that the prospect of a WTO challenge is influencing Biosecurity Australia. If this is in fact the case, the cause lies not so much with Biosecurity Australia, as with the way states have negotiated the SPSA. Biosecurity Australia may merely be responding in a risk-averse way to the likelihood of a WTO challenge. The real difficulty is that the type of response that will avert a WTO challenge may often be the very response that softens quarantine restrictions to permit trade and thus potentially allows invasive alien

¹⁶⁴ The Australian Apple and Pear Industry Fireblight Taskforce is comprised of members from each State in Australia that produces apples and pears. The members have technical expertise in all aspects of the apple and pear product sectors. See Australian Apple and Pear Industry Fireblight Taskforce *Submission to the Senate Rural and Regional Affairs and Transport Legislation Committee Importation of Apples from New Zealand* at 5 Australian Apple and Pear Industry Fireblight Taskforce 2005 <http://www.aph.gov.au/Senate/committee/rrat_ctte/apples04/submissions/sub14.doc> (April 2007).

¹⁶⁵ Senate Standing Committee on Rural and Regional Affairs and Transport, Parliament of Australia, *Administration of Biosecurity Australia – Revised Draft Import Risk Analysis for Apples from New Zealand*, above n 56 at paragraph 2.25.

¹⁶⁶ *Ibid*, paragraph 2.27.

¹⁶⁷ *Ibid*, paragraph 2.29.

species to gain entry. In this way, the chilling effect of the SPSA is yet another means by which quarantine regulation is moving away from prevention.

5.5 CONCLUSION

The problem of finding balance between quarantine and trade is one that states have grappled with from the inception of the early trade treaties and the earliest quarantine treaties. The multi-faceted nature of the relationship between quarantine and trade means that although quarantine restricts trade, it is also necessary for stopping the introduction and spread of pests and diseases introduced by way of international trade. Therefore, states need to maintain both quarantine and trade regimes, but in a way that balances one against the other.

States have developed two primary means of balancing quarantine restrictions against the freedom to trade. The first is a discrimination-based approach that evolved from early quarantine treaties and treaties of trade and commerce. It is, in fact, the approach that underpins quarantine regulation under GATT. The second approach is that which is fostered by the SPSA. This overlays discrimination-based principles with requirements for scientific certainty. The problem with the latter is that may not provide states with sufficient flexibility to deal with uncertainties and gaps in information. This is particularly important to the regulation of IAS where there are often large gaps and uncertainties with respect to knowledge of alien species and their invasive potential.

Although the use of science might be seen as an objective and transparent means of designing quarantine regulation, science, as such, may not necessarily provide all the answers; or ensure that measures are adequate or appropriate; or, admit social and policy concerns that are important to

states. Moreover, the measures themselves may often be the result of political compromises over science.¹⁶⁸

The introduction of a science-based approach has also coincided with the translocation of the quarantine-trade balance into the trade arena, cementing the use of science as a means of limiting quarantine restrictions on international trade. Under the processes of the SPSA, cases of doubt are decided in favour of the continuation of trade. This is perhaps not surprising, for the SPSA is a trade treaty and it is to be anticipated that primacy is given to the free flow of international trade. Yet, where quarantine is reduced to a level where it remains operative, but perhaps not at an optimum, the regime may evolve into a way of dealing with harm rather than evaluating risk to prevent harm. In reality, the reliance on science, the chilling effect of the WTO and the overall push away from prevention, can all limit the implementation of effective quarantine regimes. Moreover, as quarantine regulation is important to environmental protection, deficiencies in quarantine will also have environmental consequences. The effects of these limitations on the protection of biodiversity are discussed in the next Chapter.

¹⁶⁸ David A Wirth 'The Role of Science in the Uruguay Round and NAFTA Trade Disciplines' (1994) 27 *Cornell International Law Journal* 817; F Campbell, above n 151; Vern Walker, above n 135; Jeffery Atik and David A Wirth 'Science and International Trade – Third Generation Scholarship' above n 135.

CHAPTER 6

QUARANTINE AND THE EVALUATION OF INVASIVE ALIEN SPECIES: THE DIVIDE BETWEEN INTERNATIONAL ENVIRONMENTAL LAW AND INTERNATIONAL TRADE LAW

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CHAPTER 6

QUARANTINE AND THE EVALUATION OF INVASIVE ALIEN SPECIES: THE DIVIDE BETWEEN INTERNATIONAL ENVIRONMENTAL LAW AND INTERNATIONAL TRADE LAW

6.0 INTRODUCTION

This Chapter compares and contrasts the evaluation process for invasive alien species in international environmental law and international trade law to ascertain whether quarantine regulation is effective in protecting biodiversity from invasive alien species (IAS). The use of quarantine, by way of border controls, is a crucial regulatory response to the problem of IAS; and is a key concept within the Guiding Principles for the Prevention, Introduction and Mitigation of Impacts of Alien Species that Threaten Ecosystems, Habitats or Species (CBD Guiding Principles).¹ However, the design and implementation of quarantine regulation is also subject to limitations, notably those imposed by international trade law, particularly the provisions of the Agreement on the Application of Sanitary and Phytosanitary Measures (SPSA).

The objective of this Chapter is to examine whether states are able to incorporate biodiversity-related issues into the evaluation of species for their invasive potential without breaching their obligations under the WTO.

At the core of the Chapter lies a comparison of the impact on quarantine regulation of the provisions of the CBD Guiding Principles and the SPSA. Although the CBD Guiding Principles are not binding, they have been chosen for discussion as they represent the most comprehensive approach

¹ CBD, 'Guiding Principles for the Prevention, Introduction and Mitigation of Impacts of Alien Species that Threaten Ecosystems, Habitats or Species', Guiding Principle 7.

currently available for the protection of biodiversity from IAS. The SPSA has been selected because it embodies states' obligations with respect to trade and IAS. The discussion commences with a comparison of the different mechanisms by which species and pathways are evaluated by states for their potential to introduce IAS. Mechanisms include environmental impact assessment (EIA), risk analysis and risk assessment.

The discussion then moves to a consideration of specific elements of the evaluation process such as, allocation of the burden of proof, quantification of biodiversity in economic terms, incorporation of the precautionary principle and ecosystem approach and finally, a consideration of transboundary and extraterritorial issues. The conclusion is reached that the manner in which these elements are incorporated into the evaluation process for IAS means that the protection of biodiversity plays a secondary role to the protection of the free flow of trade.

6.1 EVALUATIONS OF IAS AND BIODIVERSITY

6.1.1 CBD Guiding Principles, Cartagena Protocol and the SPSA

The CBD Guiding Principles is the most comprehensive international instrument that provides guidance on preventing the entry, establishment and spread of alien species that threaten biodiversity. Other international regimes and instruments that potentially also deal with the protection of biodiversity include the Cartagena Protocol on Biosafety to the Convention on Biological Diversity (Cartagena Protocol)²; standards developed under the auspices of the 1997 International Plant Protection Convention (IPPC)³ and 1924 International Agreement for the Creation at

² 2000 *Cartagena Protocol on Biosafety to the Convention on Biological Diversity* (Cartagena Protocol), adopted 29 January 2001, 39 ILM 1027 Articles 15 and 16 (entered into force 11 September 2003). As at November 2007, 143 instruments of ratification, or accession, have been deposited with the UN Secretary-General.

³ *International Plant Protection Convention 1997* is the second revised text of the *International Plant Protection Convention 1951* (as revised 28 November 1979), adopted 17 November 1997, [2005] ATS No 23 (entered into force 2 October 2005). As of November 2007, the *International Plant Protection Convention 1997* (IPPC) had 166 parties. The first revised text of the *1951 International Plant Protection Convention* is

Paris of an International Office for Dealing with Contagious Diseases of Animals, and Annex (OIE);⁴ and the articles of the SPSA. A selection of provisions from these instruments that relate to the evaluation process for alien species is set out below in Table 11.

Items 1 through to 6 deal generally with evaluation processes. As we see from Item 1 of Table 11 the CBD Guiding Principles recommend the use of environmental impact assessment within a risk analysis framework;⁵ the Cartagena Protocol⁶ and international standards set by the 1997 IPPC and the OIE make use of risk analysis;⁷ while the provisions of the SPSA adopt one aspect of risk analysis, that of risk assessment.

6.1.2 EIA, Risk Analysis and Risk Assessment

EIA is described in the 1992 Convention on Biological Diversity (CBD)⁸ as a process “of evaluating the likely environmental impacts of a proposed project or development, taking into account inter-related socio-economic cultural and human-health impacts, both beneficial and adverse”.⁹ Read in

the 1979 International Plant Protection Convention, adopted 28 November 1979. [1991] ATS No 50, (entered into force 4 April 1991. As at November 2007 73 governments had adhered to the convention. The initial *International Plant Protection Convention 1951* adopted on 6 December 1951, [1952] ATS No 5 (entered into force 3 April 1952). As at November 2007 127 governments had adhered to this convention.

⁴ *International Agreement for the Creation at Paris of an International Office for Dealing with Contagious Diseases of Animals, and Annex 1924*, adopted 25 January 1924 [1925] ATS No 15, (entered into force 12 January 1925). The organization is known as the OIE and as at November 2007 had 173 members..

⁵ For a discussion of the operation of EIA see generally Peter Wathern, ‘An Introductory Guide to EIA’ in Peter Wathern (ed), *Environmental Impact Assessment Theory and Practice* Unwin Hyman London (1988) 3.

⁶ Cartagena Protocol, Articles 15 and 16.

⁷ See generally V Covello, and J Mumpower, ‘Risk Analysis and Risk Management: An Historical Perspective’ (1985) 5 *Risk Analysis* 103.

⁸ *Convention on Biological Diversity 1992*, adopted 5 June 1992, [1993] ATS no 32. (entered into force 29 December 1993). The convention had 190 Parties as of November 2007. In addition the World Summit on Sustainable Development (WSSD), held in 2002, made a number of recommendations with respect to sustainable development and achievement of the objectives of Agenda 21. See United Nations Report of the World Summit on Sustainable Development 2002, UN Doc A/CONF.199/20 (2002).

⁹ Convention on Biological Diversity, Conference of the Parties Decision VIII/28 on ‘Impact Assessment: voluntary Guidelines on Biodiversity-inclusive Impact Assessment’ UNEP/CBD/COP/8/31 (26 June 2006) paragraph 5. See also the International Association for Impact Assessment (IAIA) Principles of Environmental Impact Assessment: Best Practice. Part 2.1 Definition of EIA. Available at <www.iaia.org> (March 2007). The International Association for Impact Assessment (IAIA) is an international association that provides a forum for the development of best practice in the

TABLE 11
A Comparison of Evaluation Systems Under the CBD Guiding Principles, the Cartagena Protocol and the SPSA

Item	CBD GUIDING PRINCIPLES	CARTAGENA PROTOCOL	SPSA (Including IPPC and OIE Standards)
1.Evaluation Process	EIA within risk analysis Framework. ¹⁰	Risk analysis includes elements of risk assessment and risk management. ¹¹	International Standards (based on risk analysis), or otherwise states carry out their own risk Assessment. ¹²
2. General Basis of Decisions	No net loss of biodiversity. ¹³	Introductions should be based on a risk assessment that is itself based on science and takes into account “relevant international organizations”. ¹⁴	Decisions should be based on scientific certainty, be as least trade- restrictive as possible, and not be discriminatory nor disguised restrictions on international trade. ¹⁵ Cost benefit analysis. ¹⁶ Can be based on, or conform to, international standards determined by IPPC and OIE. ¹⁷
3. Deliberate Introductions	Would the introduction of the species lead to serious damage or, total loss of an ecosystem? ¹⁸ Would the introduction of the species cause a direct or indirect loss of a	Determining the risks posed by modified organisms and considering them in the light of risks posed by the non-modified recipients in the proposed environment. ²¹ Identification of novel	Determined by phytosanitary standards set by IPPC for plants. OIE standards have not yet determined standards for species that are invasive, as opposed to species that might

field of impact assessment. It seeks to combine sound science with public participation and thereby provide a basis for sustainable development. In addition, the 1991 *Convention on Environmental Impact Assessment in a Transboundary Context*, adopted 25 February 1991, [1989] *United Nations Treaty Series* 310, Annex 1 provides a definition of EIA (entered into force on 10 September 1997). As at November 2007 the Convention had 45 parties.

¹⁰ CBD Guiding principles, Principles 10 and 11 and definitions in footnote (57) paragraph (vii) that defines risk analysis.

¹¹ Cartagena Protocol, Articles 15 and 16.

¹² See for example, ISPM No. 11 (2004) Pest risk analysis for quarantine pests, including analysis of environmental risks and living modified organisms. Secretariat of the International Plant Protection Convention FAO 2006; *Terrestrial Animal Health Code* 2007 16th Edition OIE Paris (2007) Section 1.5 ‘Risk Analysis for Biologicals for Veterinary Use’; SPSA Articles 2.2 and 5.

¹³ Convention on Biological Diversity, Conference of the Parties, Decision VIII/28 on ‘Impact Assessment: voluntary Guidelines on Biodiversity-inclusive Impact Assessment’, UNEP/CBD/COP/8/3 (15 June 2006) paragraph 25.

¹⁴ Cartagena Protocol, Annex III Risk Assessment paragraph 3.

¹⁵ SPSA, Articles 2.3, 3.1 and 5.5.

¹⁶ SPSA, Article 5.2.

¹⁷ SPSA, Articles 2.2 and 2.3.

¹⁸ Convention on Biological Diversity, Conference of the Parties, Decision VIII/28 on ‘Impact Assessment: Voluntary Guidelines on Biodiversity-inclusive Impact Assessment’, UNEP/CBD/COP/8/3 (15 June 2006).

¹⁹ Convention on Biological Diversity, Conference of the Parties, Decision VIII/28 on Impact ‘Impact Assessment: voluntary Guidelines on Biodiversity-inclusive Impact Assessment’, UNEP/CBD/COP/8/3 (15 June 2006) Table 1.

²⁰ Ibid.

	<p>population of a species?¹⁹</p> <p>Would the introduction result in the extinction of a population of a localized endemic species of scientific, ecological or cultural value?²⁰</p>	<p>characteristics that may make the modified organism have adverse effects on biodiversity and human health.²²</p> <p>Evaluation of the likelihood of the adverse effects being realized.²³</p> <p>Evaluation of the consequences.²⁴</p> <p>Evaluation of the overall risk posed by modified organism based on evaluation of the previous two points.²⁵</p> <p>Recommendation whether or not risk is acceptable or manageable²⁶</p>	<p>be diseased.</p> <p>States may conduct their own risk assessment or rely on assessment carried out by other state or organization. The risk assessment must be supported by scientific evidence.</p>
4. Unintentional Introductions	<p>Pathways of introductions need to be identified and provisions set in place to minimize accidental introductions.²⁷</p>	<p>The parties are to take measures to prevent unintentional transboundary movements of living modified organisms that include undertaking a risk assessment prior to the first release of a living modified organism.²⁸</p>	<p>Process of risk analysis, as applied in cases such as <i>Australia Salmon</i> and <i>EC Hormones</i>, makes it difficult to use risk analysis for pathways to detect unintentional introductions.</p>
5. Basis of regulations	<p>Decisions should be made on a long-term basis and include environmental, economic and social issues.²⁹</p>	<p>Based on risk management.</p> <p>Measures should be imposed to the extent necessary to prevent adverse effects on the conservation and sustainable use of biological diversity, while also taking also into account risks to human health within the territory of the Party of import.³⁰</p> <p>In reaching their decisions, parties may take into account, consistent with their international obligations, socio-economic considerations, especially with regard to the value of biological diversity to indigenous and local communities.³¹</p>	<p>Based on risk assessment.</p> <p>Based on risk assessment and principles of scientific certainty.</p> <p>Linked to article 3.3 of SPSA that provide measures as least trade restrictive as possible, not be discriminatory nor disguised restrictions on international trade.</p>

²¹ Cartagena Protocol, Annex III Risk Assessment paragraph 5.

²² Cartagena Protocol, Annex III Risk Assessment paragraph 8(a).

²³ Cartagena Protocol, Annex III Risk Assessment paragraph 8(b).

²⁴ Cartagena Protocol, Annex III Risk Assessment paragraph 8(c).

²⁵ Cartagena Protocol, Annex III Risk Assessment paragraph 8(d).

²⁶ Cartagena Protocol, Annex III Risk Assessment paragraph 8(e).

²⁷ CBD Guiding Principles, Principle 11.

²⁸ Cartagena Protocol, Article 16(3).

²⁹ CBD Guiding principles, Principle 2 and definitions in footnote (57) paragraph (vii) that defines risk analysis; See also IUCN Guidelines paragraph 5.3.7; paragraph 2 of the Guidelines point out that the guidelines are not designed to address issues of the economics, human health and cultural impacts created by IAS.

³⁰ Cartagena Protocol, Article 16.

³¹ Cartagena Protocol, Article 26.; see also CBD Guiding Principles, definitions in footnote (57) paragraph (vii) that defines risk management to include socio-economic and cultural considerations.

6.Risk Management	Recognized as separate mechanisms. ³²	Articles 15 and 16 recognize risk assessment and risk management as separate mechanisms.	Not recognized as a mechanism separate from risk assessment.
7.Burden of Proof	The importer should bear the burden of proof. ³³	The importer shall ensure that risk assessments are carried out, but it may require the exporter to carry out the risk assessment. ³⁴	The complaining party needs to prove initial inconstancy with WTO documents, after which the burden transfers to defending party to refute allegations. Defending party needs to prepare risk assessment.
8. Precautionary Principle	Decisions should be made in accordance with principle 15 of the 1992 Rio Declaration on Environment and Development. ³⁵	Lack of scientific knowledge, or scientific consensus, should not necessarily be interpreted as indicating a particular level of risk, absence of risk, or an acceptable risk. ³⁶	Not recognized in the sense that it is understood in the environmental sector. Finds reflection in article 5.7 of the SPSA.
9. Ecosystem Approach³⁷	To be undertaken in accordance with decision V/6 of the Conference of the Parties. Ecosystem Approach (CBD).	Not specifically referred to but Article 17 refers to unintentional transboundary movement of species, and Article 26 refers to Socio-economic considerations.	No specifically mentioned – depends on scope of “SPS measure” and whether Ecosystem Approach (CBD) can be validly considered as part of risk assessment.
10. Transboundary Issues	States should recognize the risks they pose to other states as a potential source of IAS. ³⁸	Advanced informed procedure on transboundary movement of living modified organisms.	An unresolved issue depending on the meaning of an “SPS Measure” and the relationship of GATT to the SPSA.

conjunction with the objectives of the CBD, the concept of “environmental impacts” includes the protection of biological diversity.³⁹ Additionally, it is implicit in the description of EIA that the process permits consideration of a wide range of scientific, social and policy issues.⁴⁰

EIA normally comprises six stages: screening that determines which projects require EIA; scoping that determines which impacts within the projects require assessing; assessment of impacts that evaluates the impacts and elaborates alternative proposals; reporting the EIA, which

³² CBD Guiding Principles, footnote 57(vii).

³³ CBD Guiding Principles, Principle 10.

³⁴ Cartagena Protocol, Article 16.

³⁵ CBD Guiding Principles, Principle 1; see also IUCN Guidelines paragraph 5.1.

³⁶ Cartagena Protocol, Annex III Risk Assessment paragraph 4. The precautionary principle, as defined in principle 15, is referred to by name only in the preamble to the Cartagena Protocol.

³⁷ CBD Guiding Principles, Principle 3.

³⁸ CBD Guiding Principles, Principle 4.

³⁹ CBD, Article 1; CBD, Article 2, Definition of biological diversity.

⁴⁰ Philippe Sands, *Principles of International Environmental Law* Cambridge University Press Cambridge (2003) 799-825.

puts the EIA into the public domain; and review of the EIA, which includes public participation, as well as monitoring and environmental auditing to determine the accuracy of predicted impacts and effectiveness of proposed mitigation measures.⁴¹

Risk analysis is a process that evaluates the likelihood of an event occurring and its ramifications in the midst of *uncertainty*.⁴² It encompasses three stages: risk assessment, which is a scientific evaluation of risk; risk management, which determines the choice of measures to manage the risk and which can also take into account non-scientific considerations, such as policy judgements;⁴³ and risk communication, which involves making the results of the assessment process publicly available so that decisions receive the widest public support.⁴⁴

EIA and risk assessment have much in common, for they can both be used to evaluate “the likely consequences of environmental change”⁴⁵ and assist planners, regulators and decision-makers to make informed choices.⁴⁶ It is important to keep in mind that the processes were not designed to provide a “right” or “wrong” solution. Rather, the processes were designed to provide decision-makers with information allowing them to balance issues, such as development, environmental protection and

⁴¹ Roel Slootweg, Arend Kolhoff, Rob Verheem and Robert Höft, *Biodiversity in EIA and SEA Background Document to CBD Decision VIII/28: Voluntary Guidelines on Biodiversity-Inclusive Impact Assessment* Commission for Environmental Assessment The Netherlands April (2006) ch 5.

⁴² John Mumford, ‘Environmental Risk Evaluation in Quarantine Decision Making’ in Kym Anderson, Cheryl McRae and David Wilson (eds), *The Economics of Quarantine and the SPS Agreement*, Centre for International Economic Studies Adelaide and AFFA Biosecurity Australia (2001) 353.

⁴³ Mike Nunn, ‘The analytical foundation of quarantine risk analysis’ in Kym Anderson, Cheryl McRae and David Wilson (eds), *The Economics of Quarantine and the SPS Agreement* Centre for International Economic Studies Adelaide and AFFA Biosecurity Australia. (2001) 29, 30; European Strategy on Invasive Alien Species, Standing Committee of the Convention on the Conservation of European Wildlife and Natural Habitats. T-PVS (2003) revised. Box 1.

⁴⁴ A Brookes, ‘Environmental risk assessment and risk management’ in Peter Morris and Riki Therivel (eds), *Methods of Environmental Impact Assessment* Spon Press London (2001) 362; Global Invasive Species Programme 3.4 Risk Assessments <http://www.cabi-bioscience.ch/wwwgisp/gtc3_4.htm> (March 2006).

⁴⁵ Peter Wathern ‘An Introductory Guide to EIA’ above n 5, 20, 85.

⁴⁶ Olga Demidova and Aleg Cherp, ‘Risk Assessment for Improved Treatment of Health Considerations in EIA’ (2005) 25 *Environmental Impact Assessment Review* 411, 413.

social and economic factors.⁴⁷ It should also be kept in mind that the processes are linked by the concepts of “risk” and “impact”. A risk assessment calculates the “probability, magnitude and severity”⁴⁸ of events occurring, while an EIA evaluates impacts which may be regarded as changes in the level of environmental risk attributable to a programme or policy.⁴⁹

The two processes are not identical, nor should they be considered interchangeable. In particular, EIA and the first component of risk analysis – risk assessment – are very different in methodology and substance.⁵⁰ Many of these differences stem from the origins of the processes. EIA, for example, was initially developed to “increase accountability to citizen groups”, while risk assessment was developed to “increase internal management control in order to foster consistency across actions and programmes”.⁵¹ Thus, EIA methodology is strongly characterized by social and political components,⁵² while risk assessment is strongly characterized by scientific ones.

The harnessing of public and political support can be important in the institution of measures to prevent entry and establishment of IAS. Even where states have adequate legislative and institutional bases for regulating IAS, public awareness and support of government initiatives can heighten public attentiveness to the problem of IAS, leading to more responsive compliance with regulation. Guiding principle 6 of the CBD Guiding Principles emphasizes that public awareness and education of

⁴⁷ Peter Wathern ‘An Introductory Guide to EIA’ above n 5, 19-20.

⁴⁸ Olga Demidova and Aleg Cherp, above n 46, 413.

⁴⁹ See definition of ‘risk’ and ‘impact’ in the World Bank ‘Health Aspects of Environmental Assessment’ Environmental Assessment Sourcebook Update no 18, at 2 Environment Department July 1997.

⁵⁰ R Andrews ‘Environmental Impact Assessment and Risk Assessment: Learning from Each Other’ in Peter Wathern (ed), *Environmental Impact Assessment Theory and Practice* Unwin Hyman London (1988) 85, 87; Olga Demidova and Aleg Cherp, above n 46, 413.

⁵¹ R Andrews ‘Environmental Impact Assessment and Risk Assessment: Learning from Each Other’ above n 50, 93.

⁵² Convention on Biological Diversity Conference of the Parties Decision VIII/28 on ‘Impact Assessment: Voluntary Guidelines on Biodiversity-inclusive Impact Assessment’ UNEP/CBD/COP/8/31 (26 June 2006) paragraph 40.

IAS is “crucial to the successful management of invasive alien species” and that mitigation measures should “engage local communities and appropriate sector groups in support of such measures”. Therefore, social and policy issues can be critical to the effective implementation of measures dealing with IAS.

Social and policy concerns can also be important to placing the issue of IAS into the broader picture of conservation goals and their relationship to development and trade⁵³ – or in other words into the sphere of sustainable development.⁵⁴ Achieving the latter should be seen as a means of achieving balance between trade and preventing the entry of IAS for “intact ecosystems can deliver ecosystem services in a sustainable manner”.⁵⁵

EIA and risk analysis have advantages that can benefit each other. Integration of EIA with risk analysis, for example, can assist in providing EIA with the scientific rigour of risk assessment, which is the first phase of risk analysis.⁵⁶ Additionally, social and policy components inherent to EIA can be used to harness public and political support for administrative and management decisions that might otherwise be lacking in the scientific rigour of risk assessment.⁵⁷ Calls for integration of the two processes commenced in the 1980s⁵⁸ and have continued to the present.⁵⁹

⁵³ Rüdiger Wittenberg (ed), *An Inventory of Alien Species and their Threat to Biodiversity and Economy in Switzerland* CABI Bioscience Switzerland Centre report to the Swiss Agency for Environment, Forests and Landscape Délémont (2005) 29.

⁵⁴ See CBD, Article. The concept is often taken to refer to use that meets the needs of the present generation without compromising the ability of future generations to meet their own needs. See also discussion in section 2.2.3 of Chapter 2 of this study.

⁵⁵ Rüdiger Wittenberg (ed) above n 53, 29.

⁵⁶ R Andrews, ‘Environmental Impact Assessment and Risk Assessment: Learning from Each Other’ above n 50, 85; Olga Demidova and Aleg Cherp, above n 46, 414; Ahmed El Sherbiny, Ahmed Sherif and Ali Hassan, ‘Model for Environmental Risk Assessment of Tourism Project Construction on the Egyptian Red Sea Coast’ [2006] *Journal of Environmental Engineering* 1272.

⁵⁷ Olga Demidova and Aleg Cherp, above n 46, 418.

⁵⁸ See for example, R Andrews ‘Environmental Impact Assessment and Risk Assessment: Learning from Each Other’ above n 57.

⁵⁹ Olga Demidova and Aleg Cherp, above n 46; Ahmed El Sherbiny, Ahmed Sherif and Ali Hassan, above n 56.

The purpose of integration should not, however, be seen merely as the generation of statistical estimates of risk, or exhaustive lists of environmental impacts, rather, it should be seen as a way of producing “a rationale for making public policy decisions that is both well reasoned and recognised as legitimate” and acceptable to the public.⁶⁰ Methodologies for such integration have already been developed in a number of fields, including health⁶¹ and tourism.⁶²

6.1.3 Integrating EIA, Risk Analysis and Risk Assessment to Protect Biodiversity

The integration of EIA with risk analysis to protect biodiversity from IAS can be regarded as a two-stage process: first, the actual integration of EIA with risk analysis; and, second, the incorporation of biodiversity-related concerns into EIA and risk analysis.

To integrate EIA into risk analysis requires that at the very least social and policy concerns reflected in EIA are incorporated into risk assessment and/or risk management. If we return to Item number 1 of Table 11, we see that Principles 10 and 11 of the CBD Guiding Principles anticipate such integration.⁶³ However, this is not the case with the provisions of the Cartagena Protocol, or standards developed by the IPPC, or the OIE. Rather than the use of EIA, these instruments advocate the use of two components of risk analysis: namely, risk assessment and risk management. However, because risk management by its very nature permits the consideration of social and policy factors, it is feasible that risk management can be integrated with EIA. The integration of EIA with risk assessment may prove more problematic. Although methodologies have been developed in the field of health and tourism for integrating EIA

⁶⁰ R Andrews, ‘Environmental Impact Assessment and Risk Assessment: Learning from Each Other’ above n 50, 85.

⁶¹ See generally Olga Demidova and Aleg Cherp, above n 46.

⁶² Ahmed El Sherbiny, Ahmed Sherif and Ali Hassan, above n 56.

⁶³ CBD Guiding Principles, Guiding Principles 10(1) and 11(2). The CBD Guiding Principles recommend integrating EIA with risk analysis, whereas the literature on integration recommends integrating risk analysis into EIA. The differences inherent in each method are not pursued in this study. The rationale in arguing for integration is the inclusion of social and policy concerns into the evaluation process which would occur no matter the method of integration.

with risk assessment,⁶⁴ these methodologies may not necessarily be compatible with risk assessment conducted under the auspices of other regimes, such as the SPSA. It partly depends on how “scientific” risk assessment is regarded.

The provisions of the SPSA are narrowly focussed⁶⁵ and centre on a type of risk assessment that is strongly dominated by science. Although the Appellate Body has indicated that states may take a variety of matters into account when conducting a risk assessment,⁶⁶ the process and resulting measures still need scientific evidence of a very high order.⁶⁷ Therefore, in the absence of cogent scientific evidence, it is unlikely that social and policy factors important to EIA can be accommodated.⁶⁸ Moreover, without integration of these factors, it is also unlikely that EIA itself can be integrated with risk assessment. This represents a significant point of divergence from the recommendations of the CBD Guiding Principles.

Analogous problems stem from the integration of biodiversity-related concerns into the evaluation process. Items 3 and 4 of Table 11 set out differences amongst the regimes, with respect to criteria relevant in evaluating deliberate and accidental introductions of IAS. The CBD, for example, has elaborated a biodiversity-inclusive EIA process based on a set of principles, “Biodiversity in Impact Assessment”,⁶⁹ developed under

⁶⁴ R Andrews ‘Environmental Impact Assessment and Risk Assessment: Learning from Each Other’ in *Environmental Impact Assessment Theory and Practice* above n 50; Olga Demidova and Aleg Cherp, above n 46; Ahmed El Sherbiny, Ahmed Sherif and Ali Hassan, above n 56.

⁶⁵ SPSA, Article 5 and definitions contained in Annex A paragraph 4; *EC – Hormones* paragraph 181. The SPSA, of course, does encourage states to use international standards as an alternative to carrying out their own risk assessment. In both instances, the scientific evidence is being evaluated, but in the former case the basis of the evaluation has already been agreed upon at the international level. See discussion in section 4.3.8 of Chapter 4 of this study.

⁶⁶ *EC – Hormones*, paragraph 187.

⁶⁷ See discussion in section 5.2.5 of Chapter 5 of this study.

⁶⁸ *European Communities — Measures Concerning Meat and Meat Products (Hormones) (EC – Hormones)* WTO Doc WT/DS/26/AB/R (report of the Appellate Body 1998) paragraphs 181, 202-206.

⁶⁹ International Association for Impact Assessment, ‘Biodiversity in Impact Assessment’ *Special Publication Series* No 3, July 2005.

the auspices of the International Association for Impact Assessment.⁷⁰ The primary objective of the principles is that there should be “no net loss of biodiversity”.⁷¹ The principles advocate the use of the precautionary principle⁷² and Ecosystem Approach (CBD)⁷³ in EIA. The Conference of the Parties to the CBD have incorporated these principles in a set of voluntary guidelines entitled “Biodiversity-Inclusive Impact Assessment” (the Voluntary Guidelines) adopted at the eighth meeting of the conference of the parties.⁷⁴

The Voluntary Guidelines are not designed to be a technical manual, but rather are designed to facilitate the inclusion of biodiversity concerns into the EIA process.⁷⁵ The Voluntary Guidelines include a description of the different stages of EIA⁷⁶ and guidance on how biodiversity issues can be integrated into those stages.⁷⁷ These developments are intended to cement biodiversity issues into EIA in a way that balances the protection of biodiversity with developmental issues.

In other instruments, the provisions of the Cartagena Protocol envisage the use of risk assessment and risk management to protect human health and biodiversity. Although there are no specific guidelines for integrating biodiversity concerns into risk assessment and risk management, Articles 15 and 16 of the Protocol that respectively deal with risk assessment and

⁷⁰ The International Association for Impact Assessment (IAIA) is an international association that provides a forum for the development of best practice in the field of impact assessment. It seeks to combine sound science with public participation and thereby provide a basis for sustainable development. See web site www.iaia.org

⁷¹ International Association for Impact Assessment, ‘Biodiversity in Impact Assessment’ above n 69, 2.

⁷² Ibid, 3.

⁷³ Ibid, 2. The Ecosystem Approach (CBD) is used to distinguish the ecosystem approach as used in the CBD Guiding Principles from the ecosystem approach as used elsewhere. See discussion in section 6.2.4 of this Chapter.

⁷⁴ Convention on Biological Diversity, Conference of the Parties Decision VIII/28 on ‘Impact Assessment: voluntary Guidelines on Biodiversity-inclusive Impact Assessment’. UNEP/CBD/COP/8/31 (26 June 2006).

⁷⁵ Ibid, paragraph 3.

⁷⁶ Ibid, paragraph 5.

⁷⁷ Ibid, paragraphs 6-27.

risk management both stress the need to conserve biological diversity from the potential adverse effects of Living Modified Organisms.⁷⁸

Similarly, the SPSA does not specifically refer to biodiversity, although, international standards recommended by the SPSA, such as, ISPM no 11⁷⁹ developed by the IPPC, contain provisions dealing with environmental consequences of the introduction of a “quarantine pest”.⁸⁰ Currently, the OIE has not developed standards to determine whether an animal is a potential IAS. However, individual scientists are developing standards as part of risk assessment to determine whether animal species have the potential to become invasive.⁸¹ While these developments signal the possibility that biodiversity-related issues can indeed be incorporated into both EIA and risk assessment, the acid test is whether these issues can be incorporated in a way that does not breach states’ obligations under the WTO.

In a broader sense, this issue derives from the fact that evaluation methods advanced under the different regimes potentially shape IAS regulation in distinctive ways. Hence, regulatory regimes implemented pursuant to the CBD Guiding Principles will utilize risk analysis, EIA and emphasize the protection of biodiversity; while regimes implemented pursuant to the SPSA will utilize risk assessment and emphasise the protection of free trade. Figure 2 below illustrates how these links operate.

To determine whether biodiversity-related matters can be incorporated into IAS regulation without breaching states’ obligations under the WTO requires a more detailed examination of specific features in the evaluation

⁷⁸ In addition, Cartagena Protocol Article 1 provides that the objective of the protocol is to contribute to ‘ensuring an adequate level of protection in the field of the safe transfer, handling and use of living modified organisms resulting from modern biotechnology that may have adverse effects on the conservation and sustainable use of biological diversity.’

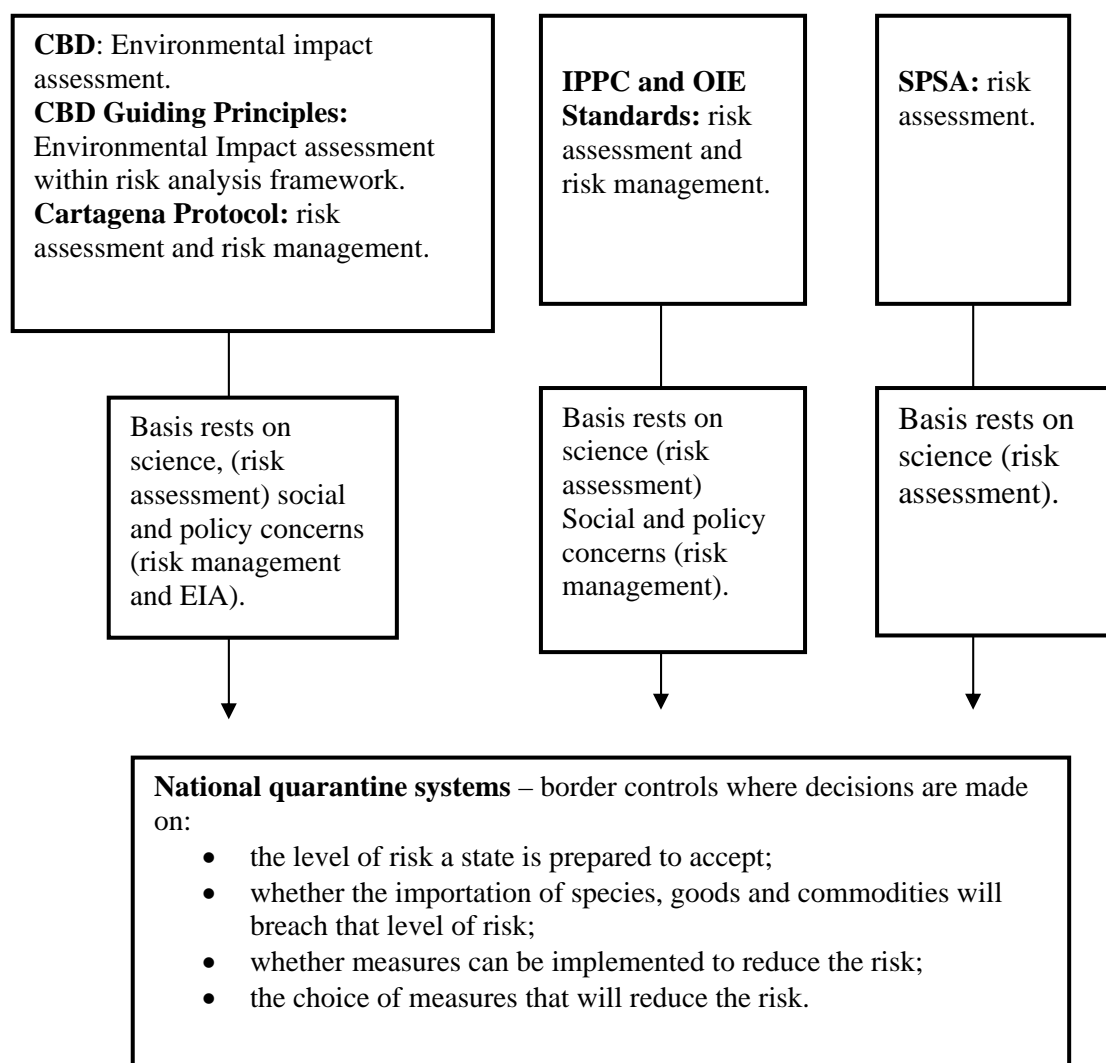
⁷⁹ IPPC ISPM No 11 Pest Risk Analysis for Quarantine Pests Including Analysis of Environmental Risks and Living Modified Organisms FAO (2006) paragraph 2.3.2.4.

⁸⁰ See discussion section 3.3.1 of Chapter 3 of this study.

⁸¹ Mary Bomford, *Risk Assessment for the Import and Keeping of Exotic Vertebrates in Australia* Bureau of Rural Sciences, Canberra (2006).

processes that determine whether species are actual or potential IAS; or, whether pathways can introduce IAS.

FIGURE 2
THE RELATIONSHIP BETWEEN REGULATION AND
EVALUATION PROCESSES



6.2 EVALUATING SPECIES AND PATHWAYS TO PROTECT BIODIVERSITY

Important components of evaluation processes for IAS include the matters set out in Items 2, 7, 8, 9 and 10 of Table 11: the allocation of the burden of proof, the quantification of biodiversity in economic terms; the role of

the precautionary principle, the role of the ecosystem approach and the relative importance afforded to transboundary and extraterritorial issues. Each of these components can potentially influence the design of regulatory regimes for IAS and, hence, the protection of biodiversity from IAS.

6.2.1 Burden of Proof

In any dispute, the party who bears the burden of proof bears the legal obligation of adducing evidence and making arguments before a court, panel or tribunal.⁸² In evaluations to determine whether species should be permitted or denied entry, or whether pathways should be targeted for regulation, the allocation of the burden of proof can become the deciding factor where evidence is lacking, or inconclusive.

Item 7 of Table 11 indicates the CBD Guiding Principles and Cartagena Protocol place the burden of proof on the party proposing an introduction. Under the SPSA, however, an initial burden of proof is imposed on the complainant to establish a *prima facie* case of inconsistency with the SPSA; after which the burden shifts to the defending party to counter, or refute the inconsistency.⁸³ If the *prima facie* case is not rebutted, then a ruling must be made in favour of the complainant.⁸⁴ This contrasts with the allocation of the burden of proof under the CBD Guiding Principles and the Cartagena Protocol, where species, goods and commodities are denied entry unless their safety can be demonstrated.

Consequently, the SPSA places a substantial burden on the state contesting the import. To rebut a *prima facie* case, the standard of evidence presented would logically need to be sufficient to counter the

⁸² Juliane Kokott, *The Burden of Proof in Comparative and International Human Rights Law* Kluwer Law International (1998) 16-17.

⁸³ *Japan – Measures Affecting Agricultural Products*. (Japan – Agricultural) WTO Doc WT/DS76/AB/R (Report of the Appellate Body 1999) paragraph 122 See also *EC – Hormones*, paragraphs 108-9.

⁸⁴ *Japan – Measures Affecting the Importation of Apples* (Japan – Apples) WTO Doc WT/DS245/AB/R (Report of the Appellate Body 2003) paragraph 159.

evidence already offered⁸⁵ and as such would need to be of a higher measure.⁸⁶ How much higher, though, does not appear to be settled.

Disputes within the WTO are governed by the Understanding on Rules and Procedures Governing the Settlement of Disputes (DSU)⁸⁷ that sets up the Dispute Settlement Body, comprised of a Panel and an Appellate Body. Neither the DSU, nor the SPSA itself nominates a standard of proof.⁸⁸ Therefore, the standard of proof is not set at a pre-determined level, such as “the balance of probabilities”; and perhaps what is being allocated is what one commentator has called the risk of “non-persuasion”.⁸⁹ Nevertheless, the level of proof still needs to be considered in the light of the SPSA itself and the stringent thresholds of scientific evidence required to satisfy a proper risk assessment.⁹⁰ Where the subject of the dispute concerns an IAS, the evidence would relate to the safety of the proposed introduction, as well as whether remedial measures are SPSA compliant. The content of the risk assessment needs to be detailed

⁸⁵ *Korea – Taxes on Alcoholic Beverages*. WTO Doc WT/DS75/AB/R, WT/DS/84/AB/R (report of the Appellate Body 1999) paragraph 156.

⁸⁶ R Cooney, ‘Precaution and invasive alien species: challenges at the interface of the trade and environment regimes.’ (Paper presented in the Proceedings of a Global Synthesis Workshop on Biodiversity Loss and Species Extinctions; Managing Risk in a Changing World. Sub theme: Invasive Alien Species – Coping with Aliens, San Jose, Costa Rica. May 1999) 5, 6. Available at <<http://www.iucn.org/congress/documents/outputs/biodiversity-loss/precaution-cooney.pdf>> (November 2007) ; Theofanis Christoforou, ‘Settlement of Science-Based Trade Disputes in the WTO: A Critical Review of the Developing Case Law in the Face of Scientific Uncertainty’ (2000) 8 *New York University Environmental Law Journal* 622, 644.

⁸⁷ The Understanding on Rules and Procedures Governing the Settlement of Disputes (DSU) [1995] ATS no 8. The DSU is the main WTO document dealing with how disputes are resolved. The Dispute Settlement Body is made up of all member governments represented by ambassadors. See explanation on WTO website www.wto.org

⁸⁸ *Japan – Apples* Report of the Panel, paragraph 7.4. Article 11 of the DSU provides that the panel, which is the arbiter of fact in WTO disputes, should make an objective assessment of the material before it. In *European Communities – Measures Affecting Asbestos and Asbestos – Containing Products* the Appellate Body held that Article 11 of the DSU really goes to the credibility of the evidence and the weight that should be given to it and this is a matter of discretion for the panel. WTO Doc WT/DS135/AB/R (report of the Appellate Body 2001), paragraphs 176-177.

⁸⁹ Juliane Kokott, above n 82, 15.

⁹⁰ See discussion in section 4.3.9 of Chapter 4 of this study, as well as sections 5.2.2 and 5.2.3 of Chapter 5 of this study.

enough and of a sufficient standard to withstand WTO scrutiny;⁹¹ it has also been pointed out that the SPSA supports countries that “have a surfeit of administrative procedures”, buttressed by sufficient resources to maintain paper trails chronicling every stage of a dispute.⁹²

In practice, the standard is sufficiently onerous to make defence of measures difficult⁹³ and could potentially lead to a less rigorous evaluation method and the easier admission of species.⁹⁴ This is especially the case when the burden of proof is considered against the backdrop of practical difficulties states face with respect to generating information on alien species, particularly predicting which alien species will become invasive and garnering sufficient information and resources to defend their measures.

Operational differences in the allocation of the burden of proof mean that under the CBD Guiding Principles uncertainties are decided *against* introducing alien species, while under the SPSA uncertainties are decided *in favour* of permitting trade. Given that once an alien species has become invasive it is almost impossible to eradicate,⁹⁵ placing the burden of proof on the introducer would ensure a high standard of evidence underpins decisions permitting introductions. Yet in negotiating the SPSA, states have implemented a policy choice that balances free trade and environmental protection in favour of trade. This appears to be reinforced by other factors, such as the need to quantify biodiversity in economic terms, which may serve to restrict consideration of biodiversity-related matters in the conduct of a risk assessment.

⁹¹ D Gascoine, ‘WTO Dispute Settlement: Lessons Learned from the Salmon Case’, (Paper presented at a Conference on International Trade Education and Research held in Melbourne 26 and -27 October 2000) paragraph 10.

⁹² Steve Charnovitz, ‘The Supervision of Health and Biosafety Regulation by World Trade Rules’ (1999-2000) 13 *Tulane Environmental Law Journal*. 271, 290.

⁹³ The amount of detail required is exemplified by the implementation phase of the *Australia – Salmon* dispute. See *Australia - Measures Affecting Importation of Salmon (Article 21.5 - Canada)* WTO Doc WT/DS18/RW (report of the Panel 2000); See also *Japan – Measures Affecting the Importation of Apples, Recourse to Article 21.5* WTO Doc WT/DS245/RW (report of the Panel 2005) and discussion in section 4.3.10 of Chapter 4 of this study.

⁹⁴ See discussion on chilling effect on measures in section 5.4 of Chapter 5 of this study.

⁹⁵ See discussion in Section 1.3.5 of Chapter 1 of this study.

6.2.2 Quantifying Biodiversity in Economic Terms

Article 5(3) of the SPSA sets out that

In assessing the risk to animal or plant life or health and determining the measure to be applied for achieving the appropriate level of sanitary or phytosanitary protection from such risk, Members shall take into account ... relevant economic factors: the potential damage in terms of loss of production or sales in the event of the entry, establishment or spread of a pest or disease; the costs of control or eradication in the territory of the importing Member; and the relative cost-effectiveness of alternative approaches to limiting risks.⁹⁶

Consequently, states need to be able to quantify biodiversity in economic terms to take into account the impact on biodiversity of those IAS introduced by way of international trade. This stance presupposes that biodiversity can in fact be quantified economically. While it may be possible to develop formulae that ascribe mathematical and economic values to biodiversity, this approach may not necessarily capture biodiversity values where they are not readily quantifiable in economic terms.

To start with, the attribution of economic value can potentially be influenced by the variety of uses and worthiness of biodiversity to humans. In one sense, it could be argued that biodiversity comprises all living organisms⁹⁷ and provides biological and social resources to humans. Therefore, biodiversity could be quantified by assigning a monetary value to those living organisms – akin to putting a price on biodiversity.⁹⁸ Alternatively, it could be said that biodiversity also includes the “variability” of living organisms and their value to

⁹⁶ See also discussion in section 3.3.1 of Chapter 3 of this study with respect to the definition of a “quarantine pest” and the need for evidence of “potential economic importance” to classify a pest as a quarantine pest.

⁹⁷ *Convention on Biological Diversity*, Article 2 ‘Biological diversity’ means the variability among living organisms from all sources including, *inter alia*, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems.

⁹⁸ Biodiversity Unit, Department of the Environment, Sport and Territories ‘Biodiversity and its value Biodiversity Series’, Paper No. 1 Department of the Environment, Sport and Territories Commonwealth of Australia (1993). Available <<http://www.environment.gov.au/biodiversity/publications/series/paper1/>> (March 2007).

ecosystems and ecosystem functioning or ecosystem services.⁹⁹ Yet again, it could be said that biodiversity's greatest value lies in the "opportunities it gives us for adapting to change".¹⁰⁰ These latter two facets of biodiversity may not be readily translated into economic terms,¹⁰¹ meaning that the worth or value of biodiversity may not be as easily quantified as its economic "price".

In the context of international trade and quarantine measures, the provisions of the SPSA anticipate that economic quantification should be undertaken as part of risk assessment and be based on a cost-benefit analysis that takes into account:

the potential damage in terms of loss of production or sales in the event of the entry, establishment or spread of a pest or disease; the costs of control or eradication in the territory of the importing Member; and the relative cost-effectiveness of alternative approaches to limiting risks.¹⁰²

The cost-benefit analysis is a means of comparing benefits and costs by way of a common unit expressed in terms of money. The accuracy of this type of analysis, however, depends on the accuracy of the estimates of the costs and benefits. Normally, these are measured in terms of market choices, or market values.¹⁰³ In effect, this means that biodiversity is valued in accordance with empirical surveys gauging peoples' willingness to pay for biodiversity.¹⁰⁴ There are some commentators who have expressed confidence that the market can capture the divergent

⁹⁹ *Convention on Biological Diversity*, Article 2. 'With regard to valuing ecosystem services see David Tilman, 'Biodiversity in Ecosystem Functioning' in Gretchen C Daily (ed) *Nature's Services, Societal Dependence on Natural Ecosystems* Island Press, Washington, D.C. (1997) 93; Robert Costanza and Carl Folke, 'Valuing Ecosystem Services with Efficiency, Fairness and Sustainability as Goals' in Gretchen C Daily (ed) *Nature's Services, Societal Dependence on Natural Ecosystems* Island Press, Washington, D.C. (1997) 49.

¹⁰⁰ Biodiversity Unit, Department of the Environment, Sport and Territories above n 98; John Gowdy, 'The Value of Biodiversity: Markets, Society and Ecosystems' (1997) 37 *Land Economics* 25, 32.

¹⁰¹ Biodiversity Unit, Department of the Environment, Sport and Territories, above n 98; John Gowdy, 'above 9 100, 32.

¹⁰² Article 5.3 SPSA.

¹⁰³ See discussion John Gowdy, above n 100, 26-31.

¹⁰⁴ Nick Hanley and Clive Spash, *Cost-Benefit Analysis and the Environment* Edward Elgar Publishing Ltd UK (1993) 261.

components and uses that comprise “biodiversity”.¹⁰⁵ There are other commentators, however, including ecologists,¹⁰⁶ biologists¹⁰⁷ and some economists,¹⁰⁸ who would disagree. In particular, many ecologists and biologists consider that the preservation of biodiversity is necessary for the very survival of human beings and, therefore, question whether the market place is a suitable mechanism for ascribing this type of value.¹⁰⁹ Moreover, the complex nature of biodiversity, its relationship to ecosystem services and sustainability of life, indicate that “the total value of biodiversity is essentially infinite” and may never be calculated.¹¹⁰

In an effort to take these types of concerns into account, other economists advocate a “contingent valuation”, which operates as an expanded version of the market-place approach.¹¹¹ The contingent valuation is developed from the empirical survey of the market-place approach, but the surveys analyse responses to questions that are “*contingent* on the occurrence of a particular hypothetical situation”.¹¹² For example, people might be surveyed and asked their “maximum willingness-to-pay” if a species were to be preserved, or if they were charged to use a wilderness area or a national park.¹¹³ This approach, however, is still largely market-based and hence raises the same problems that traditionally stem from using the market-based approaches that have just been discussed.

The problem is that in general economists are loath to value resources without the type of strong economic base provided by a market-place.¹¹⁴ This factor has prompted some commentators to suggest that “economists

¹⁰⁵ See discussion generally Nick Hanley and Clive Spash Ibid, 261-273; W Michael Hanemann, ‘Valuing the Environment Through Contingent Valuation’ (1994) 8 (4) *Journal of Economic Perspectives* 19,20-1; John Gowdy, above n 100, 32.

¹⁰⁶ John Gowdy, above n 100, 25.

¹⁰⁷ Ibid.

¹⁰⁸ Nick Hanley and Clive Spash above n 104, 270-272; W Michael Hanemann, above n 105, 20-1.

¹⁰⁹ J Gowdy, above n 100, 25.

¹¹⁰ Ibid, 27.

¹¹¹ Ibid, 32.

¹¹² G Garrod and K Willios, *Economic Valuation of the Environment* Edward Elgar Publishing Ltd UK (1999) 125.

¹¹³ W Michael Hanemann, above n 105, 20; G Garrod and K Willis above n 112, 125-126.

¹¹⁴ John Gowdy, above n 100, 32.

need to broaden their concept of value”¹¹⁵ beyond that determined by market exchange and cost-benefit analysis and instead consider the incorporation of social and policy considerations.¹¹⁶

In reality, the valuation of biodiversity becomes even more complex and problematic when considered in the context of IAS and the biodiversity of natural and semi-natural ecosystems.¹¹⁷ In managed systems, such as agricultural ones, it may be relatively easy to quantify economic consequences using a cost-benefit analysis, primarily because of the more comprehensive information that is available on these systems. A cost-benefit analysis would weigh up the costs of a variety of control or eradication measures against each other, against other means of limiting the risk and also against the loss of potential production or sales. The latter would particularly provide an accepted basis for calculation of economic consequences.¹¹⁸

However, these methods are more suited to taking into account impacts on farmed plants or animals and may not be suited to impacts on native biodiversity; making the latter more difficult to quantify. In Australia, for example, these differences mean that losses attributable to IAS, in terms of lost production, eradication and containment methods have been quantified, while environmental losses attributable to introduced rabbits, pigs, goats, cane toads, camels and many other species have not.¹¹⁹

Nevertheless, in spite of the difficulties in valuing biodiversity, from a purely pragmatic point of view, it is unavoidable. All states face resource constraints and valuing biodiversity is seen as a means of giving decision-makers the opportunity to allocate resources in a transparent way that

¹¹⁵ John Gowdy, above n 100, 38; for a short discussion of some of the alternatives see Nick Hanley and Clive Spash, above n 104, 270-272.

¹¹⁶ Ibid.

¹¹⁷ See discussion of ‘natural’ and ‘semi-natural’ ecosystems in section 1.1.3 of Chapter 1 of this study.

¹¹⁸ Ian Hodge, *Environmental Economics, Individual Incentives and Public Choices* Macmillan Press Ltd London (1995) ch 5.

¹¹⁹ Ross McLeod, *Counting the Cost: Impact of Invasive Animals in Australia* Cooperative Research Centre for Pest Animal Control, Canberra (2004) 60.

balances competing claims.¹²⁰ However, as in other areas of IAS regulation, one of the biggest problems in valuing biodiversity will be lack of knowledge of IAS and their impact on biodiversity. Where gaps and uncertainties in the knowledge base restrict the ability of states to quantify biodiversity economically, it also impacts upon the ability of states to take the effects of IAS on biodiversity into consideration in a risk assessment. Overall, such restraints potentially guide regulatory regimes away from preventing entry of IAS. A similar problem occurs with respect to the role of the precautionary principle and how states deal with gaps and uncertainties in knowledge of IAS.¹²¹

6.2.3 The Precautionary Principle

In the evaluation of species and pathways for their potential to introduce IAS it is all but impossible to eliminate uncertainty. Even the most meticulous assessments cannot completely account for the human factor and stochastic or chaotic events.¹²² The importance of the precautionary principle lies in its treatment of uncertainty.

Although the precautionary principle is often cited as having its origins in the 1970's German precept of "Vorsorgeprinzip,"¹²³ as early as 1909 the botanist Alfred Ewart said of potentially invasive plants that might be introduced into the Australian state of Victoria:

It is not too much to say that no new plant should be introduced into this State [Victoria], and not even a private garden, if there is any chance of it spreading, unless an official report on its capacities for good and evil had been obtained, and unless the report is a favourable one.¹²⁴

¹²⁰ Stefano Pagiola, Konrad von Ritter and Joshua Bishop, *Assessing the Economical Value of Conservation* International Bank for Reconstruction and Development/THE WORLD BANK, Washington (2004) chs 3 and 4; Nick Hanley and Clive Spash, above n 104, 269-270.

¹²¹ Rosie Cooney, *The Precautionary Principle in Biodiversity Conservation and Natural Resource Management: An issues paper for policy-makers, researchers and practitioners* IUCN Gland, Switzerland and Cambridge UK (2004) 8.

¹²² R Andrews, 'Environmental Impact Assessment and Risk Assessment: Learning from Each Other' above n 50, 91.

¹²³ Justice Paul Stein, 'Are Decision-makers too Cautious with the Precautionary Principle?' (2000) 17 *Environmental and Planning Law Journal* 3, 4.

¹²⁴ Ewart, as quoted in Tim Low *Feral Future* Viking Victoria Australia (1999) 29.

This quote not only reflects the essence of the precautionary principle, which is the need for precaution in the face of uncertainty, but also underscores the fact that the need to be cautious should accompany human activities whenever they are potentially detrimental to the environment. Yet, the concept of precaution and the content of the “precautionary principle” itself are not uniformly settled.¹²⁵ For example, different formulations of the precautionary principle, as a “principle”, an “approach” or acts of “prudence” are found across different regimes and even within regimes.¹²⁶

Guiding Principle 1 of the CBD Guiding Principles recommends that decisions with respect to intentional introduction of alien species should be based on the “precautionary approach”.¹²⁷ The “precautionary approach” is further elaborated as incorporating Principle 15 of the Rio Declaration on Environment and Development (Rio Declaration)¹²⁸ and the preamble of the 1992 Convention on Biological Diversity (CBD). Yet the precautionary approach in the Rio Declaration and the precautionary principle in the preamble of the CBD are not identical. Principle 15 of the Rio Declaration provides that:

In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation.

¹²⁵ Owen McIntyre and Thomas Mosedale, ‘The Precautionary Principle as a Norm of Customary International Law’ (1997) 9 *Journal of Environmental Law* 221, 236; David A Wirth ‘The Role of Science in the Uruguay Round and NAFTA Trade Disciplines’ (1994) 27 *Cornell International Law Journal* 817, 838-9. T Cors ‘Biosafety and international trade: conflict or convergence?’ (2000) 2 *International Journal of Biotechnology* 27; See also generally A Arcuri, *The Case for a Procedural Version of the Precautionary Principle Erring on the Side of Environmental Preservation*, Working Paper no 09/04 Hauser Global Law School Program <<http://www.nyulawglobal.org/workingpapers/documents/GLWP0904Arcuri.pdf>> (March 2006).

¹²⁶ See generally Jacqueline Peel ‘Precaution – A Matter of Principle, Approach or Process?’ (2004) 5 *Melbourne Journal of International Law* 483.

¹²⁷ CBD Guiding Principles, Guiding Principle 1.

¹²⁸ Rio Declaration, Principle 15 described the precautionary principle as the ‘precautionary approach’: ‘Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation’.

While the preamble to the CBD provides that:

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

Similarities between the two formulations include the fact that each applies in the face of scientific uncertainty; that each allocates the burden of proof to the party proposing a particular action; and that neither version imposes particular obligations upon states to take measures. Rather, in this latter case, states are permitted to take measures where scientific evidence is uncertain.¹²⁹ It is also important to note that based on a textual analysis of each version, the concept of “uncertainty” is not limited to the volume or quantity of scientific evidence, but can extend to inclusiveness of the scientific evidence.

The two versions, however, do have a number of differences, primarily relating to the level of threat and seriousness of potential loss of biodiversity that can trigger measures. The Rio Declaration, for example, refers to “serious or irreversible damage”, while the CBD refers to “significant reduction or loss of biological diversity”. By referring to an “irreversible” threat, the Rio version would appear to require a greater threat to trigger measures than the CBD version.

Some commentators have suggested that while these formulations differ, they “do not necessarily conflict”.¹³⁰ It is possible to regard Article 15 of the Rio Declaration as providing a general base for the precautionary principle, while other formulations, such as that found in the preamble to

¹²⁹ R Cooney, above n 121, 5-6. This contrasts with the Wingspread Statement of the precautionary principle that ‘affirmatively states that action should be taken’ see B Goldstein and R Carruth, ‘The Precautionary Principle and/or Risk Assessment in World Trade Organization Decisions: A Possible Role for Risk Perception’ (2004) 24 *Risk Analysis* 491, 491-492.

¹³⁰ For analogous arguments on the precautionary principle in the Cartagena Protocol, see Cameron Hutchinson ‘International Environmental Law Attempts to be ‘mutually supportive’ with International Trade Law: a compatibility analysis of the Cartagena Protocol to the Convention on Biological Diversity with the World Trade Organisation agreement on the application of sanitary and phytosanitary measures’ (2001) 4 (1) *Journal of International Wildlife Law & Policy* 1, paragraph 5.3.

the CBD, provide for a precautionary principle based on “more explicitly worded” footings.¹³¹

The differences, however, do highlight an emerging problem with the practical operation of the precautionary principle: whether the principle is used by states to implement measures in cases of uncertainty, or whether the principle is seen as a way of articulating a state’s perception of risk. In the context of IAS, uncertainty may be considered as a level of knowledge that is insufficient to conclude with confidence whether or not a species will become invasive, or whether a pathway is likely to introduce IAS. A perception of risk may be viewed as a combination of two elements: first a subjective assessment of the probability of a species becoming invasive or a pathway introducing an IAS, and second a subjective evaluation of “how concerned we are with [the] consequences”¹³² of such introductions. The subjective nature of the perception of risk means that “risk” can represent different things to different people. It may for example be influenced by social, cultural and inter-personal factors,¹³³ including how risk averse an individual is. Risk perception may not even have a clear connection with actual risk.

Commentators have pointed to the fact that states’ perception to the risks of genetically modified food products varies in accordance with “differing interest groups, whose values underpin different national regulatory paradigms”.¹³⁴ Similarly, most states will be anxious to prevent the entry of pests and diseases of crops and farm animals in order to protect their food supplies, but may not be as motivated to protect biodiversity at large

¹³¹ Ibid.

¹³² Lennart Sjöberg, Bjørg-Elin Moen and T Torbjørn Rundmo, *Explaining Risk Perception* Rotunde Norwegian University of Science and Technology, Trondheim (2004) paragraph 1.2; see also generally R Kasperson, O Renn, P Slovic, H Brown, J Emel, R Goble, J Kasperson and R Ratick, ‘The Social Amplification of Risk: A Conceptual Framework’ (1988) 8 *Risk Analysis* 177.

¹³³ R Kasperson, O Renn, P Slovic, H Brown, J Emel, R Goble, J Kasperson and R Ratick, above n 132, 177.

¹³⁴ Aynsley Kellow, Marcus Haward and Kristy Welch, ‘Salmon and Fruit Salad: Australia’s Response to World Trade Organisation Quarantine Disputes’ (2005) 40 *Australian Journal of Political Science* 17, 30.

because that risk is not as visible, or perceived to be as significant as the threat to food supplies.¹³⁵

This is not to say that uncertainty and risk are unconnected. They are indeed linked, for an incomplete knowledge-base or an unknown outcome can influence perceptions of risk.¹³⁶ However, where regulators use incomplete information as if it were complete, the decision-making process glosses over uncertainties and shifts towards decisions based on perceptions of risk. This very situation can potentially develop with respect to IAS introduced by way of international trade.

The provisions of the CBD Guiding Principles commence with the precautionary principle and thus focus on uncertainties in the scientific evidence, rather than perceptions of risk.¹³⁷ However, this is not the case with the SPSA. Unlike the CBD Guiding Principles that give the precautionary principle a prominent role, the provisions of the SPSA do not even refer to the precautionary principle. In *EC – Measures Concerning Meat and Meat Products (Hormones)*,¹³⁸ the EC argued that the precautionary principle was an established principle of international law,¹³⁹ and hence, could be used to justify precautionary measures banning beef grown using hormones in satisfaction of the provisions of the SPSA.¹⁴⁰ The Appellate Body, however, held that it was “less than clear” whether the precautionary principle had crystallized into a principle of customary international law.¹⁴¹ Moreover, even if it had, the principle

¹³⁵ See for example discussion in section 2.4 of Chapter 2 and section 3.4.2 of Chapter 3 of this study where an examination of state practice reveals that states are expending resources on protecting agriculture and farming products rather than biodiversity in general.

¹³⁶ Lennart Sjöberg, Bjørg-Elin Moen and T Torbjørn Rundmo, above n 132, paragraph 1.2.

¹³⁷ CBD Guiding Principles, Guiding Principle 1, where the precautionary principle is called the ‘precautionary approach’.

¹³⁸ *EC Measures Concerning Meat and Meat Products (Hormones)*, (*EC – Hormones*) WTO Doc WT/DS/26/AB/R (report of the Appellate Body 1998).

¹³⁹ *EC – Hormones*, paragraph 121.

¹⁴⁰ *EC – Hormones*, paragraph 121.

¹⁴¹ *EC – Hormones*, paragraph 123.

could not override the provisions of Articles 5.1 and 5.2 of the SPSA that require members to base their measures on a risk assessment.¹⁴²

The Appellate Body further described the precautionary principle as an act of prudence¹⁴³ and found that while the principle was not written into the SPSA, it was nevertheless reflected in a number of provisions of that Agreement including Article 5.7.¹⁴⁴ Article 5.7 specifies that

In cases where relevant scientific evidence 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.

Article 5.7, therefore, permits members to adopt provisional measures where the scientific evidence is insufficient, although the measures need to be reviewed within a reasonable time.¹⁴⁵ One result of the temporary nature of measures is to discourage their casting as a static type of regulation that does not keep pace with changes in science and technology.¹⁴⁶ This factor in itself does not make Article 5.7 inconsistent with environmental formulations of the precautionary principle. Indeed,

¹⁴² *EC – Hormones*, paragraphs 123, 124 and 125. See discussion Kevin Kennedy ‘Resolving International Sanitary and Phytosanitary Disputes in the WTO: Lessons and Future Directions’ (2000) 55 *Food and Drug Law Journal* 81, 95; Laurent A Ruessmann ‘Putting the Precautionary Principle in its Place: Parameters for the Proper Application of a Precautionary Approach and the Implications for Developing States in the Light of the Doha WTO Ministerial’ (2002) 17 *American University International Law Review* 905, 935-6, 937.

¹⁴³ *EC – Hormones*, Paragraph 124; see discussion in Jacqueline Peel above n 126, 497-500.

¹⁴⁴ *EC – Hormones*, paragraph 124. The other provisions of the SPSA that according to the Appellate Body reflect the precautionary principle are the preamble and Article 3.3. These provisions permit members to implement measures based on standards higher than those found in international standards, where the measures give effect to a member’s ALOP. Where the measures are more stringent than those based on international standards, the measures must be scientifically justified by way of a risk assessment.

¹⁴⁵ The provisional nature of measures implemented pursuant to Article 5.7 has been discussed in *Japan-Agricultural*, paragraph 93, where the Appellate Body noted that the time-frames for gathering additional information would be determined on a case-by-case basis, depending on ‘the difficulty of obtaining the additional information necessary for the review and the characteristics of the provisional SPS measure.’

¹⁴⁶ Dennis Gebbie and Bruce Bowen, ‘Does the SPS Agreement Need a Precautionary Principle? The case of Food Safety’ in *Quarantine and Market Access. Forum Proceedings 6-7 September 2000 Department of Agriculture & Forestry- Canberra Australia* (2000) 165, 169.

there is nothing in the latter to indicate that precautionary measures should be permanent.¹⁴⁷ The precautionary principle applies in the face of uncertainty, thus, if the uncertainty is removed, appropriate measures may be implemented.

The precautionary principle and Article 5.7 may, however, conflict in a number of other respects. Article 5.7 operates as a qualified exemption from members' obligations to base their measures on risk assessment.¹⁴⁸ This means that there are overarching obligations under the SPSA for members to undertake evaluations of available scientific evidence. Moreover, within the evaluation process, a sufficient *quantity* of reliable evidence can be evaluated, whether or not it is *conclusive*. This approach is inconsistent with the formulation of the precautionary principle in the Rio Declaration¹⁴⁹ and the CBD¹⁵⁰ that do not confine uncertainty to lack of quantity of scientific evidence, but also permit precautionary measures where the scientific evidence is inconclusive.

By not acknowledging that inconclusive evidence can also be "insufficient", the Appellate Body has steered the inquiry of scientific evidence towards the risk assessment process and perceptions of risk, rather than focusing on the sufficiency of the scientific evidence itself. As one commentator has indicated, this can deflect a regulatory response away from uncertainty and towards perceptions of risk.¹⁵¹ A decision based on a perception of risk may mean that if a state is not particularly risk-averse, it will take the chance of allowing species entry based on incomplete information. Moreover, by tacitly not acknowledging that available information is incomplete, or inconclusive, there is no incentive to monitor decisions, or seek further information.

¹⁴⁷ See for example, Cartagena Protocol Cartagena Protocol, Schedule III 8 (f) that deals with uncertainty in risk.

¹⁴⁸ *Japan – Apples*, paragraph 80. See discussion in section 4.3.7 of Chapter 4 of this study.

¹⁴⁹ Rio Declaration, Article 15.

¹⁵⁰ CBD, preamble.

¹⁵¹ Jacqueline Peel, above n 126, 497-500.

The focus on risk rather than uncertainty also exacerbates flaws inherent in the way that environmental hazards are linked to thresholds of risk in the implementation of measures. The CBD, for example, refers to “significant reduction or loss of biodiversity”, while under the SPSA, the risk must be one that breaches a state’s ALOP, without being a speculative or theoretical risk.¹⁵² Yet, knowing whether a risk is significant, speculative or theoretical, in circumstances where there are gaps and uncertainties in information may be problematic. Assessments can, however, pinpoint uncertainties and lack of information in the context of a risk assessment.¹⁵³ One area of tension between the SPSA and the CBD Guiding Principles lies in how uncertainty is determined. As already discussed,¹⁵⁴ pursuant to the SPSA, uncertainty in scientific evidence means that measures cannot be maintained. Yet where there is a serious risk of environmental harm, the CBD Guiding Principles indicate that states can implement remedial measures. Australia has developed an evaluation process, the Weed Risk Assessment (WRA),¹⁵⁵ which provides an example of how balance might be achieved between the requirements of the SPSA and the CBD Guiding Principles. However, given the differing focal points of the two regimes, the WRA is not foolproof.

The basis of the WRA¹⁵⁶ is a set of questions about the plant proposed to be imported that cover matters such as the plant’s distribution,¹⁵⁷ whether the plant is toxic to animals,¹⁵⁸ whether it hybridises naturally,¹⁵⁹ and

¹⁵² For a discussion of this point in the context of the Cartagena Protocol see C Hutchinson ‘International Environmental Law Attempts to be ‘mutually supportive’ with International Trade Law: a compatibility analysis of the Cartagena Protocol to the Convention on Biological Diversity with the World Trade Organisation agreement on the application of sanitary and phytosanitary measures’ above n 130, paragraph 5.4.

¹⁵³ Rosie Cooney, above n 121, 132.

¹⁵⁴ See section 5.2.3 of Chapter 5 of this study.

¹⁵⁵ DAFF, Fact Sheet on the Weed Risk Assessment System <<http://www.daffa.gov.au/ba/reviews/weeds/system>> (April 2007). See also T Low ‘Preventing Alien Invasions. The Precautionary Principle in Practice in Weed Risk Assessment in Australia’ in R Cooney and B Dickson B (Ed), *Biodiversity and the Precautionary Principle: Risk and Uncertainty in Conservation and Sustainable Use*. Earthscan, London (2005) 141.

¹⁵⁶ See discussion in section 3.5.3 of Chapter 3 of this study.

¹⁵⁷ DAFF, Fact Sheet on the Weed Risk Assessment System above n 155 question 2.

¹⁵⁸ Ibid DAFF, Fact Sheet on the Weed Risk Assessment System question 4.05.

¹⁵⁹ Ibid DAFF, Fact Sheet on the Weed Risk Assessment System question 6.03.

information about its dispersal.¹⁶⁰ The answers are scored¹⁶¹ and a minimum number of questions must be answered. Depending on the score, the procedure determines whether to accept, reject, or further evaluate the species. If the species requires further evaluation, it is denied entry until additional information is obtained. This type of determination is sometimes referred to as placing a species onto a “grey list”.

The advantages of the WRA are that it not only identifies risks, but it also identifies areas of uncertainty, either because the information is insufficient, or because it is inconclusive. It means that the species is not subject to a full risk assessment, because there is insufficient information to undertake this process. The fact that a species is denied entry until further information is obtained means that the ultimate decision is made on the basis of certainty and conclusiveness in the information, rather than on the basis of how regulators perceive the risks associated with the entry of a particular species. Essentially, the WRA represents a way of making the precautionary principle operational. It is not certain, however, whether the provisional nature of an importation ban accords with both the precautionary principle and also states’ obligations pursuant to Article 5.7 of the SPSA.

For one thing, states could have differing perceptions on whether sufficient information has been provided to carry out a full risk assessment. This could lead to a challenge where a species has been categorized onto a “grey list”. The WRA is also not used to assess animal species or pathways of introduction. In reality, this latter point is part of a larger problem within the WTO, with respect to regulating IAS by vectors or pathways of invasion. Although the precautionary principle can be adapted to target pathways and vectors, such as cut flowers¹⁶² and trash in agricultural products,¹⁶³ the Appellate Body’s interpretation of the

¹⁶⁰ Ibid DAFF, Fact Sheet on the Weed Risk Assessment System question 7.

¹⁶¹ DAFF, Fact Sheet on the Weed Risk Assessment System, above n 155.

¹⁶² See discussion in section 1.2.2 of Chapter 1 of this study.

¹⁶³ The word ‘trash’ in this sense refers to organic material, such as leaves, twigs, soil and timber left over from the harvesting and packaging process. See Biosecurity Australia,

sufficiency of scientific evidence, the scope of a risk assessment and the need to assess known risks for each IAS limit the utility of the of the pathway or vector approach, including its application with respect to the precautionary principle. In general, while Article 5.7 shares many common features with the precautionary principle, it should not be considered as equivalent to, or as a substitute for, the precautionary principle. Analogous difficulties can also occur with respect to the application of another environmental concept, the ecosystem approach.

6.2.4 The Ecosystem Approach

Guiding Principle 3 of the CBD Guiding Principles recommends that the parties base their IAS regimes on the ecosystem approach.¹⁶⁴ An ecosystem is defined in the CBD as “a dynamic complex of plant, animal and micro-organism communities and their non-living environment, interacting as a functional unit”.¹⁶⁵ The ecosystem approach is an approach to land, water and resource management, based on ecosystem boundaries, that “seeks to achieve a satisfactory balance between conservation and development”.¹⁶⁶ In essence it is an integrated style of management drawing together conservation, utilization and development “in an equitable way”.¹⁶⁷

Revised Draft Import Analysis Report for the Importation of Cavendish Bananas from the Philippines Biosecurity Australia (2007). (Released in parts A, B and C) paragraph 1 Overview and Part B Available <<http://www.daffa.gov.au/ba/ira/current-plant/banana-philippines>> (April 2007).

¹⁶⁴ The Ecosystem approach was adopted by the Conference of the Parties to the CBD in decision V/6 set out in Report of the Fifth Meeting of the Conference of the Parties to the Convention on Biological Diversity dated 22 June 2000 at 103 UNEP/CBD/COP/5/23 (22 June 2000).

¹⁶⁵ CBD Article 2.

¹⁶⁶ Horst Korn, Jutta Stadler, Edward Maltby and Alexander J. Kerr, *Report of the Scientific Workshop on “The ecosystem approach -what does it mean for European ecosystems?”* German Federal Agency for Nature Conservation (1999).

¹⁶⁷ FAO, FAO Fisheries Department Glossary taken from J Alcamo, N Rashid and E Hassan (ed) *Ecosystem and Human Well-being. A framework for Assessment*. Millennium Ecosystem Assessment (2003). <<http://www.fao.org/fi/glossary/default.asp>> (March 2006). For a discussion on the origins of the ecosystem approach see Owen McIntyre, ‘The Emergence of an ‘Ecosystem Approach’ to the Protection of International Watercourses under International Law’ (2004) 13 (1) *Review of European Community & International Environmental Law* 1. On the ecosystem approach, see generally Mike Bader, ‘The Need for an Ecosystem Approach for Endangered Species Protection’ (1992) 13 *The Public Land Law Review* 137; Jutta Brunée and Stephen J Toope, ‘Environmental

In the context of protection of biodiversity, the ecosystem approach was adopted by the Fifth Meeting of the Conference of the Parties to the CBD,¹⁶⁸ supplemented by additional guidelines adopted at the Seventh Meeting of the Conference of the Parties.¹⁶⁹ The objectives of the CBD version of the ecosystem approach are similar to objectives found in other regimes.¹⁷⁰ However, the CBD version specifically targets the protection of biodiversity and will be referred to as the Ecosystem Approach (CBD) to distinguish it from the ecosystem approach adopted by other regimes.

The Ecosystem Approach (CBD) is supported by twelve principles that cover matters such as the relationship of ecosystems to each other,¹⁷¹ the importance of managing ecosystems in appropriate spatial and temporal scales¹⁷² as well as the inclusion of policy and societal considerations in management approaches.¹⁷³ In this latter respect, the Ecosystem Approach

Security and Freshwater Resources: A Case for International Ecosystem Law' (1994) 5 *Yearbook of International Environmental Law* 41; Alfred Duda and Kenneth Sherman, 'A New Imperative for Improving Management of Large Marine Ecosystems' (2002) 45 *Ocean and Coastal Management* 797; R Edward Grumbine, 'Reflections on 'What is Ecosystem Management?'' (1997) 11 *Conservation Biology* 41; Bruce Pardy, 'Changing Nature: The Myth of the Inevitability of Ecosystem Management' (2003) 20 *Pace University School of Law* 675.

¹⁶⁸ Decision V/6 set out in Report of the Fifth Meeting of the Conference of the Parties to the Convention on Biological Diversity above n 164.

¹⁶⁹ Convention on Biological Diversity 'Implementation Guidelines to the Ecosystem Approach. Decision VII/11 'Ecosystem Approach' UNEP/CBD/COP/7/21 (13 April 2004).

¹⁷⁰ For example, one of the major goals of the ecosystem approach adopted by the Conference of the parties to the CBD is to achieve "conservation and sustainable use in an equitable way". This is similar to the ecosystem approach to fisheries. S. M. Garcia, A Zerbi, C Aliaume, T Do Chi and G Lasserre *The Ecosystem Approach to Fisheries* FAO, Rome (2003) paragraph 1.5.

¹⁷¹ Ecosystem Approach, Principle 3: Ecosystem managers should consider the effects (actual or potential) of their activities on adjacent and other ecosystems.

¹⁷² Ecosystem Approach, Principle 7: The ecosystem approach should be undertaken at the appropriate spatial and temporal scales; Principle 8: Recognizing the varying temporal scales and lag-effects that characterize ecosystem processes, objectives for ecosystem management should be set for the long term.

¹⁷³ Ecosystem Approach, Principle 1: The objectives of management of land, water and living resources are a matter of societal choice. Principle 11: The ecosystem approach should consider all forms of relevant information, including scientific and indigenous and local knowledge, innovations and practices. Principle 12: The ecosystem approach should involve all relevant sectors of society and scientific disciplines. In addition, the ecosystem approach also provides for the following principles: Principle 2: Management should be decentralized to the lowest appropriate level. Principle 4: Recognizing potential gains from management, there is usually a need to understand and manage the ecosystem in an economic context. Principle 5: Conservation of ecosystem structure and functioning, in order to maintain ecosystem services, should be a priority target of the ecosystem approach. Principle 6: Ecosystems must be managed within the limits of their

(CBD) seeks to balance human needs with the maintenance of ecosystem functioning and economic considerations.¹⁷⁴ One benefit of the ecosystem approach in general, is that it is based on environmental parameters, rather than political parameters. As political parameters rarely coincide with ecosystem boundaries, the ecosystem approach manages environmental concerns more appropriately according to naturally occurring divisions, rather than politically-created divisions.¹⁷⁵

The Ecosystem Approach (CBD) also does not exclude other management approaches, such as single species conservation, or management regimes used in agricultural areas. This means that the Ecosystem Approach (CBD) can potentially be integrated with other management regimes including those designed to manage IAS under the CBD Guiding Principles and the provisions of the SPSA with respect to risk assessment.

However, a closer examination of the Ecosystem Approach (CBD) and the SPSA reveals substantial differences between the two instruments that may make assimilating the Ecosystem Approach (CBD) impracticable within the confines of the SPSA. One difference relates to the role of social and policy issues. While processes within the SPSA rely heavily on science, as one commentator has pointed out, “ecosystem management is not just about science ... it offers a fundamental reframing of how humans may work with nature”.¹⁷⁶ This means that social and policy concerns are important to the Ecosystem Approach (CBD) in a way that they may not be under the SPSA.¹⁷⁷ This is not to say that scientific knowledge is ignored under the Ecosystem Approach (CBD), but it is only one of a number of disciplines available to regulators. Principles 11 and 12 of the

functioning. Principle 9: Management must recognize that change is inevitable. Principle 10: The ecosystem approach should seek the appropriate balance between, and integration of, conservation and use of biological diversity.

¹⁷⁴ Ecosystem Approach, principle 5.

¹⁷⁵ Ecosystem Approach, principles 3 and 7. See discussion in part 3.8 of Chapter Three of this study.

¹⁷⁶ R Edward Grumbine, above n 167, 27.

¹⁷⁷ Although the Appellate Body in *EC – Hormones* at Paragraph 187 held that measures can be based on a wide variety of criteria, they still need a rational relationship in science to the risk assessment. See discussion in section 5.2.5 of Chapter 5 of this study.

Ecosystem Approach (CBD) support this proposition by providing that all forms of knowledge are relevant to ecosystem management¹⁷⁸ that should involve “all relevant sectors of society and scientific disciplines”.¹⁷⁹

Another potential area of conflict stems from the in-depth,¹⁸⁰ but adaptive system of management fostered by the Ecosystem Approach (CBD). The more in-depth management becomes, the more knowledge is needed to support management decisions.¹⁸¹ Data needs to be collected and collated so that cumulative and cross-sectoral¹⁸² impacts are taken into account. Therefore, not only must each sector have sufficient knowledge to underpin its own activities, but also sectors with overlapping regimes need to cooperate to assimilate their activities. The need for a large amount of knowledge, does not itself contradict risk assessment under the SPSA.

However, the need for detailed information under the Ecosystem Approach (CBD) is counterbalanced by the very nature of adaptive systems of management¹⁸³ that allow regulators to make small but incrementally significant management decisions that are continuously monitored, assessed and refined.¹⁸⁴ It is a precautionary style of management that allows regulators to respond in a timely manner by making decisions even in the absence of scientific certainty.¹⁸⁵ The latter, in particular, has the potential to conflict with Articles 2.2 and 5.7 of the SPSA.

¹⁷⁸ Ecosystem Approach, Principle 11.

¹⁷⁹ Ecosystem Approach, Principle 12.

¹⁸⁰ For example, Principle 2 of the Ecosystem Approach recommends that Management should be decentralized to the lowest appropriate level. The more targeted management becomes, the more in-depth and detailed it becomes.

¹⁸¹ See for example, Ecosystem Approach, Principle 1, Principle 4, Principle 10 and Principle 12.

¹⁸² Paragraph C ‘Operational Guidance for the application of the ecosystem approach’ in Decision V/6 of the Conference of the parties above n 164 envisages that the sectors are product sectors, such as ‘agriculture, fisheries, forestry and other production systems that have an effect on biodiversity’. Moreover, cooperation should extend across a range of administrative and governmental levels.

¹⁸³ See for example, Ecosystem Approach Principles 5, 6 and 9.

¹⁸⁴ R Cooney, above n 121, 31.

¹⁸⁵ CBD The Ecosystem Approach Decisions Adopted by the Conference of the Parties to the Convention on Biological Diversity at its Fifth Meeting paragraph A. Decision V/6 UNEP/CBD/COP/5/23 (22 June 2000).

Article 2.2 requires scientific justification for maintaining measures, a requirement that directly contradicts the implementation of measures in the absence of complete, or conclusive information. Article 5.7 permits temporary measures where scientific evidence is insufficient, but states are obliged to obtain further information in a “reasonable time”. This phrase is not defined and the Appellate Body has indicated that the concept of reasonableness should be determined on a case-by-case basis.¹⁸⁶ While this feature does not contradict the Ecosystem Approach (CBD), Principles 7 and 8 of that approach recognize that ecosystem management should be undertaken at the appropriate spatial and temporal scales, taking into account lag-effects that characterize ecosystem processes.

Given that it is not uncommon for the invasive potential of a species to take up to 170 years to manifest¹⁸⁷ and that it is not settled how “reasonable” ought to be interpreted for the purposes of the SPSA, this can potentially be an abundant source of conflict. One state might consider that two or three years is a reasonable time-frame for reassessing temporary measures;¹⁸⁸ while another state might consider a longer time more reasonable.

Yet, a further difficulty stems from the application of Principle 3 of the Ecosystem Approach (CBD) that specifies ecosystem managers should consider the effects (actual or potential) of their activities on adjacent and other ecosystems. This principle forms part of a cluster of guidelines and obligations that relate to transboundary and extraterritorial issues in the regulation of IAS.

¹⁸⁶ *Japan –Agricultural*, paragraph 93.

¹⁸⁷ See discussion in section 1.3.3 of Chapter 1 of this Study.

¹⁸⁸ See for example, Senate Standing Committee on Rural and Regional Affairs and Transport, Parliament of Australia, *Administration of Biosecurity Australia – Revised Draft Import Risk Analysis for Bananas from the Philippines* 2005, Commonwealth of Australia, Senate Printing Unit, Canberra (2005) paragraphs 2.1- 2.16 and the discussion on monitoring and the review of measures. Although Biosecurity Australia recommended a period of one year for monitoring the Senate increased this to 10 years.

6.2.5 Transboundary and Extraterritorial Issues

Transboundary issues are an important consideration in regimes designed to prevent the entry of IAS. States operate as political entities within political parameters, yet the CBD Guiding Principles call for management of IAS along ecosystem lines.¹⁸⁹ Where ecosystems cross political boundaries it spotlights the role of transboundary and extraterritorial issues in regulation. Customary international law, for example, obliges states to prevent, reduce and control transboundary environmental harm.¹⁹⁰ In addition, incrementally more specific recommendations are found in Principle 3 of the Ecosystem Approach (CBD) and Guiding Principle 4 of the CBD Guiding Principles that advise and guide states on how to prevent transboundary harm in the management of ecosystems and with respect to IAS.

Principle 3 of the Ecosystem Approach (CBD) applies on a spatial scale to ecosystems located across shared political boundaries, as well as ecosystems located further afield. Guiding Principle 4(2) of the CBD Guiding Principles specifies states should cooperate to minimize the harmful impacts of:

- (a) The intentional transfer of an invasive alien species to another State (even if it is harmless in the State of origin); and
- (b) The intentional introduction of an alien species into their own State, if there is a risk of that species subsequently spreading (with or without a human vector) into another State and becoming invasive;
- (c) Activities that may lead to unintentional introductions, even where the introduced species is harmless in the state of origin.¹⁹¹

Although both Principle 3 of the Ecosystem Approach (CBD) and Guiding Principle 4 of the CBD Guiding principles refer to transboundary

¹⁸⁹ The approach of the CBD Guiding Principles also coincides with the definition of an IAS that incorporates the discussion in section 1.1.2 of Chapter 1 of this study.

¹⁹⁰ See *Trail Smelter* arbitration (*United States v Canada*) Initial Decision 16 April 1938 (1939) 33 *AJIL* 182; Final Decision 11 March 1941 (1941) 35 *AJIL* 684. See discussion Patricia Birnie and Alan E Boyle *International Law and the Environment* Clarendon Press Oxford (1992), 89-102.

¹⁹¹ CBD Guiding Principles, Principle 4.

matters, the CBD Guiding Principles deal with these issues in the context of national jurisdiction, as does customary international law. However, neither of these formulations of transboundary harm excludes the operation of the Ecosystem Approach (CBD). The key issue is whether transboundary and extraterritorial matters can be adapted into the evaluation process for species and pathways of invasion. The CBD Guiding Principles contemplate that indeed they can.

Guiding Principle 4(2) of the CBD Guiding Principles needs to be read in conjunction with Guiding Principles 10 and 11. The combined effect of these principles means that the state proposing an introduction, transfer or activity related to alien species should evaluate the proposed introduction or activity not only for its potential to introduce IAS in the member's territory, but also for the potential to introduce IAS in the territory of other states or other ecosystems. The issue within the WTO is not so settled.

The importance of the potential conflict between the two regimes may be illustrated by revisiting a problem identified earlier in this study with respect to the conduct of trade between Canada and the United States.¹⁹² Canada does not regulate fruit flies because they will not establish, yet from Canada fruit flies can enter the United States, where they would be a problem.¹⁹³ If Canada should enact quarantine measures aimed at preventing the introduction of fruit fly, these measures would apply within the territory of Canada, but would be designed to protect the territory of another state, in this case the United States.

To a large extent, the question whether this action would breach the SPSA depends on the definition of an SPS measure. An SPS measure includes

¹⁹² See discussion in section 3.4.2 of Chapter 3 of this study. See also the discussion on the Ruddy duck in section 1.3.2 of Chapter 1 of this study and the discussion in section 3.4.2 of Chapter 3 of this study of the problem of invasive plants being introduced from surrounding states into Namibia.

¹⁹³ Anne Perrault, Morgan Bennett, Stas Burgiel, Aimee Delach and William Carroll Muffett, 'Invasive Species, Agriculture and Trade: Case Studies from the NAFTA Context'. (Paper presented at the Second North American Symposium on Assessing the Environmental Effects of Trade, Mexico City, 25-26, March, 2003) 8.

measures “to protect animal or plant life within the territory of the member”, and measures to “prevent or limit other damage within the territory of the Member from the entry, establishment or spread of pests”.¹⁹⁴ In *European Communities – Measures Affecting the Approval and Marketing of Biotech Products (Biotech case)*¹⁹⁵ the Appellate Body gave a very wide meaning to an “SPS measure”¹⁹⁶ so that quarantine measures of all description are adjudicated within the SPSA. However, the question of transboundary and extraterritorial issues was not decided in that case.

The phrase “within the territory of the member” is open to at least three interpretations. First, it could be understood as indicating that a measure is not a proper SPS measure, unless the object of protection is located within the territory of the member; second, it could be understood that a measure is an SPS measure, whenever the measure is implemented within the territory of the member enacting the law, irrespective of the location of the object of protection; and, third, the phrase could be interpreted as a limiting factor to the jurisdiction of the SPSA. In this latter case, it would mean that the SPSA only regulates measures where the object of protection is located within the territory of the member enacting the law, and otherwise the validity of the law is determined by a different method, such as GATT.

The three interpretations represent vastly different understandings of the place of transboundary issues and extraterritoriality within the WTO. The first interpretation invalidates the measure out of hand. The second and third interpretations do not automatically invalidate the measure, but still require the measure to be validated pursuant to the WTO.

¹⁹⁴ SPSA, Annex 1 Definitions paragraph 1 (d).

¹⁹⁵ *European Communities – Measures Affecting the Approval and Marketing of Biotech Products* WTO Doc WT/DS/291, WT/DS/292 and WT/DS/293 (*Biotech case*) (Report of the Panel, 2006) paragraph 7.158.

¹⁹⁶ *Ibid*; see also discussion in section 4.3.4 of Chapter 4 of this study.

In the second case, the measure would be adjudicated upon the basis of the SPSA. This represents a real likelihood that the measure would be declared invalid. To start with, international standards so far accepted under the SPSA do not address the rights or obligations of one state to take into account invasive species that could spread from their territory into the territory of other states.¹⁹⁷ While the OIE¹⁹⁸ and the IPPC are concerned that pests and diseases do not spread between jurisdictions,¹⁹⁹ neither organization has yet developed standards that deal with broader transboundary issues. Standards generally issued by the 1997 IPPC in pest risk analysis, for example, do not oblige a state to consider impacts on another state when carrying out a risk assessment.²⁰⁰

In addition, it is not clear whether extraterritorial protection of biodiversity is a valid consideration to be taken into account in setting an ALOP. Quarantine measures must not exceed the ALOP;²⁰¹ and if transboundary impacts cannot be incorporated into the ALOP, neither can they be reflected in measures. The reverse is also the case, so that, where measures are unable to be enacted that take into account transboundary concerns, it also means that transboundary issues cannot be incorporated in the ALOP. Overall, these points indicate that, at present, extraterritorial concerns are most unlikely to be valid considerations pursuant to the SPSA.

¹⁹⁷ Where two states cooperate it is, of course, unlikely that they will commence action against each other in the WTO. Their actions, however, could impact on the international trading rights of third parties. See further discussion in section 7.1.6 of Chapter 7 of this study.

¹⁹⁸ See for example, OIE *Aquatic Animal Health Code 2007* 10th Edition OIE Paris 2007 and OIE *Terrestrial Animal Health Code* above n 11.

¹⁹⁹ 1997 IPPC, Articles IV, V and VII.

²⁰⁰ CBD 'Invasive Alien Species: Comprehensive Review on the Efficacy of Existing Measures for their Prevention, Early Detection, Eradication and Control' UNEP/CBD/SBSTTA/6/7(20 December 2000) paragraph 42; Note by the Executive Secretary, 'Invasive Alien Species, A Review of the Efficiency and Efficacy of Existing Legal Instruments Applicable to Invasive Alien Species' UNEP/CBD/SBSTTA/6/INF/5 (26 February 2001) paragraph 87.

²⁰¹ SPSA, Article 5.6; *Australia – Measures Affecting Importation of Salmon* (Australia – Salmon) WTO Doc WT/DS/18/AB/R (Report of the Appellate Body, 1998). paragraph 200.

The third interpretation is based on the premise that the SPSA does not concern itself with extraterritorial matters and that such measures may be governed by the article XX exceptions to GATT; and in particular Article XX(g).²⁰² Jurisprudence on Article XX(g) indicates that this Article is open to measures with transboundary and extraterritorial objectives, as long as states first try to collaborate and cooperate.²⁰³ This approach is consistent with customary international environmental law obligations to prevent reduce and control environmental harm, as well as the duty to cooperate.²⁰⁴ Moreover, the provisions of Article XX(g) GATT are not incompatible with Principle 3 of the Ecosystem Approach (CBD) and Guiding Principle 4 of the CBD Guiding Principles.

It appears that while transboundary and extraterritorial concerns are important to the regulation of IAS, these concerns rest on uncertain footings within the WTO. In addition, while the inclusion of transboundary and extraterritorial concerns are more likely to be upheld under GATT the way forward appears to be based on collaboration and cooperation under the auspices of international law.

6.3 CONCLUSION

There are many points of similarity between the SPSA and the CBD Guiding Principles that states can draw on when designing and implementing their quarantine regimes to protect biodiversity from IAS.

²⁰² See discussion in section 4.2.2 of Chapter 4 of this study.

²⁰³ Early decisions involving Article XX(g) took a conservative approach to the question of extraterritoriality. See *United States – Restrictions on Imports of Tuna 1991 (Tuna I)* Report of the Panel DS21/R paragraph 5.31. However, this stance has been mitigated somewhat by later trade decisions, notably in *United States – Import Prohibition of Certain Shrimp and Shrimp Products* WTO Doc WT/DS/58/AB/R (Appellate Body Report, 1998), at paragraph 133, where the Appellate Body did not reject measures out of hand merely because they had an extraterritorial component. See Discussion Bradley J Condon ‘Multilateral Environmental Agreements and the WTO: Is the Sky Really Falling?’ (2001-2002) 9 *Tulsa Journal of Comparative and International Law* 533,540-5; Bradley J Condon ‘GATT Article XX and Proximity of Interest: Determining the Subject Matter of Paragraphs b and g’ (2004) 9 *University of California Los Angeles Journal of International Law and Foreign Affairs* 137.

²⁰⁴ See discussion in section 2.1.4 of Chapter 2 of this study.

Common elements, for example, include the use of evaluations to determine whether species are potential IAS and the use of scientific evidence as part of risk assessment. However, there are also substantial variations in the goals and objectives of the CBD Guiding Principles and the SPSA that make the design and implementation of quarantine regulation significantly different for each regime.

Consequently, states that attempt to incorporate into their evaluation processes matters specified by the CBD Guiding Principles, such as the allocation of the burden of proof on an introducer, the implementation of the precautionary principle and Ecosystem Approach (CBD), and the inclusion of transboundary issues face the real likelihood that that their actions will breach the SPSA. Moreover, the overall approach of the SPSA and its focus on science does not readily admit the inclusion of social and policy concerns.

From an environmental perspective, the aim should be to protect *biodiversity* from the deleterious impacts of IAS; yet the international trade law regime aims to protect *international trade* from SPS measures that the regime itself determines to be an unwarranted restriction on international trade. In essence, what should be regarded as a matter that straddles trade and environmental issues is being treated solely as a trade matter. This has partly occurred due to the parallel development of two major regimes with inadequate cross-sectoral integration.

The resultant fragmentation of jurisdiction means that while quarantine regulation has the potential to bridge the gap between the trade and environmental regimes, at present it is not as effective as it could be. The next Chapter explores these and related issues in the context of improving the protection of biodiversity.

CHAPTER 7

IMPROVING PROTECTION OF BIODIVERSITY FROM IAS

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CHAPTER 7

IMPROVING PROTECTION OF BIODIVERSITY FROM IAS

7.0 INTRODUCTION

The study thus far has identified a number of problems with respect to the regulation of invasive alien species (IAS) that have hampered the development of a strong regime to protect biodiversity. These problems partly stem from lack of political will and the want of resources on the part of states that leads to inadequate regulation of IAS. Difficulties at the domestic level are further complicated by lack of appropriate guidance at the international level. In the latter case, a very real deficiency stems from the lack of integrated cross-sectoral approaches. This means that provisions in instruments, such as the Guiding Principles for the Prevention, Introduction and Mitigation of Impacts of Alien Species that Threaten Ecosystems, Habitats or Species (CBD Guiding Principles) and provisions in instruments, such as, those found in the World Trade Organization (WTO), provide states with conflicting rights and obligations when designing and implementing measures to combat invasive alien species.

This Chapter examines ways of improving the protection of biodiversity from IAS to provide broader support for domestic measures, and in particular, quarantine measures. The discussion commences with one suggestion – the adoption of a protocol to the Convention on Biological Diversity (CBD) that specifically targets IAS. While the extent of political support for the negotiation of such a protocol is not clear, the proposal is advanced on the premise that regulation of IAS requires more normative

support to lend substance to the framework provisions of article 8(h) of the CBD.¹

Yet, even if an IAS protocol were to be negotiated and adopted, it would not necessarily resolve underlying policy conflicts that characterize the relationship of the environmental law regime with the international trade law regime. Consequently, while an IAS protocol would represent a substantive agreement reached by states on the question of IAS, the considerable links between trade and the introduction of IAS mean that the efficacy of the protocol would at least partly depend on the interpretation and interrelation of the two regimes.

Therefore, an alternative avenue for improvement is proposed using existing institutions and processes found in international standards accepted by the WTO. This represents a way of integrating environmental, quarantine and trade matters in a cooperative manner. The suggestion is posited on the basis that states have the capacity to participate in standard-setting processes and implement adopted standards. States, therefore, need to have appropriate resources at their disposal for designing and implementing quarantine regimes that incorporate the protection of biodiversity. The chapter concludes with a discussion on capacity-building and a proposal for garnering financial resources based on the Australian levy scheme.

7.1 STRENGTHENING THE PROTECTION OF BIODIVERSITY

7.1.1 A Protocol to the Convention on Biological Diversity?

This study has argued that while states generally put effort into reducing the impacts of IAS, the current IAS regime does not adequately protect biodiversity.² Measures have largely been implemented in an uneven

¹ See discussion in section 2.2.5 of Chapter 2 of this study.

² See for example discussion in section 2.4 of Chapter 2 and Chapter 6 generally of this study.

manner, with the greatest endeavours targeting resources towards the protection of agriculture and farming interests.³ The idea of adopting a protocol to the Convention on Biological Diversity to strengthen IAS regulation is not new;⁴ it is seen as one way of providing overarching obligations that can bring a sense of cohesion to the piecemeal and inconsistent nature of the current regime.⁵ A protocol would represent an attempt at an international solution to the global problem of IAS and would seem to be an essential foundation for an effective regulatory regime. From a practical point of view, lack of measures, or weak measures in some states, may undermine stronger measures in other states.⁶ A binding treaty with respect to IAS might be seen as one way of providing minimum baselines for harmonization of quarantine measures.

At present, the non-binding CBD Guiding Principles is the most comprehensive instrument to deal with IAS that threaten biodiversity. Not only do the Principles apply to all IAS that threaten biodiversity but the Principles also incorporate essential environmental elements, such as the precautionary principle and the Ecosystem Approach (CBD).⁷ Importantly, the CBD Guiding Principles emphasise prevention and the use of risk analysis in environmental impact assessment to evaluate species and pathways for their potential to introduce IAS. Although states party to the CBD should be using the Principles as the foundation for the design of national IAS regimes, State practice indicates that the principles are not being used as intended.⁸

³ Ibid.

⁴ See generally Lyle Glowka and Cyril de Klemm, 'International Instrument, Processes and Non-indigenous Species Introductions – Is a Protocol Necessary?' [1996] *Environmental Policy and Law* 247.

⁵ See discussion in section 2.2.4 of Chapter 2 of this study.

⁶ See discussion in Section 3.2.2 of Chapter 3 of this study and Section 5.2.2 of Chapter 5 of this study, the latter in particular with respect to the draft IRA conducted by Biosecurity Australia 'Importation of Fresh Bananas from the Philippines Draft IRA Report February 2004' Biosecurity Australia DAFF (2004). Available <http://www.daffa.gov.au/data/assets/pdf_file/22866/banana_rev_draft.pdf> (April 2007).

⁷ This refers to the ecosystem approach as adopted by the Fifth Meeting of the Conference of the Parties to the CBD in decision V/6 dated 22 June 2000 at 103 UNEP/CBD/COP/5/23 (22 June 2000).

⁸ See discussion in Section 2.4 of Chapter 2 of this study.

A number of reasons have been ventured for the seeming lack of appropriate use, including: inadequate political will,⁹ insufficient resources,¹⁰ and the difficulties that states grapple with in implementing the Principles in the face of a pre-existing and somewhat contradictory international trade law regime that covers similar ground.. The adoption of a Protocol incorporating the Guiding Principles would certainly give binding force to the Principles. However, the question is whether a binding Protocol would make the implementation of the Principles any more effective. This question raises issues common to all situations where a multilateral environmental agreement is adopted that involves trade restraints.

7.1.2 The Preference for Multilateral Environmental Agreements

Multilateral environmental agreements or MEAs are international agreements negotiated to achieve environmental objectives. In the context of the trade and environment debate¹¹ MEAs often provide for a range of

⁹ See discussion in Section 1.3.1 of Chapter 1 and Section 5.4 of Chapter 5 of this study.

¹⁰ See discussion in Section 2.4 and Table 8 of Chapter 2 of this study.

¹¹ See for example: Donald Buckingham Does the World Trade Organization Care about Ecosystem Health? The case of Trade in Agricultural Products (1998) 4 *Ecosystem Health* 92; M Cadeddu 'Turtles in the Soup? An analysis of the GATT Challenge to the United States Endangered Species Act Section 609 Shrimp Harvesting Nation Certification Program for the Conservation of Sea Turtles' (1998) 11 *The Georgetown International Environmental Law Review* 179; Steve Charnovitz 'Supervision of Health and Biosafety Regulation by World Trade Rules' (1999-2000) 13 *Tulane Environmental Law Journal* 271; Laurence Boisson de Charzournes and Makane Mbengue 'GMOs and Trade: Issues at Stake in the EC Biotech Dispute' (2004) 13 (3) *Review of European Community & International Environmental Law* 289; M Cooper and A Rosser 'International Regulation of Wildlife Trade: Relevant Legislation and Organizations' (2002) 1 *Scientific and Technical Review Office International des Epizooties* 103; T Cors 'Biosafety and international trade: conflict or convergence?' (2000) 2 *International Journal of Biotechnology* 27; Jeffrey L Dunoff 'Institutional Misfits: the GATT, the ICJ and Trade-Environment Disputes' (1994) 15 *Michigan Journal of International Law* 1043; Alexandra González-Calatayud and Gabrielle Marceau 'The Relationship Between the Dispute-Settlement Mechanisms of MEAs and those of the WTO' (2002) 11 (3) *Review of European Community & International Environmental Law* 275; Robert Howse 'The Appellate Body Rulings in the Shrimp/Turtle Case: A New Legal Baseline for the Trade and Environment Debate' (2002) 27 *Columbia Journal of Environmental Law* 491; Richard J McLaughlin 'UNCLOS and the Demise of the United States' Use of Trade Sanctions to Protect Dolphins, Sea Turtles Whales and Other International Marine Living Resources' (1994) 21 *Ecology Law Quarterly* 1; Marceil Yeater and Juan Vasquez 'Demystifying the Relationship Between CITES and the WTO' (2001) 10 (3) *Review of European Community & International Environmental Law* 271; Daniel Esty *Greening the GATT: Trade, Environment and the Future* Institute for International Economics, Washington DC (1994); Kenneth Ewing and Richard G Tarasofsky *Trade and Environment Agenda Survey of Major Issues and Proposals* IUCN Environmental Law

measures that are more trade-restrictive than permitted by trade instruments. This indicates that in some circumstances states are willing to negotiate treaties subordinating free trade to the protection of the environment. Examples of instruments providing for outright trade restraints include the 1973 Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) 1973,¹² the Montreal Protocol on Substances that Deplete the Ozone Layer (Montreal Protocol) 1987 to the Vienna Convention for the Protection of the Ozone Layer 1985¹³ and the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal, (Basel Convention) 1989.¹⁴

MEAs also represent a means of cooperation amongst states to achieve environmental objectives. Cooperation is of course a keystone of international law and references to its desirability are found in numerous international environmental instruments, including the Rio Declaration,¹⁵ the Convention on Biological Diversity, and the 2000 Cartagena Protocol on Biosafety to the Convention on Biological Diversity (Cartagena

Centre, Bonn (1997). Available at www.iucn.org/themes/law/elp-publications_trade.pdf ; Fiona Macmillan, *WTO and the Environment* Sweet and Maxwell London (2001).

¹² 1973 *Convention on International Trade in Endangered Species of Wild Fauna and Flora* (CITES) adopted 3 March 1973, [1976] ATS 29 (entered into force 1 July 1975). As at November 2007 CITES had 172 parties. Articles VIII Articles III, IV and V regulate trade in listed species. See also article II(1) that refers to species listed in appendix I as those species that are in danger of extinction and which therefore must be subject to 'particularly strict regulation in order not to endanger further their survival.'

¹³ 1987 *Montreal Protocol on Substances that Deplete the Ozone Layer* (Montreal Protocol) to the Vienna Convention for the Protection of the Ozone Layer 1985 adopted 16 September 1987, [1989] ATS 18 (entered into force 1 January 1989). As at November 2007 the *Montreal Protocol* had 192 parties. Article 4 of the Protocol deals with control of trade with non-parties while article 4A deals with control of trade between parties to the protocol.

¹⁴ 1989 *Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal*, (Basel Convention), adopted 22 March 1989, [1992] ATS 7 (entered into force on 5 May 1992). As at November 2007 the convention had 170 parties. The Convention deals with transboundary movement of hazardous wastes and therefore has potential impact on trade in the disposal of these products. The agreement is underpinned by obligations such as that found in article 4(2)(g) to prevent the import of hazardous wastes and other wastes if it has reason to believe that the wastes in question will not be managed in an environmentally sound manner; and article 4(5) that prohibits hazardous wastes to be exported to a non-party or imported from a non-party.

¹⁵ 1992 Rio Declaration (1992) 31 ILM 874, Article 12.

Protocol).¹⁶ Specifically, with respect to IAS, the CBD Guiding Principles provide that cooperative efforts may include the negotiation of MEAs targeting invasive alien species and recommend that:

Agreements between countries, on a bilateral or multilateral basis, should be developed and used to regulate trade in certain alien species, with a focus on particularly damaging invasive species;¹⁷

States of course, are always free to negotiate a treaty, even in the absence of the CBD Guiding Principles. However, the important point is that while the CBD Guiding Principles do not themselves tackle the substantive relationship between trade and IAS, they do encourage states to formulate their own agreements, for the purposes of protecting biodiversity.

The negotiation of MEAs is also favoured within the WTO as a means of resolving environmentally-related trade disputes,¹⁸ and particularly by the Committee on Trade and Environment (CTE)¹⁹ of the WTO. The CTE was established to identify and clarify the relationship between environmental and trade measures. To date, the committee has issued 12 reports,²⁰ with

¹⁶ 2000 *Cartagena Protocol on Biosafety to the Convention on Biological Diversity* (Cartagena Protocol), adopted 29 January 2001, 39 ILM 1027 articles 14 (entered into force 11 September 2003). As at November 2007, 143 instruments of ratification, or accession, have been deposited with the UN Secretary-General.

¹⁷ CBD Guiding Principles, Guiding Principle 4(b).

¹⁸ In reality, GATT and WTO jurisprudence favours bilateral and multilateral agreements with unilateral environmental measures having only been upheld in limited circumstances. See for example *United States – Import Prohibition of Certain Shrimp and Shrimp Products - Recourse to Article 21.5 by Malaysia (US – Shrimp Article 21.5)* WTO Doc WT/DS58/RW (Appellate Body 2001), paragraph 137 where the Appellate Body said that unilateral measures are not automatically incapable of being justified pursuant to the Article XX exceptions, especially where those measures relate to the adoption of policies equivalent to those applying in the importing members territory that have been recognized as important and legitimate.

¹⁹ The Committee on Trade and Environment (CTE) was established pursuant to a decision on trade and environment made as part of the 1994 Marrakech Agreement establishing the WTO. Membership to the Committee is available to all WTO members. Part of the mandate of the CTE is to examine the relationship between MEAs and trade. The CTE reports to the WTO's General Council. The General Council is the highest decision-making organ of the WTO. It is comprised of all member governments and acts in a number of capacities including the ministerial conferences every two years and the Dispute Settlement body. See explanation on web site of the WTO: <http://www.wto.org/english/thewto_e/gcounc_e/gcounc_e.htm> (March 2006).

²⁰ Report of the Committee on Trade and Environment WTO Doc WT/CTE/1 (1996), Report of the Committee on Trade and Environment WTO Doc WT/CTE/2 (1997), Report of the Committee on Trade and Environment WTO Doc WT/CTE/3 (1998), Report of the Committee on Trade and Environment WTO Doc WT/CTE/4 (1999),

the first and most detailed report published in 1996 confirming that “MEAs based on international consensus are viewed by the international community as the best way of coordinating policy action to tackle global and transboundary environmental problems cooperatively.”²¹ This statement was subsequently cited with approval by the Appellate Body in *United States — Import Prohibition of Certain Shrimp and Shrimp Products (US-Shrimp)*;²² a case that itself strongly favoured the use of MEAs over unilateral actions.²³ However, while the environmental and trade regimes are in agreement on the use of MEAs, this does not automatically settle the role of MEAs either with respect to their content regarding IAS or the limits of MEAs within the international trade law regime. In particular, it does not conclusively predetermine the supremacy of trade restrictions found in MEAs. A great deal depends on the forum that adjudicates upon the validity of trade restrictions and the applicable law. Where MEAs and the rules of international trade intersect, the validity of trade restrictions in MEAS often depends, in a practical and

Report of the Committee on Trade and Environment WTO Doc WT/CTE/5 (2000), Report of the Committee on Trade and Environment WT/CTE/6 (2001), Report of the Committee on Trade and Environment WTO Doc WT/CTE/7 (2002), Committee on Trade and Environment, Report of the Committee on Trade and Environment to the General Council WTO Doc WT/CTE/9 (2003), Committee on Trade and Environment - Report to the 5th Session of the Ministerial Conference in Cancún of the Doha Ministerial Declaration WTO Doc WT/CTE/8 (2003) paragraphs 32 and 33, Report of the Committee on Trade and Environment WTO Doc WT/CTE/10 (2003), Committee on Trade and Environment, Report of the Committee on Trade and Environment WTO Doc WT/CTE/11 (2004), Report of the Committee on Trade and Environment WTO Doc WT/CTE/12 (2005). Available from <<http://www.docsonline.wto.org>> (November 2007) See short discussion of the role of the CTE in Olivette Rivera-Torres ‘The Biosafety Protocol and the WTO’ (2003) 26 *Boston College International and Comparative Law Review* 263, 265.

²¹ Committee on Trade and Environment ‘Report (1996) of the Committee on Trade and Environment’ WTO Doc WT/CTE/W/40 (12 November 1996).

²² *United States — Import Prohibition of Certain Shrimp and Shrimp Products* WTO Doc WT/DS/58/AB/R (Appellate Body Report, 1998) paragraph 168.

²³ In that case, for instance, the Appellate Body, at paragraph 168, took note of multilateral agreements, such as the Convention on the Conservation of Migratory Species (the Bonn Convention), to find that sea turtles are an endangered species in need of protection. 1979 *Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention)*, adopted on 23 June 1979 [1991] ATS 32, Articles II, III(4) and V(4) (entered into force 1 November 1983). As at November 2007 the Convention had 104 parties. The approach of the Appellate Body is also consistent with previous GATT jurisprudence on determinations of Article XX(g) in cases such as *United States — Restrictions on Imports of Tuna (Tuna II)*, at paragraphs 5.26-5.27 and 5.38-5.39 DS29/R (panel report circulated June 1994, but not adopted). See also discussion Bradley J Condon ‘Multilateral Environmental Agreements and the WTO: Is the Sky Really Falling?’ (2001-2002) 9 *Tulsa Journal of Comparative and International Law* 533, 547

legal sense, on their consistency with WTO principles.²⁴ The arbiters of this consistency are primarily the Panel and Appellate Body of the WTO. This makes the interpretation of environmental instruments by the WTO a crucial matter.

7.1.3 Interpreting the MEA

Three environmental instruments important to the regulation of IAS have been selected for discussion, with respect to the interpretation of MEAs: the CBD, the Cartagena Protocol and the CBD Guiding Principles. The CBD contains Article 8(h), an overarching provision calling on the parties to prevent the introduction of or eradicate those alien species that threaten ecosystems, habitats or species;²⁵ the Cartagena Protocol deals with a particular type of alien species, the genetically modified one;²⁶ and, the CBD Guiding Principles provide substance to the framework provisions of Article 8(h).²⁷ Although the CBD Guiding Principles are not binding, the Principles are examined on the basis that if an IAS Protocol to the CBD were to be adopted, the provisions of the CBD Guiding Principles would provide the basis of the Protocol.

One important issue is determining which instrument takes precedence where the provisions of MEAs and the WTO conflict. In this respect, the wording and membership of treaties can provide important signposts. Article 30 of the Vienna Convention on the Law of Treaties²⁸ (the Vienna Convention) states:

2. When a treaty specifies that it is subject to, or that it is not to be considered as incompatible with, an earlier or later treaty, the provisions of that other treaty prevail.

²⁴ See discussion towards the end of section 5.1.2 on the prohibitive nature of the application of the SPSA.

²⁵ See discussion in section 2.2.5 of Chapter 2 of this study.

²⁶ See discussion in section 2.2.6 of Chapter 2 of this study.

²⁷ See discussion in sections 2.2.5 and 2.3 of Chapter 2 of this study.

²⁸ 1969 *Vienna Convention on the Law of Treaties*, adopted 22 May 1969, [1974] ATS 2 (entered into force 27 January 1980). As at November 2007, the treaty had been ratified by 108 states, although in any event many of its provisions represent customary international law and, consequently, are binding even in the absence of ratification.

3. When all the parties to the earlier treaty are parties also to the later treaty but the earlier treaty is not terminated or suspended in operation under article 59, the earlier treaty applies to the extent that its provisions are compatible with those of the later treaty.
4. When the parties to the later treaty do not include all the parties to the earlier one:
 - (a) as between two parties, each of which is a party to both treaties, the same rule applies as in paragraph 3;
 - (b) as between a party to both treaties and a party to only one of the treaties, the treaty to which both are parties governs their mutual rights and obligations.

With respect to the wording of treaties, a significant issue is whether one treaty is subordinated to the other. Often, this may be effected by the use of articles known as “savings provisions”.

7.1.4 Savings Provisions

A savings provision is a provision in a later instrument that preserves or “saves” an earlier instrument from automatic subordination by an inconsistent later instrument.²⁹ In subordinating one treaty to another, savings provisions preserve a type of hierarchical treaty pecking order. An example of a savings provision can be found in Article 22 of the CBD that specifies:

The provisions of this Convention shall not affect the rights and obligations of any Contracting Party deriving from any existing international agreement, except where the exercise of those rights and obligations would cause a serious damage or threat to biological diversity³⁰

Although found in the preamble, rather than an Article, the wording of the Cartagena Protocol expresses a similar sentiment and ambiguously states:

Emphasizing that this Protocol shall not be interpreted as implying a change in the rights and obligations of a Party under any existing international agreements,

²⁹ Sabrina Safrin, ‘Treaties in Collision? The Biosafety Protocol and the World Trade Organization Agreements’ (2002) 96 *The American Journal of International Law* 606, 613.

³⁰ CBD, Article 22(1). This is not to suggest that the CBD is subordinated to the WTO by virtue of this provision. The CBD entered into force before the WTO. Hence, the WTO as the later treaty would take precedence for members of the CBD who are also members of the WTO.

Understanding that the above recital is not intended to subordinate this Protocol to other international agreements,³¹

In the context of MEAs and the WTO, the use of savings provisions is part of a greater trend towards what commentators have identified as the “chilling effect” of the WTO.³² Above all, it means that trade restrictions in MEAs are “less forceful and extensive” than they could be³³ with the spectre of the WTO acting as a type of self-censoring in the negotiation of MEAs.³⁴

The CBD Guiding Principles do not contain a savings provision. Indeed, they do not deal with the relationship of IAS to trade in any concrete way. The preamble recognizes that international trade increasingly represents a threat to biodiversity³⁵ and that the relationship of trade and IAS needs to be addressed by international cooperation.³⁶ Yet, the Guiding Principles lack detail on how this should be achieved. At present, this deficiency has not created anything more than potential problems; for the CBD Guiding Principles are not binding, so they would not in any case override the provisions of the WTO. However, were the principles to be adopted as a protocol, the relationship between the WTO and the protocol could become contentious and a savings provision might well be on the agenda.³⁷

³¹ See also Article 2(4) of the Cartagena Protocol that permits parties to take more protective measures than provided by the protocol, as long as ‘such action is ...in accordance with that Party's other obligations under international law’. See discussion Robyn Eckersley, ‘The Big Chill: the WTO and Multilateral Environmental Agreements’ (2004) 4 (2) *Global Environmental Politics* 24, 41.

³² Robyn Eckersley, above n 31, 41; see also Ken Conca, ‘The World Trade and the Undermining of Global Environmental Governance’ (2000) 7 *Review of International Political Economy* 484.

³³ Robyn Eckersley, above n 31, 41.

³⁴ Ibid, 26.

³⁵ CBD Guiding Principles, Paragraph II of the preamble to decision VI/23 of the Conference of the Parties above n 7.

³⁶ CBD Guiding Principles, Paragraphs III(15)(b) and III(16) of the preamble to decision VI/23 of the Conference of the Parties, and Guiding Principle 9 Above n 7.

³⁷ Points of conflict could potentially occur with respect to matters, such as the precautionary principle and the inclusion of social and policy concerns in the evaluation processes for IAS. See discussion in Sections 6.1 and 6.2.3 of Chapter 6 of this study..

At the adoption of the CBD Guiding Principles, for example, Australia was concerned that the wording of Guiding Principle one, relating to the precautionary principle might conflict with the science-based approach of the SPSA.³⁸ Moreover, additional points of conflict were identified by the inclusion of “social” costs and impacts in Guiding Principles two and five.³⁹ Australia was supported in its concerns by other states, including Argentina, Canada and the United States.⁴⁰ The upshot of these objections is that the CBD Guiding Principles carry a notation that they were adopted in the face of a formal objection by one representative, which was supported by a number of others. In view of these concerns and the closeness of the links between quarantine measures and restrictions on international trade,⁴¹ there is a possibility that states would settle an IAS protocol to include either a savings provision in the style of the CBD, or a preambular notation, as in the Cartagena Protocol. Depending on the content of the savings provision, it may either represent a means of achieving compromise between trade and biodiversity concerns,⁴² or it may exacerbate existing incompatibilities between the environmental regime and the SPSA.⁴³

7.1.5 The Doctrine of *lex specialis*

An associated issue stems from whether an IAS protocol, as a specialized agreement, would take precedence over the more generalized WTO. Article 31 of the Vienna Convention provides that treaties should be interpreted in accordance with the ordinary meaning of the words in the light of the treaty’s object and purpose. Interpretive aids, such as the

³⁸ The *Agreement on the Application of Sanitary and Phytosanitary Measures* (SPSA) [1995] ATS No 8, 14; Report of the Sixth Meeting of the Conference of the Parties to the Convention on Biological Diversity May 2002. UNEP/CBD/COP/6/20 (23 September 2002) paragraphs 295 and 321.

³⁹ Guiding Principles 2 and 5 of the CBD Guiding Principles deal respectively with the three-staged hierarchical approach and research and monitoring.

⁴⁰ Report of the Sixth Meeting of the Conference of the Parties to the Convention on Biological Diversity May 2002 Paragraphs 294-324. Above n 38.

⁴¹ See discussion in Section 3.5.2 of Chapter 3 of this study and Section 5.1 of Chapter 5 of this study.

⁴² Gilbert Winham, ‘International Regime Conflict in Trade and Environment: the Biosafety Protocol and the WTO’ (2003) 2 (2) *World Trade Review* 131, 142-3.

⁴³ See for example sections 6.2.3, 6.2.4 and 6.2.5 of Chapter 6 of this study.

maxim *lex specialis derogat lege generali* (*lex specialis*),⁴⁴ or that a more specialized law will prevail over a general law, can assist.⁴⁵ However, the application of the maxim in trade disputes largely depends on how it is perceived in the WTO and in particular on the Understanding on Rules and Procedures Governing the Settlement of Disputes (DSU).⁴⁶

Article 3(2) of the DSU provides that

The dispute settlement system of the WTO ... (may) clarify the existing provisions of ... (the WTO) agreements in accordance with customary rules of interpretation of public international law. Recommendations and rulings of the DSB cannot add to or diminish the rights and obligations provided in the covered agreements.

The phrase “public international law” is wider than “GATT” law, or “WTO” law. Consequently, treaty law from instruments such as the Vienna Convention and customary rules of interpretation of international law are available to panels and appellate bodies in the determination of WTO disputes.⁴⁷ However, as Pauwelyn has pointed out, it is not clear whether the doctrine of *lex specialis* is part of the customary rules of interpretation of public international law.⁴⁸ In addition, the application of

⁴⁴ This precept states that a specialized law will prevail over a more general law; International Law Commission ‘Fragmentation of International Law: Difficulties Arising from the Diversification and Expansion of International Law’ UN General Assembly A/CN.4/L.682 April (2006) paragraphs 56-122; see also the doctrine of *lex posterior derogat lege priori* and discussion in Joost Pauwelyn, *Conflict of Norms in Public International Law: How WTO Law Relates to other Rules of International Law* Cambridge University Press (2003), 385; Chris Wold, ‘Multilateral Environmental Agreements and the GATT: Conflict and Resolution?’ (1996) 26 *Environmental Law* 841, 910-913; P Morici *Reconciling Trade and the Environment in the World Trade Organization* Economic Strategy Institute Washington DC (2002) 87.

⁴⁵ J Pauwelyn, above n 44, 385; P Morici above n 44, 87.

⁴⁶ The Understanding on Rules and Procedures Governing the Settlement of Disputes [1995] ATS no 8. The DSU is the main WTO document dealing with how disputes are resolved.

⁴⁷ See discussion in J Pauwelyn ‘The Role of Public International Law in the WTO: How Far Can We Go?’ (2001) 95 *The American Journal of International Law* 535 at 560; B Condon, above n 23, 565; Duncan Brack and Kevin Gray, *Multilateral Environmental Agreements and the WTO* Royal Institute of International Affairs Sustainable Development Programme Report (2003), 25; Kenneth Ewing and Richard G Tarasofsky, above n 11, 40, for a different perspective see J Patrick Kelly ‘The Seduction of the Appellate Body: Shrimp/Sea Turtle I and II and the Proper Role of States in WTO Governance’ (2005) 38 *Cornell International Law Journal* 459, 447-82.

⁴⁸ Joost Pauwelyn *Conflict of Norms in Public International Law: How WTO Law Relates to other Rules of International Law* above n 44, 385; Nevertheless, the WTO has referred to the maxim on a number of occasions. See for example *European Communities*

the doctrine is triggered by evidence of a conflict between treaty provisions. In *Indonesia – Certain Measures affecting the Automobile Industry Report of the Panel (Indonesia-Automobiles)*⁴⁹ the Panel held that a conflict does not automatically exist merely because two treaties deal with the same subject matter, but from differing perspectives, or because one treaty is more far-reaching than the other.⁵⁰ This means that, where it is possible to interpret two treaties as complementing each other, or to interpret each as having a separate sphere of operation, there will be no conflict and no need for one treaty to take precedence over another.⁵¹

Although this approach takes a narrow view of what is meant by “conflict”, it does not necessarily create difficulties where it allows consistent, albeit differing, treaty obligations to remain intact. Regimes may be designed to serve divergent purposes and where a tribunal allows both sets of obligations to stand, it represents an opportunity to “balance the objectives of both laws”.⁵² However, where it is possible to comply with both sets of laws, but in so doing the results are detrimental to the objectives of one regime, a finding that there is no conflict may be artificial. Rather than representing a balance, the outcome may, in fact, represent one regime prevailing over the other.

In the context of IAS, the CBD Guiding Principles provide for a number of recommendations that guide the design of quarantine regimes towards preventing introductions. These include Guiding Principle one that

- *Regime for the Importation, European Communities – Regime for the Importation, Sale and Distribution of Bananas (EC – Bananas III)* WTO Doc WT/DS27/AB/R, (Report of the Appellate Body, 1997) paragraph 7.75; *Indonesia – Certain Measures affecting the Automobile Industry Report of the Panel (Indonesia-Automobiles)* WTO Doc WT/DS54/R, WT/DS55/R, WT/DS59/R, WT/DS64/R. (Report of the Panel 1998) paragraphs 14.26 and 14.28.

⁴⁹ *Indonesia – Automobiles* paragraphs 14.26 and 14.28; *European Communities - Regime for the Importation, Sale and Distribution of Bananas - Complaint by the United States* WTO Doc WT/DS27/R/USA (Report of the Panel 1997) paragraph 7.75.

⁵⁰ *Indonesia – Automobiles*, paragraph 14.28. Furthermore, there is a presumption against conflict where separate agreements are concluded by the same parties. *Indonesia – Automobiles*, paragraph 14.28.

⁵¹ *Indonesia – Automobiles*, paragraphs 14.28, 14.29. Also in paragraph 14.49, the panel pointed out that there is a presumption against conflict, where separate agreements are concluded by the same parties and here the SCM and GATT had the same parties.

⁵² P Morici above n 44, 87.

advocates the use of the precautionary approach, Guiding Principle two that recommends a three-staged hierarchical approach to regulation commencing with prevention as well as Guiding Principles ten and eleven that deal with evaluations to prevent deliberate and accidental introductions. In implementing preventative measures, states may impose a range of measures including an outright trade ban, or systems of permits, licensing and treatment.⁵³ Each type of measure hinders the free flow of trade to varying degrees.

In *Japan – Measures Affecting the Importation of Apples, Recourse to Article 21.5 (Japan – Apples 21.5)*, the reader may recall,⁵⁴ Japan imposed quarantine measures such as inspections, treatments and monitoring to prevent the entry of fire blight. The measures fell far short of a trade ban, yet they emphasised prevention in a manner that would have been consistent with the objectives of the CBD Guiding Principles. Nevertheless, the United States successfully argued that the measures unnecessarily hindered trade and hence breached the SPSA.⁵⁵ The success of the argument is especially significant, as it is not known how fire blight was initially introduced from the United States to other parts of the world.⁵⁶ The uncertainty surrounding this circumstance and the devastating impacts of fire blight could arguably trigger an application of the precautionary principle in accordance with Guiding Principle one. Were the *lex specialis* doctrine to be enlivened, it would mean that the

⁵³ See for example measures imposed by Australia in *Australia – Measures Affecting Importation of Salmon* Australia - Recourse to Article 21.5 (Australia – Salmon Article 21.5) WTO Doc WT/DS18/RW (Report of the Panel, 2000); and measures imposed by Japan in *Japan – Measures Affecting the Importation of Apples, Recourse to Article 21.5 (Japan – Apples 21.5)* WTO Doc WT/DS245/RW (report of the Panel, 2005).

⁵⁴ *Japan – Measures Affecting the Importation of Apples, Recourse to Article 21.5* above n 53.

⁵⁵ See discussion in section 4.3.10 of Chapter 4 and section 5.2.4 of Chapter 5 of this study.

⁵⁶ *Japan – Apples 21.5* Panel report, paragraphs 2.5 and 2.6. See Also discussion generally Gavin Goh, ‘Tipping the Apple Cart: The Limits of Science and Law in the SPS Agreement after *Japan – Apples*’ (2006) 40 *Journal of World Trade* 655. See discussion in section 4.3.10 of Chapter 4 of this study.

CBD Guiding Principles, adopted as a protocol, would represent the more specialized and later treaty and would therefore prevail over the SPSA.⁵⁷

However, if a narrower view of “conflict” were taken, a different result might be achieved. It is possible, for example, to argue that scientific evidence can be subject to a risk assessment under both instruments and, therefore, there is no conflict. Article 5.1 of the SPSA, for example, provides for the conduct of a risk assessment, as does Guiding Principle ten. Without a conflict there is no scope to invoke the *lex specialis* doctrine. Yet, as already discussed,⁵⁸ the treatment of inconclusive evidence and whether it should be subject to a risk assessment differs under each regime. Within the WTO, a lack of conclusiveness in the scientific evidence means that measures cannot be maintained.⁵⁹ The same level of inconclusiveness, however, could indeed prompt an application of the precautionary principle under the CBD Guiding Principles. The identical evidence, therefore, would lead to different results, depending on whether a dispute were brought to the WTO, or considered in the light of a protocol based on the CBD Guiding Principles.

Further problems may also stem from the purpose of the risk assessment process. The conduct of a risk assessment, either for the purposes of the CBD Guiding Principles, or the SPSA, does not of itself provide an instance of inherent conflict or inconsistency. A risk assessment can, after all, be conducted for more than one purpose. However, in accordance with the SPSA, risk assessment is used to evaluate both the risk and choice measures. By contrast, under the CBD Guiding Principles, the choice of measures forms part of risk management. Thus, while both instruments encourage the parties to carry out a risk assessment, it is, in reality, a different process under each regime. The danger is that the SPSA may not allow a state to take into account matters such as country choices that can correctly form part of risk management under the CBD Guiding

⁵⁷ This statement assumes that the proposed Protocol would not be subordinated to the WTO by a savings provision.

⁵⁸ See discussion in section 5.2.3 of Chapter 5 of this study.

⁵⁹ Article 2.2 of the SPSA. See discussion in section 5.6.2 of Chapter 5 of this study.

Principles.⁶⁰ It is a situation that represents a case of “competing regulation,” where different regimes with differing rules can both claim jurisdiction⁶¹ and is an aspect of the problem of fragmentation of international law, discussed below in section 7.1.7. The point, however, is that in taking a narrow view of “conflict” the regime that accepts jurisdiction might not acknowledge differences between regimes that might otherwise prevent them from applying their own law in preference to the law of the competing regime.

Overall, the adoption of a protocol dealing with alien species that threaten biodiversity would be worthwhile in helping to crystallize international law on the problem of IAS. However, it is questionable whether states would be prepared to adopt the CBD Guiding Principles as a Protocol if the Protocol would conflict with the WTO.⁶² Moreover, the adoption of a protocol would not necessarily resolve the relationship of the protocol to other treaty regimes. An analogous issue stems from the position of third parties, that is, non-parties to the Protocol and whether treaty law can be enforced against them.

7.1.6 Third Parties

Treaties of course cannot impose obligations on non-parties without their consent.⁶³ However, the operation of treaties may affect the rights of non-parties. In IAS regulation, for example, an important issue potentially stems from whether environmental obligations can be enforced in a way that restricts trade *viz à viz* a non-member of an MEA who is a member of the WTO. This question was explored by the Panel in *European Communities – Measures Affecting the Approval and Marketing of Biotech Products* (the *Biotech* case).⁶⁴ In that case, the EC had argued that

⁶⁰ See discussion in section 6.5 of Chapter 6 of this study.

⁶¹ Gerhard Hafner, ‘Pros and Cons Ensuing from Fragmentation of International Law’ (2004) 25 *Michigan Journal of International Law* 849, 855.

⁶² See, for example, discussion surrounding above n 38-40.

⁶³ Vienna Convention on the Law of Treaties, article 34 and also if treaty provision is part of customary international law, Vienna Convention on the Law of Treaties Article 3.

⁶⁴ *European Communities – Measures Affecting the Approval and Marketing of Biotech Products* WTO Doc WT/DS/291, WT/DS/292 and WT/DS/293 (the *Biotech* case) (Report of the Panel, 2006).

instruments such as the CBD and the Cartagena Protocol were relevant to evaluating parties' obligations under the SPSA.⁶⁵ The Panel, however, pointed out that Article 30(2) of the Vienna Convention specifies that rights and obligations of states are determined by the treaty to which all members belong.⁶⁶ Hence, the Panel was not obliged to take into account either the CBD, or the Cartagena Protocol, because not all parties to the WTO dispute were parties to those treaties. Moreover, the Panel added that while the phrase "any relevant rules of international law" in Article 31(3)(c) of the Vienna Convention was in itself sufficiently broad to take into account treaties and customary international law,⁶⁷ the phrase "applicable in the relations between the parties" served to narrow the focus of Article 31(3)(c) to the parties being "States which have consented to be bound by the treaty which is being interpreted".⁶⁸

The Panel concluded that it was irrelevant that some parties, such as the United States, had signed, but not ratified, the CBD. Although a party that signs a treaty tacitly acknowledges that it intends to comply with the objects and purpose of the treaty,⁶⁹ the Panel considered that the objects and purpose of a treaty cannot be regarded as binding upon parties in the same way as substantive treaty provisions.⁷⁰ This approach ignores the fact that a party signing a treaty "signals its intent to comply with" that treaty.⁷¹ The stance of the Panel was based purely on a technical construal of the SPSA and the Cartagena Protocol that interpreted international law in a very compartmentalized manner.⁷² This is part of a broader problem of international law that emanates from the fragmentation nature of its formation and jurisdiction.

⁶⁵ The *Biotech* case, paragraph 7.52-7.55.

⁶⁶ The *Biotech* case, paragraph 7.66-7.

⁶⁷ The *Biotech* case, paragraph 7.67.

⁶⁸ The *Biotech* case, paragraph 7.68.

⁶⁹ Scott Barrett, 'On the Theory and Diplomacy of Environmental Treaty-Making' (1998) 11 *Environmental and Resource Economics* 317, 321.

⁷⁰ The *Biotech* case, footnote 251 to paragraph 7.74.

⁷¹ Scott Barrett, above n 69, 321.

⁷² For a critique of this approach see International Law Commission 'Fragmentation of International Law: Difficulties Arising from the Diversification and Expansion of International Law' at paragraphs 470-472 UN General Assembly A/CN.4/L.682 April 2006

7.1.7 Fragmentation of Jurisdiction

Fragmentation of jurisdiction in international law is largely a result of the *ad hoc* nature of its creation by states.⁷³ Treaty regimes develop in tandem with each other and provide for overlapping but alternative fora for adjudication of disputes. Consequently, international law is “characterised by fragmentation, or decentralisation” of jurisdiction,⁷⁴ which may occur in both a “procedural and substantive” manner.⁷⁵ The former relates to jurisdictional issues and the latter to inconsistency in the understanding and “application of legal rules”.⁷⁶ The latter, for example, may be illustrated by recalling the differing interpretations and versions of the precautionary principle that are emerging from the international environmental and trade law regimes.⁷⁷ With respect to the former, procedural fragmentation can occur where different treaty regimes both legitimately claim jurisdiction and the outcome of a dispute may depend upon the forum chosen for adjudication.

This type of scenario could occur if a protocol dealing with IAS were to be adopted and the parties to a dispute were parties both to the protocol and to the WTO. Although both treaty systems could claim jurisdiction, an environmentalist might regard the matter as an environmental problem to be resolved pursuant to the protocol; but a trade protagonist might regard the same matter as a trade issue to be resolved in a trade arena.

⁷³ See generally International Law Commission ‘Fragmentation of International Law: Difficulties Arising from the Diversification and Expansion of International Law’ UN General Assembly A/CN.4/L.682 April 2006; Karin Oellers-Frahm, ‘Multiplication of International Courts and Tribunals and Conflicting Jurisdiction – Problems and Possible Solutions’ (2001) 5 *Max Plank Yearbook of United Nations Law*, 67, 72.

⁷⁴ Alan E Boyle, ‘Dispute Settlement and the Law of the Sea Convention: Problems of Fragmentation and Jurisdiction’ (1997) 46 *International and Comparative Law Quarterly* 37, 39; generally Mario Prost and Paul Kingsley Clark, ‘Unity, Diversity and the Fragmentation of International Law: How Much Does the Multiplication of International Organizations Really Matter?’ (2006) 5 *Chinese Journal of International Law* 341.

⁷⁵ Rosemary Rayfuse, ‘The Future of Compulsory Dispute Settlement Under the Law of the Sea Convention’ (2005) 36 *Victoria University of Wellington Law Review* 683, 700.

⁷⁶ *Ibid.*

⁷⁷ See discussion in Section 6.2.3 of Chapter 6 of this study.

Within the WTO, the stance appears to be that while WTO members retain the right to bring disputes to the WTO, if a dispute arises between parties to an MEA over the use of trade measures originating from the MEA, the parties must first try to resolve their dispute by use of the MEA.⁷⁸ Although this stance favours the use of MEAs, it does not dismiss, out of hand, the possibility of the WTO accepting jurisdiction. The DSU, for example, does not deny jurisdiction to the WTO on the grounds that another treaty regime has concurrent jurisdiction. In common with environmental instruments, such as the CBD,⁷⁹ the DSU advocates consultation and negotiation⁸⁰ as the first step towards dispute settlement. The DSU, however, also assigns dispute settlement jurisdiction within the WTO. Article 2 of the DSU sets up an internal Dispute Settlement Body that is comprised of the Panel and Appellate Body. By way of contrast, the CBD does not create a dispute settlement jurisdiction within the CBD, but rather specifies the use of external arbitration,⁸¹ or the International Court of Justice.⁸² Generally speaking, dispute resolution procedures in MEAs place more emphasis on informal processes, such as “country reporting and independent verifications systems”, as well as conciliation and mediation.⁸³ By contrast, disputes arising out of the WTO are more likely to be remitted to a formal dispute resolution process.⁸⁴

By way of example, in the *EU-Chile Swordfish* case, a dispute arose between the EC and Chile concerning fishing by EC members in the South Pacific. The WTO could exercise jurisdiction, because Chile denied the EC access to Chilean ports and this breached articles V and XI GATT,

⁷⁸ See 1996 Report of The Committee On Trade And Environment World Trade WTO Doc WT/CTE/1 (1996) paragraph 178.

⁷⁹ See for example, CBD Article 27(1).

⁸⁰ DSU, Article 4.

⁸¹ CBD, Article 27(3)(a). Annex II Part 1.

⁸² CBD, Article 27(3)(b). The International Court of Justice is the principle judicial organ of the United Nations. It was established pursuant to Articles 92-96 of the Charter of the United Nations. Rules relating to the practice and procedure of the court are found in the Statute of the International Court of Justice which is an annexure to the Charter of the United Nations. The Charter of the United Nations was concluded on 26 June 1945 and entered into force on 24 October 1945. As of November 2007 the United Nations has 192 members.

⁸³ P Morici, above n 44, 37, where the writer points out that this occurs even though many MEAs contain dispute resolution mechanisms.

⁸⁴ Ibid, 27, 28.

which respectively provide for freedom of transit for goods and prohibitions on quotas; while the International Tribunal of the Law of the Sea (ITLOS) could exercise jurisdiction, because the case was alleged to involve breaches *inter alia* of articles 64 and 116-119 of the Law of the Sea Convention (LOSC),⁸⁵ which deals with highly migratory fish stocks. The concurrent jurisdiction exercisable by both the WTO and ITLOS centred on the way that the states presented their cases; hence, the EC sought to have the matter adjudicated by the WTO, and Chile requested dispute resolution by ITLOS. Although the matter was settled by agreement in January 2001 with both the WTO and ITLOS proceedings being suspended,⁸⁶ the case does illustrate the types of problems that may occur where differing regimes may each exercise jurisdiction.⁸⁷

This means that disputes involving trade that also involve environmental issues can potentially be brought within the DSU and decided according to the rules of international trade. Clearly, matters remitted to the DSU must involve trade issues, but they could also involve important environmental issues and the choice of forum will often influence the

⁸⁵ Rosemary Rayfuse, above n 75.

⁸⁶ See summary on Trade and Environment at the WTO: Background document Trade and Environment division World Trade Organization. Page 37 <http://www.wto.org/english/tratop_e/envir_e/envir_backgrnd_e/contents_e.htm> (March 2006); *Chile – Measures Affecting the Transit and Importing of Swordfish* WTO Doc WT/DS193/3, 6 April 2001, WTO Doc WT/DS193/3/Add.1, 9 April 2001; ‘*Case Concerning the Conservation and Sustainable Exploitation of Swordfish Stocks in the South-Eastern Pacific Ocean*’, ITLOS Order 2001/1, 15 March 2001. See discussion Marcos A Orellana, ‘The Swordfish Dispute Between the Eu and Chile at the ITLOS and the WTO’ (2002) 71 *Nordic Journal of International Law* 55, 69-71. The suspension is still in place see *Chile – Measures Affecting the Transit and Importing of Swordfish* WTO Doc WT/DS193/3/Add.2, 17 November 2003; WTO Doc WT/DS193/3/Add.2, 22 December 2005 and WTO Doc WT/DS193/3/Add.2 17 December 2007; and ‘*Case Concerning the Conservation and Sustainable Exploitation of Swordfish Stocks in the South-Eastern Pacific Ocean*’ ITLOS Order 2003/2, 16 December, 2003; ITLOS Order 2005/1, 29 December 2005; ITLOS Order 2007/3, 30 November 2007.

⁸⁷ Karin Oellers-Frahm, above n 73, 86-87. See also the clash involving the sale of African ivory and CITES. Mario Del Baglivo, ‘CITES at the Crossroad: New Ivory Sales and Sleeping Giants’ (2002-2003) 14 *Fordham Environmental Law Journal* 279. Indeed Article 1 of the DSU provides that the rules and procedures of the DSU apply to ‘covered agreements’, which include the SPSA. Given the wide interpretation of an SPS measure, this gives the WTO an extensive jurisdiction with respect to matters relating to IAS. See discussion in section 4.3.4 of this study.

result, because of the different way that the law is interpreted and applied.⁸⁸

This last point is made on the basis that panels and tribunals make their findings autonomously.⁸⁹ Since there are neither obligations to harmonize decisions from the various dispute resolution tribunals,⁹⁰ nor methods for achieving that harmony, the same situation may be interpreted differently with different jurisdictions applying different rules of law. Indeed, the same situation may be subject to differing perspectives of the factual situation where one state regards the matter as a trade issue and another state as a fisheries or environmental issue. These factors contribute to the substantive fragmentation of international law that was discussed at the beginning of this section.

The upshot of these difficulties is that the adoption of a protocol specifically targeting IAS will not solve the problem of the relationship between trade and the MEA unless states decide to subordinate the WTO to an IAS protocol. At this stage this appears unlikely. It also raises similar issues to those canvassed on a broader scale in the context of reforming and strengthening environmental governance and the creation of a world environment organization.⁹¹

7.1.8 Environmental Governance

As with the adoption of an IAS protocol, important issues in the context of environmental governance relate to whether strengthening the environmental regime is best fulfilled by the establishment of an international environmental organization and whether the establishment of

⁸⁸ Karin Oellers-Frahm, above n 73, 74; see also general discussion: T Cors, 'Biosafety and international trade: conflict or convergence?' (2000) 2 *International Journal of Biotechnology* 27, 39-40; Fiona Macmillan, above n 11, paragraph 6.52.

⁸⁹ R Rayfuse, above n 75; Karin Oellers-Frahm, above n 73, 75.

⁹⁰ R Rayfuse, above n 75; Karin Oellers-Frahm, above n 73, 75.

⁹¹ For a discussion of some of these see Robyn Eckersley, 'The Big Chill: the WTO and Multilateral Environmental Agreements' above n 31, 44; B Condon, above n 23, 562-6; Committee on Trade and Environment. Report (1996) of the Committee on trade and Environment. 12 November 1996. World Trade WT/CTE/W/40; Duncan Brack and Kevin Gray, above n 47 at 35-37; Frank Biermann and Steffan Bauer (ed), *A World Environment Organization* Ashgate Publishing Ltd Hants England (2005).

such an organization will necessarily settle jurisdictional issues as against the international trade law regime. Some of the most cogent arguments for and against a world environmental organization have been brought together by Bierman and Bauer.⁹² Arguments in favour of a world environmental organization point to the worsening “global environmental crisis” and the need for a global solution.⁹³ These arguments range from proposals to upgrade UNEP,⁹⁴ proposals integrating existing environmental organizations under a streamlined agency,⁹⁵ to proposals creating a peak intergovernmental environmental organization with “enforcement powers, vis-à-vis states”.⁹⁶

Arguments urging caution include the fact that adopting a world environmental organization will not solve the problem of environmental governance and may duplicate existing institutional deficiencies.⁹⁷ Alternative suggestions for reform have emerged, such as the establishment of environmental “clusters”. Under this proposal the environmental regime would be arranged into groups or clusters such as conservation, the marine environment and hazardous substances,⁹⁸ to provide efficiencies of scale, jurisdiction and expertise.

In general, there appears to be agreement amongst environmental commentators that the environmental regime needs strengthening, with

⁹² Frank Biermann and Steffan Bauer (ed), *A World Environment Organization* Ibid.

⁹³ Steffan Bauer and Frank Biermann, ‘The Debate on a World Environment Organization: An Introduction’ in F Frank Biermann and Steffan Bauer (ed), *A World Environment Organization* (2005) 1, 1-2.

⁹⁴ UNEP is the United Nations Environment Programme. Bauer and F Biermann ‘The Debate on a World Environment Organization: An Introduction’ above n 93 at 8.

⁹⁵ Steffan Bauer and Frank Biermann, ‘The Debate on a World Environment Organization: An Introduction’ above n 93, 9.

⁹⁶ Ibid 10.

⁹⁷ See generally S Oberthür and T Gehring, ‘Reforming International Environmental Governance: An Institutional Perspective on Proposals for a World Environmental Organization’ in Frank Biermann and Steffan Bauer (ed), *A World Environment Organization* Ashgate Publishing Ltd Hants England (2005) 205.

⁹⁸ Konrad von Moltke ‘Clustering International Environmental Agreements as an Alternative to a World Environment Organization’ in Frank Biermann and Steffan Bauer (ed), *A World Environment Organization* Ashgate Publishing Ltd Hants England (2005) 175, 187-91.

differences largely stemming from how to achieve this objective.⁹⁹ Arguments against establishing a world environmental organization highlight that simply creating additional institutional structures without providing adequate resources, dispute resolution mechanisms and jurisdictional certainty may prove to be a pyrrhic exercise.¹⁰⁰

In IAS regulation, strengthening the environmental regime is crucial to the protection of biodiversity. By analogy, however, reform should not stop at this point. In similarity with issues regarding the adoption of a world environmental organization, adopting an IAS protocol would not necessarily resolve jurisdictional issues with respect to precedence of the protocol over the trade regime.¹⁰¹ Moreover, the issue may not prove to be as simple as determining which regime trumps the other. In both a practical and legal sense the fact that international trade contributes to the introduction and spread of IAS indicates that international trade needs to be part of the solution.

In this respect, however, an underlying temptation should be resisted to treat any dispute involving trade as a trade dispute, rather than, for example, an environmental dispute involving trade. The call will normally be made by the party commencing proceedings and, as illustrated by the *EU-Chile Swordfish* case, parties may have differing views on this matter. However, if any element of trade is considered sufficient to categorize the dispute as a trade dispute and usher parties into a trade arena, this may result in a jurisdictional determination that does not allow MEAs to serve their purpose of achieving environmental regulation. For in that case the focus has shifted to MEAs as a means of resolving trade disputes. This is

⁹⁹ See, for example, Steffan Bauer and Frank Biermann, 'The Debate on a World Environment Organization: An Introduction' above n 93, 10-11; Matthijs Hisschemöller, 'Problem-Solving through International Environmental Agreements: The Issue of Regime Effectiveness' (1999) 20 *International Political Science Review* 151; Ken Conca, above n 32.

¹⁰⁰ A Najam, 'Neither Necessary, Nor Sufficient: Why Organizational Tinkering Will Not Improve Environmental Governance' in Frank Biermann and Steffan Bauer (ed), *A World Environment Organization* Ashgate Publishing Ltd Hants England (2005) 235-253.

¹⁰¹ Ibid.

despite the fact that trade arenas, such as the WTO, are not designed to evaluate the merits of competing environmental and trade claims. The provisions of Article 3(2) of the DSU, for example, strongly emphasize that interpretation of WTO agreements should be undertaken strictly without additions or variations to the parties' obligations under the WTO, an approach reinforced by the decision in the *Biotech Case*.

In *US-Shrimp*, for example, the Appellate Body said of trade restrictions imposed to achieve environmental objectives: "It is relevant to observe that an import prohibition is, ordinarily, the heaviest "weapon" in a Member's armoury of trade measures." Yet, from an environmental perspective, it might be said that an import prohibition is the heaviest weapon in a Member's armoury of environmental measures.¹⁰²

Consequently, while work towards strengthening the environmental regime and the adoption of a protocol to deal with IAS are worthwhile, without addressing the relationship of trade to the environment these initiatives may not achieve their desired objectives. In the interim, another way forward is proposed by the author that builds on the work of commentators such as Konrad and Moltke who have proposed the formation of "clusters" of environmental regimes.¹⁰³ However, rather than the formation of clusters of regimes with similar objectives, the proposal of the author is to bring together regimes with divergent objectives that nevertheless share some common elements. The proposal is specifically aimed at IAS introduced and spread by way of international trade; it incorporates suggestions for collaboration and cooperation, as well as fine-tuning existing processes, institutions, and international standards accepted within the WTO.

¹⁰² *US-Shrimp* Appellate Body, paragraph 171.

¹⁰³ Konrad von Moltke, above n 98.

7.2 CO-OPERATION AND STANDARDS

In the context of international trade, the use of cooperative efforts by way of international standards that bring together trade and environmental concerns may provide a politically more acceptable means of strengthening environmental protection against IAS than a stand-alone IAS protocol. The use of international standards, recognized in the WTO, provides a means of “clustering” components of IAS regulation, allowing states to design regimes that draw together trade and environmental issues. As a further incentive, the use of standards can potentially achieve this on neutral grounds, because standards used within the WTO are set by independent organizations, namely the 1997 International Plant Protection Convention (IPPC)¹⁰⁴ and the 1924 International Agreement for the Creation at Paris of an International Office for Dealing with Contagious Diseases of Animals (OIE).¹⁰⁵

It will be recalled¹⁰⁶ that pursuant to section 3 of Annex A of the SPSA the IPPC and OIE are nominated as standard-setting organizations for the regulation of alien species and hence are influential in the design and implementation of domestic quarantine measures to prevent the entry of IAS. Standards can, therefore, potentially provide a way of balancing quarantine with the free flow of trade. The problem at present is that this potential is not being fulfilled and environmental considerations are under-represented in international standards set by the IPPC and OIE.¹⁰⁷ There are at least two alternative ways of promoting environmental matters to an equal footing with trade: first, nominating the CBD as standard-setting body under the SPSA; and second initiating collaboration

¹⁰⁴ *International Plant Protection Convention 1997*, adopted 17 November 1997, [2005] ATS No 23 (entered into force 2 October 2005). As of November 2007, the *International Plant Protection Convention 1997* (IPPC) has 166 parties.

¹⁰⁵ *International Agreement for the Creation at Paris of an International Office for Dealing with Contagious Diseases of Animals, and Annex 1924*, adopted 25 January 1924 [1925] ATS No 15, (entered into force 12 January 1925). The organization is known as the OIE and as at November 2007 has 173 members..

¹⁰⁶ See discussion in section 4.3.8 of Chapter 4 of this study.

¹⁰⁷ Although ISPM 11 does incorporate a supplement to deal with environmental matters this is not sufficiently comprehensive. See discussion in section 3.4.1 of Chapter 3 of this study. Moreover, as also discussed in section 3.4.1 of Chapter 3 OIE, standards do not consider whether animals can be an IAS.

amongst the CBD, IPPC and OIE to integrate biodiversity concerns into international standards.

With respect to the first possibility, there is nothing in the SPSA to indicate that the current list of standard-setting bodies is closed. Indeed, for matters not covered by the IPPC and OIE Annex A Article 3(d) of the SPSA extends the definition of standards to standards and guidelines “promulgated by other relevant international organizations open for membership to all Members, as identified by the Committee”.¹⁰⁸

Although to date the Committee has not identified such organizations, it is at least arguable that the Committee could nominate international organizations other than the IPPC and OIE to set standards used in international trade. One approach, therefore, would be to lobby for either the Conference of the Parties to the CBD, or the Subsidiary Body on Scientific Technical and Technological Advice (SBSTTA)¹⁰⁹ of the CBD to be named as a standard-setting body. This has the benefit of ensuring that environmental standards are given equal consideration to standards generated by the IPPC and OIE. An obvious hurdle, though, is that it might be considered unlikely that an SPS Committee would recommend this step. The CBD and the WTO have vastly different policy and conceptual priorities. The CBD Guiding Principles, for example, aim to protect biodiversity from IAS, guided by overarching precepts such as the

¹⁰⁸ Indeed, in the slightly different context of risk assessment the Appellate Body in *European Communities — Measures Concerning Meat and Meat Products (Hormones)* (EC – Hormones) WTO Doc WT/DS/26/AB/R WT/DS48/AB/R (report of the Appellate Body, 1998) said that members may rely on a risk assessment carried out by another Member, or an international organization. *EC-Hormones* paragraph 190. However, that is probably more useful with respect to assessment of food products, rather than assessment of species for actual or potential invasive qualities. Humans are more likely to have standard reactions to additives and contaminants, whereas the reaction of species may vary according to their surroundings, including climate factors and presence of predators. See discussion Gretchen Stanton, ‘The Multilateral Trading System and SPS Agreement’ in Quarantine and Market Access. Forum .Proceedings 6-7 September 2000,. Department of Agriculture & Forestry- Canberra Australia (2000) 73, 75-76.

¹⁰⁹ The Subsidiary Body on Scientific Technical and Technological Advice is an open-ended inter-governmental scientific advisory body established pursuant to Article 25 of the CBD. It provides advice to the COP, and undertakes assessments of the status of biological diversity. <<http://www.dbd.int/convention/sbstta.shtml>> (March 2006).

precautionary principle. This may entail the imposition of trade restraints, even in the absence of full scientific certainty. On the other hand, the goal of the WTO is to ensure that trade flows as freely and smoothly as possible;¹¹⁰ and in the context of IAS, trade restraints need to be underpinned by strong scientific evidence – a stance that may not sit well with the application of the precautionary principle. Other areas of divergence have been highlighted in section 6.2 of Chapter 6 of this study and include the allocation of the burden of proof, the role of risk assessment in the evaluation of alien species, the application of the Ecosystem Approach (CBD) and the treatment of transboundary and territorial matters.

However, there is no reason why the OIE and IPPC cannot collaborate with the secretariats of the CBD and secretariats of other relevant treaty organizations.¹¹¹ Indeed, this has already started to occur in the form of a memorandum of cooperation signed between the IPPC and CBD in order to promote synergy and avoid duplication of initiatives.¹¹² Suggestions for cooperation and collaboration have extended beyond the setting of standards, to include “joint activities of the relevant governing bodies”.¹¹³ This could incorporate sharing of information, technological expertise, experience and practice. The IPPC and OIE have a long history of dealing with unwanted species and many of their processes and procedures could be used to protect biodiversity from IAS.¹¹⁴

¹¹⁰ WTO *The World Trade Organization* at 7 Information pamphlet issued 2007 by the WTO. Available <http://www.wto.org/english/res_e/download_e/inbr_e.pdf> (April 2007).

¹¹¹ These could include treaties with IAS provisions such as for example the *Law of the Sea Convention* (Article 196) (1982 *Law of the Sea Convention*, adopted 10 December 1982, [1994] ATS 31 (entered into force 16 November 1994). As at November, 2007 the Convention had 150 parties); and the SPS Committee set up under Article 12 of the SPSA.

¹¹² Report of the Consultation on IPPC – CBD Cooperation. February 6-8, 2001, Bangkok. Agreement reproduced in document ICPM 04 INF/15.

¹¹³ Ralf Lopian, ‘International Plant Protection Convention and Invasive Alien Species’ *Identification of Risks and Management of Invasive Alien Species Using the IPPC Framework* Proceedings of a workshop in Braunschweig, Germany 22-26 September 2003 IPPC Secretariat (2005) 15.

¹¹⁴ See generally discussion in section 3.2 of Chapter 3 of this study. .

Additional standards would need to be developed that take into account the matters discussed in Chapter 6 of this study. Important environmental considerations, such as the precautionary principle and the Ecosystem Approach (CBD), would need to be incorporated into standards, along with the integration of environmental impact assessment with risk assessment. Further standards could also be developed that take into account the role of states in accordance with Guiding Principle 4 of the CBD Guiding Principles. OIE standards, with respect to animals, would arguably require greater elaboration and refinement because at the moment they do not cover all animals, nor do they broach the situation where the animal is the invasive species.

If standards are to be used to support the protection of biodiversity from IAS, they need to be suitable for local conditions. Further matters for consideration, therefore, stem from the way that standards are set and the level of state participation. Any member of the nominated standard-setting organization is free to participate in the standard-setting process for that organization¹¹⁵ and attendance is actively encouraged. The FAO, for example, has set up a trust fund to assist representatives from developing states to attend IPPC meetings.¹¹⁶ Yet, participation is not truly representative. Statistics issued by the IPPC indicate that attendance by developing states at regional IPPC meetings is good at 89%. But attendance at meetings of the Commission on Phytosanitary Measures where standards are determined is a meagre 39%.¹¹⁷

¹¹⁵ For example, article XI(3) of the IPPC provides that membership of their standard-setting body, the Commission on Phytosanitary Measures is open to all parties of the IPPC. The OIE Appendix to the International Agreement for the creation of an Office International Des Epizooties - Organic Statutes - The Office International Des Epizooties Article 6 provides that each member may have one representative on the Committee. <http://www.oie.int/eng/OIE/textfond/en_statuts_organiques.htm> (April 2007) In the Codex Procedural Manual Article 6 provides that the Executive Committee should ensure adequate representation of world's geographical areas. The Rules of Procedure (rule VII) provide that each member has one vote. Available at: <ftp.fao.org/docrep/fao/007/y5817e/y5817e00.pdf> (April 2007).

¹¹⁶ See fact sheet FAO: FAO Trust Fund for Food Security and Food Safety 2007 <http://www.fao.org/tc/Tca/food_en.asp> (April 2007).

¹¹⁷ Interim Commission on Phytosanitary Measures, fifth session 2003. Developing Country Participation in IPPC Standard-Setting and Listing of Experts for IPPC Working Groups 200-2002. ICPM 03/INF/2 Available at <https://www.ippc.int/servlet/BinaryDownloaderServlet/13742_1997_English.pdf?filena>

Moreover, while these figures reveal attendance patterns, they do not reveal the extent of substantive input by members from developing states.¹¹⁸ For example, difficulties with respect to participation often relate to lack of expertise and information. In one study, the IPPC noted that developing states have trouble using the web-based phytosanitary portal established by the IPPC for dissemination of information. This is due to “poor information technology infrastructure and/or lack of capacity” on the part of developing states.¹¹⁹ In addition, participation is often linked to availability of resources and expertise of personnel. Where states lack the funds to send personnel to meetings, and where personnel have insufficient technical expertise to participate, it means that the interests of those states may not be adequately represented. This potentially leads to the adoption of standards that may not be suitable for the circumstances of those states.¹²⁰ Therefore, using international standards to protect biodiversity from IAS needs to be accompanied by capacity building to ensure that member states are able to participate in the standard setting process.

7.3 CAPACITY BUILDING

Developing states contain some of the most diverse biological regions in the world and at the same time these nations often see trade as a means of developing.¹²¹ Yet, as trade increases, so do the chances of transporting

[me=/publications/13742.New Revised Text of the International Plant Protectio.pdf&refID=13742](#) > (March 2006).

¹¹⁸ FAO *Independent Evaluation of the Workings of the International Plant Protection Convention and its Institutional Arrangements* at paragraph 19 PC 98/3 FAO 2007.

¹¹⁹ Ibid.

¹²⁰ M Friis Jensen, *Reviewing the SPS Agreement: A Developing Country Perspective* Danish Institute for International Studies. CDR Working Paper 02.3 Printed in Denmark by Centre for Development, 19.

¹²¹ The *UN Millennium Project* is an independent report commissioned by the UN Secretary-General, Kofi Annan. The Project identifies 8 goals including the eradication of poverty and hunger and the achievement of environmental sustainability. The report recognizes that international trade is a useful means of promoting economic growth. United Nations Development Programme Earthscan UK and USA (2005) 211, 213; World Wide Fund for Nature Australia, *Greening the 2001 Agenda*. WWF (2000) paragraph 13

and introducing IAS.¹²² This means that these states are progressively under threat from the pressures exerted by invasive alien species.¹²³

In order to implement an effective IAS regime a state needs to have the capabilities to build appropriate legal and institutional mechanisms. This includes the capacity to comply with international standards and prepare risk assessments,¹²⁴ as well as the capacity to provide staff and finance for the conduct of WTO proceedings¹²⁵ that are litigated in Geneva.¹²⁶ No state has an unlimited supply of resources,¹²⁷ thus technical and financial limitations can represent significant hurdles for any state. However, lack of resources and the need for capacity building will be most felt in the case of developing states.

In the context of IAS, capacity building is required in the areas of trade, environment and quarantine. In addition, capacity building should also be spread as evenly as possible across these three areas to assist with the integration of trade, environment and quarantine concerns. In the trade arena, capacity building may be defined as a set of objectives that enhance:

.... the ability of partner country policy-makers, enterprises and civil society actors to:
Collaborate in formulating and implementing a trade development strategy that is embedded in a broader national development strategy.
Strengthen trade policy and institutions – as the basis for reforming import regimes, increasing the volume and value-added of exports, diversifying export products and markets and increasing foreign investment to generate jobs and exports.
Participate in – and benefit from – the institutions, negotiations and

¹²² See discussion in section 1.3.3 of Chapter 1 of this study.

¹²³ See generally Clare Shine, Nattley Williams and Lothar Gündling, *A Guide to Designing Legal and Institutional Frameworks on Alien Invasive Species*. IUCN Gland Switzerland Cambridge and Bonn (2000) 1-4.

¹²⁴ Michael Friis Jensen above n 120, 14.

¹²⁵ Ibid, 26.

¹²⁶ Digby Gascoine, 'Lessons Learned from the Salmon Case' Quarantine and Market Access. Forum Proceedings 6-7 September 2000, Department of Agriculture & Forestry- Canberra Australia (2000) 106, 109. See also discussion in section 6.2.1 of Chapter 6 of this study.

¹²⁷ See discussion in section 2.4 of Chapter 2 and Table 8 in Chapter 2 of this study.

processes that shape national trade policy and the rules and practices of international commerce.¹²⁸

From an environmental perspective Agenda 21 describes capacity building as a process to enhance “the ability [of states] to evaluate and address the crucial questions related to policy choices and models of implementation among development options, based on an understanding of environmental potentials and limits and of needs as perceived by the people of the country concerned”¹²⁹

In the context of quarantine, capacity-building should ensure that quarantine regimes “support domestic industry’s ability to meet SPS measures required by trading partners;...implement trade-related SPS obligations and...participate in SPS-related trade discussions in international standard-setting organizations at the WTO”.¹³⁰ To those requirements may be added the capacity to participation in OIE and IPPC committees that set international standards and the capacity to develop and implement standards that protect biodiversity from IAS.

¹²⁸ OECD, *Strengthening Trade Capacity for Development* OECD Publications Service Paris (2001) 13 in Executive Summary. See discussion in Susan Prowse ‘The Role of International and National Agencies in Trade-related Capacity Building’ (2002) 25 *The World Economy* 1235, 1238-1239. The OECD is the *Convention on the Organisation for Economic Co-operation and Development* [OECD], and *Supplementary Protocols 1 and 2*, signed 14 December 1960, [1971] ATS No 11 (entered into force 30 September 1961). As at November 2007 OECD had 30 members.

¹²⁹ Agenda 21, printed in: *Agenda 21 and the UNCED Proceedings*, 3rd Series, Volume 4 *International Protection of the Environment*, Nicholas A Robinson (ed) Oceana (1993) paragraph 37.1.

¹³⁰ Victoria Waite and Digby Gascoine, *Trade Capacity Building and Sanitary and Phytosanitary Control* Contract no PCE-1-00-98-00016-00, Task Order 13 Nathan Associates Inc USAID/Washington (2003) IV (executive summary).

The Global Environment Facility (GEF)¹³¹ points out that capacity building has both a wide and narrow connotation. In the latter case, it may refer to “strengthening the competence of a particular organization”,¹³² such as, an environmental agency, or a quarantine inspection service; in a broader sense, it may refer to “the process of nurturing relatively stable patterns of social relations”.¹³³ This means that in a broad sense capacity building comprises more than technology transfer, or funding, and involves the competence of states to make long-term policy decisions, including those in relation to environmental matters. This broader view of capacity building is clearly brought out in the definitions and descriptions that incorporate the setting of long-term policy goals. However, it should be kept in mind that without adequate funding, neither a narrow nor a broad achievement of capacity building is possible.

In regulatory regimes that deal with IAS, a narrow concept of capacity building could focus on amassing sufficient resources to participate in standard-setting processes; it could also involve gaining sufficient technical expertise to prevent the entry and establishment of IAS by strengthening evaluation procedures, such as risk analysis and environmental impact assessment that support quarantine measures. It could further extend to strengthening monitoring activities implemented in association with eradication and containment measures. In this respect, the CBD Guiding Principles link cooperation and capacity building to the

¹³¹ The Global Environment Facility was established in 1991 as an independent financial organization to help developing states fund projects in a number of environmental areas, including biodiversity. It is funded by donor states and its work is overseen by the United Nations and the World Bank, <<http://www.gefweb.org/>> (March 2006). GEF has 177 participating states.

<http://gefweb.org/participants/Members_Countries/members_countries.html> (April 2007); see general discussion Laurence Boisson de Chazournes, ‘The Global Environment Facility (GEF): A unique and Crucial Institution’ (2005) 14 (3) *Review of European Community & International Environmental Law* 193; Charlotte Streck, ‘The Global Environmental Facility – a Role Model of International Governance?’ (2001) 1 (2) *Global Environmental Politics* 71; Alfred Duda and Kenneth Sherman, ‘A New Imperative for Improving Management of Large Marine Ecosystems’ (2002) 45 *Ocean and Coastal Management* 797, 801-2, 803-11, 814-21 and 828-9.

¹³² John Ohiorhenuan and Stephen Wunker, *Capacity Building Requirements for Global Environmental Protection* Working Paper Number 12 at 3-4 GEF Washington (1995)

¹³³ Ibid.

sharing of information, cooperation in reference to IAS introduced via trade and the supporting of states that lack expertise and resources.¹³⁴

In a broader sense, capacity building could incorporate developing the capability of setting of policy with regard to IAS and placing the IAS issue in the wider context of sustainable development. It requires the drawing together of environment, trade and quarantine matters within appropriate legislative and institutional frameworks that are supported by adequate allocation of human and technical resources.¹³⁵

Viewing trade as a means of fostering economic growth,¹³⁶ strengthens the desire, or need, to increase the volume of trade which itself lessens the desire to limit imports.¹³⁷ This means that there is little incentive to increase understanding of the effects of IAS, or tighten legislation that deals with the effects of IAS. Studies undertaken in the Pacific region, for example, indicate that legislation and policies in Pacific Island Developing states have not yet comprehensively engaged the issue of invasive alien species.¹³⁸ This is exacerbated by the bigger gaps in scientific knowledge of biodiversity and alien species that developing

¹³⁴ CBD Guiding Principles, Guiding Principle 9.

¹³⁵ Victoria Waite and Digby Gascoine, *Trade Capacity Building and Sanitary and Phytosanitary Control* above n 130, 10-12.

¹³⁶ See discussion in the *UN Millennium Project*. The project is an independent report commissioned by the then UN Secretary-General, Kofi Annan. The Project identifies 8 goals including the eradication of poverty and hunger and the achievement of environmental sustainability. The report recognizes that international trade is a useful means of promoting economic growth. United Nations Development Programme Earthscan UK and USA (2005) 211, 213; see also World Wide Fund for Nature Australia, above n 121, paragraph 13.

¹³⁷ Ted L McDowell, 'Slow-Motion Explosion': The Global Threat of Exotic Species and the International Response to the Problem in the South Pacific. (1998) 9 *Colorado Journal of Environmental Law and Policy* 187, 195; for funding issues in developing countries, see generally Nick Robbins, 'European Community Funding for the Environment in Developing Countries' (1994) 3 (2) *Review of European Community and International Environmental Law* 127; for economic aspects of funding issues in developing countries see Phillip Suttle, 'Financial Flows to Developing Countries: Recent Trends and Near-Term Prospects' [2003] *Global Development Finance* 7; for public health issues and funding in developing countries, see S Macfarlane, M Racelis and F Muli-Suslime, 'Public Health in Developing Countries' (2000) 356 *Issue* 9232 *The Lancet* 841.

¹³⁸ Greg Sherley, Susan Timmins and Sarah Lowe, 'Draft Invasive Species Strategy for the Pacific Islands Region' in Greg Sherley (ed), *Invasive Species in the Pacific: A Technical Review and Draft Regional Strategy* SPREP Samoa (2000) 1.

states face.¹³⁹ Moreover, as the actual process of gathering enough information to substantiate remedial action is resource-consuming, this means that funds earmarked for environmental programmes may be expended on areas considered more urgent, such as waste disposal and soil erosion.¹⁴⁰ Even in areas where preventative measures are important, such as border controls in quarantine, lack of funding and trained personnel means that these may be implemented irregularly, leading to species remaining undetected.¹⁴¹

Developing states can also be a source of IAS, so resource constraints affect their ability to regulate outgoing trade with potential flow-on effects as developed states seek to stop imports from developing states.¹⁴² Such circumstances are ripe for disputes to be adjudicated within the WTO. The expertise and expense associated with bringing these proceedings represents yet other reasons why resource and funding issues are crucial to any IAS regime.¹⁴³

The issue of capacity building with respect to developing states is broached in the SPSA and at first glance, the SPSA appears to have special regard for these states. The preamble, for instance, recognizes that developing states may encounter difficulties, both in formulating their SPS measures and also in complying with the measures of others.¹⁴⁴ Moreover, the SPSA also provides for facilitation in the supply of

¹³⁹ Ibid.

¹⁴⁰ Todd E McDowell, above n 137, 195.

¹⁴¹ Ben Boer (ed) *Environmental Law in the South Pacific*. Environmental Policy and Law Paper no 28 South Pacific Regional Environment Programme IUCN Environmental Law Centre. IUCN The World Conservation Union (1996), 49 – see discussion of The Plant Act 1973 of the Cook Islands. The authors point out that although legislation and regulations contain comprehensive provisions to prevent entry of unwanted species ‘experience has shown that this has been difficult to completely control as a certain amount of plants escape detection through unchecked luggage.’

¹⁴² See discussion on EU trade ban of fish imports from the Lake Victoria region for fear of toxic contamination. Victoria Waite and Digby Gascoine, *Trade Capacity Building and Sanitary and Phytosanitary Control* above n 130, 4.

¹⁴³ Australia’s defence in *Australia - Measures Affecting Importation of Salmon (Australian Salmon)* for instance has been estimated at over \$AU1.5 million Commonwealth of Australia, Hansard, Senate, Rural and Regional Affairs and Transport Legislation Committee, Reference: Importation of Salmon Products into Australia. 11 November 1999. RRA&T 347-348. Answers by Mr Gascoine to Senator O’Brien.

¹⁴⁴ Michael Friis Jensen above n 120, 7.

technical assistance¹⁴⁵ and the phasing in of SPS measures.¹⁴⁶ These concessions are supplemented by an acknowledgment of the need to take into account technical and economic feasibility in the establishment and maintenance of measures.¹⁴⁷ However, it must be remembered that these stipulations are designed to promote trade by protecting,¹⁴⁸ or exploiting export markets of developing states.¹⁴⁹ No corresponding mention is made of assistance for developing states to establish their own quarantine regimes, or to design regimes and measures that suit their needs. As the WTO aims at facilitating trade, this is not unexpected; however, by shepherding the focus of SPS regulation towards the development of trade, it potentially ignores the value of an even application of limited human, technical and financial resources.

Resource shortages are not, of course, limited to developing states. Developed states themselves have indicated that lack of resources is one of the main reasons for not implementing more comprehensive measures to protect biodiversity from IAS.¹⁵⁰ One issue that stems from these difficulties is whether there are ways of enhancing funding to assist with capacity building.

7.4 LACK OF RESOURCES AND FUNDING

Despite the limitations that lack of resources place on the design and implementation of IAS regimes, funding issues do not appear to represent a top priority for states. A consideration of national reports submitted by member states to the Conference of the Parties of the CBD¹⁵¹ as set out in Table 12 indicates that less than 4% of members have developed

¹⁴⁵ SPSA, Article 9.

¹⁴⁶ SPSA, Article 10.2.

¹⁴⁷ SPSA, Article 5.6.

¹⁴⁸ SPSA, Article 9.1.

¹⁴⁹ SPSA, Article 9.2

¹⁵⁰ See discussion in Section 2.4 and Table 8 of Chapter 2 of this study.

¹⁵¹ Convention on Biological Diversity *Third National Report to the Convention on Biological Diversity*. The reports are all available from <<http://www.biodiv.org/reports/list.aspx?type=nr-03>> (February 2007).

comprehensive financial measures and policies to reduce the threat of IAS, while almost 34% of members have taken no action in this regard.

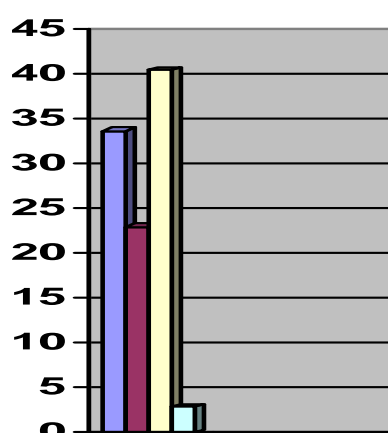
TABLE 12
Capacity to Reduce the Threat of Invasive Alien Species

QUESTION 56

Has your country developed financial measures and other policies and tools to promote activities to reduce the threats of invasive species? (decision VI/23)

- (a) No
- (b) No, but relevant measures and policies are under development
- (c) Yes, some measures, policies and tools are in place
- (d) Yes, comprehensive measures and tools are in place

a	b	c	d	No answer	TOTAL
35	24	42	3	10	114
33.7%	23%	40.4%	2.9%		



Source: compiled from information obtained from the Third National Reports to the Convention on Biological Diversity 2006.

Current IAS programmes comprise mixtures of licensing systems, subsidies, taxes, criminal sanctions and penalties.¹⁵² Yet the systems do

¹⁵² For example, section 9 of the *Exotic Diseases of Animals Act 1991* (NSW) imposes penalties for those who introduce exotic animal diseases. See also discussion in. A Acquaye, J Alston, H Lee, and D Sumner 'Economic Consequences of Invasive Species

not provide a means of generating sufficient funding to make IAS regimes self-sustaining – something that is surely needed to finance evaluations, research, monitoring, eradication, control and other associated efforts.¹⁵³

7.4.1 The Australian Levy Systems

Administrative schemes based on a levy system could be adapted for use with IAS. The Australian Ballast Water Levy Act,¹⁵⁴ for example, is based on a set levy being charged on ships entering Australia in accordance with the size and type of ship. The system was introduced in 1998 to collect funds to assist in ballast water research.

In a similar vein, a government organization in Australia located within the Australian Government Department of Agriculture, Fisheries and Forestry, known as the Levies Revenue Service, is responsible for the collection of over 60 different types of levies from stakeholders in the primary industries sector.¹⁵⁵ Revenue is levied in accordance with the Primary Industries Levies And Charges (National Residue Survey Levies) Regulations 1998.¹⁵⁶ The regulations provide for contributions based on the industry involved, which are, in fact, only determined after industry consultation; different industries attract different levies, in keeping with their needs. Currently, levies include fees applied on the export of aquatic animals, on the production and export of honey and on the export of live animals, such as sheep, goats and lambs.

Policies in the Presence of Commodity Programs: Theory and Application to Citrus Canker' 27 Issue 3 September 2005 *Review of Agricultural Economics* 498.

¹⁵³ Convention on Biological Diversity 2003. Note by the Executive Secretary, 'Invasive Alien Species: Identification of Specific Gaps and Inconsistencies in the International Regulatory Framework' UNEP/CBD/SBSTTA/9/INF/32 (5 November 2003) paragraph 98; P Jenkins Paying for Protection from Invasive Species Fall 2002 *Issues in Science and Technology* 67 at 69-70.

¹⁵⁴ *Ballast Water Research and Development Funding Levy Act 1998 and Ballast Water Research and Development Funding Levy Collection Act 1998* (Cth).

¹⁵⁵ <<http://www.affa.gov.au/content/levies.cfm>> (April 2007).

¹⁵⁶ *Primary Industries Levies And Charges (National Residue Survey Levies) Regulations 1998* made pursuant to the *Primary Industries Levies and Charges Collection Act 1991*. Regulations.

The money provides a way of pooling resources and is used to provide finance for marketing and promotional activities, quality control, research and development as well as database collection. However, to ensure that this scheme is not counter-productive by discriminating against poorer states that will not be able to pay the levy, the levy ideally should only be collected from developed states.

7.4.2 The Benefits of a Levy System

The levy system provides a way of internalizing costs and expenses by raising funds from those that use and benefit from a product sector. It also can potentially provide a steady source of revenue to assist with implementation and/or capacity building. To the extent that IAS are primarily introduced and spread through trade in a manner in which the traded price of the commodities does not reflect the true costs associated with the species, the trading activity itself permits economic imbalances that need to be addressed. This is particularly evident in some product sectors, such as horticulture and agriculture, where introductions designed to sustain these activities may generate risks to the environment and biodiversity that are not reflected in the wholesale or retail prices of the commodities.¹⁵⁷

If biodiversity is to be protected from IAS, regulators need to have at their disposal an adequate knowledge-base, adequate programmes and policy and sufficient human and financial resources to implement their regimes.

¹⁵⁷ J McNeely *Global Strategy for Addressing the Problem of Invasive Alien Species* GISP, IUCN Gland (2001) paragraph 17 page 8; for discussions generally on levy systems see Andrew Jordan, Rüdiger Wurzel, Anthony Zito and Lars Brückner 'The Innovation and Diffusion of 'New' Environmental Policy Instruments (NEPIs)' (paper presented at the European Union and its Member States Conference on the Human Dimensions of Global Environmental Change in Berlin 2001); T Jiang and W McKibbin, 'Assessment of China's Pollution Levy System: An Equilibrium Pollution Approach' (2002) 7 *Environment and Development Economics* 75. In accordance with both the ecosystem approach and economic theory, the non-internalization of costs represents a market failure that ought to be internalized and addressed as close as practicable to the source. See Michael Margolis and Jason Shogren, *How Trade Politics Affect Invasive Species Control* Discussion paper 04-07 Resources for the Future Washington DC (2004) 1. Available from <<http://www.rff.org/Documents/RFF-DP-04-07.pdf>> (March 2006).

The adequacy of the knowledge-base and adequacy of resources are closely connected, for construction of the knowledge-base requires constant surveillance and monitoring, which in turn requires human, technological and financial resources. For this reason, only a small number of nations undertake systematic monitoring and surveillance in their territory.¹⁵⁸ Again, the internalisation of costs can provide a financial base from which to launch initiatives to gather information and provide resources to increase knowledge of IAS by monitoring and surveillance. While states have started quantifying the costs of lost production, and some research costs associated with major IAS,¹⁵⁹ costs related to monitoring and surveillance do not at this stage appear to have been quantified. This could be due to the fact that states have not yet generally established monitoring and tracking systems for IAS,¹⁶⁰ which means that these systems are not highly developed and hence have not yet been appropriately costed.

One point that will need clarification is whether these types of charges contravene the international rules of trade, as administered by the WTO. Potential problems stem from an accusation that the levy amounts to a disguised, or discriminatory, restriction on international trade. This means that any taxes and levies would need to be imposed in a way that does not treat imported products and services less favourably than domestic ones. It also means that process charges cannot be adjusted at the border.¹⁶¹ For example, a state could impose a charge on all imported plants and plant products, although it is questionable whether a state would be able to impose a higher fee based on the country of origin of the species, or the route by which the species was transported. This would be the case, even

¹⁵⁸ CBD Note By The Executive Secretary, 'Invasive Alien Species, a Review of the Efficiency and Efficacy of Existing Legal Instruments Applicable to Invasive Alien Species' UNEP/CBD/SBSTTA/6/INF/5 (26 February 2001) paragraphs 75-77. See also discussion in Section 2.4 of Chapter 4 and Table 4 of this study.

¹⁵⁹ See for example, Ross McLeod, *Counting the Cost: Impact of Invasive Animals in Australia* Cooperative Research Centre for Pest Animal Control, Canberra (2004).

¹⁶⁰ See for example Table 4 in Chapter 2 of this study that indicate 65.7% of states have not yet established a tracking system for IAS.

¹⁶¹ Trade and Environment at the WTO: Background document Trade and Environment division World Trade Organization. <http://www.wto.org/english/tratop_e/envir_e/envir_backgrnd_e/contents_e.htm> (March 2006).

where climate conditions in the country of export are similar to the country of import, signifying that alien species are more likely to establish and spread. Similarly, the fact that particular means of transport and packaging are more likely to carry hitch-hikers is irrelevant. These factors make it problematic to implement schemes that provide incentives, such as the imposition of a sliding scale of fees that take into account adherence to principles of good management practice, or industry codes of conduct.

The use of industry codes of conduct is, of course, different from the imposition of a levy scheme. Nevertheless, combining the two can provide a means of working with industry sectors and represents a more responsive form of regulation.¹⁶² The adoption of industry codes of conduct can, for example, target pathways of invasion and particular types of species that have a reputation for becoming invasive.¹⁶³ Such codes have already been negotiated in the fisheries product sector.¹⁶⁴

As a responsive form of regulation, these codes have a greater chance of succeeding than command and control regulation, because key industry players have been instrumental in their development. The codes would represent a set of rules and regulation that industry can work with, while at the same time providing for protection of the environment. Were the codes to work in tandem with contributions to a levy fund, this could provide an additional incentive for product sectors to develop and adhere to codes that incorporate protection of biodiversity. A final point of discussion is how these initiatives could assist developing states.

¹⁶² Angus Corbett 'A Proposal for a More Responsive Approach to the Regulation of Corporate Governance' (1995) 23 *Federal Law Review* 277.

¹⁶³ Anne Perrault and William Carroll Muffet, *Encouraging Prevention, Developing Capacity and Providing Accountability: A strategy for Addressing International Invasive Alien Species Issue*. Distributed at the Sixth Meeting of the SBSTTA Montreal, 12-16 March 2001. Center for International Environmental Law, Washington DC, USA (2001) paragraph 7.

¹⁶⁴ See for example the FAO Code of Conduct for Responsible Fisheries 1995. 1995 The code was adopted at the 28th session of the Food and Agriculture Organization (FAO) on 31st October 1995 and is supported by 9 Technical Guidelines and 4 Plans of Action. Published by the FAO, Rome, 1995. See discussion Anne Perrault and William Carroll Muffet *Encouraging Prevention, Developing Capacity and Providing Accountability: A strategy for Addressing International Invasive Alien Species Issues* above n 163, paragraph 7.

7.4.3 Funding and Developing States

As part of capacity building, developing states need funding to assist them in the design and implementation of their IAS regimes. A number of possibilities exist, including the provision of aid through an international fund, or the direct provision of aid individually by developed states.

At the international level, no fund currently exists to assist developing states exclusively with respect to IAS. Existing mechanisms within bodies, such as GEF, the Standards and Trade Development Facility¹⁶⁵ and initiatives undertaken by the International Maritime Organization (IMO), have been used to provide funding to developing states for projects dealing with some IAS.

GEF has facilitated IAS projects, such as control of IAS in Galapagos and the Pacific Invasive Species Management Project.¹⁶⁶ The Standards and Trade Development Facility, which was a product of the Doha Ministerial Conference,¹⁶⁷ is designed to assist developing states in fulfilling their SPSA requirements. It is a cooperative effort by the Food and Agriculture Organization (FAO), the OIE, the World Bank, the World Health Organization (WHO) and the WTO.¹⁶⁸ The IMO assists in preventing IAS transported by ballast water through the technical assistance provisions of the IMO convention¹⁶⁹ and the programme aimed at Removal of Barriers to the Effective Implementation of Ballast Water Control and

¹⁶⁵The Standards and Trade Development Facility is an initiative of the FAO, WTO, OIE and World Bank that has the aim of assisting developing countries in implementing standards such as sanitary and phytosanitary standards that can assist in developing countries gaining access to export markets. See web site: <http://www.standardsfacility.org/> (August 2007)

¹⁶⁶ See discussion in Convention on Biological Diversity 2003. Note by the Executive Secretary, Invasive Alien Species: Identification of Specific Gaps and Inconsistencies in the International Regulatory Framework at paragraph 99.

¹⁶⁷ The Doha Ministerial Conference was held in Doha, Qatar in 2001. The conference adopted 'The Doha Declaration' on the TRIPS Agreement and Public Health. The text of the declaration is available from the web site of the WTO http://www.wto.org/English/thewto_e/min01_e/mindecl_e.htm (March 2006).

¹⁶⁸ For a short discussion see Convention on Biological Diversity 2003. Note by the Executive Secretary, 'Invasive Alien Species: Identification of Specific Gaps and Inconsistencies in the International Regulatory Framework' UNEP/CBD/SBSTTA/9/INF/32 (5 November 2003) paragraph 101.

¹⁶⁹ *International Convention for the Control and Management of Ships' Ballast Water and Sediments*, 2004 BWM/CNF/36. 16 February 2004, Article 13 (Not yet in force).

Management Measures in Developing States (GloBallast Programme).¹⁷⁰ The former finds its origins in article 13 of the Convention on the Intergovernmental Maritime Consultative Organization (IMO),¹⁷¹ where parties agree to give assistance at ports in developing states, with respect to technology, equipment and facilities. The programme of activities of the latter includes undertaking Ballast Water Risk Assessment, dissemination of information and global coordination of activities. While these initiatives are useful, they fall short of a dedicated international IAS fund.

An alternative approach would be to set up such a fund, say, along the lines of the 1995 Fish Stocks Assistance Fund established under Articles 25 and 26 of part VII of the Agreement for the Implementation of the Provisions of the United Nations Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks 1995 (1995 UN Fish Stocks Agreement).¹⁷² Funds are available to help developing states with costs of bringing and defending legal proceedings, as well as providing funds for research and conservation matters with respect to straddling fish stocks and highly migratory fish stocks. The fund is administered by the FAO and contributions to it are voluntary.¹⁷³

¹⁷⁰The Global Ballast Water Management Programme (GloBallast) is an initiative of GEF, UNDP and the IMO. It is designed to assist developing countries to reduce the transfer of harmful species *via* ballast water. See web site: <http://globallast.imo.org/>

¹⁷¹The Convention establishing the *International Maritime Organization* (IMO) is known as the Convention on the *Intergovernmental Maritime Consultative Organization*, adopted 6 March 1948 [1958] ATS 5. (entered into force 17 March 1958) and the name of the organization was changed to the International Maritime Organization in 1982. As at November 2007 the IMO had 167 members and three associated members.

¹⁷²*Agreement for the Implementation of the Provisions of the United Nations Law of the Sea of 10 December 1982 Relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks* 1995 (1995 UN Fish Stocks Agreement) adopted 4 December 1995 [2001] ATS 8 (entered into force on 11 December 2001). As at November 2007, the Agreement had 73 parties. See explanation 'Background Information' and link to application form: http://www.un.org/Depts/los/convention_agreements/fishstocktrustfund/fishstocktrustfund.htm (November 2007).

¹⁷³*UN Fish Stocks Agreement*, paragraphs 7 and 11, Terms of Reference for the Assistance Fund Under Part VII.

A similar fund could be set up under the auspices of an existing facility such as GEF to deal with IAS. The question is whether such a fund would be politically and economically acceptable to developed states that will be making the contributions. The voluntary nature of contributions should go some way towards making the fund acceptable. Moreover, where developed states have set up levy systems within their own jurisdictions, funds generated from these levies could be used to make contributions to the voluntary fund. However, the problem would still remain how to make the fund workable. The fund set up under the UN Fish Stocks Agreement, for example, is underused with lack of contributions being a major problem.¹⁷⁴

Developed states can, of course, provide assistance to developing states, independently of an assistance fund. Australia, for example, through AusAID, provides assistance to developing states to reduce poverty and attain sustainable development.¹⁷⁵ While this type of aid often needs to be in the national interest of developed states¹⁷⁶ it is plausible that preventing entry of IAS from developing states is in the national interest.

While finding a way of generating regular funding for protecting biodiversity from IAS is challenging, it is a vital component to assist with capacity building. In the absence of capacity building the problem of IAS will be difficult if not impossible to address effectively.

7.5 CONCLUSION

States have been hampered in their efforts to deal with IAS by a number of factors, including lack of an integrated IAS regime at the international level, lack of capacity and lack of resources. These are deficiencies, however, that states have the power to remedy.

¹⁷⁴ Yoshinobu Takei 'UN Fish Stocks Agreement: 2006 Review Conference' (2006) 21 (4) 551, 563-4.

¹⁷⁵ See web site <<http://www.aisaid.gov.au/>> (March 2007) . See discussion at the end of section 3.4.2 and footnote 215 in Chapter 3 of this study.

¹⁷⁶ Ibid <<http://www.aisaid.gov.au/>>.

To begin with, states create international law. Therefore, the effectiveness of international law, including international environmental law depends at least partly on how states negotiate and arrange the instruments that make up this body of law.¹⁷⁷ As Ralf Lopian has said “it is ultimately [the responsibility of states] to determine the policy of the international organizations to which they belong”.¹⁷⁸

Yet for states to be able to determine such policy presupposes that states can reach agreement on matters they consider important. The danger is that even where states agree on matters, the negotiation and implementation of international instruments may become a matter of political expediency.¹⁷⁹ This potentially results in the negotiation of instruments constrained by compromises and weakened provisions that may not necessarily achieve their purpose.¹⁸⁰ States have, however, already created three international organizations, the CBD, IPPC and OIE, whose work can be integrated to develop international standards, recognized within the international trade law regime, that protect biodiversity from IAS.

Yet resource constraints, especially in the case of developing states, may prove problematic at all levels of IAS regulation. Thus, capacity building is vital to strengthen and develop processes that support domestic quarantine regimes. Technology transfer, for example, can assist developing states to structure effective quarantine systems as can long-term capacity building which can be coordinated with the protection of biodiversity to shape policy and goals with respect to IAS.

¹⁷⁷ Ralf Lopian, ‘International Plant Protection Convention and Invasive Alien Species’ in *Identification of Risks and Management of Invasive Alien Species Using the IPPC Framework* above n 113, 6.

¹⁷⁸ *Ibid*, 15.

¹⁷⁹ Duncan Brack and Kevin Gray, above n 47, 19.

¹⁸⁰ For a discussion of some of the shortcomings see sections 2.2.4 and 2.2.5 of Chapter 2 of this study.

Proposals for capacity building and the need to strengthen environmental regulation are not new.¹⁸¹ Nor are discussions relating to funding issues in the context of IAS.¹⁸² Nevertheless, states need to implement practical measures, such as a levy scheme, or an assistance fund, that generate resources, enabling both developed and developing states to strengthen the design and management of their IAS regimes for the better protection of biodiversity.

¹⁸¹ Michael Friis Jensen above n 120; OECD *Strengthening Trade Capacity for Development* in Executive Summary OECD Publications Service Paris above n 128; Victoria Waite and Digby Gascoine, *Trade Capacity Building and Sanitary and Phytosanitary Control* above n 130; A Perrault and W Muffet *Encouraging Prevention, Developing Capacity and Providing Accountability: A strategy for Addressing International Invasive Alien Species Issues* above n 163.

¹⁸² McNeely *Global Strategy for Addressing the Problem of Invasive Alien Species* above n 157.

CONCLUSION

THE HUMAN ELEMENT

This study started with an account of Thomas Austin and his introduction of 24 rabbits into Australia, an act that would unleash the destructive potential of one of the worst invasive alien species (IAS) Australia has ever seen.¹ Worldwide, the history of invasive alien species is littered with such examples, encompassing intentional and accidental introductions,² species introduced for commercial purposes³ and species introduced for recreational reasons.⁴ Like others who have introduced alien species, Mr. Austin did not introduce the rabbits with the intention of causing harm, but the introduction nevertheless took place without adequate regard to the potential impacts on native biodiversity.⁵

This human connection in the introduction and spread of IAS lies at the heart of the problem of IAS.⁶ While it is natural for “the distribution of plants and animals [to change] over time”,⁷ naturally-occurring changes generally progress sufficiently slowly for ecosystems to adapt. Human-induced changes, however, do not.⁸ Humans can transport alien species to regions that the species might never normally reach;⁹ it is also humans

¹ See Introduction to this study.

² See Chapter 1 of this study and in particular sections 1.2.1 and 1.1.3.

³ See section 1.3.1 of Chapter 1 of this study.

⁴ Ibid.

⁵ For discussion of the human factor in the introduction and spread of IAS see generally Jeffrey A McNeely, ‘The great reshuffling: how alien species help feed the global economy’ in O Sandlund, P Schel and A Viken (eds), *Proceedings of the Norway/UN Conference on Alien Species* Trondheim July 1995 Directorate for Nature Management, Trondheim (1996) 53

⁶ Ibid.

⁷ Department for Environment Food and Rural Affairs (DEFRA), ‘Review of Non-Native Species Policy’ Report of the Working Group at page 34 DEFRA Publications London 2003; see also Australian Academy of Science *Submission to the review of the Australian Quarantine Inspection Service* March 1996, <<http://www.science.org.au/reports/aqiscont.htm>> (March 2007) paragraph 2.1.3.

⁸ Tim Low *Feral Future* Viking Victoria Australia (1999), Chapter 36, 261-265

⁹ J Mumford ‘Economic Issues Related to Quarantine in International Trade’ (2002) 29 (3) *European Review of Agricultural Economics* 329, 330.

who have been responsible for the introduction and spread of the worst IAS.¹⁰ Moreover, trade is implicated in the majority of these cases.¹¹

Trends gleaned from trade statistics show that the volume of trade is increasing, and increasing over longer distances.¹² This further increases the chances of alien species being introduced to ecosystems where states might be totally unprepared for such drastic impacts. All in all, these developments demonstrate that the problem of IAS is closely connected to the growth of international trade. Therefore, the problem of IAS cannot be effectively resolved without taking into account the trade and IAS connection. Yet the fact that both IAS¹³ and trade¹⁴ may provide substantial economic benefits to states means that resolving the problem of IAS will not be easy.

IDENTIFYING THE INVASIVE ALIEN SPECIES

The difficulties of identifying IAS begin with the basic requirement of defining exactly what they are. Chapter 1 of this study demonstrated just how contentious this requirement can be, with many terms and descriptions being employed, often dependent upon the uses that humans have for the species in question.¹⁵ Where a species is regarded as a useful resource the fact that it also impacts adversely on biodiversity is not necessarily decisive to classifying the species as “invasive”.¹⁶ Yet, definitions act as triggers and parameters for regulation and without a clear definition of “invasive alien species” regulators may not be clear

¹⁰ See the Global Invasive Species Data Base, which includes a list of ‘100 of the World’s Worst Invasive Alien Species’. The data base is maintained by the Invasive Species Specialist Group (ISSG) of the IUCN Species Survival Commission. It was developed as part of the global initiative on invasive species, led by the Global Invasive Species Programme (GISP). Available from <<http://www.issg.org/database/welcome/>>.

¹¹ Ibid. See also discussion in section 1.2.2 of Chapter 1 of this study.

¹² See discussion in section 1.2.2 of Chapter 1 of this study, especially surrounding footnotes 169 and 170.

¹³ See discussion in section 1.3.1 of Chapter 1 of this study.

¹⁴ Above n 12.

¹⁵ Section 1.1 of Chapter 1 of this study.

¹⁶ Section 1.3.1 of Chapter 1 of this study.

about the goals and objectives they are trying to achieve. Despite the importance of the definition of an IAS in the overall scheme of regulation,¹⁷ discussion of this point is under-represented in the literature. In Chapter 1, I demonstrated that, although regulation might be designed and implemented by states as political entities,¹⁸ a definition of an IAS needs to be elaborated in a uniform manner that incorporates ecological criteria.¹⁹ These criteria should include the use of attributes that observe the natural distribution of species, rather than the use of political boundaries that splinter ecosystems and fragment jurisdictions dealing with IAS.

PREDICTING WHICH SPECIES WILL BECOME INVASIVE

In addition to the definition of an IAS, another stumbling block to the design and implementation of effective IAS regimes is predicting which species will become invasive.²⁰ Not all alien species will become invasive and, with lag times of up to 170 years,²¹ the task is never going to be an easy one. Even leaving aside technical and resource demands,²² the practical difficulties of predicting invasiveness are compounded by the diversity of species that may be introduced and the many means by which they may be introduced.²³

In the case of accidentally introduced species, for example, regulators do not have the opportunity to conduct evaluations on a case-by-case basis prior to introduction. Consequently, rather than predicting invasiveness, regulators will need to predict which pathways are most likely to facilitate the introduction of alien species.²⁴ The fact that a pathway has introduced

¹⁷ See discussion in section 1.1 of Chapter 1 of this study.

¹⁸ Section 1.3.2 of Chapter 1 of this study.

¹⁹ Section 1.1.2 of Chapter 1 of this study.

²⁰ Sections 1.3.3, 1.3.4 and 1.3.6 of Chapter 1 of this study.

²¹ Section 1.3.3 of Chapter 1 of this study especially discussion surrounding footnotes 203-207.

²² Sections 1.3.3-1.3.6 of Chapter 1 of this study.

²³ See generally sections 1.2 and 1.3 of Chapter 1 of this study.

²⁴ Section 1.2 of Chapter 1 of this study.

one alien species means it is very likely it will introduce other alien species.²⁵ Therefore, with the pathway approach, identifying and predicting the potential of pathways for introductions may be a more effective means of regulation than predicting invasiveness of individual species.

This, for example, is the approach that is taken by states in dealing with ballast water discharges. Ballast water is a recognized vector for introduction of IAS.²⁶ While the exact number and type of species introduced by ballast water discharges may never be known, it is known that those discharges have introduced IAS and will continue to introduce IAS. Therefore, the pathway itself is regulated, rather than each individual species. Yet, regulation by pathways is something that by its nature is very much a trial-and-error exercise, where the best guide is often what has occurred in the past – that is, what pathways have already facilitated the accidental introduction of alien species. In general, the requirements of the WTO to provide detailed information on specific species prior to the implementation of preventive measures do not facilitate regulation of IAS by the vector or pathways approach and can present formidable challenges for even the most developed and advanced state.

PREVENTING THE ENTRY AND ESTABLISHMENT OF IAS

In designing regulatory regimes for IAS, the primary objective should be one of prevention.²⁷ Prevention, in this context, relates both to preventing entry of the IAS and to preventing the species from establishing.²⁸ These are important considerations, for once an alien species has become invasive it is difficult, expensive and complicated, if not impossible, to

²⁵ See section 5.2.2 of Chapter 5 of this study for difficulties identified by the Global Invasive Species Programme of multiple hitchhikers in commodities, such as nursery stock and cut flowers

²⁶ See discussion in section 1.2.2 of Chapter 1 of this study.

²⁷ See discussion in sections 1.3.5 of Chapter 1 and 2.3 of Chapter 2 of this study.

²⁸ See discussion in sections 1.3.5 of Chapter 1 of this study.

eradicate.²⁹ Chapter 2 showed that states have obligations in international law to protect the environment, including protecting biodiversity from the deleterious impacts of IAS.

The discussion in Chapter 2 showed that, customary international law obligations to prevent, control and reduce transboundary environmental harm can apply as much to the introduction and spread of IAS as to other sources of environmental harm. In addition, the number and variety of international instruments that touch upon IAS is considerable. Moreover, the instruments range from environmental treaties, plant and animal protection agreements and conventions and international trade instruments, to soft law mechanisms encompassing codes of conduct and guidelines. Yet one of the truly surprising points to emerge from this scrutiny of international instruments is that, notwithstanding the large number of references to IAS, it is difficult to discern an overarching and *binding* IAS regime. While there are a great many instruments that contain references to IAS, each only deals with a part of the IAS problem. The result is an uncoordinated system that does not necessarily provide adequate guidance and generate coherent obligations for states.³⁰

The most wide-reaching provision is found in Article 8(h) of the Convention on Biological Diversity (CBD) that calls upon states to prevent and control alien species that threaten biodiversity. This is a framework provision and details of how these obligations are to be met are elaborated in the Guiding Principles for the Prevention, Introduction and Mitigation of Impacts of Alien Species that Threaten Ecosystems, Habitats or Species (CBD Guiding Principles).³¹ Although the CBD Guiding Principles are not binding, there is an expectation that member

²⁹ See discussion of the rabbit and *phylloxera* problems in the introduction to this study; section 1.3.5 of Chapter 1 and section 2.3 of Chapter 2 of this study.

³⁰ See discussion in section 2.2.4 of Chapter 4 of this study.

³¹ Guiding Principles for the Prevention, Introduction and Mitigation of Impacts of Alien Species that Threaten Ecosystems, Habitats or Species. Adopted April 2003 as part of Decision VI/23 of the Conference of the Parties. Report of the Sixth Meeting of the Conference of the Parties to the Convention on Biological Diversity, UNEP/CBD/COP/6/20 (23 September 2002); see discussion in section 2.2.5 of Chapter 2 of this study.

states of the CBD will adhere to the Principles. Yet, the examination of state practice in this study indicated that this is not happening.

The Guiding Principles reflect mainstream opinion within the CBD that regards prevention as the best management option; they adopt a three-staged hierarchical approach, which commences with prevention and continues with control and eradication. The Guiding Principles also emphasise that it is only those alien species that are an actual or potential threat to biodiversity that need to be regulated.³² This brings us back to the thorny issues relating to the definition of “invasive alien species”: predicting invasiveness for individual species and predicting the likelihood of introduction of IAS for pathways of introduction. These matters may be particularly problematic, given the gaps in knowledge and information on IAS.³³

For this reason, the CBD Guiding Principles advocate the use of a principle designed to deal with lack of full scientific certainty – the precautionary principle.³⁴ It means that where there is a risk of serious environmental damage from IAS, states are permitted to take measures, even in the absence of conclusive scientific evidence. The use of the precautionary principle can also assist in identifying gaps in the knowledge base, indicating areas where additional research and action is required.³⁵

Another component of effective preventive measures is for regulation to proceed along ecosystem lines,³⁶ as called for by the CBD Guiding Principles.³⁷ Not only does this allow environmental problems to be dealt

³² CBD Guiding Principles, Guiding Principles 7, 10 and 11.

³³ See discussion in sections 1.3.3-1.3.5 of Chapter 1 and the discussion on state practice section 2.4 of Chapter 2 of this study.

³⁴ CBD Guiding Principles, Guiding Principle 1. See discussion in section 6.2.3 of Chapter 6 of this study.

³⁵ See discussion in section 6.2.3 of Chapter 6 of this study.

³⁶ CBD Guiding Principles, Guiding Principle 3. See discussion in section 6.2.4 of Chapter 6 of this study.

³⁷ The Ecosystem Approach was adopted by the Conference of the Parties to the CBD in decision V/6 set out in Report of the Fifth Meeting of the Conference of the Parties to the

with according to naturally occurring ecological parameters, but it also means that states need to consider the effect of their actions on ecosystems that straddle political boundaries as well as on ecosystems located fully in other jurisdictions, or located in areas beyond national jurisdiction.³⁸ The ecosystem approach also draws together scientific knowledge, social issues and policy concerns as matters of equal importance.³⁹ Consequently, these considerations will be equally important to regulators when making determinations with respect to IAS. Although the CBD Guiding Principles are not binding, the principles are there to guide CBD members, who at least must consider them.

In Chapter 2, I demonstrated that states are not fulfilling their international law obligations with regard to IAS.⁴⁰ States are not using the CBD Guiding Principles,⁴¹ nor are they implementing the precautionary principle⁴² and the ecosystem approach.⁴³ Rather, states are concentrating their efforts on the most urgent threats to their agricultural and farming product sectors and on perhaps a handful of notorious IAS.⁴⁴ This is to be expected. States face many difficulties in designing and implementing IAS regimes. Not only is work needed to identify individual IAS and pathways of introduction, but efforts are also needed to develop monitoring and surveillance procedures, as well as designing contingency plans should IAS gain entry. Moreover, to be effective, these requirements need to be supported by strong legal and institutional frameworks, reinforced by appropriate human, technological and financial resources. Resource constraints, in reality, represent one of the biggest stumbling blocks to the design and implementation of effective IAS regimes.⁴⁵ The irony, of course, is that for as long as states do not prevent the entry and

Convention on Biological Diversity UNEP/CBD/COP/5/2 (22 June 2000), 103.

³⁸ Ecosystem approach principle 3.

³⁹ Ecosystem approach, principle 11.

⁴⁰ See generally section 2.4 of Chapter 2 of this study.

⁴¹ See Table 1 in Chapter 2 of this study and surrounding discussion.

⁴² See Table 7 in Chapter 2 of this study and surrounding discussion.

⁴³ See Table 6 in Chapter 2 of this study and surrounding discussion.

⁴⁴ See Table 2 in Chapter 2 of this study and surrounding discussion.

⁴⁵ See Table 8 in Chapter 2 of this study and surrounding discussion; see also sections 7.3 and 7.4 of Chapter 7 of this study.

establishment of IAS, they are compounding the IAS problem. With lengthy lag times, the mistakes of today may not materialize for several generations,⁴⁶ laying the foundation for ever-increasing future problems.

THE NEED FOR INTERNATIONAL LAW

The need for international law is indicated by a number of factors. Primarily, these include the lack of use of the CBD Guiding Principles⁴⁷ and the overall failure to implement effective measures to prevent the entry and spread of IAS.⁴⁸ Additionally, it is significant that IAS are increasingly becoming a global problem⁴⁹ and that for those IAS introduced by way of international trade strong measures in one jurisdiction may be weakened by lack of, or inadequate, measures in other jurisdictions.⁵⁰ The regime is only as ‘strong as the weakest link’ – a fact long recognized in the field of quarantine.

QUARANTINE REGULATION

Effective quarantine regulation is essential to preventing entry of IAS. It is not surprising therefore that, increasingly, international environmental instruments require tighter quarantine regulations⁵¹ including improved border controls⁵² and monitoring processes.⁵³ Nevertheless, while quarantine is important in preventing entry of IAS, it has not been the

⁴⁶ Above n 21.

⁴⁷ Above n 40.

⁴⁸ Above n 40-43.

⁴⁹ See generally discussion in sections 1.2 and 1.3.2 of Chapter 1 of this study.

⁵⁰ See discussion in the context of quarantine regulation in 3.2 of Chapter 3 of this study.

⁵¹ See for example, CBD Guiding Principles, Guiding Principle 7; United Nations General Assembly Programme of Action for the Sustainable Development of Small Island Developing States paragraphs 55A(iii), 55 (C)(ii) and generally 55A-C UN Doc A/CONF.167/9 (October 1994); Appendix C of the ICES Code of Practice on the Introductions and Transfers of Marine Organisms 2004 developed by the International Council for the Exploration of the Sea. Available at <<http://www.ices.dk/reports/general/2004/ICESCOP2004.pdf>> (April 2006). See discussion of the latter two instruments in section 2.2.3 of Chapter 2 of this study.

⁵² CBD Guiding Principles, Guiding Principle 7.

⁵³ CBD Guiding Principles, Guiding Principle 5.

subject of vigorous analysis in the literature and, in Chapter 3, I reviewed the origins of quarantine and examined how it can be used to prevent the entry of IAS. To fulfill the latter role, quarantine regulation needs to undergo a number of transformations, including elevation from the national to the international arena by way of harmonized international standards. Moreover, those standards need to expand the purview of quarantine from agricultural and farming pests and diseases towards the protection of biodiversity at large.

Quarantine itself began many centuries ago as a unilateral national response to the entry and spread of disease and pestilence.⁵⁴ By the nineteenth century, however, states recognized that effective quarantine necessitated a unified response, strengthened by international collaboration and coordination. Although seen as essential, the move towards the international arena was fraught with difficulties.⁵⁵ Nevertheless, by the end of the twentieth century, quarantine regulation had undergone a major transformation, as states negotiated treaties with wide application that sought to prevent the entry and establishment of a broad range of pests and diseases.⁵⁶ Quarantine regulation developed institutions and techniques expressly geared towards preventing entry of unwanted species that could readily be adapted to protecting biodiversity from IAS.⁵⁷ Quarantine measures include pre-import border controls as well as post-import surveillance and monitoring mechanisms. Pre-import border controls can be designed to evaluate planned introductions for their invasive potential and detect and intercept unplanned introductions; while post-import measures can provide valuable information on planned introductions that have gone wrong and also provide information on unplanned introductions.⁵⁸ The database this knowledge builds can be used to help states make decisions about where and when to implement

⁵⁴ See discussion in section 3.2.1 of Chapter 3 of this study.

⁵⁵ Ibid.

⁵⁶ See discussion in section 3.3.3 of Chapter 3 of this study.

⁵⁷ See discussion in section 3.3.4 of Chapter 3 of this study.

⁵⁸ For an example of the practical application of measures, see the Australian case study in section 3.5 of Chapter 3 of this study.

eradication and containment measures and also to understand why planned introductions have indeed gone wrong.

Yet, quarantine regulation needs to undergo a second major transition for this potential to be fulfilled. Specifically, states need to ensure that quarantine is not only used to protect farming and agricultural interests, but is also used to protect the environment at large. The historical links of quarantine to farming and agriculture, coupled with its *ad hoc* development, present substantial problems, which will make the transition difficult.⁵⁹

Some states, Australia for example, have comprehensive quarantine regimes in place; but this does not apply to all states. Chapter 3 considered how states are using their quarantine regimes.⁶⁰ In many cases, legislative frameworks adopted in furtherance of international obligations under the 1997 International Plant Protection Convention (IPPC) and the 1924 International Agreement for the Creation at Paris of an International Office for Dealing with Contagious Diseases of Animals (OIE), are mainly geared towards detecting and intercepting species harmful only to agriculture, farming, or economic interests. Thus, the potential of using quarantine regulation to block entry of IAS that impact on biodiversity is not being realised.⁶¹

A further matter for consideration is the relationship of quarantine regulation to other areas of law, and in particular, international trade law. Even where states do have comprehensive quarantine systems in place, measures still need to conform to the wider body of international legal obligations that can overlap with quarantine regulation. Quarantine regulation frequently involves trade restraints;⁶² therefore, one of the main areas of law that governs quarantine systems derives from international

⁵⁹ See discussion in section 3.2 of Chapter 3 of this study.

⁶⁰ Section 3.4.2 of Chapter 3 of this study.

⁶¹ See discussion in section 3.6 of Chapter 3 of this study, with respect to the limitations on the role of quarantine in protecting biodiversity from IAS.

⁶² See discussion in section 3.1 of Chapter 3 and section 5.1 of Chapter 5 of this study.

trade law. Consequently, any analysis of law to protect biodiversity from the deleterious effects of IAS must incorporate an examination of the relationship of trade, IAS and quarantine.

THE WTO

The relationship of the operations of GATT and the WTO to the IAS problem, and the specific examples discussed in Chapter 4 in the context of quarantine, give a new perspective to the IAS issue.

The WTO traces its origins to early treaties of trade and commerce and GATT 1947 that all followed a discrimination-based approach towards permissible trade restrictions.⁶³ This meant that domestic quarantine measures also needed to be applied in a non-discriminatory manner. Yet, the thresholds set by this discrimination-based test were seen as notoriously difficult to challenge.⁶⁴ The current GATT retains this discrimination-based approach, which to some extent set the scene for the adoption of the Agreement on the Application of Sanitary and Phytosanitary Measures (SPSA).⁶⁵

The SPSA represents an alternative approach to permissible trade restraints – one that overlays discrimination-based principles with requirements for scientific certainty.⁶⁶ While GATT provides the strongest expression of the discrimination-based approach towards trade restraints,

⁶³ See discussion in section 4.1 of Chapter 4 of this study. This approach resonates strongly in Articles I and III of GATT that respectively provide that concessions given to one member must be given to all GATT members and imported products should receive treatment ‘no less favourable’ than treatment afforded to ‘like products’ produced domestically. For discussion in an environmental context, see Daniel Esty *Greening the GATT: Trade, Environment and the Future* Institute for International Economics, Washington DC (1994), 245-246. See also Peter Van Den Bossche, *The Law and Policy of the World Trade Organization Text, Cases and Materials*, Cambridge University Press (2005) Chapter 4.

⁶⁴ See discussion in section 4.2 and 4.3.1 of Chapter 4 of this study.

⁶⁵ The Agreement on the Application of Sanitary and Phytosanitary Measures [1995] *ATS* 8 at 65

⁶⁶ See discussion in section 4.3.1 of Chapter 4 of this study.

the SPSA exemplifies the science-based approach. The latter, in particular, is very influential in the way states design and implement their quarantine regimes.

Since 1995, these science-based requirements have meant that domestic quarantine measures that restrict international trade need to be supported by scientific evidence; either by compliance with international standards,⁶⁷ or by the application of a risk assessment.⁶⁸ These are significant developments, for the Appellate Body of the WTO has held that the provisions of the SPSA can apply equally to measures designed to protect biodiversity and to measures protecting animal and plant health in the agricultural and farming product sectors.⁶⁹ This means that the essential components of an IAS regime (considered in section 2.3 of Chapter 2 to include the application of the precautionary principle, the ecosystem approach and the use of environmental impact assessment and risk analysis), must pass the tests enumerated in the SPSA. Yet it is not clear whether these components can be incorporated into quarantine regimes where the SPSA does not allow for their inclusion.

One of the biggest hurdles to this incorporation is the way science is used in the SPSA to underpin measures at each stage of regulation. Risk assessment, for example, is a scientific process that is traditionally used to evaluate the level of risk. However, under the SPSA, risk assessment is also used to determine the choice of measures, a process that traditionally has been regarded as part of risk management and is conducive to the incorporation of social and policy considerations.⁷⁰ Thus, science is also indirectly used to validate a state's policy choices; for these are set under the umbrella of the appropriate level of protection, or ALOP, and are made operational by the selection measures.⁷¹

⁶⁷ See discussion in section 4.3.8 of Chapter 4 of this study.

⁶⁸ See discussion in section 4.3.9 of Chapter 4 of this study.

⁶⁹ See discussion in section 4.3.4 of Chapter 4 of this study.

⁷⁰ See discussion in section 4.3.6-4.3.9 of Chapter 4 and section 5.2 and 5.3 of Chapter 5 of this study.

⁷¹ For limitations in the setting of an ALOP see section 4.3.6 of Chapter 4 of this study.

The overall conclusion reached in Chapter 4 is that while the use of science is not in itself problematic, difficulties nevertheless arise from the expectations of this approach. Not only is it anticipated that science will provide answers at all levels of IAS regulation, but that measures based on science are in some way “better” than measures chosen for other reasons. Consequently, the SPSA has ushered in a scientific and technical approach towards quarantine regulation that in many ways provides for a more restrictive threshold than GATT.⁷² The question is what the effect of this shift in focus does to the design and implementation of measures by states to protect biodiversity from IAS. It is an issue that squarely brings the relationship of quarantine and international trade into the spotlight.

THE RELATIONSHIP OF QUARANTINE TO TRADE

In Chapter 5, I explored the link between quarantine and international trade. This discussion breaks new ground as the relationship of quarantine to trade has thus far been little explored in the literature.

Although quarantine restricts trade, quarantine is also necessary to the survival of trade. Otherwise the continual introduction and spread of pests and diseases might destroy some of the very resources to be traded.⁷³ From an environmental perspective, however, protection of biodiversity from the deleterious impacts of IAS may require strong quarantine measures that restrict trade, even where these measures do not protect traded products or commodities.⁷⁴ A clash of perspectives will occur where trade restraints, necessary for the protection of biodiversity, are nevertheless deemed to be an unwarranted restriction on international trade. Thus, environmental, trade and quarantine matters are inexorably

⁷² See section 4.3.1 and conclusion to Chapter 4 of this study.

⁷³ See discussion in section 5.1 of Chapter 5 of this study.

⁷⁴ Although the CBD Guiding Principles do not squarely address the relationship between trade and the introduction of IAS, several Guiding Principles foreshadow the implementation of preventative measures that by their nature may restrict international trade. These include Guiding principles 7, 10 and 11 that respectively deal with quarantine, and minimizing intentional and unintentional introductions.

linked. To enable quarantine regulation to protect the environment, states need to design quarantine regimes that balance the protection of biodiversity with the freedom to trade, rather than designing quarantine regimes that pit the environment against the trade regime, which is how things stand at present.

Reliance solely on principles of scientific certainty may be seen as an objective and transparent means of designing quarantine regulation, yet it may not necessarily provide a workable solution, or one that ensures measures are adequate, or even suitable. Often, for example, measures may be the result of political compromises over science; and the insistence on scientific certainty may not provide states with sufficient flexibility to take social and policy concerns into account that are important to the application of the ecosystem approach, environmental impact assessment and risk management and that consequently may be crucial to a state's appropriate level of protection.⁷⁵

In addition, the use of science has developed in parallel with the expansion of jurisdiction of the WTO, including the negotiation of the SPSA. The latter agreement is strongly premised on the right of states to enjoy a free flow of trade, unless trade restrictions can be scientifically substantiated. Cases of doubt are henceforth decided in favour of continuing trade. This is not surprising, as the SPSA is a trade treaty, and it is to be anticipated that primacy would be given to the free flow of trade. However, the influence of the WTO appears to be extending towards what commentators have described as the "chilling effect" of the WTO – a type of self-censoring in the negotiation of environmental agreements that may impact on international trade.⁷⁶ In Chapter 5, I demonstrated that this chilling effect may also be extending to domestic evaluation processes, such as risk assessment, undertaken as part of domestic quarantine systems.⁷⁷

⁷⁵ See discussion on the managed risk approach in section 5.2 of Chapter 5 of this study.

⁷⁶ See, for example, R Eckersley 'The Big Chill: The WTO and Multilateral Environmental Agreements' (2004) 4 (2) *Global Environmental Politics* 24.

⁷⁷ See discussion in section 5.4 of Chapter 5 of this study.

By promoting free trade on the basis that science can provide answers, even where there are gaps in the information base, the SPSA is shepherding the regulatory regime towards dealing with manifestations of harm rather than focusing on activities to prevent harm. In essence, the over-reliance on science, the ever-present chilling effect of the WTO and the overall push away from prevention, appears to limit the design and application of quarantine measures.⁷⁸ This also limits states in the design and implementation of quarantine measures to protect biodiversity.

PROTECTING BIODIVERSITY FROM IAS: THE ROLE OF QUARANTINE AND TRADE

In Chapter 6, I used provisions from the SPSA and the CBD Guiding Principles to illustrate how the international regime hinders states in their design and implementation of quarantine regulation to protect biodiversity and meet their obligations pursuant to Article 8(h) of the CBD.⁷⁹

Although the SPSA and the CBD Guiding Principles have some points of similarity,⁸⁰ there are also considerable variations between them.⁸¹ Matters relating to the evaluation process for introductions,⁸² the allocation of the burden of proof,⁸³ the quantification of biodiversity in economic terms,⁸⁴ the application of the precautionary principle⁸⁵ and the ecosystem approach,⁸⁶ as well as the treatment of transboundary issues,⁸⁷ reveal very different underlying policy objectives that bring the regimes into conflict.

⁷⁸ See conclusion to chapter 5 of this study.

⁷⁹ These were summarized in Table 11 of Chapter 6 of this study and form the bulk of the discussion for that Chapter.

⁸⁰ For example, both instruments use risk assessment. See discussion in section 6.1.2 of Chapter 6 of this study.

⁸¹ See discussion in sections 6.1.2, 6.1.3 and 6.2 of Chapter 6 of this study.

⁸² See discussion in sections 6.1.2 and 6.1.3 of Chapter 6 of this study.

⁸³ See discussion in section 6.2.1 of Chapter 6 of this study.

⁸⁴ See discussion in section 6.2.2 of Chapter 6 of this study.

⁸⁵ See discussion in section 6.2.3 of Chapter 6 of this study.

⁸⁶ See discussion in section 6.2.4 of Chapter 6 of this study.

⁸⁷ See discussion in section 6.2.5 of Chapter 6 of this study.

This means that the aims and objectives of quarantine regulation will differ in accordance with the regime that underpins the regulation.

A quarantine regime designed with the SPSA in mind will look quite different from one based on the CBD Guiding Principles.⁸⁸ Pursuant to the former, for example, a state will need to provide scientific evidence of the appropriateness of measures; it will need to choose the least trade restrictive measures and will take biodiversity into consideration where it can be quantified economically. It means that where states attempt to incorporate concepts, such as the precautionary principle and ecosystem approach into their quarantine regimes, those states face the possibility that their actions will breach the SPSA.⁸⁹ Indeed, this also appears to be the case with matters such as the allocation of the burden of proof and the inclusion of transboundary, social and policy concerns that are important to protecting biodiversity from IAS.⁹⁰

With respect to transboundary issues, the reach of the SPSA includes measures “to protect animal or plant life within the territory of the Member”, and measures to “prevent or limit other damage within the territory of the Member from the entry, establishment or spread of pests”.⁹¹ Although the phrase is somewhat ambiguous, it could be said that measures designed to protect the territory of another state or territory beyond national jurisdiction might automatically fall foul of the SPSA.⁹² If this is indeed the case, then it represents a significant point of conflict with Guiding Principle 4 of the CBD Guiding Principles that specifies states should cooperate to minimize the harmful impacts of IAS, even where the species is harmless in the state of origin.⁹³

⁸⁸ See discussion in section 6.1.1 of Chapter 6 of this study.

⁸⁹ See discussion in section 6.2 of Chapter 6 of this study.

⁹⁰ See discussion in section 6.2.5 of Chapter 6 of this study.

⁹¹ SPSA Annex 1 Definitions paragraph 1 (d). See discussion in section 4.3.4 of Chapter 4 and section 6.2.5 of Chapter 6 of this study.

⁹² See discussion in section 6.2.5 of Chapter 6 of this study.

⁹³ See discussion in section 6.2.5 of Chapter 6 of this study.

With respect to the inclusion of social and policy considerations, the heavy reliance on scientific evidence required by the SPSA makes it difficult for states to assimilate social and policy considerations as part of environmental impact assessment, risk management and the application of the ecosystem approach. While the Appellate Body has indicated that states enjoy the privilege of choosing from a wide range of measures,⁹⁴ it has also pointed out that in evaluating species for their invasive potential, the SPSA only recognizes the process of risk assessment.⁹⁵ By locating the choice of measures as part of risk assessment, rather than risk management, the choice of measures themselves needs to be based on the same scientific certainty as the identification of risk.⁹⁶

It is questionable whether the adoption of such a strongly science-based approach is desirable, or workable, in the context of invasive alien species. To start with, the need for very detailed and specific information in the risk assessment process may not sit well with the notion of *preventing* harm – especially where the knowledge base is incomplete, as is often the case with IAS.⁹⁷ Moreover, the need for specific and detailed information on every pest and disease does not facilitate the regulation of IAS by a pathways or vector approach.⁹⁸ Given that pathways and commodities can introduce multiple alien species,⁹⁹ the requirement of this volume of information does not facilitate strong preventative measures.

The problem is essentially one of determining how to balance quarantine restrictions against the freedom to trade. At present, states have established the WTO with a set of binding rules and an expansive

⁹⁴ *European Communities — Measures Concerning Meat and Meat Products (Hormones)* (EC – Hormones) WTO Doc WT/DS/26/AB/R WT/DS48/AB/R (report of the Appellate Body, 1998) paragraph 187. See discussion in section 6.1.3 of Chapter 6 of this study.

⁹⁵ See discussion in section 5.2.5 of Chapter 5 and section 6.1.3 of Chapter 6 of this study. The reader will recall that traditionally this is regarded as a scientific process to determine the nature and extent of a risk.

⁹⁶ See discussion in section 5.2.5 of Chapter 5 of this study.

⁹⁷ Above n 33.

⁹⁸ See discussion in section 1.2.2 of Chapter 1 of this study.

⁹⁹ Above n 25.

coverage of jurisdiction with respect to all manner of IAS.¹⁰⁰ Moreover, the WTO is supported by a strong dispute resolution mechanism.¹⁰¹ The CBD Guiding Principles, on the other hand, are not binding and the CBD itself is not endowed with the type of internal formalized dispute resolution mechanism found in the WTO. This means that matters that should be regarded as environmental concerns might instead be regarded as trade concerns and be determined in a trade arena, according to the rules of trade.¹⁰² This situation has partly developed because of the fragmented nature of international law and the difficulties inherent in large numbers of states reaching agreement on the content, jurisdiction and coverage of the regimes they create.

THE WAY FORWARD

One of the major deficiencies of the international IAS regime is the lack of binding rules dealing with the protection of biodiversity from the adverse effects of IAS. Consequently, adopting a dedicated IAS protocol to the Convention on Biological Diversity might be seen as a way of redressing this shortcoming. However, even if states were to adopt a protocol, it would not, as such, necessarily resolve the IAS dilemma. Even leaving aside technical and resource difficulties in implementing a protocol, problems deriving from lack of ratification, lack of implementation and fragmentation of jurisdiction would continue to exist.

The underlying difficulty appears to be lack of political will. States determine the relative importance of treaties they negotiate and regimes they create; states may also subordinate environmental instruments in the name of political expediency to reach a concluded agreement.¹⁰³

¹⁰⁰ As already discussed, the definition of an SPS measure is wide enough to cover all types of quarantine measures, be they implemented for trade, or environmental purposes; see discussion in section 4.3.4 of Chapter 4 and section 7.1.7 of Chapter 7 of this study.

¹⁰¹ See discussion in section 7.1.7 and the discussion surrounding footnote 38 in Chapter 7 of this study.

¹⁰² *EU-Chile Swordfish* case; see discussion in section 7.1.7 of Chapter 7 of this study.

¹⁰³ Duncan Brack and Kevin Gray *Multilateral Environmental Agreements and the WTO*

Generally speaking, international environmental instruments have different goals and outcomes from treaties that deal with international trade. Yet environmental instruments rarely address the relationship that their regimes have with international trade regimes.¹⁰⁴ Rather, environmental instruments tend to include ambiguous “savings provisions” that can be interpreted as subjugating environmental instruments to trade agreements. If a similar approach were to occur with an IAS protocol, it would entrench an IAS regime subjugated to trade and would move regulation further away from prevention.

An alternative way forward is to be found in the operations of three existing international organizations, the CBD, IPPC and OIE. In the setting of international standards, the work of the latter two can provide a bridge between the environmental and trade regimes. Standards set by the IPPC and OIE are accepted within the WTO and the input of environmental considerations from the CBD has the potential to ensure development of environmentally-inclusive standards accepted within the WTO.

This suggestion may be politically more palatable than the negotiation of a dedicated IAS protocol. Both the IPPC and OIE enjoy a wide membership,¹⁰⁵ so states already use the forums provided by these organizations to negotiate and determine standards. It means that states are likely to be more receptive to the guidance and influence of the CBD, IPPC and OIE, in the context of forums to set international standards, rather than negotiating a fresh protocol. Moreover, the CBD secretariat

at 25 Royal Institute of International Affairs Sustainable Development Programme Report (2003) 25.

¹⁰⁴ Ibid. A notable exceptions to this trend includes the 1973 Convention on International Trade in Endangered Species of Wild Fauna and Flora, Articles VIII Articles III, IV and V regulate trade in listed species. See also Article II(1) that refers to species listed in appendix I as those species that are in danger of extinction and which therefore must be subject to ‘particularly strict regulation in order not to endanger further their survival’. Another exception is found in the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer (Montreal Protocol) to the Vienna Convention for the Protection of the Ozone Layer. Article 4 of the Protocol deals with control of trade with non-parties while Article 4A deals with control of trade between parties to the protocol.

¹⁰⁵ As at November 2007 the IPPC has 166 members and the OIE has 173 members.

has commenced collaborating with the IPPC.¹⁰⁶ In similarity to the IPPC and OIE, the CBD also enjoys a wide membership,¹⁰⁷ providing a further reason for its input to be acceptable to states.

Standards, however, also need to be translated into measures and at present states are hampered in their efforts by lack of capacity and lack of resources. In Chapter 2, I demonstrated that only a small percentage of states¹⁰⁸ have developed the capacity to use risk assessment to address the threats posed by invasive alien species to biodiversity. More than one-third of states¹⁰⁹ have only undertaken activities with respect to species of major concern.

Capacity building is needed to strengthen and develop evaluation processes that support quarantine regimes and will be of most importance to developing states. Short-term, capacity building can comprise technology transfer. However, capacity building also involves developing the ability to design and implement long-term policy goals and objectives.¹¹⁰ Therefore, states need to ensure allocation of sufficient resources to realize long-term goals and targets. One telling point to emerge from the third CBD national reports is that of 94 states,¹¹¹ only two¹¹² thought they had adequate resources to prevent introductions and control IAS. Fifty three states regard the lack of financial, human and technical resources as representing a high challenge to implementing effective IAS regulation.¹¹³ It is also noteworthy that both developed and

¹⁰⁶ See discussion in section 7.2, footnote 116 and surrounding text in Chapter 7 of this study.

¹⁰⁷ As at November 2007 the CBD has 190 members.

¹⁰⁸ See discussion surrounding Table 5 in Section 2.4 of Chapter 2 of this study that reveals only 13.4% of states have implemented comprehensive measures.

¹⁰⁹ See discussion surrounding Table 5 in Section 2.4 of Chapter 2 of this study that reveals 67.4% of states have implemented measures for species of major concern.

¹¹⁰ See discussion in section 7.3 of Chapter 7 of this study.

¹¹¹ See discussion surrounding Table 8, with respect to question 'M' of the *Third National Report* in Section 2.4 of Chapter 2 of this study. 114 states filed national reports. Of those 20 did not answer question M, or prepared their reports in a non-standard format, so it was not possible to obtain this information.

¹¹² The two states are the Netherlands and Singapore.

¹¹³ See discussion surrounding Table 8 with respect to question 'M' of the *Third National Report* in Section 2.4 of Chapter 2 of this study

developing states regard lack of resources as a drawback.¹¹⁴ Yet problems with respect to lack of resources and funding are likely to be compounded in the case of developing states.

A proposed suggestion is the implementation of a levy system that raises funds by imposing a fee on the trade in alien species.¹¹⁵ This will allow developed states to generate funds for their own regimes and also to assist developing states in capacity building. In this latter respect, a proposal was put forward for voluntary funding using the Global Environment Facility (GEF).¹¹⁶ The voluntary nature of contributions could provide an acceptable means of raising funds for capacity building in developing states. The success of such this proposal, however, depends on whether states are willing to make contributions to GEF. As an alternative, developed states can provide aid directly to developing states.

THE FINAL ANALYSIS

While objectives of cooperation and harmonization across the regimes are possible to accomplish, they require decision and action by states. Problems exist at a number of levels, making it increasingly formidable for states to design and implement effective quarantine regulation and making it more difficult to find an acceptable and workable solution to the problem of IAS.

At the first level, difficulties arise from the individual regimes themselves. In Chapter 2, I showed that the international environmental regime lacks coordination and binding guidelines. This is reflected in state practice that does not adequately target those IAS that threaten biodiversity. In Chapter 3, I demonstrated that while quarantine regulation has the potential to prevent the entry and establishment of IAS, this potential is not being

¹¹⁴ See footnote 139 in section 7.3 of Chapter 7 for discussion on identifying developing states.

¹¹⁵ See discussion in section 7.4.1 of Chapter 7 of this study.

¹¹⁶ See discussion in section 7.4.1 of Chapter 7 of this study.

fulfilled, as the focus of quarantine regulation is still strongly targeted towards agricultural and farming interests. Although the case study of Australia showed that it is possible to design a quarantine regime that targets IAS, state practice revealed that the potential of quarantine is not being fulfilled. In Chapters 3 and 4, I showed that the WTO is premised on the free flow of trade unless there is scientific evidence sufficient to justify trade restraints. These developments collectively indicate that although the international IAS regime should be based on prevention, in fact, it is not.

The second level of problems stem from the clash of obligations found in the different regimes. In Chapter 5, I showed how the international trade law regime limits the operation of quarantine and in Chapter 6, I showed how these limitations also hinder states in constructing effective IAS regimes to protect biodiversity. These limitations are also at variance with Article 8(h) of the CBD and the recommendations found in the CBD Guiding Principles. However, even if states were to implement Article 8(h) of the CBD by using the Guiding Principles, conflicting obligations under the WTO would lead to the third layer of problems, which is the clash of jurisdiction of the regimes themselves.

The character of the IAS problem is a global one, yet the prevailing mechanisms still lack a global solution. This omission means that IAS measures are largely implemented in a piecemeal manner, with the focus currently centering on the protection of farming and agriculture.

In the final analysis, this study is all about achieving international cooperation to enhance the operation of domestic quarantine regimes. International cooperation can foster reforms that guide states towards achieving better IAS regulation. It can also assist with capacity building, resourcing and funding to support domestic quarantine regimes. Thus international cooperation will be the linchpin in the evolution of quarantine towards a system of regulation that prevents the entry and establishment of alien species that threaten biodiversity. If this

cooperation is forthcoming, quarantine regulation can help resolve the problem of invasive alien species.

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